

The Relationship Between Teacher Burnout and Physical Activity Among High School Teachers

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Teaching is a high-stress profession that often leads to teacher burnout, which negatively impacts educators' physical and emotional well-being as well as student learning outcomes. This study examines the relationship between physical activity levels and teacher burnout among high school educators, with particular attention to implications for teacher leaders. Using the International Physical Activity Questionnaire (IPAQ) and the Burnout Assessment Tool (BAT-23), data were collected from 243 teachers across three high schools in the same district. Pearson's correlation and multivariate analysis of variance analyses were conducted using physical activity levels, teacher burnout, and demographic variables (age, gender, race, education level, experience, and school). Results indicate a significant negative correlation between physical activity and burnout. These findings suggest that increasing physical activity may help mitigate teacher burnout, especially among teacher leaders who often navigate elevated role demands. The study underscores the importance of school-based wellness initiatives that support the well-being of all educators and promote sustainable teacher leadership.

Keywords: Teacher burnout, burnout, physical activity, high school teachers, burnout mitigation

Introduction

Being a teacher is stressful work. Social and professional interactions with students, colleagues, administration, and the community can compound the stress and lead to occupational burnout. In addition to instructional responsibilities, teachers are increasingly called upon to take on leadership roles within their schools, further compounding role-related stress (York-Barr & Duke, 2004; Wenner & Campbell, 2017). Occupational burnout is defined as possessing a limited ability to deal with the occupational stressors that accompany any job that requires personal interaction (Maslach & Jackson, 1981). The highest levels of burnout are found among occupations that require the most human interaction, and teaching finds itself atop the list (De Oliveira et al., 2011). De Oliveira and colleagues outlined teacher stress to be a product of social and professional interactions but changes in the type and amount of interaction experienced by teachers – paired with increases in teachers' perceived stress during the COVID-19 pandemic – presented new ramifications for teaching and learning (Jakubowski et al., 2021). Although occupational burnout is relevant to all professions, and especially relevant to teachers and teacher

leaders who often serve as mentors, department chairs, or coordinators of school climate initiatives (Wenner & Campbell, 2017), the present study addressed burnout among teachers with the hope of exploring physical activity as a means by which teachers and teacher leaders can reduce or prevent their own burnout.

As schools were sent home in March 2020, teachers began to explore the world of virtual teaching and learning and how to navigate the profession from behind their computer screen bunkered in their home. It may seem that the connection between personal interaction and teacher stress and teacher burnout would lead to lowered levels of teacher stress and teacher burnout, but the opposite proved to be true (Pogere et al., 2019). Levels of self-reported teacher mental distress significantly increased during the first wave of COVID-19 during March 2020 and the second wave of cases from September 2020 through May 2021 (Jakubowski et al., 2021). Jakubowski and colleagues (2021) reported that teachers were experiencing moderate levels of stress (45.52%), anxiety (46.9%), and depression (44.14%) at the beginning of the pandemic during April 2020. Each level increased to 47.14%, 50.71%, and 55% respectively during the second wave of COVID-19 in the Fall of 2020. Burnout occurrence among teachers also increased from April to June 2020 (Sokal et al., 2020) even as teachers reported a decreased workload and more creative freedom in their lesson planning (Bubb & Jones, 2020). Emerging research suggests that teacher leaders play a pivotal role in modeling and promoting well-being practices that help mitigate teacher burnout. However, their own wellness is rarely prioritized in these efforts (Nguyen et al., 2019; Doyle Fosco et al., 2023), which is especially relevant to this study in that it was conceived and carried out by a practicing teacher leader who turned to physical activity as a means of supporting both his own well-being and that of his colleagues during the pandemic. As such, the purpose of the study was to examine the relationship between level of physical activity and teacher burnout among current high school teachers at three high schools within the same school district.

Literature Review: Teacher Burnout and Teacher Well-Being

Teacher burnout needs to be explored due to the implications for the health and well-being of teachers. Burnout has been significantly positively related to obesity (Armenta-Hernández, 2021) and heart disorders such as heart rate variability, elevated blood pressure (May et al., 2018), and mitochondrial dysfunction (Johannsen & Ravussin, 2009). Teacher burnout has been shown to limit physiological functions that can be negative predictors of health and wellness (May et al., 2018; Sabagh et al., 2018). Understanding that cardiac and mitochondrial dysfunction are both major health concerns for the physical health of teachers should increase the urgency with which stakeholders seek adequate methods for mitigating stress and limiting the onset of teacher burnout.

Importantly, teachers who hold formal or informal leadership roles are especially susceptible to these health impacts. Research shows that teacher leaders often take on added responsibilities in school improvement, peer mentoring, and student support—roles that place them at the center of relational and emotional labor (York-Barr & Duke, 2004; Wenner & Campbell, 2017). Without adequate wellness support, these demands can contribute to elevated stress levels, even among teachers who serve as wellness advocates within their school communities (Fosco et al., 2023).

Along with the physiological complications of teacher burnout, the effects of being burned out are just as harmful to one's mental health. Studies have shown that burnout is related

to depression and is linked to irritability, low self-efficacy, and increases in anxiety (Brand et al., 2020). Physical activity as an intervention for teacher burnout may also have positive outcomes for mental health, as physical activity interventions have shown decreases in stress (Bretland & Thorsteinsson, 2015), anxiety (Freitas et al., 2014), and depression (Kvam et al., 2016). Lindegard and colleagues (2015) found that increased levels of physical activity were related to decreases in depressive symptoms and burnout at 12- and 18-month follow-up periods when compared to a non-physical activity control group.

Notably, these benefits apply across various roles in the teaching profession, including those in leadership positions. Teacher leaders are often expected to support colleagues' well-being while navigating their own stressors without institutional structures for care or respite (Nguyen & Hunter, 2019). Addressing mental health in this context calls for wellness strategies that are not only individualized but also embedded in the professional identity of those leading school-based improvement efforts. This evidence suggests that general levels of stress, burnout, depression, and anxiety can be improved through physical activity of any intensity—an important finding for high school teachers and teacher leaders alike.

