Teaching and Teacher Education 132 (2023) 104209

Contents lists available at ScienceDirect

Teaching and Teacher Education

journal homepage: www.elsevier.com/locate/tate

Research paper

Special educators' mental health and burnout: A comparison of general and teacher specific risk factors

John McGrew [a], Lisa Ruble [b, *], Christopher J. Cormier [c], David Dueber [d]

[a] Indiana University-Purdue University Indianapolis, United States
[b] Ball State University, United States
[c] Loyola Marymount University, United States
[d] University of Toledo, United States

HIGHLIGHTS

F0B7 Nearly 40% of special educators' met criteria for one or both mental illness diagnoses with rates 5 to 12 times higher than a normative adult sample.
F0B7 Occupational and school variables were better predictors of burnout for special educators', although psychosocial variables added valuable explanatory variance.

ARTICLE INFO

Article history:
Received 12 December 2022
Received in revised form
26 April 2023
Accepted 2 June 2023
Available online xxx

Keywords:
Teachers mental health
Special education
Teacher burnout
Teacher stress
Special education teachers

ABSTRACT

The cross-sectional study ascertained prevalence rates of stress-related outcomes of 490 special educators (i.e., major depressive disorder, generalized anxiety disorder) and examined the relative importance of variables hypothesized as predictive of stress outcomes (i.e., psychosocial model of stress, school/teacher variables). Over 60% scored at the dangerous level in emotional exhaustion (i.e., burnout). Nearly 40% met criteria for one or both mental illness diagnoses with rates 5 to 12 times higher than a normative adult sample. Psychosocial variables were the best predictors of mental illness outcomes. Occupational and school variables were better predictors of burnout, although psychosocial variables added valuable explanatory variance.

There is a crisis facing American schools. Teachers are exhausted, overworked, and underappreciated and as a consequence, many are contemplating or choosing to leave the profession. Burnout, stress and their effects are a primary cause of teacher attrition (Van Droogenbroeck & Spruyt, 2015). Maslach and Leiter (2016) have defined burnout as a psychological syndrome emerging as a prolonged response to chronic interpersonal stressors on the job. High levels of occupational stress can lead to decreased job satisfaction, mental health problems, and may result in burnout and decisions to leave the profession (Brackett et al., 2010; Wang et al., 2015). Maslach et al. (1986) operationalized burnout as a three-dimensional construct characterized by emotional exhaustion (EE), depersonalization (DP), and reduced personal accomplishment (PA). EE refers to feelings of being emotionally overextended; and DP refers to maladaptive and cynical attitudes and feelings towards others. PA refers to the negative evaluation of oneself in relation to one's job. A recent survey conducted by the National Education Association (2022) of 3621 educators indicated that 90% reported that personal feelings of burnout were a very serious or somewhat serious issue. The pandemic was a large contributor to these feelings; 91% reported stress from the pandemic as a very serious or somewhat serious issue. However, other factors impacting potential attrition and viewed as somewhat serious or very serious included unfilled job openings (80%), low pay (78%), student behavioral issues (76%), and lack of respect from parents and public (76%). Together these trends are likely to exacerbate the existing shortage of trained teachers, with more than half (55%) stating they were more likely to leave the profession earlier than they had planned, almost double the number reporting they might leave early in July of 2020 (28%).

* Corresponding author. Department of Special Education, Teachers College, Muncie, IN, 46306, United States.
E-mail address: laruble@bsu.edu (L. Ruble).

https://doi.org/10.1016/j.tate.2023.104209
0742-051X/

These potential future failures in retention are particularly concerning given the fact that there already exists a substantial shortage estimated to equal 110,000 teachers. As García and Weiss (2019) note in their aptly titled report from the Economic Policy Institute, "The Teacher Shortage Is Real, Large and Growing, and Worse than We Thought." Moreover, this shortage is exacerbated by the fact that not all current teachers meet the education, experience, and certification requirements needed to be a highly qualified teacher. For example, 8.8 percent of teachers do not have a standard state or advanced professional certificate, and nearly a third of teachers (31.5 percent) have an education background different than their subject assignment. Given the importance of teaching as a profession in creating a well-educated citizenry, it is critical to better understand the intrapersonal and situational factors that might underlie these worrying statistics.

Loss of trained teachers is costly both financially and in terms of the quality of education that is delivered. Filling a vacancy cost $21,000 on average (Carver-Thomas & Darling-Hammond, 2017), and Carroll (2007) estimated that the total annual cost of turnover (e.g., selection, recruitment, training), to the educational system was $7.3 billion per year. Teacher turnover also impacts organizational stability and institutional memory and reduces availability of experienced mentors leading to a negative impact on teaching quality and student educational outcomes (Carver-Thomas & Darling-Hammond, 2019; McLeskey & Billingsley, 2008).

Given that a variety of organizational and intrapersonal factors have been proposed as critical to understanding attrition (e.g., burnout, stress, low pay, etc.; National Education Association, 2022), burnout has been consistently identified as an important factor underlying attrition (Goddard & Goddard, 2006). Educators, in general, encounter occupational stressors specific to their profession such as managing challenging students, dealing with pressures from caregivers, and maintaining the overall classroom environment (Sharp & Jennings, 2015). However, special education (SPED) teachers have been in short supply (Billingsley & Bettini, 2019) and are especially prone to attrition. According to the U.S. Department of Education (U.S. Department of Education Office of Postsecondary Education, 2022), 96% of states and the District of Columbia report a shortage of SPED teachers. While about half of public schools report teaching vacancies across the United States, of these, SPEDs were identified as having the highest vacancies (National Center for Education Statistics, 2022). Unlike general education teachers, SPED teachers have roles that have expanded and are less defined (Bettini et al., 2017). Shepherd et al. (2016) summarize the increased complexity and lack of role clarity that have resulted from contextual factors such as changes in policy. SPED teachers are often expected to support students across the educational context, providing both preventive services and specialized instruction (McCray et al., 2014). Further, they are responsible for the development and implementation of Individual Education Programs that account for each student's strengths and challenges through the development of accommodations and modifications across an array of content areas such as academic (e.g., reading, writing), social emotional (e.g., social skills), and adaptive (e.g., self-help) skills. Their work also requires collaboration with caregivers, general education teachers, paraprofessionals, and ancillary service providers (speech and language therapists). Lastly, SPED teachers experience high administrative and supervisory responsibilities as a result.

For SPED teachers, comprehensive reviews are available that identify causes of burnout (Billingsley & Bettini, 2019; Brunsting et al., 2023; Park & Shin, 2020). SPED teachers of students who (a) are older and have behavioral disorders (Carlson & Thompson, 1995; Frank & McKenzie, 1993; Nichols & Sosnowsky, 2002; Singer, 1993) and (b) from high-poverty, high-minority, or urban schools report higher burnout (Abel & Sewell, 1999; Carver-Thomas & Darling-Hammond, 2019). Also, teachers who experience poor working conditions such as limited opportunity for professional growth and decision-making, lack role clarity, have high job demands, and experience low administrative and collegial support report higher burnout (Ansley et al., 2019; Bettini et al., 2020; Cancio et al., 2018; Liu & Ramsey, 2008; Tyler & Brunner, 2014). Further inexperienced, minority, and male SPED teachers report higher burnout (Bettini et al., 2017; Billingsley, 2004; Zabel & Zabel, 2002).

One factor that has received relatively little investigation, however, is teacher mental health, even though there are good reasons to examine stress, burnout and mental illness together given their strong conceptual and empirical overlap. A popular model for understanding the etiology of mental illness, for example, is the diathesis-stress model, where vulnerability to a particular disorder (i.e., the diathesis) combined with high levels of stress lead to manifestation of a specific disorder. That is, both burnout and mental health are thought to be related to high levels of stress. In fact, studies have shown strong correlations between burnout and mental illness, although the degree of association depends on the measures used. For example, Schonfeld and Bianchi (2016) recently reported a correlation of 0.77 between depression as measured by the PHQ-9 and burnout as measured using the Shiron-Melamed Burnout Measure (SMBM; Shiron & Melamed, 2006). Bianchi et al. (2018a) have gone so far as to suggest that burnout is actually a form of depression, based on both strong empirical associations and shared etiologic factors.

In effect, unresolvable stress, which is thought to play a causative role in the development of burnout, has been shown to be at the center of the etiology of depression. As emphasized by Sapolsky (2004), 'it is impossible to understand either the biology or psychology of major depressions without recognizing the critical role played in the disease by stress' (p. 271) and 'genes that predispose to depression only do so in a stressful environment (p. 345).

1. Understanding the relationship between stress, burnout and mental health: Taylor and Aspinwall psychosocial stress model

A helpful model for understanding the impact of stress on psychosocial outcomes, such as burnout and mental health, was suggested by Taylor and Aspinwall (1996; see Fig. 1). In this model, stress and its effects on health and psychological well-being are viewed in a multilevel fashion with proximal processes, such as stress appraisal, coping styles and diatheses (i.e., vulnerabilities), nested within more distal social and personality resource factors. For example, referring to the figure and using depression as the psychosocial outcome, increased depression has been consistently linked to external resources, such as lower socioeconomic status (Yu & Williams, 1999), personal resources, such as decreased optimism (Schueller & Seligman, 2008) or higher levels of neuroticism (Lahey, 2009), stress appraisal style, in particular viewing stressors as threats (Park et al., 2006), low levels of social support, both in terms of decreased satisfaction and amount of social support (e.g., Holahan et al., 1995; Park et al., 2006), and coping style, such as decreased active coping (Holahan et al., 1995) or increased avoidance coping (Livneh, 1999; Livneh & Antonak, 1997). We intend to apply and test this model in understanding burnout, depression, and anxiety in special education teachers.

1.1. Teacher mental health

A variety of papers have examined stress, distress, burnout, or mental health of teachers when compared to other occupations.

