
Article:
Madigan, Daniel J. and Kim, Lisa orcid.org/0000-0001-9724-2396 (2020) Does teacher burnout affect students? A systematic review of its association with academic achievement and student-reported outcomes. International Journal of Educational Research. 101174. ISSN 1873-538X

https://doi.org/10.1016/j.ijer.2020.101714

Madigan, D. J., & Kim, L. E. (in press). Does teacher burnout affect students? A systematic review of its association with academic achievement and student-reported outcomes. *International Journal of Educational Research.*

Does Teacher Burnout Affect Students?

A Systematic Review of its Association with Academic Achievement and Student-Reported Outcomes

Daniel J. Madigan

York St John University, UK

&

Lisa E. Kim

University of York, UK

Author Note

Daniel J. Madigan, School of Science, Technology, and Health, York St John University, Lord Mayor's Walk, York, UK. Lisa E. Kim, Department of Education, University of York, York, UK. Correspondence concerning this article should be addressed to Daniel J. Madigan, e-mail: d.madigan@yorksj.ac.uk

Abstract

We provide the first systematic review of studies examining the consequences of teacher burnout for students. In doing so, we focused on academic achievement and student-reported outcomes. A systematic literature search returned 14 studies including 5,311 teachers and 50,616 of their students. The findings provided some evidence that teacher burnout is associated with worse academic achievement and lower quality student motivation, but little evidence that it is associated with student wellbeing. There is a clear need for more studies in this area, especially those adopting more robust designs, exploring moderating factors, and examining the mechanisms that explain these relationships. Nonetheless, the present findings provide preliminary evidence that teacher burnout can affect the students they teach.

Keywords: burnout; exhaustion; teacher attrition; students; student performance; academic achievement; mental health

Introduction

Students will gain invaluable skills, knowledge, and experience in the classroom. This not only includes access to further study and improved social outcomes via high levels of academic achievement, but also enhanced motivation and even increased wellbeing (Groot & Maassen van den Brink, 2007; OECD, 2016). Importantly, these outcomes are a function of both the student themselves (and the behaviors they engage in) and also their teachers (and the educational environment they create; Richardson, Abraham, & Bond, 2012; Wayne & Youngs, 2003). Research has sought to examine the factors that affect students' classroom experiences and outcomes. In this regard, theoretical models acknowledge that teacher wellbeing is a prominent factor (e.g., Jennings & Greenberg, 2009; Schleicher, 2018). In the present study, we are interested in understanding whether a particular facet of teacher wellbeing — burnout — may have implications for students' performance, motivation, and wellbeing. To do so, we extend previous work by offering the first systematic review of teacher burnout, academic achievement, and student-reported outcomes. It is our hope that this will help provide further understanding regarding how to improve the quality of education that students receive.

Teacher Burnout

Burnout was originally conceived in the care-giving professions in the mid-1970s. The term was coined to describe the process of gradual exhaustion and loss of commitment that had been observed in those working in these contexts. Based on these observations, burnout was defined as a psychological syndrome that develops in response to chronic work stress (Maslach & Jackson, 1981). As a syndrome, burnout is defined by three symptoms, namely, reduced professional efficacy (feelings of reduced competence and achievement in one's work with people), cynicism (an unfeeling and impersonal response toward recipients of one's service, care, treatment, or instruction), and emotional exhaustion (feelings of being

emotionally overextended and exhausted at one's work; Maslach, Jackson, Leiter, Schaufeli, & Schwab, 1986).

Burnout can manifest in many occupations but is particularly prevalent among teachers (Iancu, Rusu, Măroiu, Păcurar, & Maricuțoiu, 2018). In fact, teaching is considered one of the most stressful professions (Kyriacou, 2001). This is perhaps unsurprising given the many demands and stressors that teachers experience on a day-to-day basis (McCarthy, Lambert, Lineback, Fitchett, & Baddouh, 2016), including student misbehavior, high workloads, and frequent performance evaluations (Kyriacou, 2001). Taken together, these factors provide plenty of opportunity for teachers to be at risk of burnout development (Schaufeli et al., 2003).

Burnout is associated with numerous negative experiences and outcomes for teachers. This includes changes in mood and wellbeing as illustrated by increased irritability and symptoms of mental ill-health (Capone, Joshanloo, & Park, 2019; Hakanen, Bakker, & Schaufeli, 2006). Burnout also affects how likely a teacher is to stay in their job (Billingsley & Bettini, 2019). This is because it can result in increased absenteeism, lower job commitment, and increased turnover intentions (Brouwers & Tomic, 2000). Consequently, burnout will have a multitude of effects for teachers themselves. What is less clear, however, is how being taught by a teacher with high levels of burnout affects student experiences and outcomes.

Teacher Burnout and Students

Theoretical models aimed at understanding how teacher wellbeing can impact the effectiveness of classroom instruction suggest that burnout will affect the experiences and outcomes of students (e.g., Chang, 2009). Of these theories, the Prosocial Classroom Model is perhaps the most relevant to the present study (Jennings & Greenberg, 2009). This theory proposes that teacher wellbeing and socioemotional functioning influence the capacity of

teachers to effectively lead educational instruction and manage classroom behaviors. These factors will in turn affect student outcomes such as performance and motivation (Jennings & Greenberg, 2009). More specifically, when teachers struggle with their wellbeing, including when they experience burnout symptoms, they are more likely to have adversarial relations with their students, become annoyed when students do not follow instruction, and to have negative views of their students (Grayson & Alvarez, 2009). These factors will likely have an impact on student experiences and outcomes.

There are also theoretical explanations that lie within burnout theory itself. In this regard, Maslach and Leiter (1999) proposed that teacher burnout, and especially emotional exhaustion and cynicism, will lead to less involvement and effort in lesson planning and less favorable social behavior towards students. It is also possible burnout will lead to other relevant withdrawal behaviors such as absence from the classroom altogether (cf. Taris, 2006). Emotional exhaustion and cynicism will also result in teachers being more critical and providing lower levels of encouragement in response to student success. In turn, students may feel less competent and be less likely to internalize intrinsic motives for studying, collectively reducing the capacity and depth of their learning (and subsequent motivation and achievement). It is also possible that the distance that burnout creates between students and their teacher will have consequences for students' sense of belonging, relatedness, and wellbeing.

One further mechanism may explain how teacher burnout may affect their students. This is via a contagion effect, whereby burnout passes from teachers to their students (Bakker & Schaufeli, 2000). Research in this area has explored the potential for individuals to pick up and imitate emotional cues, and there is evidence that students may be particularly astute in this regard (Sutton & Wheatley, 2003). This possibility means that students will also be at risk of the direct consequences of burnout. This includes reduced achievement

(Madigan & Curran, in press), increased forms of controlled motivation (Zhang, Klassen, & Wang, 2013), and increased depression (Ishak et al., 2013). This possibility also provides an explanation for how teachers can indirectly influence the wellbeing of their students. It is therefore possible that contagion effects could compound the direct effects of burnout from teachers' behaviors.