Physical Activity as a Coping Mechanism

Physical activity has been shown to reduce stress-related mental disorders (Lindegard et al., 2015) and improve overall well-being (Bretland & Thorsteinsson, 2015). While emotional coping strategies such as meditation and journaling can be effective, emotional reactions to stress—if unmanaged—can be detrimental. Increased physical activity not only reduces negative emotional coping but also enhances task-oriented coping strategies that mitigate stress (Gillian et al., 2013). Studies have demonstrated that individuals who engage in regular physical activity experience lower stress levels and improved stress management. For example, Bogaert et al. (2014) found that leisure-time physical activity contributes to stress reduction by enhancing intrinsic motivation, self-esteem, and active coping. Additionally, higher levels of physical activity have been associated with lower occupational stress and absenteeism. Corbett et al. (2022) highlighted that physical activity interventions significantly reduce teacher stress and improve overall well-being. Similarly, daily exercise has been identified as a short-term self-regulation mechanism for work-related stress (Feuerhahn et al., 2014).

Importantly, several studies confirm that increased physical activity decreases stress among teachers, making it a viable strategy for mitigating burnout (Gerber et al., 2013; Jakubowski et al., 2021; Klaperski & Dawans, 2014). These findings underscore the importance of supporting teachers—not only as educators but also as teacher leaders who typically model effective practices for their peers and students (Mangin & Stoelinga, 2008; York-Barr & Duke, 2004).

Physical Activity, Teacher Burnout, and Teacher Wellness

Research indicates that physical activity serves as a protective factor against burnout by reducing emotional exhaustion, increasing job satisfaction, and fostering an awareness of physical well-being (Abós et al., 2021; Brasfield et al., 2019; Carson et al., 2010). Carraro et al. (2010) found that teachers with higher levels of physical activity reported increased personal accomplishment both inside and outside the classroom. Moreover, increased physical activity is associated with reduced burnout symptoms, even when accounting for demographic factors such as age, gender, years of experience, and educational background (Ali et al., 2020). While most research on physical activity and burnout has been correlational, experimental studies also

demonstrate its effectiveness. For example, Abós et al. (2021) found that teachers who participated in a structured physical activity program experienced significant improvements in job satisfaction, vigor, and engagement compared to a control group. Likewise, Bretland and Thorsteinsson (2015) found that a four-week physical activity intervention reduced burnout levels from 37.9% to 14.9% among highly burned-out individuals.

Engaging in physical activity—regardless of its type, duration, or intensity—has been shown to support teacher wellness, with the act of participation itself yielding significant benefits (Carson et al., 2010). This finding is particularly relevant for teacher leaders, who often spearhead school wellness efforts and serve as influential models for their peers (Doyle Fosco et al., 2023). Research highlights that a wide range of physical activities—including leisure pursuits (Carson et al., 2010), organized sports (Ngalagou et al., 2018), aerobic exercises, and strength training (Naczenski et al., 2017)—can reduce stress and mitigate symptoms of burnout. Even low-intensity physical activity has been linked to lower levels of exhaustion, disengagement, and emotional fatigue (Ali et al., 2020). These findings position physical activity not only as a personal wellness strategy, but also as a teacher leadership practice that supports healthier school communities.

It cannot be overstated that teacher wellness is a crucial factor in job satisfaction and professional identity. Emotional exhaustion, lack of personal accomplishment, and depersonalization are all negatively associated with teacher wellness (Brasfield et al., 2019). In contrast, teachers who engage in physical activity often report heightened health awareness, increased enthusiasm for their work, and a stronger commitment to both personal and collective wellness efforts (Freitas et al., 2014; Iancu et al., 2018). Given the deep connections between teacher leadership, professional identity, and school culture, research suggests that teacher wellness should be recognized not only as a personal concern but as a core teacher leadership issue. As York-Barr and Duke (2004) argue, teacher leadership is intrinsically tied to how teachers see themselves and shape their school environments—situating wellness an essential component of sustainable, effective teacher leadership.

Summary and Significance: The Negative Impact of Burnout on Teachers and Students

Negative implications of teacher burnout are much too severe to ignore because the performance and well-being of both students and teachers are at the core of any educational system. Research consistently shows that burnout impairs instructional effectiveness, weakens teacher-student relationships, and contributes to reduced student engagement and achievement (Jennings & Greenberg, 2009; Arens & Morin, 2016; Herman et al., 2020). As burnout increases, so too do the risks for both teacher withdrawal and negative classroom environments, which are not isolated to the individual teacher—they reverberate through classrooms, schools, and communities, as student success is closely tied to teacher stability and support.

The literature reviewed for this study outlines the urgent need for strategies that reduce the prevalence and severity of teacher burnout. Stress has been identified as the primary cause of burnout (Castillo et al., 2017; De Oliveira et al., 2011; McClafferty et al., 2018; Mohamed et al., 2021; Pogere et al., 2019), and burnout can result from an imbalance between stress and the mechanisms available to cope with it (Brasfield et al., 2019). As burnout rises, both teachers and students experience adverse consequences—highlighting the importance of exploring interventions that can disrupt this cycle.

Physical activity has emerged as a promising coping strategy to reduce stress and mitigate burnout, with benefits reported across teacher demographics including age, gender, and

experience (Abós et al., 2021; Ali et al., 2020). This study contributes to the existing research base by 1) examining the relationship between physical activity and teacher burnout and 2) reinforcing physical activity as a viable and accessible wellness strategy. Importantly, this project is grounded in the lived experience of a practicing teacher leader, who turned to physical activity as a means of supporting both his own wellness and that of his colleagues during the COVID-19 pandemic. In doing so, this study not only reinforces physical activity as a viable intervention but also positions teacher leaders as central actors in shaping school-wide wellness practices that benefit both educators and students. The lead researcher, a public high school science teacher with over a decade of experience, also serves in multiple leadership roles, including wellness coordinator for a school of 250+ certified staff. Firsthand observations and anecdotes revealed teacher burnout as a major concern, alongside a noticeable lack of emphasis on physical activity and self-care—framing the study's problem of practice. Informed by both university and public school experience, this research is grounded in practical teacher leadership (Katzenmeyer & Moller, 2013), with the goal of amplifying the voices of PK–12 teachers as researchers and advocates for their own well-being.

Conceptual Framework

This study is guided by a conceptual framework that positions teacher burnout as a multidimensional phenomenon with far-reaching implications for both educator wellness and student learning. Drawing from the foundational work of Maslach and Jackson (1981), burnout is understood to comprise emotional exhaustion, depersonalization, and reduced personal accomplishment. This classic model has been expanded by Schaufeli et al. (2020) through the Burnout Assessment Tool (BAT), which incorporates four dimensions: exhaustion, mental distance, emotional impairment, and cognitive impairment. These indicators offer a comprehensive assessment of burnout severity and reflect the increasingly complex stressors teachers face in modern school systems.