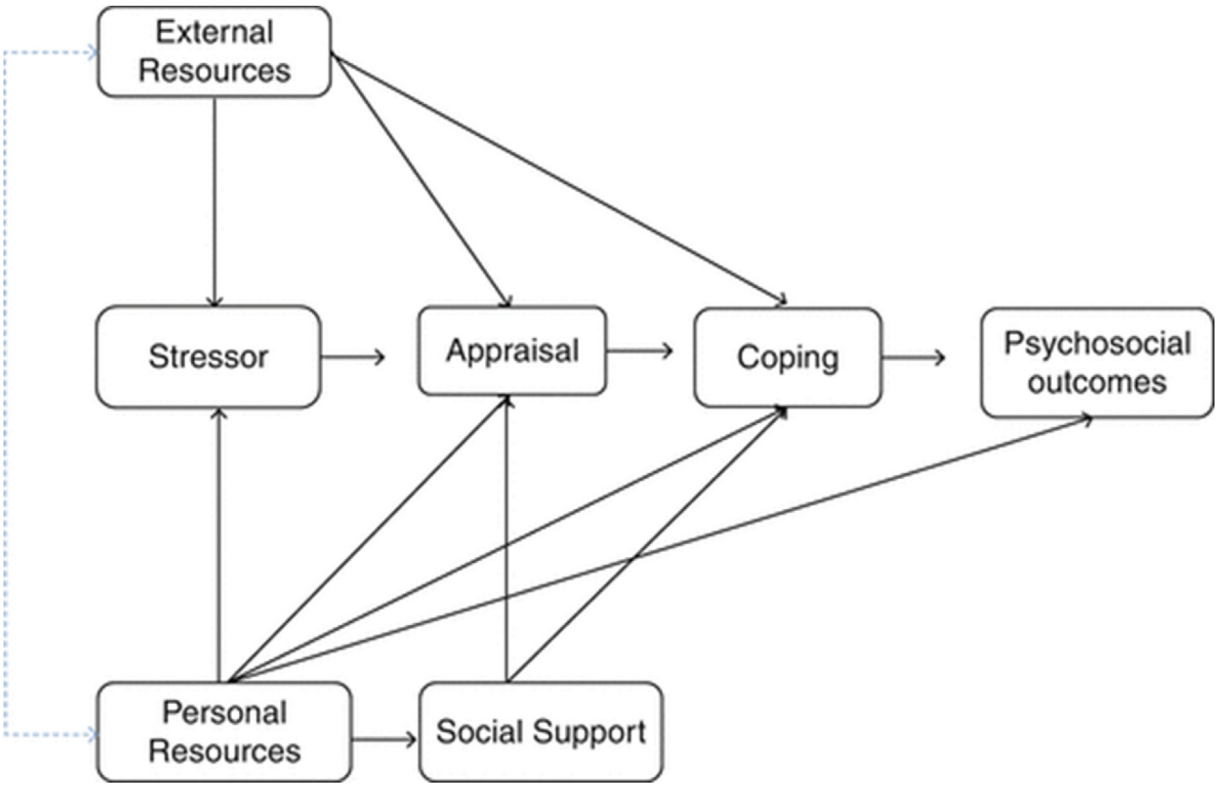

Fig. 1. Multilevel Model of Stressors, Resources, and Psychosocial Outcome by Taylor and Aspinwall (1996) (used by permission from the publisher).

Van Droogenbroeck and Spruyt (2015) published an exhaustive review of papers published since 1980 and identified 28 that met their criteria. They concluded that there was insufficient evidence that teachers have worse mental health than other occupations. However, there were a variety of methodological problems with the extant literature, limiting confidence in their conclusions. One critical problem was a marked lack of consistency across studies on how to define and measure mental illness. For example, six studies arguably did not assess mental illness at all, instead assessing burnout, stress or distress. Similarly, almost half of the studies (12 of 28) were from the United Kingdom Labor Force Survey which used as their measure of mental illness a single item that combined symptoms of stress, anxiety and depression. In fact, only four of the 28 studies used structured interviews or survey instruments that are well validated for the identification of mental illness (e.g., Diagnostic Interview Schedule; Robins et al., 1982). Another common problem was that half of the studies (14 of 28) failed to specify the type of teacher being studied (e.g., primary school, secondary school, college professors, special educators), so that the vast majority of the findings pertained to teachers generally. Of particular importance to this study, which focuses on special educators, only four of the studies explicitly included SPED teachers as a separate category and none focused solely on SPED teachers.

Although, as mentioned above, Van Droogenbroeck and Spruyt (2015) identified four studies that specifically included SPED teachers (i.e., Eaton et al., 1990; Grosch & Murphy, 1998; Kovess-Masfety et al., 2006; Wieclaw et al., 2005), three failed to report results separately for SPED, instead combining SPED with other teachers or counselors. Only Grosch and Murphy (1998) separated SPED teachers when reporting their results. They examined occupational differences in depression and global health in 239 occupations using data from a sample of 8486 employed persons who completed the 1987 National Medical Expenditure Survey, after adjusting scores for age, race, sex, tenure, and hours worked per week. Interestingly, special educators were one of the ten occupations with the lowest z-scores on depression (i.e., one of the least depressed groups). However, the SPED sample was very small (n = 20), which limits confidence in the findings.

Van Droogenbroeck and Spruyt (2015) tried to address many of the methodological problems identified in their review of the literature by examining teacher mental health using data from 3 waves of the Belgian Health Interview Survey (BHIS). The BHIS is a national survey that interviews a representative sample of the Belgian population comprising at least 10,000 individuals every 3–5 years. Mental health was determined from well-validated scales, i.e., the 12-item General Health Questionnaire (Goldberg & Williams, 1988) and diagnostic subscales of the Symptom Checklist −90 (Derogatis, 1977). Different types of teachers were compared against individuals from 31 other occupations. Results showed that teachers did not have worse mental health than people in other occupations. They also did not find any difference in mental illness between Primary, Secondary, Higher Education and SPED teachers, however their sample of special educators was very small (n = 42), limiting their ability to detect differences.

Two more recent articles also examined mental health among teachers, including special educators, and used validated instruments (Holt et al., 2020) to assess depression (e.g., Center for Epidemiological Studies Depression Scale; Eaton et al., 2004) or inpatient and outpatient registries (Johansson et al., 2022) to

confirm that individuals had been diagnosed with and treated for depression. Holt et al. (2020) used nationally representative samples from the 1979 and 1997 cohorts of the U.S. National Longitudinal Survey of Youth (NLSY). In the 1979 cohort, women teachers reported better mental health than their non-teaching peers, however, in the 1997 cohort teachers fared no better (or worse) than their non-teaching professional peers. Overall, they concluded that teacher mental health outcomes are as good or better than their peers in other professions. However, they did not report results for SPED teachers separately. Johansson et al. (2022) used population data from the Swedish Work, Illness, and labor market Participation (SWIP) registry to examine depression among teachers. Type of occupation was defined by the Swedish version of the International Standard Classification of Occupations (ISCO) codes as recorded in the SWIP Registry. Depression was identified by a diagnosis of depression recorded in the Swedish National in- or out-patient registries. For women, teachers had a decreased risk of developing depression compared to other occupations and this was especially true for primary and secondary teachers, but this association was not significant after adjusting for covariates such as education. For men, teachers had an increased risk of depression both before and after adjustment of covariates, and primary and special educators were at increased risk compared to university teachers.

2. Summary

As reviewed above, there have been several studies of mental illness in teachers. However, half, or more of the studies purportedly examining "mental illness" failed to do so, instead examining related constructs such as stress, burnout, or distress. Moreover, even those studies that did examine mental health often used measures that were of questionable or unknown validity (e.g., single item measures). Given that so few studies could be reliably categorized as examining mental illness, the results are difficult to summarize. In general, however, we agree with the conclusions of Van Droogenbroeck and Spruyt (2015) that, currently, there is insufficient evidence that teachers have worse mental health than other occupations.

Additional methodological problems further limit our confidence in the findings. In addition to the inconsistency with measures of mental illness, another problem was the general failure to differentiate teacher type when examining mental health (e.g., primary, secondary, special educator). For example, we are particularly interested in the negative impacts of teaching demands on special educators, yet could find only three studies that actually reported results separately for SPED teachers (Grosch & Murphy, 1998; Johansson et al., 2022; Van Droogenbroeck & Spruyt, 2015) and none that focused exclusively on SPED teachers although there is a particular shortage of SPED teachers and SPED teachers may be at highest risk for increased levels of burnout (Billingsley & Bettini, 2019). Another limitation was the failure to utilize a conceptual framework to examine and explain the risk for mental illness. Although there have been cross-occupational studies examining the utility of models deriving chiefly from the organizational psychology literature, e.g., the impact of job and organizational variables on mental illness, such as Karasek's (1979) job strain model or the effort-reward imbalance model (Stansfeld & Candy, 2006), these models have been tested for occupations in general (e.g., Stansfeld et al., 2013), not for teachers specifically. A few studies adjusted for covariates such as gender, race, education, or age, however, to our knowledge, none have adopted and tested a model specifically focused on understanding the factors that have been proposed as particularly important to vulnerability to mental illness generally, such as the psychosocial model of stress reviewed earlier (Taylor & Aspinwall, 1996).

2.1. Research questions

We had three research questions. First, we wanted to know the prevalence of, and correlation between, three psychosocial stress outcomes in special education teachers (i.e., burnout, depression, and anxiety). We picked depression and anxiety because they are the most common mental illnesses (Kessler & Zhao, 2010) and have available short, well validated measures that can both provide an overall severity score and a diagnosis. We also included a measure of burnout because of its association with teacher attrition (Brunsting et al., 2023). Second, we wanted to test the predictive validity of the psychosocial model of stress in accounting for variance in mental health (i.e., depression and anxiety) and burnout. Third, we wanted to examine the incremental variance, i.e., the additional explanatory power, of adding teacher/school specific covariates to the psychosocial model of stress in accounting for variance in the stress outcome measures. Additionally, we have an exploratory aim to test for potential differences in the answers to the first three questions on the basis of gender and race. For example, women in the general population, regardless of race, tend to have higher prevalence rates and Blacks, regardless of gender, tend to have lower prevalence rates of both mood and anxiety disorders (Kessler et al., 2005).