There is some empirical support for the aforementioned models in relation to the effect teacher burnout can have on students. In particular, a meta-analysis of the association between teacher burnout and student misbehavior found that all dimensions of burnout were associated with higher levels of disruptive behaviors (Aloe, Shisler, Norris, Nickers, & Rinker, 2014). However, evidence for other student experiences and outcomes is less clear. For example, there is evidence that teacher burnout has no effect on academic achievement (Reyes et al., 2012) and evidence that it inhibits achievement (Klusmann et al., 2016). The effects of teacher burnout are also unclear in relation to student-reported outcomes such as motivation, wellbeing, and social perceptions (e.g., Braun et al., 2020). Consequently, it remains unclear whether teacher burnout affects academic achievement and student-reported outcomes.

The Present Study

It is against this background that the present study aims to provide the first systematic review of research on teacher burnout, academic achievement, and student-reported outcomes. A focus on student performance and student-reported outcomes is important because reporting the association between two variables from the same source of report (i.e., the teacher) can result in methodological bias (Paulhus, 2002). As such, use of both objective (e.g., test scores) and student-reported outcomes when examining their association with teacher burnout will provide much needed clarity on how teachers' burnout symptoms manifest and affect the students they teach. This study also provides evidence with regard to

whether teacher burnout is something that needs further consideration in educational policy. Finally, we identify potential gaps in our understanding so as to guide future research. In summary, we aim to identify, describe, and summarize all available empirical research in this area to provide greater insight into the implications of teacher burnout for students.

Method

Literature Search

First, an extensive computerized literature search was conducted using the following common databases in psychology and education: PsycINFO, PsychARTICLES, MEDLINE, Education Abstracts, Educational Administration Abstracts, and ProQuest Dissertations (see also Mérida-López & Extremera, 2017). The following search terms were used: "teacher" and "burnout" and "student" and "effectiveness OR grade OR performance OR achievement OR motivation OR commitment OR engagement OR satisfaction OR outcome OR success OR efficacy". The search was conducted in June 2020. Overall, the search returned 2,190 studies. In addition, so as to overcome potential database biases, we supplemented our database search with an exploratory search on GoogleScholar and by scanning the reference lists of relevant reviews, book chapters, and journal articles. After removing duplicates and screening abstracts for relevance, 63 articles remained. These were assessed further using the inclusion criteria below.

Inclusion Criteria

Studies were included in the systematic review if they: (a) measured teacher burnout (b) measured academic achievement or a student-reported outcome; (c) were published in English; (d) were a published journal article, thesis/dissertation, or conference presentation; and (e) included a sample that was unique (e.g., not included in more than one study). Studies were excluded if they did not measure teacher burnout (n = 27), did not measure a student outcome (n = 16), and included insufficient information (n = 6). These criteria

resulted in the final inclusion of 14 studies. See Figure 1 for a PRISMA diagram of this overall process.

Data Extraction

The identified studies were reviewed in full. To summarize these studies, the following data were extracted: (a) publication information (authors/year), (b) teacher demographics, (c) student demographics, (d) instructional environment (primary, secondary, or tertiary), (e) measure of burnout, (f) study design, (g) main analyses employed, (h) outcome variables, and (i) main findings. Both authors extracted all data. Inter-rater reliability was calculated using Cohen's Kappa (McHugh, 2012). Kappa was .94 indicating excellent inter-rater reliability. The few disagreements were resolved via a consensus among authors with reference to the original material. Table 1 presents the extracted information for all studies.

Results

The results of the review are organized around characteristics of the studies; namely the measures of burnout used, the designs of the studies, and the samples recruited. Thereafter, the findings of the studies are discussed based on four types of outcomes: performance (including academic achievement), motivation, wellbeing, and social outcomes. Table 1 provides further details concerning the ways in which these outcomes were operationalized.

Measures of Burnout

In the 14 studies included in the present review, 13 studies adopted Maslach's conceptualization of burnout. This consisted of seven studies utilizing the original Maslach Burnout Inventory (Maslach et al., 1986) and six studies utilizing the MBI-Educator Survey (Maslach, Jackson, & Leiter, 1996). These studies used various combinations of the burnout dimensions. Four studies used a total score (across all three dimensions). Three studies used all three dimensions. One study used the exhaustion and cynicism dimensions. Four studies

used the exhaustion dimension only and one study used the cynicism dimension only. By contrast, one study (Mifont et al., 2008) adopted Kristensen et al.'s (2005) conceptualization of burnout and utilized the Copenhagen Burnout Inventory, and used the student-related burnout dimension only. Like in other domains, it appears researchers have a clear preference for adopting the original model provided by Maslach and colleagues.

Study Designs

Most studies in the present review adopted non-experimental cross-sectional research designs (k = 8). Four of the studies adopted longitudinal designs (Braun et al., 2020; Coman, 2013; Hoglund et al., 2015; Shen et al. 2015). Lastly, two studies adopted experimental designs. The first randomly assigned teachers (and their classrooms) to a professional development program ("Incredible Years") or a control condition (Herman et al., 2018). The second randomly assigned teachers (and their classrooms) to a classroom management training program (see Sprick, Garrison, & Howard, 1998) or a business as usual control condition (Herman et al., 2020). Table 1 also outlines the analyses that were employed in each study.

Teacher and Student Samples

In the present studies, a total of 5,311 teachers were recruited. They were on average 45.07 years old (range 37.78 – 48.59 years), 73.67% female (range 22.00 – 96.2%), and had 15.37 years of teaching experience (range 10.38 – 22.00 years). A total of 50,616 students were recruited. They were on average 11.14 years old (range 5.90 – 18.30 years) and 44.00% female (range 16.50 – 57.90%). Out of the 14 studies included in the present review, eight studies recruited teachers (and their students) from primary school settings. The remaining six studies recruited teachers (and their students) from secondary school settings. Finally, two studies recruited students with Autism Spectrum Conditions (see Table 1).

Student Outcomes

Performance. Eight studies examined outcomes that are relevant to student performance. Of these studies, seven examined academic achievement (Arens & Morin, 2016; Coman, 2013; Herman et al., 2018; Hoglund et al., 2015; Klusmann et al., 2008; Klusmann et al., 2016; Reyes et al., 2012). The findings show that teacher burnout was associated with worse achievement more often than not (in four of the seven studies), this included associations with lower reading ability, lower mathematics test scores, and less growth in literacy skills over time, this was especially the case for the exhaustion dimension. All effect sizes were small-to-medium sized (see Table 1 for full details). Arens and Morin (2016) also examined students' competence. However, exhaustion was not associated with perceptions of competence. The remaining study examined goal attainment (Wong et al., 2017). It showed that reduced efficacy was associated with lower goal attainment, with the overall model explaining a substantial proportion of variance (see Table 1).