Burnout emerges from the accumulation of persistent, unmitigated stress—stemming from individual, organizational, and transactional factors (Chang, 2009; Herman et al., 2018). Teachers and teacher leaders often operate within emotionally demanding environments that require sustained interpersonal engagement, high cognitive load, and ongoing adaptation to policy and instructional change. As exhaustion takes root, it becomes the core mechanism through which teachers begin to disengage emotionally and cognitively from their work. This withdrawal not only impairs teacher performance and satisfaction but can also hinder leadership capacity, professional efficacy, and increase turnover (Chen et al., 2020; Klausmann et al., 2021).

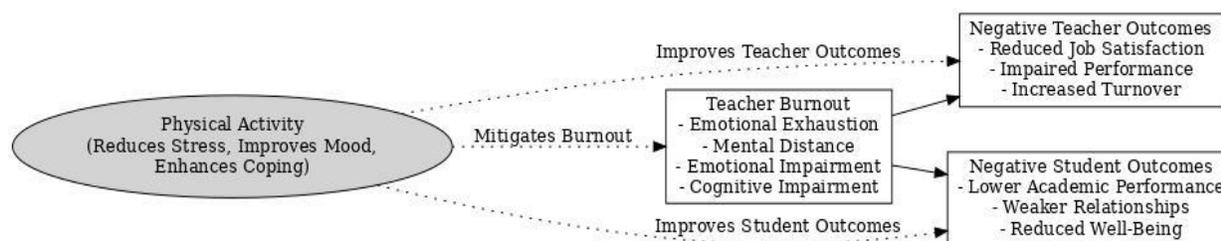
The consequences of burnout are not limited to teachers alone. A growing body of research demonstrates that teacher burnout is negatively associated with student academic performance, classroom climate, and student well-being (Jennings & Greenberg, 2009; Herman et al., 2020). Burned-out teachers may exhibit reduced instructional effectiveness, lower responsiveness to student needs, and diminished capacity to form strong teacher-student relationships—factors that are central to positive student outcomes. In this way, burnout becomes both a personal health and instructional effectiveness issue.

Within this conceptual model, physical activity functions as a promising stress-buffering mechanism that supports teacher well-being. Empirical studies have shown that physical activity reduces emotional exhaustion, improves mood and cognitive function, and strengthens

individuals' capacity to cope with stress (Freitas et al., 2014; Kvam et al., 2016; Feuerhahn et al., 2014). For teachers and teacher leaders alike, regular physical activity may help preserve cognitive and emotional resources needed to sustain engagement in the classroom, with students and with colleagues. As such, it is not merely a wellness strategy, but a potential lever for instructional improvement and retention. A visual model (Figure 1) following this section illustrates the hypothesized connections between teacher burnout and its negative effects on teacher and student outcomes. It also shows how physical activity may serve as an intervention to reduce burnout and improve both teacher well-being and student experiences. The International Physical Activity Questionnaire (IPAQ) is utilized in this study to systematically measure participants' levels of physical activity across various domains of daily life, providing a standardized method to assess the relationship between physical activity and teacher burnout.

Figure 1

Conceptual Framework Illustrating the Relationship Between Teacher Burnout, Negative Outcomes, and Physical Activity as a Mitigating Factor



Methods

The purpose of this study is to examine the relationships between physical activity participation and teacher burnout. The study was conducted with a cross-sectional survey research design. Using a cross-sectional research design allowed researchers to look at the relationship between physical activity and teacher burnout across demographic groups in an effective and efficient manner. Cross-sectional research models have previously been used to examine the relationship between physical activity and burnout among educators (González-Valero et. al, 2022). Teacher samples were drawn from a school district located in one state in the Southeast United States. The researchers evaluated self-reported levels of physical activity and perceived teacher burnout using established questionnaires. To fully examine the connection between variables, the following research questions were addressed by the statistical analysis:

What is the relationship between teacher burnout, level of physical activity, age, and experience level? And, are there any significant differences on total teacher burnout and burnout constructs among levels of physical activity groups?

Participants

Participants in this study consisted of certified teachers from three public high schools in the same school district in one state in the Southeast United States. The invitation to participate

in the study was sent to a total of 572 possible participants. Data were collected in November of 2022 over a 3 week period. A total of 284 responses were collected. Excluding those surveys that did not complete demographic, burnout, and/or physical activity portions of the survey, there were 243 used for statistical analysis.

Demographic data included 55.1% were from school A (n=134), 22.6% were from school B (n=55), and 22.2% were from school C (n=54). See table 1 for full demographic results.

Table 1.
Participant Demographics

Demographic	Category	n	%	
Age	25 or Under	17	7.0	
	26-30	22	9.1	
	31-40	61	25.1	
	41-50	82	33.7	
	Over 50	61	25.1	
Years of Experience	1 or Less	10	4.1	
	2-5 years	28	11.5	
	6-10 years	46	18.9	
	11-15 years	47	19.3	
	16-20 years	47	19.3	
	21-25 years	38	15.6	
	More than 25 years	27	11.1	
Gender	Female	171	70.4	
	Male	71	29.2	
	Non-binary/Third Gender	1	0.4	
Race/Ethnicity	White	221	90.9	
	Origin	Hispanic/Latino/Spanish	6	2.5
		Black/African American	5	2.1
		Prefer not to provide	5	2.1
		Two or more races	4	1.6
		American Indian/Alaskan	1	0.4
	Native	Asian	1	0.4
Education Level	Specialist Degree	85	35.0	
	Master's Degree	85	35.0	
	Bachelor's Degree	52	21.4	
	Completed Some Graduate Work	11	4.5	
	Doctoral Degree	10	4.1	

Note. N = 243. Percentages may not total 100% due to rounding.

Instrumentation

To measure the variables in the research questions, this study adopted the following instruments: International Physical Activity Questionnaire (IPAQ) and the Burnout Assessment

Tool (BAT-23) (Shaufeli et al., 2020). The short form of the IPAQ was utilized to determine level of physical activity and the BAT-23 was used to determine levels of teacher burnout.

Physical Activity Instrumentation. To measure levels of physical activity, the researcher asked participants to complete the short version of the International Physical Activity Questionnaire (IPAQ). (IPAQ Research Committee, 2005) has been used to evaluate the relationship between physical activity and burnout (Ali et al., 2020; Macilwrait & Bennett, 2018; Olson et al. 2014). The IPAQ categorizes physical activity by intensity and aligns with international standards. Physical activity—whether occupational, necessary, or leisure—is often mistaken for exercise, which is typically seen as structured and health-focused (Booth, 2000). The IPAQ supports a broad definition to accommodate global evaluation needs.