3. Method

Participants were special education teachers at public or charter schools in the U.S.A. total of 490 teachers participated in the survey at Time 1 (89.2% female, 10.6% male, 0.2% no response). Respondents were primarily female (89.2%) and white (87.6%); 9.6% of participants were Black or African American, 6.3% Latino/a, and smaller numbers of Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, and Other. Teacher mean age was 42.94 years old (SD = 9.28). Years of experience ranged from 0 to 44 with a mean of 13.72 (SD = 9.29). A majority of respondents taught at Title 1 schools (65.9%). Most respondents taught in schools in an urban environment (52.2%), but many teachers were in suburban (34.7%) or rural (13.1%) environments. Teachers were mostly commonly situated in elementary school (38.2%), but many teachers were in middle schools (21.4%), high schools (23.7%), or taught multiple grade categories (16.7%). For classroom type: 18.7% taught in resource only (combination of self-contained and inclusion), 11.6% inclusion only (full time in general education classroom), 3.5% specialty school, 30.3% self-contained classroom only, 35.9% multiple contexts.

A recruitment flier was distributed to personal and professional contacts, social media, school districts, and professional teacher organizations across the U.S. Participants completed surveys at three timepoints: Time 1 (fall), Time 2 (early spring), and Time 3 (near end of school year). The current study is restricted to the cross-sectional sample at Time 1. Participants completed three measures assessing negative responses to stress (burnout, major depression, generalized anxiety disorder), predictive measures derived from the psychosocial stress model (Taylor & Aspinwall, 1996) (e.g., SES, social support, personality, coping, stress appraisal, subjective stress) and covariates specific to school climate (e.g., morale, supportive leadership) and teacher variables (e.g., teacher stress, work engagement, hours working, years teaching). The survey was self-report and administered using Qualtrics®. All procedures were approved by the appropriate institutional review boards.

4. Measures

4.1. Psychosocial outcomes

Burnout was assessed with the Maslach Burnout Inventory, Educator's Survey (MBI-ES; Maslach et al., 1986). The MBI-ES consists of three subscales: (a) emotional exhaustion (9 items), (b) depersonalization (5 items), and (c) personal accomplishment (8 items). Participants rated how frequently they feel burned out at work on a 7-point Likert scale (0 = never to 6 = every day). Items are averaged to produce overall subscale scores. Higher scores on the emotional exhaustion and depersonalization subscales and lower scores on the personal accomplishment subscale indicate higher levels of burnout. Lanners (2020) offered cutoff scores for the three different areas assessed by the MBI. For emotional exhaustion, scores less than 18 are considered "correct" and not indicative of exhaustion; scores between 18 and 29 are considered at risk; and scores 30 or greater are at a dangerous level. For depersonalization, scores less than 6 are correct; scores between 6 and 11 are at risk; and scores 12 or greater are at a dangerous level. For personal achievement, scores greater than 40 are correct; scores between 34 and 39 are at risk; and scores of 33 or less are at a dangerous level. Sample internal consistency and composite reliability at Time 1 were Cronbach's $\alpha = 0.90$ and McDonald's $\omega = 0.90$ for emotional exhaustion, $\alpha = 0.67$ and $\omega = 0.68$ for depersonalization, and $\alpha = 0.73$ and $\omega = 0.73$ for personal accomplishment.

Major depressive disorder (MDD) diagnosis and severity was assessed with the 9-item Patient Health Questionnaire (PHQ-9) self-report screening tool (Kroenke et al., 2001). Items correspond to the nine DSM-IV criteria (American Psychiatric Association, 2000) for MDD and are scored as 0 (not at all) to 3 (nearly every day). Item total scores indicate MDD severity (0–36). Total scores 11 or higher have excellent sensitivity (0.89) and specificity (0.89) in diagnosing MDD. Sample internal consistency and composite reliability were $\alpha = 0.90$ and $\omega = 0.91$.

Generalized anxiety disorder (GAD) diagnosis and severity was assessed with the 7-item GAD Scale (GAD-7; Spitzer et al., 2006) self-report screening tool. Items use a 4-point scale (0 = not at all; 3 = nearly every day) to assess symptom frequency and are summed to indicate symptom severity (0–28). Cut-off scores of 11 or greater indicate a diagnosis of GAD with good sensitivity (0.74) and specificity (0.83) (Plummer et al., 2016). Sample internal consistency and composite reliability were $\alpha = 0.91$ and $\omega = 0.91$.

4.2. Psychosocial stress model variables

Social Support. The 12-item Multidimensional Scale of Social Support (MSPSS; Zimet et al., 1988; Zimet et al., 1990) assessed social support from three sources: family, friends, and significant other. A 4-item subscale was created for each source. Items were rated on a 7-point Likert scale (1 = very strongly disagree to 7 = very strongly agree) and averaged to produce subscale scores. Higher scores indicate greater perceived social support. Sample internal consistency and composite reliability for the total scale were $\alpha = 0.93$ and $\omega = 0.93$.

Perceived Stress. The brief 4-item version of the Perceived Stress Scale was used (Cohen et al., 1983). Items were rated on a 5-point Likert scale (0 = never, 4 = very often) and summed to create a total score. In the normative sample the internal consistency was 0.72. Internal consistency and composite reliability of the sample were $\alpha = 0.78$ and $\omega = 0.78$.

Stress Appraisal Measure (SAM). The SAM is a 28-item self-reported measure of participants' appraisals of a stressful situation (Peacock & Wong, 1990). The SAM consists of seven 4-item subscales: (a) threat, which measures an individual's perception that the event will cause harm and/or result in a loss, (b) challenge, which measures an individual's perception that the event will result in personal growth, (c) centrality, (d) controllable by self, (e) controllable by others, (f) uncontrollable by anyone, and (g) overall stress index. For the current study, only the threat and challenge subscales were used. Items were rated on a five-point Likert scale (1 = not at all to 5 = extremely). Participants were asked to self-report their appraisal as it related to their teaching job. Higher scores indicated participants appraised their job as consistent with the subscale construct. In the pilot study, internal consistencies (α) ranged from 0.65 to 0.75 for the threat subscale and 0.66-0.79 for the challenge subscale (Peacock & Wong, 1990). The internal consistency and composite reliability of the sample were $\alpha = 0.82$ and $\omega = 0.83$ for the threat subscale and $\alpha = 0.86$ and $\omega = 0.86$ for the challenge subscale.

Coping. The 28-item Brief COPE (Carver, 1997) assesses how frequently an individual engages in certain coping skills. Individuals self-report how often they engage in different coping strategies on a 4-point Likert response scale (1 = I haven't been doing this at all to 4 = I've been doing this a lot). The Brief COPE consists of three subscales: problem focused coping (6 items), emotion focused coping (10 items), and passive avoidance coping (12 items). Items on each subscale are averaged to create overall scores. Higher scores indicate more frequent engagement in the coping method. Sample internal consistency and composite reliability were $\alpha = 0.79$ and $\omega = 0.79$ for the problem-focused subscale, $\alpha = 0.71$ and $\omega = 0.71$ for the emotion focused subscale, and $\alpha = 0.74$ and $\omega = 0.72$ for the passive avoidance subscale.

Coping Self-Efficacy. The 13-item Coping Self Efficacy Scale (CSES; Chesney et al., 2006) assesses an individual's beliefs in their ability to cope with challenges. Individuals self-report their ability to cope on an 11-point Likert scale (0 = cannot do at all, 5 = moderately certain can do, and 10 = certain can do). The original CSES consisted of 26 items; however, we only included items retained in the confirmatory factor analysis (Chesney et al., 2006). Items were averaged to produce an overall score. Higher scores indicated greater coping self-efficacy. Sample internal consistency and composite reliability wer $\alpha = 0.93$ and $\omega = 0.94$.

Optimism. The 10-item Life Orientation Test-Revised (LOT-R; Scheier et al., 1994) was utilized to measure optimism. The LOT-R consists of 3 statements described in a positive manner, 3 statements described in a negative manner, and 4 non-scored items. Participants indicate their agreement with statements using a 5-point Likert scale, ranging from strongly agree to strongly disagree. Higher scores indicate greater optimism. Sample internal consistency and composite reliability were $\alpha = 0.86$ and $\omega = 0.86$.

Neuroticism. The 12-item Neuroticism subscale of the Eysenck Personality Questionnaire Revised Short Scale (Eysenck et al., 1985) was used to measure neuroticism. Items were rated as yes or no, recoded to ensure consistent scoring direction, and summed to create a neuroticism score. Higher scores indicate greater neuroticism. Internal consistency of the neuroticism subscale was good in prior studies with a large normative population ($\alpha = 0.84$ males, $\alpha = 0.80$ females; Eysenck et al., 1985). The internal consistency and composite reliability for neuroticism in the current sample were $\alpha = 0.83$ and $\omega = 0.83$.

4.3. School/teacher variables

Demographics. The following school demographics were collected: Title 1 status, census classification (e.g., urban, rural), school student census. For participants, we collected both general (e.g., age, education, gender, race, ethnicity) and teaching-specific (e.g., years teaching, certifications) demographic information.

School climate was assessed with the 57-item School

Organizational Health Questionnaire (SOHQ; Hart et al., 2000) across 12 domains: morale (5 items), appraisal and recognition (6 items), curriculum coordination (4 items), effective discipline policy (4 items), excessive work demands (4 items), goal congruence (5 items), participative decision-making (4 items), professional growth (5 items), professional interactions (7 items), role clarity (4 items), student orientation (4 items), and supportive leadership (5 items). Items were rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Subscales were calculated by computing item mean scores. Higher scores indicate a more positive school climate for all subscales except the excessive work demands subscale. Sample internal consistency and composite reliability ranged from $\alpha = 0.80$ to $\alpha = 0.93$ and $\omega = 0.81$ to $\omega = 0.93$ across subscales.

Teacher Work Engagement. A 6-item abridged version of the Utrecht Work Engagement Scale (UWES) was used to assess work engagement (Schaufeli et al., 2006, 2019) across two domains: vigor and dedication. Scale items are rated using a 6-point Likert scale (0 = never to 5 = almost always). Since Schaufeli et al. (2006) recommended using total scores for the shortened version given the high correlations between domains, items were averaged to produce an overall work engagement score, with higher scores indicating greater work engagement. Internal consistency and composite reliability for the sample were $\alpha = 0.90$ and $\omega = 0.89$.