Motivation. Five studies examined outcomes that are relevant to student motivation. Of these studies, two examined student engagement (Hoglund et al., 2015; Reyes et al., 2012). In both cases, burnout was not associated with engagement, with effects being small sized (see Table 1). However, in one case burnout interacted with aggravated and individual externalizing behaviors (aggression, hyperactivity, and attention problems) to negatively predict change in engagement over time. The other three studies examined components of self-determination theory (Deci & Ryan, 2017). Specifically, one study showed that teacher exhaustion was associated with lower perceptions of teacher autonomy support (Shen et al., 2015) but another showed that it was not associated with levels of basic psychological need satisfaction (Klusmann et al., 2008). Finally, one study showed that cynicism was associated with lower levels of autonomous motivation (Shen et al., 2015). In all instances, effects were small-to-medium sized and explained a moderate amount of variance (see again Table 1).

Wellbeing. Four studies examined outcomes that are relevant to student wellbeing. Of

these studies, two examined depression/depressive symptoms (Denny et al., 2011; Herman et al., 2020). Teachers' student-related burnout was not associated with students' levels of depression, while exhaustion at baseline was associated with lower depression measured at follow-up. It should be noted however that this correlation did not control for the experimental design employed. In addition, both effect sizes were small (see Table 1). Two further studies examined illbeing. One study showed that teacher burnout was not associated with emotional distress (anxiety, depression, and emotional control; Braun et al., 2020). The other study showed that teachers' student-related burnout was not associated with attempted suicide in the preceding 12 months or displayed risk behaviors (e.g., alcohol, violence, sexual health; Denny et al., 2011). Again, both effects were considered small. Two studies examined teacher burnout and student wellbeing. The first showed that total burnout was not associated with a positive outlook (optimism and happiness; Braun et al., 2020), but the final study showed that exhaustion was associated with lower levels of school satisfaction, albeit with a small effect size (Arens & Morin, 2016).

Social. Five studies examined outcomes relevant to student social perceptions. Of these studies, two studies examined outcomes related to students' peers. In this regard, one study showed that total burnout was not associated with prosocial behavior (Braun et al., 2020). The other study showed that burnout was associated with friendship quality but only when combined with aggregated externalizing behaviors, where it negatively predicted changes in friendship quality over time (Hoglund et al., 2015). In both instances, effect sizes were small (see Table 1). Two studies examined outcomes related to students' teachers. One study showed that exhaustion was associated with lower levels of perceived teacher support (Arens & Morin, 2016). In addition, the other study showed that students reported higher perceptions of levels of teacher burnout than teachers themselves (Evers et al., 2004). The final study examined students' psychophysiological arousal (Oberle & Schonart-Reichl,

2016), whereby teacher exhaustion and cynicism were found to be associated with higher levels of student's morning salivary cortisol. These effects were small-to-medium sized.

Discussion

The aim of the present study was to provide the first systematic review of research on teacher burnout, academic achievement, and student-reported outcomes. By identifying, describing, and summarizing the available empirical research in this area, we hoped to provide insight into the importance of teacher burnout for students. Based on the present findings, we discuss the key findings and critical considerations to come out of the review. In doing so, we highlight the most important challenges for future research in this area and provide implications for policy and practice.

Key Findings

Although research has shown that teacher burnout has many negative consequences for teachers themselves (e.g., Aloe et al., 2014; Ghanizadeh & Jahedizadeh, 2015), our findings suggest that the consequences may also extend to the students that they teach. Perhaps one of the most important findings is that there was some evidence that teacher burnout is associated with worse student academic achievement. That is, students being taught by a teacher suffering from burnout tend to perform worse on exams, tests, and receive lower cumulative grades, than those taught by teachers not experiencing burnout. Moreover, these effects may be small-to-medium in size. This finding may be attributed to the tendency for burnout to affect teachers' ability to prepare for their classes, the materials they produce, and the way in which they are delivered, resulting in less effective instruction and subsequent achievement (Maslach & Lieter, 1999). In addition, we found some evidence that teacher burnout will affect students beyond their achievement and possibly interfere with student motivation — with small-to-medium associations found with lower quality motivation. It is possible that burnout imbues interpersonal difficulties for teachers that affect their

relationships with students and how students perceive the support that teachers offer, which in turn affects how tasks are internalized by students (Shen et al., 2015).

The findings of the present review were less clear with respect to whether teacher burnout is associated with student wellbeing. For example, there was little evidence to suggest an association between teacher burnout and students' depressive symptoms, emotional distress, or attempted suicide. It is possible that the extent to which students' experiences are impacted by teacher burnout is not sufficient to create negative consequences for their mental health as these outcomes are more distal to teacher burnout than the comparatively proximal outcomes (e.g., achievement). As such, it is possible that teacher burnout does not affect students' wellbeing directly. The current findings, however, suggest there may be other possible indirect pathways through which teacher burnout could have such effects. The most prominent possibility in this regard is a burnout contagion. In the studies reviewed here, there was some evidence that not only were students astute at recognizing burnout symptoms and affective experiences in their teachers (Evers, Tomic, and Brouwers, 2004), but that teacher burnout was associated with physiological markers of stress in the students they teach (i.e., cortisol; Oberle et al., 2016). If being around teachers who are experiencing burnout can affect students' psychophysiological stress responses, it is possible that, over time, students will themselves become stressed and burned out. Future work is necessary to test these possibilities.

Critical Considerations and Recommendations

Based on a critical appraisal of the work included in the present review, we now provide recommendations for future work in this area. In this regard, first and foremost, we simply need more studies examining the relationships between teacher burnout, academic achievement, and student-reported outcomes. Whereas the studies herein provide some preliminary evidence for the aforementioned relationships (and stronger evidence than

individual studies), a greater depth and breadth of studies in relation to design, samples, and outcomes is warranted. Here, we note that we found no study that had examined the consequences of teacher burnout for achievement or student-reported outcomes in tertiary education. As such, it is currently unknown whether the present findings will generalize to the tertiary context or whether there are unique consequences for students at this stage of education. Moreover, a variety of student-related outcomes should be examined with ranging proximal (e.g., student evaluation of teaching) and distal distance (e.g., student-reports of depressive symptoms) from the teacher. Such studies will allow us to examine the extent to which teachers' burnout symptoms affect students in various aspects of their academic lives, especially since teachers from different educational levels (e.g., primary vs secondary) have varying levels of contact with their students.

A further key consideration for future research pertains to the measurement of burnout. The vast majority of studies adopted Maslach's model and measure of burnout (Maslach & Jackson, 1981). Several of these studies adopted its contextualized version also. We note the importance of this latter point due to the context-specific nature of burnout — that it manifests in relation to specific domains such as teaching, and as a key factor discriminating it from depression and other affective disorders (cf. Schaufeli et al., 2002). We also highlight the need for researchers to consider measuring all three dimensions of burnout. Like research in other domains and other reviews on teacher burnout, emotional exhaustion was the focus of many studies in this review (e.g., Mérida-López & Extremera, 2017). This is reasonable given that emotional exhaustion shows the strongest relationships with various outcomes of the three dimensions. However, one finding that the present review attests to is the differential predictive ability of burnout dimensions. For example, cynicism showed relationships with lower autonomous motivation and exhaustion did not, and also showed larger associations in some instances. Finally, by definition burnout is three dimensions

(Maslach & Jackson, 1981). So as to measure burnout in a manner consistent with its definition, assessing all three of its dimensions is recommended.