The IPAQ was developed to assess the intensity of physical activity and sitting times that people complete during a normal week. The IPAQ consists of seven questions that require participants to recall their last seven days of physical activity. Activities are separated into vigorous, moderate, walking and sitting and are measured in days completed and average minutes per day. Vigorous and moderate physical activities are defined as activities that last for longer than 10 minutes and increase breathing to levels that are somewhat higher than normal (moderate) and much higher than normal (vigorous) (IPAQ Research Committee, 2005). Test-retest reliability for the short IPAQ was observed (or reported) at 0.65 (Craig et al., 2003) and showed acceptable reliability when compared to the New Zealand Physical Activity Questionnaire (NZPAQ) (Maddison et al., 2007). Concurrent validity between the short- and long-term versions of the IPAQ of 0.67 shows reasonable agreement between the two tests. Criterion validity was reported at 0.33 when IPAQ short form data was compared with participant accelerometer data (Craig et al., 2003).

Using data gathered from the IPAQ, two measures were used to quantify the level of physical activity in the participants. First, overall physical activity level was calculated using the equation below to establish a total metabolic (MET) output score for the week of self-reported physical activity (Met-minutes/week). The following equation was established by the IPAQ Research Committee (2005) as the method for establishing a total physical activity score presented in MET-minutes/week: *Physical Activity = (# of vigorous days * # of vigorous minutes/day * met level) + (# of moderate days * # of moderate minutes/day * met level) + (# of walking days * # of walking minutes/day * met level)*

MET level has been established by the World Health Organization using the following values for differing levels of physical activity: Vigorous= 8.0 Mets/Minute, Moderate= 4.0 Mets/minute, walking= 3.3 Mets/minute (Committee, 2005).

Participant's MET (MET-minutes/week) score were grouped into inactive, minimally active and Health Enhancing Physical Activity (HEPA) to further understand the relationship between levels of physical activity and burnout. The following parameters were used:

Table 2.
Physical activity requirements to meet activity level minimums

Activity Level	Requirements to Meet Activity Level
Inactive	-No activity OR -Not enough activity to meet minimally active or HEPA active levels
Minimally Active	-3 or more 20-minute vigorous activities per week OR -5 or more 30-minute moderate level activities per week OR -At least 600 total MET/Minutes (MM) per week
Health Enhancing Physically Active	-3 vigorous bouts of physical activity that are equal to/greater than 1500MM OR -7-day combination of physical activities that are equal to/greater than 3000MM

Teacher Burnout Instrumentation. The researcher used the full version of the Burnout Assessment Tool to assess levels of burnout among participants (Shaufeli et al., 2020). The BAT includes 23 items to determine the levels of four different dimensions of perceived burnout. Exhaustion (EX), mental distance (MD), emotional impairment (EI), and cognitive impairment (CI) using a 5-point Likert scale scored as 1-never, 2- rarely, 3-sometimes, 4-often, and 5-always. Schaufeli and colleagues (2020) used data from samples in Flanders (n=1500) and The Netherlands (N=1500) to validate the BAT with excellent internal consistency (Croanbach’s $\alpha > .90$). Validity was also established by Schaufeli and colleagues (2020) as researchers evaluated congruent and discriminant validity between the BAT, the Oldenburg Burnout Inventory (OLBI) and Maslach’s Burnout Inventory (MBI).

Burnout scores are presented as total burnout and a score for each dimension. Total burnout score was calculated by taking the sum score of all 23 questions and dividing by 23 to get an average score. Scores for each dimension of burnout were scored in a similar manner by attaining a sum score for each dimension and dividing by the total number of questions within each dimension. Ranges for total burnout and score for each dimension were reported numerically but were also categorized as low, average, high, and very high.

Table 3.
Cut-off Values for Burnout Assessment Tool

BAT-23	Total	EX	MD	EI	CI
Low	≤1.60	≤1.75	≤1.20	≤1.20	≤1.80
Average	1.61-2.40	1.76-2.70	1.21-2.40	1.21-2.19	1.81-2.59
High	2.41-3.29	2.71-3.74	2.41-3.59	2.20-3.19	2.60-3.39
Very High	≥3.30	≥3.75	≥3.60	≥3.20	≥3.40

Note. Total= BAT total score, EX=BAT exhaustion, MD= BAT mental distance, EI= BAT emotional impairment, CI= BAT cognitive impairment

Demographic Variables. The focus of the study was to examine the relationship between teacher burnout and physical activity. Analysis of demographic variables helped expand the researcher’s understanding of the relationship between physical activity and burnout.

Demographic variables were collected in the form of age, gender, race, years of experience, education level, and school and have been previously established in the literature. Age and gender are the most prevalent controlling variables (Ali et al., 2020; Brasfield et al., 2019; Carraro et al., 2010; Carson et al., 2010; Macilwrait & Bennett, 2018; Ngalagou et al., 2019; Olson et al., 2014) while educational experience (Ali et al., 2020; Brasfield et al., 2019; Carraro et al., 2010) and educational level (Ali et al., 2020) are among the variables that are found in both the present study and the literature. Ali and colleagues (2020) study uses the same demographic variables as the present study to establish a relationship between burnout and physical activity among college educators.

Data Analysis Approaches

To answer Research Question 1, the researcher used demographic data, BAT survey data and physical activity data to perform multiple statistical analyses based on proposed research questions. A series of ANOVA were used to establish an understanding of the relationship between demographic variables (gender/sex, age, and years of experience) total burnout, burnout dimensions (EX, MD, EI, CI) and physical activity (MET-minutes/week, Physical Activity Level-inactive, minimally active, HEPA active). To answer the Research Question 2, a multivariate analysis of variance (MANOVA) was conducted. Total burnout and dimensions of burnout (EX, MD, EI, CI) were the dependent variables with level of physical activity (inactive, minimally active, HEPA active) serving as independent variables.

Results

Descriptive Results. Descriptive analysis indicated a mean total burnout score of 2.37 and mean emotional exhaustion score of 2.98. These scores indicate an average level of total burnout and a high level of emotional exhaustion for the sample (Shaufeli et al., 2020). Using the total MET/minutes per week, 37.9% (n=92) are inactive, 43.6% (n=106) are minimally active, and 18.5% (n=45) reported participating in enough physical activity to enhance overall health (HEPA). Mean scores for burnout and physical activity can be found in table 3.

Table 4.