Teacher Specific Stress (Bernard, 2016) was assessed using seven items corresponding to sources of stress: (a) classroom management; (b) poor student academic performance; (c) lack of student motivation/interest; (d) helping students with special needs; (e) time and workload pressures, (f) problems with school administration; and (g) changes. Items were rated on a 5-point Likert scale (1 = not stressful to 5 = extremely stressful) and summed to create overall scores. Higher scores indicated greater stress. Scale internal consistency and composite reliability for the current sample were $\alpha = 0.66$ and $\omega = 0.63$.

4.4. Data analysis

All analyses were performed in the R statistical computing environment (R Core Team, 2022). For our first question examining the prevalence of and relationship amongst burnout, depression, and anxiety, we computed descriptive statistics for PHQ-9, GAD-7, and MBI subscales. Furthermore, we computed a correlation matrix for these five variables, using the Benjamini-Hochberg method for correcting false discovery rate for multiple testing.

For the second and third research questions, we conducted a series of correlational and regression analyses for each psychosocial stress outcome. First, raw correlations were computed between each outcome and various background factors, psychosocial factors, school factors, and teacher factors. For grouping variables (e.g., Race, School Type), the reported correlation is the square root of η^2 from an analysis of variance. Significance tests for these correlations were corrected for multiplicity using the Benjamini-Hochberg technique. Next, we conducted a hierarchical regression analysis predicting each psychosocial stress outcome beginning with background and psychosocial factors then sequentially adding the school factors followed by the teacher factors. For each step, a change in R^2 was computed and a likelihood ratio test used to determine whether the change in R^2 was significant.

The impact of grouping predictor variables was assessed using relative weights. Relative weights are a partitioning of R^2 in a multiple regression model across predictors according to each predictor's contribution to the outcome variable (Johnson, 2004); for grouping variables, the total relative weight was computed as the sum of the relative weights for all the dummy variables belonging to that grouping variable. Significance tests for relative weights were performed using parametric bootstrapping (Nimon & Oswald, 2013) using 1000 bootstrap samples.

Within each model, the relative contribution of each type of predictor (background, psychosocial, school, teacher) was computed by adding up all the relative weights for each variable of that type.

Ideally, we would address the exploratory goal of investigating differences in the relationships between predictors and outcomes across races and across genders using a moderation analysis. However, the extreme imbalance in our sample towards White females prohibits such an approach, as there are not enough Black or male participants to support the analysis. Instead, a multigroup analytic approach was utilized. Each analysis mode was refit as a multigroup model in two ways: one in which all model parameters were the same in both groups and the other in which all model parameters were allowed to vary across groups. An omnibus likelihood ratio test was performed to determine whether parameters varied across groups. In the event a significant difference was found, parameters with descriptively large (>.100) differences across groups were identified. No claims regarding statistical significance are made about individual parameters varying across groups.

Since participants were only required to respond to background questions and Maslach Burnout Inventory items to be included in the study, significant missingness was found in other variables. Missingness in PHQ-9 was 5% and missingness in GAD-7 was 6%. Missingness in psychosocial factors, school factors and teacher factors ranged from 8% to 25%. Multiple imputation for missing variables was performed using the mice package (van Buuren & Groothuis-Oudshoorn, 2011) for R and change scores were computed after imputation; 100 imputed data sets were computed and analyzed. The bootstrapping for significance testing of relative weights was conducted by drawing 1000 bootstrap samples from each of the 100 imputed data sets (MI Boot; Schomaker & Heumann, 2018).

5. Results

The results for the first research question are displayed in Table 1. All the outcome variables were correlated with each other to some extent. As shown, there was a very strong correlation between the two mental health measures, PHQ-9 and GAD-7 (r = 0.81). Both were also strongly correlated with the Emotional Exhaustion-EE subscale of the MBI (r = 0.61 and 0.60), lending some credence to the suggestion that EE is, at least in part, a measure of depression. The remaining MBI subscales (Depersonalization-DP and Personal Accomplishment-PA) were moderately to weakly correlated with the other scales, with the PA scale showing the weakest correlations with all the scales (r's ranging from −.12 to −0.18).

Table 1
Correlations amongst depression, anxiety, and burnout.

	PHQ-9	GAD-7	MBI-EE	MBI-DP	MBI-PA
PHQ-9	(.90)				
GAD-7	.81***	(.91)			
MBI-EE	.61***	.60***	(.90)		
MBI-DP	.43***	.35***	.56***	(.67)	
MBI-PA	−.14**	−.12*	−.18***	−0.13*	(.73)
Mean	9.01	8.56	32.16	5.81	37.00
SD	6.46	5.82	10.99	5.11	5.42
% above cut-score	37.8%	38.7%	62.2%	11.2%	24.5%

Note. *p < .05, **p < .01, ***p < .001. Significance tests are corrected for multiplicity using the Benjamini-Hochberg technique. The major diagonal displays Cronbach's alpha (i.e., internal consistency) for each variable.

Results indicate most of the sample could be characterized as burned out, at least as indicated by the EE subscale, with 62.2% in the dangerous range according to the cut-off scores suggested by Lanners (2020). In addition, 37.8% met DSM criteria for major depressive disorder (Kroenke et al., 2001) and 38.7% met criteria for generalized anxiety disorder (Plummer et al., 2016).

Results for the next two research questions concerning the degree to which the psychosocial model of stress accounts for variance in the mental health outcomes (i.e., depression and anxiety) and whether adding teacher/school specific covariates to the psychosocial model of stress accounts for additional significant variance in the mental health outcome measures are displayed in Tables 2 and 3. The questions for generalized anxiety are displayed in Table 2. The first column displays the raw correlations between GAD-7 and each of the predictors. With respect to demographic variables, race, specifically being of Asian descent, was weakly related to reporting slightly higher GAD-7 scores (r = 0.12). With respect to the psychosocial variables, except for social support and problem focused and emotion focused coping, each was significantly moderately related to GAD-7 scores (r's ranging from −0.32 for use of challenge appraisals to .50 for use of threat appraisals). However, perceived stress was only weakly related to GAD-7 (r = 0.22). With respect to school factors, with the exception of work demands, which was positively related (r = 0.26), all of the SOH subscales assessing general school climate were significantly, negatively, and weakly related to GAD-7 (r's ranging from −0.12 for student orientation to −0.22 for supportive leadership and professional interaction). With respect to teacher factors, all the variables measured using multi-item scales were significantly related to GAD-7 scores (r's ranging from 0.34 for teacher specific stress to −0.34 for work engagement—see Table 2). In addition, hours worked per week (r = 0.13) and years teaching (r = −0.10) were significantly but weakly related to GAD-7 scores.

The next three columns of Table 2 display the regression results for the three hypothesized models, i.e., the psychosocial model alone, the psychosocial plus school variables model, and the psychosocial plus school plus teacher variables model. We describe the results for the significant model that explained the greatest percentage of variance. The model with the best overall fit was the second model, which added school variables to the psychosocial

Table 2
Standardized regression coefficients for anxiety outcome.

Multiple Regression Models				
Predictor	Raw Correlations	Demographics/Psychosocial	Demographics/Psychosocial/School	Demographics/Psychosocial/School /Teacher
Background Factors				
Gender	−0.046	0.004	−0.008	−0.003
Race[(a)]	0.119*	0.089	0.094	0.095
Psychosocial Factors				
Social Support	−0.081	−0.017	0.005	0.025
Coping Self Efficacy	−0.377*	−0.163	−0.212*	−0.201*
Problem Focused Coping	−0.012	0.129	0.105	0.092
Emotional Focused Coping	0.003	−0.034	−0.018	−0.032
Passive Avoidance Coping	0.401*	0.104	0.107*	0.115
Neuroticism	0.442*	0.261*	0.262*	0.270*
Optimism	−0.362*	−0.139	−0.137*	−0.132*
Perceived Stress	0.216*	0.160*	0.141*	0.126*
Stress Appraisal - Threat	0.498*	0.330*	0.360*	0.318*
Stress Appraisal - Challenge	−0.321*	0.028	0.040	0.058
School Factors				
School Type[(a)]	0.083		0.158*	0.145*
Title 1 School	−0.006		−0.016	−0.010
Grade Level[(a)]	0.067		0.042	0.045
SOH - Morale	−0.208*		−0.020	0.002
SOH - Curriculum Coordination	−0.218*		−0.121*	−0.111
SOH - Effective Discipline	−0.187*		0.004	0.007
SOH - Excessive Work Demands	0.258*		0.007	0.003
SOH - Goal Congruence	−0.143*		0.022	0.024
SOH - Participative Decision Making	−0.191*		0.043	0.033
SOH - Professional Interaction	−0.220*		0.069	0.060
SOH - Student Orientation	−0.123*		0.096	0.094
SOH - Supportive Leadership	−0.222*		−0.114	−0.127
Teacher Factors				
Have Second Job	0.058			0.024
Hours Work Per Week	0.134*			0.041
Years Teaching	−0.105*			0.028
Classroom Type[(a)]	0.060			0.084
Emotional Disorder Students	0.025			0.001
Intellectual Disorder Students	0.069			0.030
SOH - Appraisal and Recognition	−0.173*			0.034
SOH - Professional Growth	−0.230*			−0.024
SOH - Role Clarity	−0.183*			0.010
Work Engagement	−0.343*			−0.024
Teacher Specific Stress	0.337*			0.083
R^2		0.507	0.547	0.559
ΔR^2		.	0.040*	0.012

Note. *p < .05; significance tests for correlation coefficients have been corrected using the Benjamini-Hochberg procedure. SOH = School Organizational Health Questionnaire. (a) Reported coefficients for grouping variables with more than two groups are the square root of proportion of variability (relative weight) explained by those groups. Correlations for these variables are the square root of η2 from analysis of variance. For the rest of the coefficients, correlations are Pearson correlations and regression coefficients are fully standardized (β).

Table 3
Standardized regression coefficients for depression outcome.