Next, further studies examining moderating factors of the present associations are warranted. That is, future studies exploring the conditions under which the negative effects of burnout may be exacerbated (or buffered) will be beneficial. In the present review, we found some evidence for moderating factors, such as aggravated and individual externalizing behaviors as a moderator between burnout and changes in engagement. Examining social support as a key factor, which has been found to buffer the effects of burnout in other contexts (Kim & Stoner, 2008), may also be a fruitful future research direction. Additional studies that build on these findings and seek to unpick these associations further would benefit both theory development and practical implementations of the findings that inform interventions or prevention strategies.

Of central importance to furthering our understanding of the effects of teacher burnout on students is to examine *mechanisms* through which this occurs. We previously discussed contagion effects as a possible mechanism (and highlight the need for more research in this regard too). However, informed by relevant theoretical models (e.g., Jennings & Greenberg, 2009), we also highlight three further pathways that may explain this link between teacher burnout and students. First, burnout may change teachers' classroom preparation. This could include less time spent on preparing material (Maslach & Leiter, 1999). Second, burnout may change actual classroom practices. For example, there is evidence that burnout is associated with an inability to control or reduce disruptive behaviors (Aloe et al., 2014). Finally, burnout may change teachers' opinions of and interactions with students. This could mean that teachers develop adversarial relationships and negative attitudes towards their students (e.g., Leiter & Maslach, 1988). All these possibilities are worth investigating further as a means to explain the present findings.

It is almost cliché to bemoan the lack of longitudinal and rigorously designed studies in a review of psychological constructs. But with only four of 14 studies adopting longitudinal designs, it is clear that such studies are indeed needed in this area, in addition to better quality studies overall (e.g., using reliable measures). Temporal precedence is a necessary (but not sufficient) condition for causal claims. Such examination is critical as there is rising evidence that challenges the assumption that some constructs, such as teacher self-efficacy, are antecedents (e.g., Holzberger et al., 2014; Praetorius et al., 2017). For example, a study using longitudinal data from teacher burnout and teacher self-efficacy found that teacher burnout predicted self-efficacy but not the other way around (Kim & Burić, in press). Examining the direction of the association between teacher burnout and student outcomes is of further interest. This is because theoretical models, such as that provided by Schleicher (2018), do not specify the nature of the direction other than it is reciprocal. Thus, a similar approach is recommended when examining the link between teacher burnout and student outcomes. Furthermore, as these studies will contain both teacher and student data, the nested structure of data (e.g., students nested in classrooms, time points nested in individuals) should be taken into account, which nine out of 14 studies did in the present review. Thus, future studies are also encouraged to use multilevel models to consider how the teacher level data may interact with student level data, when examining the effect of teacher burnout on students. Finally, to provide even stronger evidence for the aforementioned effects, randomizing students to classrooms (and therefore teachers), may provide a quasi-experimental means to test these ideas.

Implications for Practice

Although the results are preliminary, providing recommendations for preventing teacher burnout is warranted given the significant implications of reduced academic achievement and reduced motivation for students, and the numerous effects that teacher

burnout has on teachers themselves (e.g., Billingsley & Bettini, 2019). We focus on suggestions of organizational changes rather than personal changes, given that teacher's personality shows only small associations with teacher burnout (Kim, Jörg, & Klassen, 2019). In this regard, we suggest primary prevention as a more effective and cheaper strategy than secondary interventions (e.g., WHO, 2018). Such prevention strategies could include organizational changes that reduce exposure to stressors (e.g., reduced workload), improve role clarity, and increase congruence between desired and provided resources (e.g., increased reward, organizational support), which have shown to reduce burnout (e.g., Panagioti et al., 2007). In addition, there is evidence that offering more autonomy support (e.g., acknowledging teacher perspectives), social support, and positive feedback can help buffer burnout (Awa, Plaumann, & Walter, 2010).

For those teachers already experiencing burnout symptoms, there is luckily reasonably strong evidence that interventions can reduce burnout (see Iancu et al., 2018 for a meta-analysis on interventions). These interventions include those based on cognitive-behavioral therapy and mindfulness/meditation, which could be offered to all or through a self-referral or referral service system. However, it should be noted that these interventions are not effective in reducing cynicism, which the present study suggests has negative and potentially unique consequences for outcomes such as student motivation. Accordingly, more studies are needed aimed at creating and testing interventions that are capable of reducing this dimension of burnout, and should feature prominently in educational policy.

Conclusion

We have provided the first systematic review of research examining the association teacher burnout has with academic achievement and student-reported outcomes. We note that more studies adopting better designs, and examining mediating and moderating factors need to be conducted, and we have provided recommendations for how to do so. Nonetheless, the

findings suggest that teacher burnout has the potential to inhibit students' achievement and motivation. Accordingly, in addition to the consequences of burnout for teachers themselves, preventing and reducing teacher burnout is likely to be relevant to providing students with quality educational instruction and support.

References

References marked with an asterisk indicate studies included in the systematic review.

Alarcon, G. M. (2011). A meta-analysis of burnout with job demands, resources, and attitudes. *Journal of Vocational Behavior*, *79*, 549-562.

Aloe, A. M., Amo, L. C., & Shanahan, M. E. (2014). Classroom management self-efficacy and burnout: A multivariate meta-analysis. *Educational Psychology Review*, *26*, 101–126.

*Arens, A. K., & Morin, A. J. (2016). Relations between teachers' emotional exhaustion and students' educational outcomes. *Journal of Educational Psychology, 108*, 800-810.

Awa, W. L., Plaumann, M., & Walter, U. (2010). Burnout prevention: A review of intervention programs. *Patient Education and Counseling, 78*, 184-190.

Aydogdu, S., & Asikgil, B. (2011). An empirical study of the relationship among job satisfaction, organizational commitment and turnover intention. *International Review of Management and Marketing, 1,* 43-54.

Bacon, D. R., & Bean, B. (2006). GPA in research studies: An invaluable but neglected opportunity. *Journal of Marketing Education, 28,* 35-42.

Bakker, A. B., & Schaufeli, W. B. (2000). Burnout Contagion Processes Among Teachers. *Journal of Applied Social Psychology, 30*, 2289-2308.

Beer, J., & Beer, J. (1992). Burnout and stress, depression and self-esteem of teachers. *Psychological Reports, 71*, 1331-1336.

Billingsley, B., & Bettini, E. (2019). Special education teacher attrition and retention: A review of the literature. *Review of Educational Research, 89*, 697-744.

*Braun, S. S., Schonert-Reichl, K. A., & Roeser, R. W. (2020). Effects of teachers' emotion regulation, burnout, and life satisfaction on student well-being. *Journal of Applied Developmental Psychology, 69*, 101151.

Bresó, E., Schaufeli, W. B., & Salanova, M. (2011). Can a self-efficacy-based intervention decrease burnout, increase engagement, and enhance performance? A quasi-experimental study. *Higher Education*, *61*, 339-355.