Descriptive Statistics for Burnout and Physical Activity Participation

		Mean	SD
Burnout	Total Burnout	2.37	.63
	Emotional Exhaustion	2.98	.73
	Cognitive Impairment	2.26	.87
	Emotional Impairment	1.76	.76
	Mental Distance	2.14	.83
Physical Activity	Total MET/Min	1547.08	1730.83

Table 5 indicates the number and percentage of participants within each level of total burnout, emotional exhaustion, mental distance, emotional impairment, and cognitive impairment. Levels for each dimension of burnout were outlined by the BAT-23 (Shaufeli et al., 2020). Although sample mean scores for cognitive impairment, emotional impairment, and mental distance were average, 46.1% of participants have high levels of total burnout, 66.7% have high levels of emotional exhaustion, 31.7% are experiencing high levels of mental

distancing, 27.2% are experiencing high levels of emotional impairment, and 58% are experiencing high levels of cognitive impairment when using the markers for high and very high levels of each construct.

Table 5.
Levels of total burnout and burnout dimensions

	Total Burnout		Emotional Exhaustion		Mental Distance		Emotional Impairment		Cognitive Impairment	
	N	%	N	%	N	%	N	%	N	%
Low	25	10.3	11	4.5	40	16.5	85	35.0	79	32.5
Average	106	43.6	70	28.8	126	51.9	92	37.9	79	32.5
High	95	39.1	124	51.0	63	25.9	52	21.4	62	25.5
Very High	17	7.0	38	15.6	14	5.8	14	5.8	23	9.5

Note. Levels for total burnout and each dimension of burnout are from the BAT-23 (Shaufeli et al., 2020)

RQ 1. What is the relationship between teacher burnout, level of physical activity age and experience level?

To explore the mean differences between levels of total burnout, burnout dimensions, and total MET/minutes of physical activity, a one-way ANOVA was conducted for each demographic variable. Table 3 provides mean scores for each of the burnout variables and mean for total/MET minutes.

Burnout and Teacher Gender/Sex. The ANOVA results indicated that there is a significant statistical difference between male and female for total burnout ($F_{(2, 240)}=7.869$, $p<.001$), emotional exhaustion ($F_{(2, 240)}=9.9934$, $p<.001$), emotional impairment ($F_{(2, 240)}=3.194$, $p=.043$), cognitive impairment ($F_{(2, 240)}=5.228$, $p=.006$), and total MET/minutes ($F_{(2, 240)}=3.713$, $p=.026$), with the level of significance set to 0.05. Post hoc comparisons using the Tukey HSD test indicated that the mean score for female total burnout (mean=2.47, SD=.617), emotional exhaustion (mean=3.11, SD=.660), emotional impairment (mean=1.84, SD=.793), and cognitive impairment (mean=2.38, SD=.867) were all significantly greater than male levels for each burnout indicator. Post hoc analysis also indicated that male participants had significantly more total/MET minutes (mean=2009.04, SD=2056.93) than females (mean=1367.96, SD=1550.73).

Table 6.
Mean differences in burnout and physical activity among gender

Measure	Male N= 71		Female N= 171		F(2,240)	η^2
	Mean	SD	Mean	SD		
Total Burnout	2.13	.604	2.47	.617	7.869**	.062
Emotional Exhaustion	2.66	.807	3.11	.660	9.9934**	.077
Emotional Impairment	1.57	.647	1.84	.793	3.194*	.026
Cognitive Impairment	2.01	.819	2.38	.867	5.228**	.046
Mental Distance	1.98	.819	2.20	.833	2.231	.021
Total MET/Min	2009.0	2056.93	1367.9	1550.	3.713*	.032
	4		6	73		

*- indicates $p < .05$

** - indicates $p < .01$

Burnout and Teacher Age Group. ANOVA findings would indicate that there was a statistically significant difference between means for emotional exhaustion among age groups ($F(4, 238)=3.315, p=.011$). Tukey post hoc analysis revealed that these mean differences were present for emotional exhaustion between the 26-30 range and participants over 50 ($p=.031$) and the 31-40 group and participants over 50 years old ($p=.023$). Participants over 50 had a significantly lower level of emotional exhaustion (mean=2.75, $SD=.854$) than the 26-30 age group (mean=3.27, $SD=.638$) and the 31-40 age group (mean=3.14, $SD=.645$).

Burnout and Years of Teaching Experience. An ANOVA was conducted to compare means among groups based on years of experience. Similar to the mean differences for age, there was only a significant difference among groups for emotional exhaustion ($F(6, 236)=3.197, p=.005$). Tukey post hoc analysis found these differences to exist between the 6–10 year group and the more than 25 year group ($p=.004$), the 11-15 year group and the more than 25 year group ($p=.003$), and the 21-25 year group and the more than 25 year group ($p=.044$). These findings indicate that participants with more than 25 years of experience had significantly less emotional exhaustion (mean=2.49, $SD=.761$) than the group with 6-10 years of experience (mean=3.14, $SD=.678$), the group with 11-15 years of experience (mean=3.15, $SD=.636$), and the group with 21-25 years of experience (mean=3.04, $SD=.762$).

Teacher Burnout and Physical Activity Relationship. Before conducting MANOVA to further examine the relationships between physical activities and teacher burnout levels, we examined the correlations among all demographic variables, burnout, and physical activity variables (see Table 6). The analysis yielded statistically significant relationships between teacher burnout and physical activity. Specifically, there was a significant negative correlation between total MET-minutes of physical activity and total burnout ($r=-.184, p=.004$). This would indicate that participants with higher total MET-minutes of physical activity reported lower levels of total burnout. There was also a statistically significant negative relationship between total MET-minutes and emotional exhaustion ($r=-.262, p<.001$). The relationship between physical activity and emotional exhaustion also uncovered a significant negative relationship between physical activity level and emotional exhaustion ($r=-.207, p=.001$). Although the relationship between physical activity level and total burnout was not statically significant ($r=-$

.098, $p=.129$), findings did indicate that higher physical activity levels may be related to lower total burnout.

Partial correlation results also found age is significantly negatively correlated with total burnout ($r=-.127$, $p=.047$) while both age ($r=-.205$, $p=.001$) and experience level ($r=-.205$, $p=.001$) were significantly negatively correlated with emotional exhaustion. These relationships indicate that total burnout and emotional exhaustion does not increase with age and, in this sample, is related to a decrease in total burnout and emotional exhaustion. It may also be important to note that there were no significant relationships between age, total MET-minutes ($r=-.002$, $p=.978$), or activity level ($r=-.044$, $p=.494$). The lack of relationship between age and physical activity among the sample may indicate that there is not a change in physical activity as teachers age.