Multiple Regression Models				
Predictor	Raw Correlations	Demographics/Psychosocial	Demographics/Psychosocial/School	Demographics/Psychosocial/School /Teacher
Background/Demographic Factors				
Gender (Male vs. Female)	−0.006	0.031	0.025	0.028
Race[(a)]	0.107*	0.100	0.109	0.109
Psychosocial Factors				
Social Support	−0.117*	−0.064	−0.044	−0.025
Coping Self Efficacy	−0.355*	−0.090	−0.119	−0.152
Problem Focused Coping	−0.087	−0.005	−0.045	−0.055
Emotional Focused Coping	−0.021	0.015	0.036	0.018
Passive Avoidance Coping	0.389*	0.155	0.172*	0.163*
Neuroticism	0.388*	0.179*	0.189*	0.200*
Optimism	−0.368*	−0.197*	−0.202*	−0.152*
Perceived Stress	0.192*	0.154*	0.162*	0.134*
Stress Appraisal - Threat	0.466*	0.300*	0.345*	0.288*
Stress Appraisal - Challenge	−0.323*	−0.064	0.010	0.118
School Factors				
School Type[(a)]	0.041		0.138*	0.126*
Title 1 School	−0.066		−0.061	−0.053
Grade Level[(a)]	0.099*		0.077	0.071
SOH - Morale	−0.201*		−0.051	0.002
SOH - Curriculum Coordination	−0.200*		−0.168*	−0.143*
SOH - Effective Discipline	−0.135*		0.057	0.033
SOH - Excessive Work Demands	0.212*		−0.042	−0.054
SOH - Goal Congruence	−0.110*		0.037	0.064
SOH - Participative Decision Making	−0.168*		0.059	0.037
SOH - Professional Interaction	−0.188*		0.112	0.097
SOH - Student Orientation	−0.053		0.191*	0.182*
SOH - Supportive Leadership	−0.218*		−0.212*	−0.270*
Teacher Factors				
Have Second Job	0.089			0.025
Hours Work Per Week	0.184*			0.137*
Years Teaching	−0.037			0.092*
Classroom Type[(a)]	0.045			0.063
Emotional Disorder Students	0.001			0.005
Intellectual Disorder Students	0.037			−0.004
SOH - Appraisal and Recognition	−0.147*			0.130*
SOH - Professional Growth	−0.255*			−0.126*
SOH - Role Clarity	−0.112*			0.084
Work Engagement	−0.389*			−0.175*
Teacher Specific Stress	0.298*			0.029
R^2		0.447	0.520	0.562
ΔR^2		.	0.073*	0.042*

Note. *p < .05; significance tests for correlation coefficients have been corrected using the Benjamini-Hochberg procedure. SOH = School Organizational Health Questionnaire. (a) Reported coefficients for grouping variables with more than two groups are the square root of proportion of variability (relative weight) explained by those groups. Correlations for these variables are the square root of η2 from analysis of variance. For the rest of the coefficients, correlations are Pearson correlations and regression coefficients are fully standardized (β).

variables and produced a significantly improved fit over the model limited to the psychosocial variables, with an R^2 of 0.55. The greatest percentage of GAD-7 variance was explained by the psychosocial variables (43%). The school variables explained an additional 10.6% of the variance and demographics explained 1.1% of the variance. Residual error explained the remaining variance (45.3%). Six psychosocial variables were significant after Benjamini and Hochberg (1995) correction: coping self-efficacy ($\beta = -0.21$) and optimism ($\beta = -0.14$) were related to lower GAD-7 scores, and passive avoidance coping ($\beta = 0.11$), neuroticism ($\beta = 0.26$), perceived stress ($\beta = 0.14$) and use of threat appraisals ($\beta = 0.36$) were related to increased GAD-7 scores. Two school variables were significant after Benjamini-Hochberg correction: school type ($\beta = 0.16$), indicating that compared to public and private schools, teachers from Charter and other schools reported higher GAD-7 scores, and better curriculum coordination, which was related to lower GAD-7 scores ($\beta = -0.12$).

Table 3 is identical in setup to Table 2 but examines PHQ-9 depression outcomes. As with Table 2, the first column displays the raw correlations between PHQ-9 and each of the predictors. The results closely parallel those found for the GAD-7. With respect to demographic variables, race, specifically being of Asian descent, was weakly related to reporting slightly higher PHQ-9 scores ($r = 0.11$). With respect to the psychosocial variables, except for problem focused and emotion focused coping, each of the psychosocial factors were significantly moderately related to PHQ-9 scores (r's ranging from −0.32 for use of challenge appraisals to .47 for use of threat appraisals). However, perceived stress ($r = 0.19$) and social support ($r = -0.12$) were only weakly related to the PHQ-9.

With respect to school factors, with the exception of work demands, which was positively related ($r = 0.21$), and student orientation, which was non-significantly related, all of the SOH subscales assessing general school climate were significantly, negatively, and weakly related to PHQ-9 scores (r's ranging from −0.11 for goal congruence to −0.22 for supportive leadership). With respect to teacher factors, all the variables measured using multi-item scales were significantly related to PHQ-9 scores (r's

ranging from 0.30 for teacher specific stress to −0.39 for work engagement—see Table 3). In addition, hours worked per week (r = 0.18) was significantly but weakly related to PHQ-9 scores.

With respect to the multiple regression models, the third model, which added teacher variables to the psychosocial and school variables provided a significantly improved fit over the prior models, with an R^2 of 0.56. The highest percentage of PHQ-9 variance was explained by the psychosocial variables (32.8%) and by residual error (43.8%). The school variables explained an additional 13.6% of the variance, while teacher variables explained 8.4% of the variance. Demographics explained 1.4% of the variance. Five psychosocial variables were significant after Benjamini-Hochberg correction: optimism ($\beta = -0.15$) was related to decreased PHQ-9 scores, and passive avoidance coping ($\beta = 0.16$), neuroticism ($\beta = 0.20$), perceived stress ($\beta = 0.13$) and threat appraisal ($\beta = 0.29$) were related to increased PHQ-9 scores. Four school variables were significant after BH correction, curriculum coordination ($\beta = -0.14$) and supportive leadership ($\beta = -0.27$) were related to decreased PHQ-9 scores, and school type, i.e., Charter and other schools vs. public and private schools ($\beta = 0.13$) and student orientation ($\beta = 0.18$) were related to increased PHQ-9 scores. Five teacher variables were significant after Benjamini-Hochberg correction: professional growth ($\beta = -0.13$) and work engagement ($\beta = -0.18$) were related to decreased PHQ-9 scores, and hours worked per week ($\beta = 0.14$), years teaching ($\beta = 0.09$), and appraisal and recognition ($\beta = 0.13$) were related to increased PHQ-9 scores.

Table 4 is identical in setup to Tables 2 and 3 but examines the degree to which the psychosocial model of stress accounts for variance in emotional expression burnout (MBI-EE) and whether adding teacher/school specific covariates to the psychosocial model accounts for additional significant variance in MBI-EE scores. As with Tables 2 and 3, the first column displays the raw correlations between MBI-EE and each of the predictors. The results are similar to those found for depressive disorder. For example, with respect to the psychosocial variables, again with the exception of problem focused and emotion focused coping, each of the psychosocial factors were significantly moderately related to MBI-EE scores with the strongest correlations related to how teachers tend to appraise stress (r = −.44 for use of challenge appraisals and r = 0.51 for use

Table 4
Standardized Regression coefficients for Emotional Exhaustion outcome.

Multiple Regression Models				
Predictor	Raw Correlations	Demographics/Psychosocial	Demographics/Psychosocial/School	Demographics/Psychosocial/School /Teacher
Background Factors				
Gender	−0.078	−0.038	−0.021	−0.030
Race[(a)]	0.125	0.107	0.105	0.095
Psychosocial Factors				
Social Support	−0.215*	−0.046	−0.003	0.035
Coping Self Efficacy	−0.265*	−0.076	−0.075	−0.059
Problem Focused Coping	−0.060	0.018	0.019	0.009
Emotional Focused Coping	−0.018	0.026	0.061	0.049
Passive Avoidance Coping	0.240*	−0.002	0.020	0.042
Neuroticism	0.301*	0.151*	0.154*	0.133
Optimism	−0.235*	−0.033	−0.064	−0.009
Perceived Stress	0.183*	0.140	0.110	0.072
Stress Appraisal - Threat	0.508*	0.433*	0.375*	0.285*
Stress Appraisal - Challenge	−0.436*	−0.169*	−0.122*	0.052
School Factors				
School Type[(a)]	0.024		0.100	0.099
Title 1 School	−0.068		−0.059	−0.056
Grade Level[(a)]	0.072		0.074	0.068
SOH - Morale	−.0341*		−0.009	0.030
SOH - Curriculum Coordination	−0.309*		−0.089	−0.033
SOH - Effective Discipline	−0.323*		−0.057	−0.052
SOH - Excessive Work Demands	0.395*		0.127*	0.117*
SOH - Goal Congruence	−0.331*		−0.086	−0.039
SOH - Participative Decision Making	−0.357*		0.008	0.012
SOH - Professional Interaction	−0.327*		0.025	0.012
SOH - Student Orientation	−0.211*		0.127	0.079
SOH - Supportive Leadership	−0.340*		−0.097	−0.045
Teacher Factors				
Have Second Job	0.099*			0.009
Hours Work Per Week	0.213*			0.078*
Years Teaching	−0.058			0.001
Classroom Type[(a)]	0.050			0.081
Emotional Disorder Students	0.056			0.021
Intellectual Disorder Students	−0.034			0.060
SOH - Appraisal and Recognition	−0.341*			−0.007
SOH - Professional Growth	−0.351*			−0.056
SOH - Role Clarity	−0.252*			0.010
Work Engagement	−0.507*			−0.309*
Teacher Specific Stress	0.407*			0.163*
R^2		0.424	0.501	0.562
ΔR^2		.	0.077*	.061*

Note. *p < .05; significance tests for correlation coefficients have been corrected using the Benjamini-Hochberg procedure. SOH = School Organizational Health Questionnaire. (a) Reported coefficients for grouping variables with more than two groups are the square root of proportion of variability (relative weight) explained by those groups. Correlations for these variables are the square root of η2 from analysis of variance. For the rest of the coefficients, correlations are Pearson correlations and regression coefficients are fully standardized (β).

of threat appraisals). Similar to results for the PHQ-9, the weakest psychosocial variable correlations with MBI-EE were for perceived stress (r = 0.18) and social support (r = −0.22).