Brouwers, A., & Tomic, W. (2000). A longitudinal study of teacher burnout and perceived self-efficacy in classroom management. *Teaching and Teacher education, 16*, 239-253.

Capone, V., Joshanloo, M., & Park, M. S. A. (2019). Burnout, depression, efficacy beliefs, and work-related variables among school teachers. *International Journal of Educational Research, 95*, 97-108.

Carver-Thomas, D., & Darling-Hammond, L. (2019). The trouble with teacher turnover: How teacher attrition affects students and schools. *Education Policy Analysis Archives, 27*, 36-46.

Cohen, J., McCabe, L., Michelli, N. M., & Pickeral, T. (2009). School climate: Research, policy, practice, and teacher education. *Teachers College Record, 111*, 180-213.

*Coman, D. C. (2013). *The role of teacher commitment and burnout in predicting outcomes of preschoolers with autism spectrum disorders: A multilevel structural equation approach* (Doctoral dissertation, University of Miami).

Cooley, E., & Yovanoff, P. (1996). Supporting professionals-at-risk: Evaluating interventions to reduce burnout and improve retention of special educators. *Exceptional Children, 62*, 336–355.

*Denny, S. J., Robinson, E. M., Utter, J., Fleming, T. M., Grant, S., Milfont, T. L., ... & Clark, T. (2011). Do schools influence student risk-taking behaviors and emotional health symptoms? *Journal of Adolescent Health, 48*, 259-267.

Department for Education. (2019). Teacher Recruitment and Retention Strategy; Supporting teachers to make a difference. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/

attachment_data/file/773930/Teacher_Retention_Strategy_Report.PDF.pdf

Dyrbye, L. N., Thomas, M. R., Massie, F. S., Power, D. V., Eacker, A., Harper, W., ... & Sloan, J. A. (2008). Burnout and suicidal ideation among US medical students. *Annals of internal medicine*, *149*(5), 334-341.

El Ansari, W., & Stock, C. (2010). Is the health and wellbeing of university students associated with their academic performance? Cross sectional findings from the United Kingdom. *International Journal of Environmental Research and Public Health*, *7*, 509-527.

*Evers, W. J., Tomic, W., & Brouwers, A. (2004). Burnout among teachers: Students' and teachers' perceptions compared. *School Psychology International, 25*, 131-148.

Fan, H., Xu, J., Cai, Z., He, J., & Fan, X. (2017). Homework and students' achievement in math and science: A 30-year meta-analysis, 1986–2015. *Educational Research Review*, *20*, 35-54.

Furrer, C., & Skinner, E. (2003). Sense of relatedness as a factor in children's academic engagement and performance. *Journal of Educational Psychology, 95,* 148-156.

Ghanizadeh, A., & Jahedizadeh, S. (2015). Teacher burnout: A review of sources and ramifications. *Journal of Education, Society and Behavioural Science*, 24-39.

Groot, W., & Maassen van den Brink, H. (2007). The health effects of education. *Economics of Education Review, 26*, 186-200.

*Herman, K. C., Hickmon-Rosa, J. E., & Reinke, W. M. (2018). Empirically derived profiles of teacher stress, burnout, self-efficacy, and coping and associated student outcomes. *Journal of Positive Behavior Interventions, 20*, 90-100.

*Herman, K. C., Prewett, S. L., Eddy, C. L., Savala, A., & Reinke, W. M. (2020). Profiles of middle school teacher stress and coping: Concurrent and prospective correlates. *Journal of School Psychology, 78*, 54-68.

*Hoglund, W. L., Klingle, K. E., & Hosan, N. E. (2015). Classroom risks and resources: Teacher burnout, classroom quality and children's adjustment in high needs elementary schools. *Journal of School Psychology, 53*, 337-357.

Holzberger, D., Philipp, A., & Kunter, M. (2014). Predicting teachers' instructional behaviors: The interplay between self-efficacy and intrinsic needs. *Contemporary Educational Psychology*, *39*, 100–111.

Iancu, A. E., Rusu, A., Măroiu, C., Păcurar, R., & Maricuțoiu, L. P. (2018). The effectiveness of interventions aimed at reducing teacher burnout: A meta-analysis. *Educational Psychology Review*, *30*, 373-396.

IsHak, W., Nikravesh, R., Lederer, S., Perry, R., Ogunyemi, D., & Bernstein, C. (2013). Burnout in medical students: a systematic review. *The Clinical Teacher*, *10*, 242-245.

Johnson, J. G., Harris, E. S., Spitzer, R. L., & Williams, J. B. (2002). The Patient Health Questionnaire for Adolescents: Validation of an instrument for theassessment of mental disorders among adolescent primary care patients. *Journal of Adolescent Health, 30*, 196–204

Kern, M. L., Benson, L., Steinberg, E. A., & Steinberg, L. D. (2016). The EPOCH measure of adolescent well-being. *Psychological Assessment, 28*, 586–597

Kim, L. E., & Burić, I. (in press). Teacher self-efficacy and burnout: Determining the directions of prediction through an autoregressive cross-lagged panel model. *Journal of Educational Psychology.*

Kim, B., Jee, S., Lee, J., An, S., & Lee, S. M. (2018). Relationships between social support and student burnout: A meta-analytic approach. *Stress and Health*, *34*, 127-134.

Kim, L. E., Jörg, V. & Klassen, R. M. (2019). A meta-analysis of the effects of teacher personality on teacher effectiveness and burnout. *Educational Psychology Review, 31*, 163-195.

Kim, H., & Stoner, M. (2008). Burnout and turnover intention among social workers: Effects of role stress, job autonomy and social support. *Administration in Social Work, 32*, 5-25.

*Klusmann, U., Richter, D., & Lüdtke, O. (2016). Teachers' emotional exhaustion is negatively related to students' achievement: Evidence from a large-scale assessment study. *Journal of Educational Psychology*, *108*, 1193.

Kunter, M., Baumert, J., & Koller, O. (2007). Effective classroom management and the development of subject-related interest. *Learning and Instruction, 17*, 494–509.

Kusche, C. A., Greenberg, M. T., & Beilke, R. (1998). Seattle personality questionnaire for young school-aged children. (Unpublished Manuscript).

Kyriacou, C. (2001). Teacher stress: Directions for future research. *Educational Review, 53*, 27-35.

Leiter, M. P. (1993). Burnout as a developmental process: Consideration of models. *Professional burnout: Recent developments in theory and research, 237*, 250.

Leiter, M. P., & Maslach, C. (1988). The impact of interpersonal environment on burnout and organizational commitment. *Journal of Organizational Behavior, 9*, 297-308.

Madigan, D. J., & Curran, T. (in press). Does burnout affect academic achievement? A meta-analysis of over 100,000 students. *Educational Psychology Review.*

Maslach, C. (2003). Job burnout: New directions in research and intervention. *Current Directions in Psychological Science,* 12, 189-192.

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of organizational behavior*, *2*(2), 99-113.