Age and experience level were also continuous variables that were analyzed using a Pearson correlation to determine if these demographic variables play a part in the relationship between physical activity and teacher burnout. Results showed that age is significantly negatively correlated with both total burnout ($r=-.127$, $p=.047$) and emotional exhaustion ($r=-.205$, $p=.001$). There was also a significant negative relationship between experience and emotional exhaustion ($r=-.159$, $p=.013$). All three of these relationships would indicate that total burnout and emotional exhaustion does not increase with age and, in this sample, is related to a decrease in total burnout and emotional exhaustion. It may also be important to note that there were no significant relationships between age, total MET-minutes ($r=-.002$, $p=.978$), or activity level ($r=-.044$, $p=.494$).

The burnout dimension of emotional exhaustion had the highest level of correlation with total MET-minutes and physical activity level. The strength and direction of the relationship between emotional exhaustion and physical activity paired with the lack of relationship between physical activity and mental distance, emotional impairment, or cognitive impairment points towards emotional exhaustion as the key beneficiary of improvements to teacher burnout from physical activity. Correlation matrix can be found in table 7.

Table 7.

Correlation matrix for teacher burnout, physical activity and select demographic variables

Measure	1	2	3	4	5	6	7	8	9
1. Age	1								
2. Experience	.706**	1							
3. Total METs	-.002	-.010	1						
4. Activity Level	-.044	-.051	.825**	1					
5. Emotional Exhaustion	-.205**	-.159*	-.262**	-.207**	1				
6. Mental Distance	-.028	.073	-.098	-.008	.505**	1			
7. Emotional Impairment	-.043	.050	-.077	-.005	.422**	.607**	1		
8. Cognitive Impairment	-.084	-.059	-.100	-.036	.514**	.527**	.531**	1	
9. Total Burnout	-.127*	-.048	-.184**	-.098	.813**	.808**	.766**	.797**	1

** - Correlation is significant at the 0.01 level (2-tailed).

* - Correlation is significant at the 0.05 level (2-tailed).

Research Question 2: *Are there any significant differences on total teacher burnout and burnout constructs among levels of physical activity groups?*

To examine the mean difference in total burnout, emotional exhaustion, cognitive impairment, emotional impairment, and mental distance among physical activity levels, a multivariate analysis of variance (MANOVA) was conducted. Analysis showed there to be a statistically significant difference in teacher burnout based on level of physical activity (Wilks' Lambda=.918; $F(2,240)=2.594$; $p=.009$; $\eta^2 = .042$). See table 8.

Table 8.
Multivariate Tests of Teacher Burnout Among Physical Activity Levels

	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Activity Level	Wilks' Lambda	.918	2.594	8	474	0.09	.042

With a statistically significant mean difference present among teacher burnout and physical activity groups, further analysis was needed to determine the nature of the differences. Among total teacher burnout and burnout dimensions, it was found that physical activity level has a statistically significant effect on emotional exhaustion ($F(2, 240) = 6.374$; $p=.002$; partial $\eta^2 = .05$). This would indicate that among the sample, there is a mean difference in levels of emotional exhaustion between inactive, minimally active, and HEPA active groups. Examination of the partial eta squared (partial $\eta^2 = .050$) would indicate that physical activity group has a moderate effect on emotional exhaustion among the sample. Although there were also observed mean differences for total burnout ($F(2, 240) = 2.016$; $p=.135$; partial $\eta^2 = .017$) and mental distance ($F(2, 240) = 1.983$; $p=.140$; partial $\eta^2 = .016$) these differences were not statistically significant.

Further analysis of mean differences between physical activity levels for emotional exhaustion using Tukey's post hoc test found there to be statistically significant differences between activity levels for emotional exhaustion. Statistically significant differences were observed for emotional exhaustion between the inactive level and the HEPA level ($p=.001$) and the minimally active level and HEPA level ($p=.013$). Mean emotional exhaustion score decreased as level of physical activity moved from inactive (EE mean= 3.103) to minimally active (EE mean= 3.007) and finally to HEPA active (EE mean= 2.644). The largest mean difference between groups occurred from minimally active to HEPA active. Although there was a decrease in burnout from the inactive level to the minimally active level, this difference was not statistically significant ($p=.614$).

Examination of mean differences between physical activity levels for total burnout and mental distance found there to be a difference between inactive levels and HEPA active levels for each. Although these mean differences are not statistically significant (total burnout, $p=.175$; mental distance, $p=.175$) these findings would indicate that total burnout and mental distance measures are lower in participants that meet the qualifications to be considered HEPA active when compared to inactive participants. See table 9 for mean differences.

Table 9.
Means and Standard Deviations of the Participants' Scores on Teacher Burnout, Teacher Burnout Dimensions, and Levels of Physical Activity (N=243)

Factor	Activity Level	Mean	SD	N
Total Burnout	Inactive	2.4083	.61784	92
	Minimally Active	2.4151	.61127	106
	HEPA Active	2.2039	.68519	45
	Total	2.3734	.63055	243
Emotional Exhaustion	Inactive	3.1033	.72854	92
	Minimally Active	3.0071	.70938	106
	HEPA Active	2.6444	.70658	45
	Total	2.9763	.73193	243
Cognitive Impairment	Inactive	2.2848	.90286	92
	Minimally Active	2.2774	.83430	106
	HEPA Active	2.1867	.88769	45
	Total	2.2634	.86785	243
Emotional Impairment	Inactive	1.7522	.72529	92
	Minimally Active	1.7698	.77720	106
	HEPA Active	1.7333	.80679	45
	Total	1.7564	.76054	243
Mental Distance	Inactive	2.0761	.76336	92
	Minimally Active	2.2509	.87333	106
	HEPA Active	1.9867	.85748	45
	Total	2.1358	.83369	243

Findings show that there are significant mean differences for teacher burnout among levels of physical activity. Further analysis revealed that the most significant differences were observed in emotional exhaustion while total burnout and mental distance differences proved to not be statistically significant. Mean differences in total burnout and each burnout dimension proved to be lower in the HEPA active group when compared to the inactive group. Although emotional exhaustion was the only significant difference observed in this analysis of variance, the decrease in burnout supports the research hypothesis that burnout levels would be lower for more active participants.