With respect to school factors, compared to the PHQ-9, all of the SOH subscale variables were somewhat more strongly but moderately related to the MBI-EE (r's ranging from −0.31 for curriculum coordination to 0.40 for excessive work demands). However, student orientation was only weakly related (r = −0.21). With respect to teacher factors, as with the PHQ-9, all the variables measured using multi-item scales were significantly related to MBI-EE scores (r's ranging from −0.25 for role clarity to −0.51 for work engagement—see Table 4). In addition, hours worked per week (r = 0.21) and having a second job (r = 0.10) were significantly but somewhat weakly related to MBI-EE scores.

With respect to the multiple regression models, the third model, which added teacher variables to the psychosocial and school variables, provided a significantly improved fit over both prior models, with an R^2 of 0.56. Nearly equal amounts of variance were explained by the psychosocial (22%) and teacher (20%) variables. Residual error explained the largest percentage of variance (44%) and school variables explained an additional 14% of the variance. Demographics explained 1% of the variance. Only one psychosocial variable, use of threat appraisals ($\beta = 0.29$), and one school variable, excessive work demands ($\beta = 0.12$), were significant after Benjamini-Hochberg correction, and were related to increased MBI-EE scores. Finally, three teacher variables were significant after BH correction, work engagement ($\beta = -0.31$) was related to decreased MBI-EE scores, and hours worked per week ($\beta = 0.08$) and teacher specific stress ($\beta = 0.16$) were related to increased MBI-EE scores.

With respect to the exploratory goal, a significant difference in model fit was found by allowing regression parameters to vary across racial groups (Black compared to White) for the depression and emotional exhaustion burnout variables. No significant differences in model fit were found across gender groups (female compared to male). For the depression outcome, coefficients for four predictors were descriptively higher for the Black group than the white group: passive avoidance coping ($\beta = .421$ vs. $\beta = 0.126$), neuroticism ($\beta = 0.386$ vs. $\beta = 0.172$), work engagement ($\beta = -0.315$ vs. $\beta = -0.134$), and professional growth ($\beta = -0.286$ vs $\beta = -0.115$). Furthermore, total variance explained in depression was higher in the Black group (adjusted $R^2 = 0.595$) than in the white group (adjusted $R^2 = 0.504$). Likewise, for the emotional exhaustion outcome, coefficients for three predictors were descriptively higher for the Black group than the White group: hours worked per week ($\beta = 0.217$ vs. $\beta = 0.061$), work engagement ($\beta = -0.483$ vs. $\beta = -0.299$), and teacher-specific stress ($\beta = 0.311$ vs. $\beta = 0.112$). Furthermore, total variance explained in depression was higher in the Black group (adjusted $R^2 = 0.583$) than in the White group (adjusted $R^2 = 0.487$). Although the overall fit was significantly different across groups, due to the limited number of Black participants, no tests of statistical significance were performed for individual coefficients and we make no claims of their statistical difference.

6. Discussion

The overall purpose of the study was to determine the degree of stress and mental illness among special education teachers and to explore potential underlying explanatory factors. We proposed four research questions. The first asked whether special educators show evidence of mental illness and burnout. To begin to answer this question, first we examined the correlation between three indicators of psychosocial stress (i.e., burnout, depression (PHQ-9) and anxiety; GAD-7). Using the MBI-EE, all three measures were strongly correlated with each other, with r's ranging from 0.61 to 0.80. That is, all of the measures were tapping into a similar general construct related to stress/distress. Moreover, according to all three indicators, special educators were highly stressed. Specifically, the majority (62%) of teachers were classified as severely burned out, scoring in the range designated as dangerous according to cut-off scores suggested by Lanners (2020). More than a third met DSM criteria for major depressive disorder (MDD; Kroenke et al., 2001) and for generalized anxiety disorder (GAD; (Plummer et al., 2016). These represent very high prevalence rates for mental illness. For example, compared to the U.S. 12-month prevalence rates for MDD (6.7%) and GAD (3.1%; Kessler et al., 2005) the relative increased risk of mental illness for teachers in our sample was 5.6 for MDD and 12.4 for GAD. Taken together, these results provide strong and consistent evidence that this is a highly stressed sample of teachers. Whether this sample and these results are representative of special educators more generally is unknown. However, we attempted to obtain a representative sample by recruiting from a variety of sources and organizations that special educators often join and are well known within the special education field. Further, a meta-analysis of pre-COVID prevalence of anxiety, depression, and stress of teachers from different countries conducted by Ozamiz-Etxebarria et al., (2021) provides further evidence. Although the studies used different measures of anxiety and depression, the results offer some comparisons as there is a high correlation between the measures used in both studies (Peters et al., 2021). The researchers reported overall prevalence rates of anxiety (17%) and depression (19%). One of the studies reviewed (Li et al., 2020) applied the GAD with all teachers, including university instructors, in China and found a 13.7 prevalence of anxiety, a factor that is almost three times lower compared to this sample.

The second and third research questions attempted to understand what psychosocial, school or teacher variables might explain these findings. We first examined the predictive validity of the psychosocial model of stress in accounting for variance in mental health/stress outcomes, and then examined the incremental variance of adding teacher/school specific covariates in accounting for additional variance in the outcome measures. We used both bivariate (simple correlations) and multivariate analytic strategies (regression). As noted with the bivariate analyses, there was a high degree of overlap in the strongest predictors for each of the three stress outcomes. When limited to the five strongest predictors for each outcome, use of threat appraisals and work engagement were consistently strong predictors of all three outcomes. In addition, neuroticism and passive avoidance coping were strong predictors of both depression and anxiety, and teacher specific stress was a strong predictor of both anxiety and burnout. The fact that work engagement was a consistent strong negative predictor of all three outcomes is unsurprising, given that it can be viewed as a measure of lack of burnout. With respect to the remaining strong predictors, it is worth noting that all either were or could be classified as elements of the psychosocial model of stress. The exception, teacher specific stress, although classified as a teacher variable, could be classified equally well within the psychosocial model of stress because the items assess perceived stress level, when limited to experiences commonly faced by special educators such as challenges with classroom management and student academic performance or motivation, workload, and lack of administrator support. Thus, with respect to the bivariate results, compared to both the teacher and school variables, the elements of the psychosocial model of stress appear to be the most helpful in explaining and understanding the three outcomes.

The multivariate analyses produced slightly different results when explaining the stress outcomes. We conducted separate hierarchical regressions to test the relative strength of psychosocial,

school and teacher variables in explaining variance for each of the three stress outcomes. With respect to anxiety, the significant model with the highest R^2 consisted almost exclusively of elements from the psychosocial model of stress), with school variables contributing a small portion of additional explanatory power, and teacher variables failing to add any explanatory power. The individual variables with the largest beta weights were use of threat appraisal, neuroticism, and coping self-efficacy. The two significant school variables had beta weights below 0.2. Overall, the results indicated that anxiety could be best explained using the psychosocial model of stress.

With respect to the best explanatory model of major depressive disorder, similar to anxiety, the model with the highest R^2 was based predominantly on the psychosocial model of stress. However, school and teacher variables each explained additional variance. That is, the psychosocial variables were the strongest predictors overall, explaining roughly 1/3rd of the variance, and together, the school and teacher variables explained nearly 1/4th of the total variance. Similar to the findings for GAD, the individual variables with the largest beta weights were use of threat appraisal and neuroticism from the psychosocial variables. However, a strong predictor from the school variables was supportive leadership. All the remaining significant variables had beta weights below 0.2. Overall, compared to anxiety, school climate and teacher specific variables were much more important in understanding depression outcomes. That is, in understanding depression, psychosocial variables, while important and strongest overall, were clearly helped by the addition of school and teacher variables.

For emotional exhaustion, as measured by the MBI as the dependent variable, nearly equal amounts of variance were explained by the psychosocial and teacher variables. School variables explained an additional variance. That is, in total, school and teacher variables were stronger predictors overall than psychosocial variables, which is clearly different than findings for the two mental health variables. The individual variables with the largest beta weights were once again use of threat appraisal from the psychosocial stress model and work engagement from the teacher variables. All the remaining significant variables had beta weights below 0.2. Thus, although burnout and depression are clearly strongly related, the underlying explanatory variables appear to be quite different. For the two MH variables, the psychosocial variables were clearly the best predictors, whereas for burnout, occupational and school variables were better predictors, although psychosocial variables added explanatory variance.

The implications of these findings for interventions to address teacher burnout help pinpoint constructs within the psychosocial model associated with anxiety, depression, and burnout. For example, personalized interventions that target skills such as the use of challenge appraisal rather than threat appraisal and coping skills may be impactful. How to increase one's social support and use of personal resources may also be helpful. In a meta-analysis of interventions targeting teacher burnout, Iancu et al., (2018) identified 23 controlled studies with overall small effect sizes. Of the varied approaches that target teacher burnout, cognitive behavioral therapy, mindfulness and relaxation-based interventions, social-emotional skills, psychoeducational approaches, social support, and professional development/didactic lessons for student social emotional skill development, only mindfulness interventions moderated effects for MBI-EE and PA. Further, of the 23 studies reviewed, only one study represented special education teachers (Breeman et a., 2016) who received professional development on implementing an intervention to students; no differences were observed in teacher burnout. Thus, there is a significant need for intervention research with a focus on special education teachers.

While we highlighted several studies where researchers have examined mental health in the workplace with teachers, as mentioned, the work around mental health among special education teachers is almost nonexistent (for an exception see Cormier et al., 2022). Furthermore, scholars for decades have studied the issues of stress and how it correlates to burnout among special education teachers (see Billingsley & Bettini, 2019), yet the workplace experiences of special education teachers is generally from a culturally neutral stance not taking into consideration the unique variables that impact special education teachers in general and from minoritized backgrounds (see a special issue in Teacher Education and Special Education; Scott et al., 2022). Therefore, one of the major lessons that we as a research team learned after analyzing the data for this study is the importance of securing a high sample of diverse special education teachers so more inferences can be made that are disaggregated across different populations. This type of data will be useful to our knowledge about the complexities surrounding mental health among special educators and how these may be different given the often racialized expectations among certain groups of special education teachers.