Maslach, C., Jackson, S.E., & Leiter, M.P. (1996). *Maslach Burnout Inventory manual* (3rd ed.). Palo Alto, CA: Consulting Psychologist Press

Maslach, C., Jackson, S. E., Leiter, M. P., Schaufeli, W. B., & Schwab, R. L. (1986). *Maslach burnout inventory* (Vol. 21, pp. 3463-3464). Palo Alto, CA: Consulting psychologists

press.

Maslach, C., & Leiter, M. P. (1999). Teacher burnout: A research agenda. In R. Vandenberghe, A. M. Huberman, & R. Huberman (Eds.), *Understanding and preventing teacher burnout: A sourcebook of international research and practice* (pp. 295–303). Cambridge, England: Cambridge University Press.

Mather, N., & Woodcock, R. W. (2001). Examiner's manual. Woodcock-Johnson III Tests of Achievement. Itasca, IL: Riverside.

McHugh, M. L. (2012). Interrater reliability: The kappa statistic. *Biochemia Medica, 22*, 276-282.

Mérida-López, S., & Extremera, N. (2017). Emotional intelligence and teacher burnout: A systematic review. *International Journal of Educational Research, 85*, 121-130.

Mullis, I.V., Martin, M.O., Kennedy, A.M., & Foy, P. (2007). *PIRLS 2006 international report. IEA's progress in international reading literacy study in primary schools in 40 countries.* Chestnut Hill, MA: International Study Center.

Noam, G. G., & Goldstein, L. S. (1998). The resilience inventory. (Unpublished Protocol).

*Oberle, E., & Schonert-Reichl, K. A. (2016). Stress contagion in the classroom? The link between classroom teacher burnout and morning cortisol in elementary school students. *Social Science & Medicine, 159*, 30-37.

OECD. (2016). *Education at a glance 2016: OECD indicators*. Paris: OECD Publishing.

Panagioti, M., Panagopoulou, E., Bower, P., Lewith, G., Kontopantelis, E., Chew-Graham, C., ... & Esmail, A. (2017). Controlled interventions to reduce burnout in physicians: a systematic review and meta-analysis. *JAMA Internal Medicine, 177*, 195-205.

Parker, J. G., & Asher, S. R. (1993). Friendship and friendship quality in middle childhood: Links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Developmental Psychology, 29*, 611-621.

Paulhus, D. L. (2002). Socially desirable responding: The evolution of a construct. In H. Braun, D. N. Jackson, & D. E. Wiley (Eds.), *The role of constructs in psychological and educational measurement* (pp. 49–69). Erlbaum.

Praetorius, A.-K., Lauermann, F., Klassen, R. M., Dickhäuser, O., Janke, S., & Dresel, M. (2017). Longitudinal relations between teaching-related motivations and student-reported teaching quality. *Teaching and Teacher Education*, *65*, 241–254.

Purvanova, R. K., & Muros, J. P. (2010). Gender differences in burnout: A meta-analysis. *Journal of Vocational Behavior*, *77*, 168-185.

*Reyes, M. R., Brackett, M. A., Rivers, S. E., White, M., & Salovey, P. (2012). Classroom emotional climate, student engagement, and academic achievement. *Journal of Educational Psychology, 104*, 700-711.

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin, 138,* 353–387.

Ridner, S. L., Newton, K. S., Staten, R. R., Crawford, T. N., & Hall, L. A. (2016). Predictors of well-being among college students. *Journal of American College Health*, *64*, 116-124.

Roeser, R. W., Schonert-Reichl, K. A., Jha, A., Cullen, M., Wallace, L., Wilensky, R., Oberle, E., Thomson, K., Taylor, C., & Harrison, J. (2013). Mindfulness training and reductions in teacher stress and burnout: Results from two randomized, waitlist-control field trials. *Journal of Educational Psychology*, *105*, 787–804.

Roth, P. L., & Clarke, R. L. (1998). Meta-analyzing the relation between grades and salary. *Journal of Vocational Behavior*, *53*, 386-400.

Ruble, L. A., McGrew, J. H., Toland, M. D., Dalrymple, N. J., & Jung, L. A. (2013). A randomized controlled trial of COMPASS web-based and face-to-face teacher coaching

in autism. *Journal of Consulting and Clinical Psychology, 81*, 566–572

Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology, 57*, 749–760.

Schaufeli, W. B., & Taris, T. W. (2005). The conceptualization and measurement of burnout: Common ground and worlds apart. *Work & Stress*, *19*, 256-262.

Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies, 3*, 71-92.

Schneider, M., & Preckel, F. (2017). Variables associated with achievement in higher education: A systematic review of meta-analyses. *Psychological Bulletin*, *143*, 565.

Schleicher, A. (2018). *Valuing our Teachers and Raising their Status: How communities can help* (International Summit on the Teaching Profession,). OECD Publishing.

*Shen, B., McCaughtry, N., Martin, J., Garn, A., Kulik, N., & Fahlman, M. (2015). The relationship between teacher burnout and student motivation. *The British Journal of Educational Psychology, 85*, 519–532.

Sims, S., & Jerrim, J. (2020). *TALIS 2018: teacher working conditions, turnover and attrition*. Department for Education.

Skaalvik, E. M., & Skaalvik, S. (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *Journal of Educational Psychology, 99,* 611-620.

Sutton, R. E., & Wheatley, K. F. (2003). Teachers' emotions and teaching: A review of the literature and directions for future research. *Educational Psychology Review, 15*, 327-358.

Taris, T. W. (2006). Is there a relationship between burnout and objective performance? A

critical review of 16 studies. *Work & Stress*, *20*, 316-334.

UNESCO Institute for Statistics. (2016). *The world needs almost 69 million new teachers to reach the 2030 education goals* (No. 39). http://uis.unesco.org/sites/default/files/documents/fs39-the-world-needs-almost-69-million-new-teachers-to-reach-the-2030-education-goals-2016-en.pdf

Walburg, V. (2014). Burnout among high school students: A literature review. *Children and Youth Services Review*, *42*, 28-33.

Wayne, A. J., & Youngs, P. (2003). Teacher characteristics and student achievement gains: A review. *Review of Educational Research, 73*, 89-122.

Wentzel, K. R. (1993). Does being good make the grade? Social behavior and academic competence in middle school. *Journal of Educational Psychology, 85*, 357–364.

West, C. P., Dyrbye, L. N., Erwin, P. J., & Shanafelt, T. D. (2016). Interventions to prevent and reduce physician burnout: A systematic review and meta-analysis. *The Lancet*, *388*, 2272-2281.

Williams, G. C., & Deci, E. L. (1996). Internalization of biopsychosocial values by medical students: a test of self-determination theory. *Journal of Personality and Social Psychology, 70,* 767-777.

*Wong, V. W., Ruble, L. A., Yu, Y., & McGrew, J. H. (2017). Too stressed to teach? Teaching quality, student engagement, and IEP outcomes. *Exceptional Children, 83*, 412-427.

World Health organization. 2018. EPHO5: Disease prevention, including early detection of illness. Geneva: World Health Organization.