Discussion

Generalized findings indicate a significant negative correlation between total MET/minutes of physical activity and total teacher burnout with the HEPA group reporting the lowest total burnout. Essentially, this means that the more physically active teachers were, the less burned out they felt. Those who engaged in high levels of physical activity—especially vigorous activity—reported the lowest levels of overall burnout. Although this relationship has been reported in other comparable studies (Ali et al., 2020; Brasfield et al., 2019; Carraro et al., 2010; Gillan et al., 2013; Kim & Gurvitch, 2020; Ngagalou et al., 2018; Sane et al., 2012), the present findings add to this relationship with an increased understanding of emotional exhaustion as the central construct within the relationship and the differentiation of physical activity level and total physical activity participation. The findings also point to a somewhat surprising trend: that older, more experienced teachers reported lower burnout despite similar activity levels,

suggesting they may manage stress more effectively. Together, these findings offer new insights into how both the intensity of physical activity and individual factors like age and experience shape teachers' vulnerability to - and protection against - burnout.

Along with total burnout and physical activity being significantly related, the most prominent connection was established between the burnout construct emotional exhaustion and physical activity. Emotional exhaustion, identified by Maslach and Jackson (1981) as the core of occupational burnout, remains central in the Burnout Assessment Tool (BAT) developed by Schaufeli et al. (2020), where exhaustion is the primary measure of burnout.

Exhaustion was found to be significantly related to both total MET/minutes of physical activity and level of physical activity with the HEPA active group reporting significantly lower levels of exhaustion as compared to the inactive and minimally active group. Findings indicate that an increase in physical activity is related to a decrease in exhaustion and that there is a mean difference in exhaustion among physical activity groups with the most active groups reporting the lowest levels. Findings support the hypothesis that increased physical activity reduces emotional exhaustion, highlighting its potential as a method to mitigate burnout.

Demographic Differences in Teacher Burnout and Physical Activity

This study reveals a significant relationship between burnout, exhaustion, and physical activity levels. While the literature does not define a specific threshold for significant burnout levels, the findings show that 46% of participants report high to extremely high levels of total burnout, and 66.7% report high to extremely high levels of exhaustion. Additionally, 27.2% report high to extremely high emotional impairment, and 58% report high cognitive impairment. These findings highlight the importance of the connection between physical activity and total burnout/exhaustion as key components of the study.

Participants in this study reported an average level of burnout (2.37), which may indicate that teachers can cope with stress without negative effects (Schaufeli et al., 2020). A closer look shows 39.1% reporting high burnout and 7% reporting very high burnout which may indicate a need for stress mitigation. An exhaustion score of 2.98 along with 51.6% of participants reporting high exhaustion and 15.6% reporting very high exhaustion would also indicate the need for stress intervention and mitigation. Participants reported a mean score of 1547.08 total MET/minutes which would indicate the sample to be minimally active based on IPAQ norms (Committee, 2005) with 37.9% inactive, 43.6% minimally active, and 18.5% HEPA active.

The findings of this study on burnout, emotional exhaustion, and physical activity levels align with similar studies (Gillan et al., 2013; Ngalagou et al., 2018), despite differences in measurement methods, suggesting consistency with previous literature on this relationship. Emotional exhaustion was established as a key variable throughout the statistical analysis, and it is important to note the connection between exhaustion and physical activity. While this correlational study cannot establish causality, the connection between physical activity and high levels of burnout and exhaustion suggests that physical activity may be a practical approach to reducing these issues.

An analysis of variance revealed that women reported higher levels of total burnout, emotional exhaustion, emotional impairment, and cognitive impairment than men, while men reported significantly higher physical activity levels, averaging 700 more MET/minutes.

These findings align with studies examining the relationship between physical activity and burnout. Bogaert et al. (2014) and Carraro et al. (2010) found higher stress and emotional exhaustion in females compared to males. Similarly, Abos et al. (2021) and Ngalagou et al.

(2018) reported higher total burnout in females, though these differences were not significant. While Macilwrait and Bennett (2018) found that females had higher burnout and lower physical activity, these results suggest a potential link between gender, burnout, and physical activity. The differences may be attributed to work/life expectations and requirements, which tend to differ between genders.

Mean differences in emotional exhaustion were identified by age group. Participants over 50 had the lowest levels of emotional exhaustion, significantly lower than those in the 26-30 and 31-40 age groups. While no significant differences in total burnout were found, emotional exhaustion appeared most concerning for teachers in their middle years of teaching. Older teachers seem better equipped to handle stress, which is further supported by significant differences in emotional exhaustion between those with over 25 years of experience and those with less. Additionally, teachers with more than 25 years of experience reported the highest levels of physical activity, which may contribute to lower emotional exhaustion.

Older, more experienced teachers showed lower burnout and exhaustion levels, yet no significant difference in physical activity compared to younger teachers. This suggests a negative relationship between burnout and physical activity but contrasts with findings from Ali et al. (2020), who found a positive correlation between age and burnout in college faculty, alongside a negative relationship with physical activity. These discrepancies may arise from sample differences, including gender and job expectations. Male teachers may be particularly vulnerable to burnout as they age, highlighting the need for interventions to maintain physical activity and reduce burnout in aging teachers.

Correlation Between Teacher Burnout and Physical Activity

A Pearson's correlation was conducted to determine the relationship between physical activity participation, teacher burnout, age, and experience level. Inferential statistics revealed a significant negative correlation between total MET/minutes and burnout, total MET/minutes and emotional exhaustion, and physical activity level and emotional exhaustion. While total MET/minutes strongly correlated with physical activity levels ($r = .825$), the non-linear relationship allows for variations observed in this population. This would indicate that teachers can lower their total burnout and emotional exhaustion with only moderate participation in physical activity. Considering the differences between total MET/minutes and physical activity level, emotional exhaustion is a key factor when explaining burnout for this sample. Emotional exhaustion was significant with level and total/MET minutes of physical activity, indicating higher levels of physical activity is related to lower levels of emotional exhaustion while specifically outlining the importance of increasing physical activity level. The benefits of physical activity are present in the fact that any increase of total MET/minutes is related to lower emotional exhaustion and burnout, but greater benefits for emotional exhaustion are available at higher levels of physical activity.

Correlations between age, experience, burnout measures, and physical activity revealed that age and experience are significantly negatively correlated with total burnout and emotional exhaustion. Emotional exhaustion remains the key factor linking physical activity to teacher burnout, with reductions observed as age and experience increase. While older, more experienced teachers engage in similar levels of physical activity as younger teachers, the mitigating effects of exercise appear stronger with age, suggesting greater benefits for older teachers. This highlights the importance of regular physical activity for aging educators in managing burnout.