6.1. Limitations

We should note that although not intentional, data collection coincided with the first year of the COVID-19 pandemic, which undoubtedly added in a variety of ways to the stress experienced by this sample of special educators. While this information is helpful for understanding the impact of the pandemic on teacher mental health, the findings may not generalize to teachers following the pandemic.

7. Conclusions

According to our results, special educators are experiencing extremely high levels of stress. In fact, it is unusual if a special educator does not report being burned out and the levels of reported burnout are quite high. Over 60% of participants scored in the dangerous level on the emotional exhaustion subscale of the Maslach Burnout Inventory (Maslach et al., 1986). In addition, although most did not meet cutoff scores for diagnoses of major depression or generalized anxiety disorder, nearly 40% met criteria for one or both diagnoses and the prevalence rates were 5–12 times higher than that of a normative sample of US adults. That is, special educators are not just at high risk of burnout, they are also at very high risk of developing a major mental illness. Future investigators need to address mental health in addition to burnout when measuring job stress and stress reduction interventions will need to address both burnout and mental health.

We also wanted to explore factors underlying these results. For burnout, the strongest explanatory factors were school and teacher variables (34%), with work engagement being the strongest barrier to burnout and psychosocial factors accounting for a substantial remainder (22%), e.g., use of threat appraisals. For depression, which has been hypothesized as strongly related to burnout, these two factors were still explanatory, but the percentages were now reversed. That is, school/teacher variables (e.g., supportive leadership) explained 22% of the variance, while psychosocial variables (e.g., use of threat appraisals, neuroticism) explained 33% of the variance. This suggests that interventions for burnout should continue to include variables related to school and teacher factors, but in addition should include elements derived from the psychosocial model of stress. Inclusion of these same elements also should help to reduce the high prevalence rates of mental illness. With respect to generalized anxiety disorders, the vast majority of the explanatory factors derived from elements of the psychosocial model of stress. That is, school and teacher variables had little

impact on GAD diagnosis among special educators even though SPED teachers were at a 12 times increased risk for GAD.

As already noted, elements of the psychosocial stress model proved to be very helpful in understanding and explaining the stress outcomes. This suggests that factors derived from the model should be included in future interventions for burnout, while simultaneously reducing the high risk of mental disorders. Elements of special helpfulness included those related to the appraisal or perception of stress (e.g., perceived stress, tendency to appraise events as threatening). For example, viewing stressors as challenges served as a protective factor, whereas viewing stressors as threats was a very strong risk factor for poor stress outcomes. Specifically, use of threat appraisals was either the strongest individual predictor for the mental health outcomes, or the second strongest predictor, in the case of burnout. These results are consistent with Lazarus and Folkman's (1984) conception of primary and secondary appraisal as key factors in whether individuals view an event (i.e., a potential stressor, as stress).

Personality variables and coping style, specifically neuroticism and use of avoidance coping also were strong predictors of mental disorder. These results are consistent with what scholars have found with prior reviews of the literature of the relationships between personality, especially neuroticism, and mental disorder. For example, in a very large meta-analytic review of 175 studies published from 1980 to 2007, neuroticism was the strongest trait predictor of mental disorder across all tested DSM diagnostic groups (mean Cohen's d = 1.65), with a Cohen's d of 1.33 for MDD and Cohen's d of 1.96 for GAD (Kotov et al., 2010). Similarly, reviews of approach vs. avoidant coping show consistent evidence of problem outcomes associated with avoidance as a habitual coping style (Taylor & Stanton, 2007). In summary, our results both are consistent with the extant literature on mental illness and strongly support the inclusion of elements of the psychosocial model of stress in understanding factors underlying burnout and mental illness in special educators, and support their potential usefulness as intervention components.

Credit author statement

John McGrew: Conceptualization, Methodology, Writing, Lisa Ruble writing, methodology, revisions, Christopher J. Cormier, Writing, Editing, revisions David Dueber, statistical analysis.

Author note

The study is funded by the Institute of Education Sciences grant #R324A200232 awarded to the first and second authors.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). American Psychiatric Association.

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society: Series B, 57*(1), 289–300. https://doi.org/10.1111/j.2517-6161.1995.tb02031.x

Bernard, M. E. (2016). Teacher beliefs and stress. *Journal of Rational-Emotive and Cognitive-Behavior Therapy, 34*(3), 209–224. https://doi.org/10.1007/s10942-016-0238-y

Bettini, E., Cumming, M. M., Brunsting, N. C., McKenna, J. W., Cooper Schneider, C., Muller, R., & Peyton, D. (2020). Administrators' roles: providing special educators with opportunities to learn and enact effective reading practices for students with EBD. *Beyond Behavior, 29*(1), 52–61. http://doi.org/10.1177/1074295620904024.

Bettini, E., Jones, N., Brownell, M., Conroy, M., Park, Y., Leite, W., & Benedict, A. (2017). Workload manageability among novice special and general educators: Relationships with emotional exhaustion and career intentions. *Remedial and Special Education, 38*(4), 246–256. https://doi.org/10.1177/0741932517708327

Bianchi, R., Schonfeld, I. S., & Laurent, E. (2018a). Burnout syndrome and depression. In Y.-K. Kim (Ed.), *Understanding depression: Volume 2. Clinical manifestations, diagnosis and treatment* (pp. 187–202). Springer Nature. https://doi.org/10.1007/978-981-10-6577-4_14.

Billingsley, B., & Bettini, E. (2019). Special education teacher attrition and retention: A review of the literature. *Review of Educational Research, 89*(5), 697–744. https://doi.org/10.3102/0034654319862495

Brackett, M. A., Palomera, R., Mojsa-Kaja, J., Reyes, M. R., & Salovey, P. (2010). Emotion-regulation ability, burnout, and job satisfaction among British secondary-school teachers. *Psychology in the Schools, 47*(4), 406–417. https://doi.org/10.1002/pits.20478

Brunsting, N. C., Bettini, E., Rock, M., Common, E. A., Royer, D. J., Lane, K. L., Xie, F., Chen, A., & Zeng, F. (2023). Working conditions and burnout of special dducators of students with ebd: Longitudinal outcomes. *Teacher Education and Special Education, 46*(1), 44–64. https://doi.org/10.1177/08884064221076159

van Buuren, S., & Groothuis-Oudshoorn, K. (2011). Mice: Multivariate imputation by chained equations in R. *Journal of Statistical Software, 45*(11), 1–67. https://doi.org/10.18637/jss.v045.i03

Carroll, T. G. (2007). Policy brief: The high cost of teacher turnover. *National Commission on Teaching and America's Future*. https://nieer.org/wp-content/uploads/2015/06/NCTAFCostofTeacherTurnoverpolicybrief.pdf.

Carver, C. S. (1997). You want to measure coping but your protocol too long: Consider the brief cope. *International Journal of Behavioral Medicine, 4*(1), 92–100. https://doi.org/10.1207/s15327558ijbm0401_6

Carver-Thomas, D., & Darling-Hammond, L. (2017). *Teacher turnover: Why it matters and what we can do about it.* Learning Policy Institute. https://learningpolicyinstitute.org/media/174/download?inline&file=Teacher_Turnover_REPORT.pdf.

Carver-Thomas, D., & Darling-Hammond, L. (2019). The trouble with teacher turnover: How teacher attrition affects students and schools. *Education Policy Analysis Archives, 27*(36), 1–31. https://doi.org/10.14507/epaa.27.3699

Chesney, M. A., Neilands, T. B., Chambers, D. B., Taylor, J. M., & Folkman, S. (2006). A validity and reliability study of the coping self-efficacy scale. *British Journal of Health Psychology, 11*(3), 421–437. https://doi.org/10.1348/135910705X53155

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*(4), 385–396. https://doi.org/10.2307/2136404

Cormier, C. J., McGrew, J., Ruble, L., & Fischer, M. (2022). Socially distanced teaching: The mental health impact of the COVID-19 pandemic on special education teachers. *Journal of Community Psychology, 50*(3), 1768–1772. https://doi.org/10.1002/jcop.22736

Derogatis, L. (1977). *SCL-90-R: Administration, scoring and procedures manual for the R(evised) version.* School of Medicine: John Hopkins University.

Eaton, W. W., Anthony, J. C., Mandel, W., & Garrison, R. (1990). Occupations and the prevalence of major depressive disorder. *Journal of Occupational and Environmental Medicine, 32*(11), 1079–1087. https://doi.org/10.1097/00043764-199011000-00006

Eaton, W. W., Muntaner, C., Smith, C., Tien, A., & Ybarra, M. (2004). Center for epidemiologic studies depression scale: Review and revision (CESD and CESD-R). In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment* (3rd ed., pp. 363–377). Lawrence Erlbaum.

Eysenck, S. B., Eysenck, H. J., & Barrett, P. (1985). A revised version of the psychoticism scale. *Personality and Individual Differences, 6*(1), 21–29. https://doi.org/10.1016/0191-8869(85)90026-1

García, E., & Weiss, E. (2019). *The teacher shortage is real, large and growing, and worse than we thought*. Economic Policy Institute. https://www.epi.org/publication/the-teacher-shortage-is-real-large-and-growing-and worse-than-we-thought-the-first-report-in-the-perfect-storm-in-the-teacher-labor-market series/.

Goddard, R., & Goddard, M. (2006). Beginning teacher burnout in Queensland schools: Associations with serious intentions to leave. *Australian Educational Researcher, 33*(2), 61–75. https://doi.org/10.1007/bf03216834

Goldberg, D. P., & Williams, P. (1988). *The general health Questionnaire.* NFER Publishing.