Zimmerman, I.L., Steiner, V.G., & Pond, R.E. (2002). Preschool language scale-4. San Antonio, TX: The Psychological Corporation

Zhang, X., Klassen, R. M., & Wang, Y. (2013). Academic burnout and motivation of Chinese

secondary students. *International Journal of Social Science and Humanity, 3*, 134-142.

Table 1. *Studies examining teacher burnout, academic achievement, and student-reported outcomes*

Study	*N* teachers	*N* students	Level	Burnout measure	Design	Analyses	Criterion Variables	Main Findings
Arens & Morin (2016)	380 (*M*age = 47.1 years [*SD* = 11.45], 88.9% female, *M*exp = 21.73 years [*SD* = 11.45])	7899 (*M*age = 10.46 years [*SD* = 0.51]), 48.7% female)	Primary	EE MBI-ES	C/S	ML-SEM	1. Competence (10 items; "I often fail at class exams") 2. Teacher support (11 items; "Our German teacher gives advice to individual students how they could improve their learning") 3. School satisfaction (6 items; "I like to go to school) 4. Achievement (standardized reading achievement test; Mullis et al., 2007)	EE was associated with lower average levels of achievement (β = -.11, p < .001) and lower levels of teacher support (β = -.09, p < .001) and satisfaction (β = -.08, p < .05). No association with competence (β = -.03, p > .05).
Braun et al. (2020)	15 (86.0% female, *M*exp = 16.42 years [*SD* = 6.57])	320 (*M*age = 9.93 year [*SD* = 0.57], 48.0% female)	Primary	MBI	Longitudinal (3 wave)	ML growth modeling	1. Positive outlook (average of optimism and happiness; optimism subscale of the Resilience Inventory (Noam & Goldstein,1998; happiness subscale of the EPOCH Measure of Adolescent Well-Being (Kern, Benson, Steinberg, & Steinberg, 2016)) 2. Emotional distress (average of anxiety symptoms, depressive symptoms, and emotion control (reversed); Anxiety and depressive symptoms were measured using the respective subscales of the Seattle Personality Questionnaire (Kusche, Greenberg, & Beilke, 1998); Emotion control was measured using the three-item emotion control subscale of the Resilience Inventory (Noam & Goldstein,1998)) 3. Peer-reported prosocial behavior (peer nominations proportion sums within classes; Wentzel (1993))	Total burnout showed no association with nor its growth in, respectively, positive outlook (β = -.07, b = -0.02, p > .05), emotional distress (b = .09; b = 0.02, p > .05), nor prosocial behavior (b = -.03; b = 0.00, p > .05).
Coman (2013)	74 (*M*exp = 10.38 years [*SD* =	198 (*M*age = 47.6 months	Primary	MBI-ES	Longitudinal (4 wave)	ML-SEM	1. Expressive and receptive communication language ability (Preschool Language Scale-4th Edition; Zimmerman, Steiner,	Burnout (T2+T3) showed a negative but nonsignificant association

	6.22], 98.6% female)	[*SD*=7.5], 17.2% female; Autism Spectrum Disorder)					& Pond, 2002)	with language ability (β = -.38, $p > .05$).
Denny et al. (2011)	2901 (57.0% female)	9056 (97% between ages of13 to 17, 46.0% female)	Secondary	SR CBI	C/S	ML multiple regression	1. Depression (10 items; Adolescent Depression Questionnaire) 2. Attempted suicide (1 item; during the last 12 months have you tried to kill yourself (attempted suicide)?) 3. Motor vehicle risk behaviors (6 items) 4. Violence related risk behaviors (4 items) 5. Smoking cigarettes (2 items) 6. Alcohol use risk (10 items) 7. Unsafe sexual health behaviors (3 items)	Student-related burnout showed no association with any of the outcome variables (*OR*s = .81 to 1.24, $p > .05$).
Evers et al. (2004)	41 (*M*age = 49.07 years [*SD* = 6.21], 22.0% female, *M*exp = 22.00 years [*SD* = 7.80])	411 (*M*age = 18.3 years [*SD* = 2.43], 38.7% female)	Secondary	MBI-ES	C/S	T-tests	1. Student perceptions of teacher burnout (MBI-ES)	C ($d = 0.54$, $p < .001$) and RE ($d = 0.97$, $p < .001$) reported to be higher by students than their teachers.
Herman et al. (2018)	121 (95.0% female, *M*exp = 11.10 years [*SD* = 8.10])	1817 (48.0% female)	Primary	MBI	Experimental	LPA	1. Achievement (reading and mathematics; Woodcock–Johnson III Test of Achievement (Mather & Woodcock, 2006)	Of four latent profiles, a profile of high burnout and stress and low on coping was associated with worse mathematics achievement than a profile of second lowest on burnout, stress and high on coping ($d = 1.03$, $p < .05$).
Herman et al. (2020)	102 (*M*age = 37.8 years [*SD* =	1450 (50.8% female)	Secondary	EE MBI	Experimental (4 waves)	Latent class multiple regression	1. Depressive symptoms (Patient Health Questionnaire-8 Adolescent Version (Johnson, Harris, Spitzer, & Williams,	Negative association between baseline burnout and depression (T4; r = -

	8.8], 79.1% female, *M*exp = 10.40 years [*SD* = 6.30])						2002)	.04, $p < .01$). Of three latent profiles based on T1 scores, there were no differences between depression scores (T4; β = -.53, $p >$,05).
Hoglund et al. (2015)	65 (*M*age = 37.38 years [*SD* = 11.17], 96.9% female, *M*exp = 11.78 years [*SD* = 9.53])	461 (*M*age = 6.9 years [*SD* = 1.19], 51.0% female)	Primary	MBI	Longitudinal (3 wave)	ML growth modeling	1. Friendship quality (nominated 3 friends, Friendship Quality Questionnaire; Parker & Asher, 1993) 2. Engagement (School Engagement Questionnaire; Furrer & Skinner, 2003) 3. Literacy skills (National Center for Education Statistics, 2002)	Burnout was associated with significantly less growth in literacy skills across the term (ES = .03). For students instructed by teachers with high (vs low) levels of burnout, aggregated externalizing behaviors was associated with greater increase in engagement (ES = .01) and literacy skills (ES = .03). For students instructed by teachers with low (vs high) levels of burnout, aggregate externalizing behaviors was associated with greater decreases in friendship quality (ES = .01). For students with high (vs low) levels of burnout, individual externalizing behaviors were more negatively associated with engagement (ES = .16).
Klusmann et al. (2008)	318 (*M*age = 47.9 years [*SD* = 9.0], 43.4% female, *M*exp = 20.60 years	~3816	Secondary	EE MBI	C/S	Correlations	1. Mathematics achievement (international PISA 2003 mathematics assessment) 2. Basic need satisfaction (Intrinsic Need Satisfaction in Class Scale (Kunter, Baumert, & Koller, 2007)	EE showed a nonsignificant negative association with achievement ($r = -.07$, $p >$ .05) and basic need satisfaction ($r = -.10$, $p >$ .05).