Grosch, J. W., & Murphy, L. R. (1998). Occupational differences in depression and global health: Results from a national sample of US workers. *Journal of Occupational and Environmental Medicine, 40*(2), 153–164. https://doi.org/10.1097/00043764-199802000-00012

Hart, P. M., Wearing, A. J., Conn, M., Carter, N. L., & Dingle, A. R. K. (2000). Development of the school organisational health questionnaire: A measure for assessing teacher morale and school organisational climate. *British Journal of Educational Psychology, 70*(2), 211–228. https://doi.org/10.1348/000709900158065

Holahan, C. J., Moos, R. H., Holahan, C. K., & Brennan, P. L. (1995). Social support, coping, and depressive symptoms in a late-middle-aged sample of patients reporting cardiac illness. *Health Psychology, 14*(2), 152–163. https://doi.org/10.1037/0278-6133.14.2.152

Holt, S., Wang, R., & Gershenson, S. (2020). *Stress test: Examining the evolution of teachers' mental health over time [White paper]*. Institute of Labor Economics. https://doi.org/10.2139/ssrn.3627063

Johansson, E., Falkstedt, D., & Almroth, M. (2022). Depression among teachers: A Swedish register-based study. *BMC Public Health, 22*(1). https://doi.org/10.1186/s12889-022-12758-0

Johnson, J. W. (2004). Factors affecting relative weights: The influence of sampling and measurement error. *Organizational Research Methods, 7*(3), 283–299. https://doi.org/10.1177/1094428104266018

Karasek, R. A. (1979). Job Demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly, 24*(2), 285–308. https://doi.org/10.2307/2392498

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry, 62*(6), 593–602. https://doi.org/10.1001/archpsyc.62.6.593

Kessler, R. C., & Zhao, S. (2010). The prevalence of mental illness. In A. Horwitz, & T. L. Scheid (Eds.), *A handbook for the study of mental health: Social contexts, theories, and systems* (pp. 46–63). Cambridge University Press.

Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking "big" personality traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin, 136*(5), 768–821. https://doi.org/10.1037/a0020327

Kovess-Masféty, V., Sevilla-Dedieu, C., Rios-Seidel, C., Nerrière, E., & Chan Chee, C. (2006). Do teachers have more health problems? Results from a French cross-sectional survey. *BMC Public Health, 6*(1), 1–13. https://doi.org/10.1186/1471-2458-6-101

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Lahey, B. B. (2009). Public health significance of neuroticism. *American Psychologist, 64*(4), 241–256. https://doi.org/10.1037/a0015309

Lanners, M. (2020). Are teachers more affected by burnout than physicians, nurses and other professionals? A systematic review of the literature. In N. J. Lightner, & J. Kalra (Eds.), *Advances in human factors and ergonomics in healthcare and medical devices* (pp. 147–155). Springer. https://doi.org/10.1007/978-3-030-20451-8.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.

Livneh, H. (1999). Psychosocial adaptation to heart diseases: The role of coping strategies. *Journal of Rehabilitation, 65*(3), 24–32.

Livneh, H., & Antonak, R. F. (1997). *Psychosocial adaptation to chronic illness and disability*. Aspen.

Maslach, C., Jackson, S. E., Leiter, M. P., Schaufeli, W. B., & Schwab, R. L. (1986). *Maslach burnout inventory*. Consulting Psychologists Press.

Maslach, C., & Leiter, M. P. (2016). Understanding the burnout experience: Recent research and its implications for psychiatry. *World Psychiatry, 15*(2), 103–111. https://doi.org/10.1002/wps.20311

McCray, E. D., Butler, T. W., & Bettini, E. (2014). What are the roles of general and special educators in inclusive schools? In J. McLeskey, N. L. Waldron, F. Spooner, & B. Algozzine (Eds.), *Handbook of effective inclusive schools* (pp. 80–106). Routledge.

McLeskey, J., & Billingsley, B. S. (2008). How does the quality and stability of the teaching force influence the research-to-practice gap? *Remedial and Special Education, 29*(5), 293–305. https://doi.org/10.1177/0741932507312010

National Education Association. (2022). *NEA member COVID-19 survey summary*. https://www.nea.org/sites/default/files/2022-02/NEA%20Member%20COVID-19%20Survey%20Summary.pdf.

Nimon, K. F., & Oswald, F. L. (2013). Understanding the results of multiple linear regression: Beyond standardized regression coefficients. *Organizational Research Methods, 16*(4), 650–674. https://doi.org/10.1177/1094428113493929

Park, C. L., Fenster, J. R., Suresh, D. P., & Bliss, D. E. (2006). Social support, appraisals, and coping as predictors of depression in congestive heart failure patients. *Psychology and Health, 21*(6), 773–789. https://doi.org/10.1080/14768320600682368

Park, E. Y., & Shin, M. (2020). A meta-analysis of special education teachers' burnout. *Sage Open, 10*(2). https://doi.org/10.1177/2158244020918297

Peacock, E. J., & Wong, P. T. (1990). The stress appraisal measure (SAM): A multidimensional approach to cognitive appraisal. *Stress Medicine, 6*(3), 227–236. https://doi.org/10.1002/smi.2460060308

Peters, L., Peters, A., Andreopoulos, E., Pollock, N., Pande, R. L., & Mochari-Greenberger, H. (2021). Comparison of DASS-21, PHQ-8, and GAD-7 in a virtual behavioral health care setting. *Heliyon, 7*(3). https://doi.org/10.1016/j.heliyon.2021.e06473

Plummer, F., Manea, L., Trepel, D., & McMillan, D. (2016). Screening for anxiety disorders with the GAD-7 and GAD-2: A systematic review and diagnostic metaanalysis. *General Hospital Psychiatry, 39*, 24–31. https://doi.org/10.1016/j.genhosppsych.2015.11.005

R Core Team. (2022). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. https://www.R-project.org/.

Robins, L. N., Helzer, J. E., Ratcliff, K. S., & Seyfried, W. (1982). Validity of the diagnostic interview schedule, version II: DSM-III diagnoses. *Psychological Medicine, 12*(4), 855–870. https://doi.org/10.1017/s0033291700049151

Sapolsky, R. M. (2004). *Why zebras don't get ulcers* (3rd ed.). Holt.

Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement, 66*(4), 701–716. https://doi.org/10.1177/0013164405282471

Schaufeli, W. B., Shimazu, A., Hakanen, J., Salanova, M., & De Witte, H. (2019). An ultra-short measure for work engagement: The UWES-3 validation across five countries. *EuropeanJournal of Psychological Assessment, 35*(4), 577. https://doi.org/10.1027/1015-5759/a000430

Scheier, M. R., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism: A reevaluation of the life orientation test. *Journal of Personality and Social Psychology, 67*(6), 1063–1078. https://psycnet.apa.org/doi/10.1037/0022-3514.67.6.1063.

Schomaker, M., & Heumann, C. (2018). Bootstrap inference when using multiple imputation. *Statistics in Medicine, 37*(14), 2252–2266. https://doi.org/10.1002/sim.7654

Schonfeld, I. S., & Bianchi, R. (2016). Burnout and depression: Two entities or one? *Journal of Clinical Psychology, 72*(1), 22–37. https://doi.org/10.1002/jclp.22229

Schueller, S. M., & Seligman, M. E. (2008). Optimism and pessimism. In K. S. Dobson, & D. J. A. Dozois (Eds.), *Risk factors in depression* (pp. 171–194). Elsevier.

Scott, L. A., Cormier, C. J., & Boveda, M. (2022). Critical issues for the preparation and workforce development of racialized special educators. *Teacher Education and Special Education, 45*(1), 5–7. https://doi.org/10.1177/08884064211070571

Shepherd, K. G., Fowler, S., McCormick, J., Wilson, C. L., & Morgan, D. (2016). The search for role clarity: Challenges and implications for special education teacher preparation. *Teacher Education and Special Education, 39*(2), 83–97. https://doi.org/10.1177/0888406416637904

Shiron, A., & Melamed, S. (2006). A comparison of the construct validity of two burnout measures in two groups of professionals. *International Journal of Stress Management, 13*(2), 176–200. https://psycnet.apa.org/doi/10.1037/1072-5245.13.2.176.

Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine, 166*(10), 1092–1097. https://doi.org/10.1001/archinte.166.10.1092

Stansfeld, S., & Candy, B. (2006). Psychosocial work environment and mental health—a meta-analytic review. *Scandinavian Journal of Work, Environment & Health, 32*(6), 443–462. https://doi.org/10.5271/sjweh.1050

Stansfeld, S. A., Pike, C., McManus, S., Harris, J., Bebbington, P., Brugha, T., Hassiotis, A., Jenkins, R., Meltzer, H., Moran, P., & Clark, C. (2013). Occupations, work characteristics and common mental disorder. *Psychological Medicine, 43*(5), 961–973. https://doi.org/10.1017/s0033291712001821

Taylor, S. E., & Aspinwall, L. G. (1996). Mediating and moderating processes in psychosocial stress: Appraisal, coping, resistance, and vulnerability. In H. B. Kaplan (Ed.), *Psychosocial stress: Perspectives on structure, theory, life course, and methods* (pp. 71–110). Academic Press.

Taylor, S. E., & Stanton, A. L. (2007). Coping resources, coping processes, and mental health. *Annual Review of Clinical Psychology, 3*(1), 377–401.

Van Droogenbroeck, F., & Spruyt, B. (2015). Do teachers have worse mental health? Review of the existing comparative research and results from the Belgian health interview survey. *Teaching and Teacher Education, 51*, 88–100. https://doi.org/10.1016/j.tate.2015.06.006

Wang, H., Hall, N. C., & Rahimi, S. (2015). Self-efficacy and causal attributions in teachers: Effects on burnout, job satisfaction, illness, and quitting intentions. *Teaching and Teacher Education, 47*, 120–130. https://doi.org/10.1016/j.tate.2014.12.005

Wieclaw, J., Agerbo, E., Mortensen, P. B., & Bonde, J. P. (2005). Occupational risk of affective and stress-related disorders in the Danish workforce. *Scandinavian Journal of Work, Environment & Health, 31*(5), 343–351. https://doi.org/10.5271/sjweh.917

Yu, Y., & Williams, D. R. (1999). Socioeconomic status and mental health. In C. S. Aneshensel, & J. C. Phelan (Eds.), *Handbook of the sociology of mental health* (pp. 151–166). Springer.

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*(1), 30–41. https://doi.org/10.1207/s15327752jpa5201_2

Zimet, G. D., Powell, S. S., Farley, G. K., Werkman, S., & Berkoff, K. A. (1990). Psychometric characteristics of the multidimensional scale of perceived social support. *Journal of Personality Assessment, 55*(3–4), 610–617. https://doi.org/10.1080/00223891.1990.9674095