	[*SD* = 10.60])							
Klusmann et al. (2016)	1102 (*M*age = 47.64 years [*SD* = 10.52], 85.4% female, *M*exp = 21.80 years [*SD* = 12.03])	22002 (*M*age = 10.45 years [*SD* = 0.50], 49.4% female)	Primary	EE MBI	C/S	ML multiple regression	1. Mathematics achievement (standardized test; 330 items)	EE was associated with lower levels of achievement (b = -4.56, p < .01). There was an interaction between EE and class composition (proportion of language minority students; b = -1.66, p < .05).
Oberle & Schonart-Reichl (2016)	17 (*M*age = 48.59 years [*SD* = 14.20], 76.5% female, *M*exp = 13.50 years [*SD* = 8.17])	406 (*M*age = 11.27 years [*SD* = 0.89], 50.0% female)	Primary	EE and C MBI-ES	C/S	ML multiple regression	1. Salivary cortisol (3 measures, same day; 9:00, 11:30, 14:00)	Burnout was associated with higher morning cortisol levels in students (after controlling for age, gender, and time of awakening; γ =.009, p < .001). Burnout correlated positively with total cortisol release (r = .17, p < .05).
Reyes et al. (2012)	63 (88.9% female, *M*exp = 14.76 years [*SD* = 10.64])	1399 (50.0% female)	Secondary	C MBI-ES	C/S	ML multiple regression	1. Engagement (Engagement vs. Disaffection Scale (Furrer & Skinner, 2003)) 2. Academic achievement (grades)	C showed no associations with grades (γ = -1.06, p > .05) or engagement (γ = 0.08, p > .05).
Shen et al. (2015)	33 (42.4% female, *M*exp = 14.38 years [*SD* = 6.50])	1302 (*M*age = 15.9 years, 57.9% female)	Secondary	MBI-ES	Longitudinal (2 wave)	ML multiple regression	1. Teacher autonomy support (6 item, Learning Climate Questionnaire; Williams & Deci, 1996) 2. Autonomous motivation (12 item, locus of causality questionnaire; Ryan & Connell, 1989)	EE was associated with lower levels of teacher autonomy support (β = -.20, p < .05; Model R^2 = .19). C (T1) was associated with lower levels of autonomous motivation (T2; β = -.18, p < .05; Model R^2 = .25).

Wong et al. (2017)	79 (96.2% female, *M*exp = 11.02 years [*SD* = 7.90])	79 (*M*age= 5.9 years [*SD* = 1.6], 16.5% female; Autism Spectrum Conditions)	Primary	MBI-ES	C/S	Linear multiple regression	1. Performance (Psychometric Equivalence Tested Goal Attainment Scaling (PETGAS) assessed individual educational outcomes (Ruble, McGrew, & Toland, 2012)	RE was associated with lower performance (β = -.34, $p < .01$; Model R^2 = .60) [effect sizes reversed]

*Note. M*age = Mean age. *M*exp = Mean experience. MBI = Maslach Burnout Inventory. MBI-ES = Maslach Burnout Inventory-Educators Survey. CBI = Copenhagen Burnout Inventory. SR = Student-related burnout. C = Cynicism. EE = Emotional exhaustion. RE = Reduced efficacy. C/S = Cross-sectional. ML = Multilevel modeling. ML-SEM = Multilevel structural equation modeling. LPA = Latent profile analysis.

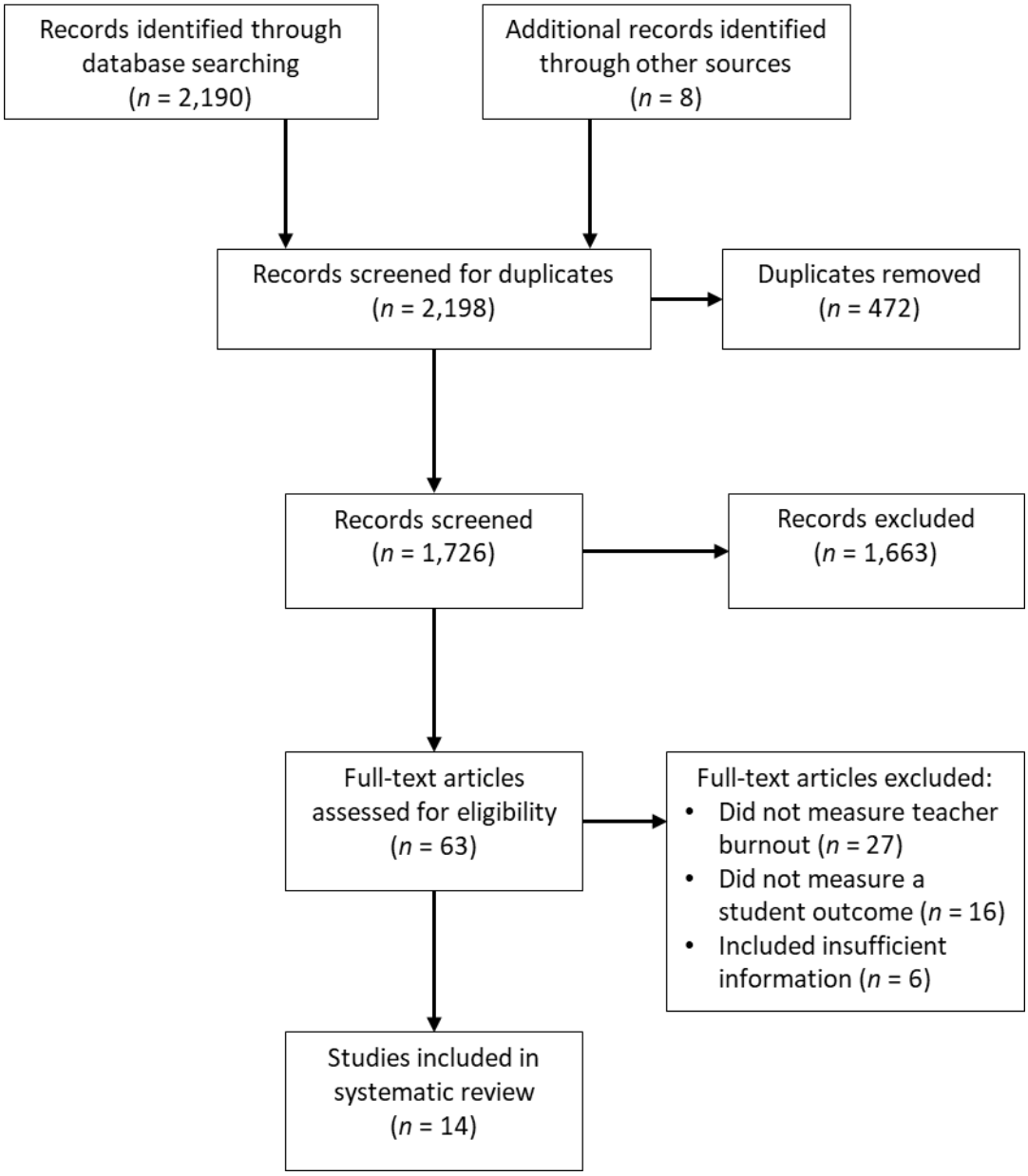

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram illustrating study selection.