Correlations were also conducted using demographic variables as controlling variables to uncover that all significant correlations were still present, and no new relationships were uncovered. Although the level of significance did not change, gender showed the largest change as a controlling variable and further indicates that gender is a factor that should be greatly considered when evaluating burnout, physical activity, or the relationship between the two.

Findings align with Ali et al. (2020), who also observed a significant negative correlation between total MET/minutes of physical activity (measured via the IPAQ) and both total burnout and emotional exhaustion (measured via the Maslach Burnout Inventory). Like the present study, they found a significant negative correlation between emotional exhaustion and physical activity level. However, unlike this study, Ali et al. (2020) also reported a significant negative correlation between total burnout and physical activity level.

Mean Difference in Teacher Burnout Among Physical Activity Levels

A multivariate analysis of variance (MANOVA) was conducted to determine if there was a difference in total burnout and burnout constructs among the levels of physical activity participation (inactive, minimally active, and HEPA active). The findings from this statistical analysis were used to answer research question #2: Are there any significant differences on teacher burnout constructs among levels of physical activity groups?

There was a significant mean difference in total burnout for physical activity level. Again, emotional exhaustion is found to be the variable most effected by differing levels of physical activity with physical activity having a statistically moderate effect on levels of emotional exhaustion among the sample. There was a significant mean difference between the inactive group and the HEPA active group, and between the minimally active group and the HEPA group. Both findings indicate the HEPA group has significantly lower levels of emotional exhaustion by comparison. The largest mean difference was found between the inactive group and the HEPA active group which would provide additional data to support the hypothesis that increases in physical activity are related to decreases in burnout and specifically emotional exhaustion. It should be noted there was a mean difference in emotional exhaustion between the inactive group and the minimally active group with the minimally active group reporting lower levels of emotional exhaustion. Although this mean difference was not statistically significant, it would indicate that there is a decrease in emotional exhaustion with an increase in physical activity level.

These findings further support the connection between physical activity and burnout among teachers in the sample. Levels of total burnout and burnout constructs were all lowest among the HEPA active group. Although not all these differences were significant, it points, again, towards reducing burnout and burnout constructs with increases in physical activity. As previously mentioned, more information is required to explain the differences between total MET/minutes and physical activity level, but general findings indicate that as either of these variables is increased, the amount of burnout is lowered.

Limitations of the study

The primary limitation of this study lies in the self-reported nature of both perceived burnout and physical activity. Self-reporting of physical activity over a single week may not be an accurate representation of each participant's regular participation of physical activity. Further limitation could be found in the variability in participant understanding of physical activity and being able to differentiate between low, moderate, and vigorous activities, despite clear IPAQ

instructions. While the IPAQ is a validated tool, integrating fitness trackers could enhance data accuracy. Data collection during November in Southeastern U.S. schools may also have influenced physical activity levels due to seasonal factors like weather, workload, and holidays, though this has not been a major variable in teacher burnout literature. Additionally, the sample may not fully represent the population; teachers with extreme burnout or low physical activity might have not felt comfortable with self-reporting such extremes. Conversely, extremely burned-out participants may have skewed results as they were seeking an outlet to express their perceived level of burnout. Along with the self-reported nature of the sample, the homogeneity of the sample, which consisted predominantly of White females, may limit the generalizability of the findings to more diverse teacher populations. Lastly, the study did not account for formal and informal teacher leadership roles, a potentially significant variable in exploring the relationship between teacher leaders' burnout and physical activity. Future research should include these factors to deepen understanding and contextualize findings specific to teacher leaders.

Implications for Practice: Teacher Leadership, Wellness, and Organizational Action

Results from this study, combined with existing literature, highlight the implications of increased teacher burnout, especially emotional exhaustion, and inform how school settings can leverage teacher leadership to address burnout and emotional exhaustion via physical activity and wellness initiatives. Results from this study point to older teachers with increased physical activity and lessened emotional exhaustion. Implications of this relationship point to the need for younger teachers to be exposed to stress mitigation skills earlier in their career. Pre-service and early-service teachers should receive leadership training and exposure that is accompanied with methods for mitigating the additional stressors (Doyle Fosco et al., 2023). Teacher leadership training should outline the stressors that come with increased responsibilities and provide a contextual understanding of the importance of mitigation practices, such as physical activity. Emotional exhaustion is linked to negative outcomes, including reduced student performance (Arens & Morin, 2016), with effects magnified in classrooms with a significant proportion of English language learners (Klusmann et al., 2016). Rising English language learner populations in the study's schools highlight the need for intervention to prevent further student achievement gaps.

Emotional exhaustion also predicts teacher migration and attrition (Carson et al., 2010), with 15% of participants reporting high levels of exhaustion, indicating that around 36 teachers are at risk of leaving the profession. This emotional exhaustion can lead to cynicism, which, if unchecked, may impair cognitive function (Koutsimani et al., 2021), affecting both teaching quality and personal well-being. The study reveals a significant relationship between physical activity and emotional exhaustion, suggesting that increased physical activity may reduce perceived emotional exhaustion. While this study cannot establish a direct causal link, physical activity may serve as a valuable intervention for teachers and teacher leaders by replenishing stressed resources (Feuerhahn et al., 2014), mitigating emotional exhaustion, and ultimately enhancing teacher leader capacity, teacher well-being, classroom instruction, and retention.

Recommendations for School and District Leaders

District leaders should stay informed on teacher burnout literature to provide accurate, timely information on its impact and prevention. The study recommends physical activity as a

focus in district-level strategies for mitigating teacher burnout. District leaders should relay the benefits of physical activity to building level administration in hopes of mitigating burnout, increasing teacher retention, and reducing healthcare costs (Brassfield et al., 2019). Principals should convey findings to their staff and provide opportunities and incentives for physical activity so teachers can establish physical activity as a regular practice. Although district and building leaders are not the focus of this study, they are not immune to occupational burnout and should focus on promoting a culture of wellness through their own physical activity habits.

Teacher leaders should form committees to promote wellness, including physical activity, as a key element of teacher burnout mitigation (Glickman & Burns, 2021). These committees can foster a school culture that values teacher wellness as a mechanism toward improved student outcomes. By offering wellness opportunities, teacher leaders can create leadership roles for teachers who might otherwise not have one, enhancing the overall school culture.

Recommendations for Teachers and Teacher Leaders

All teachers should recognize that burnout is a common challenge in their profession, affecting everyone at some point. Teachers that take on increased responsibility, either organic/informal or appointed by building leadership, should recognize their position as a teacher leader comes with increased emotional demands and their well-being should become central to their self-care efforts. While the manifestation of burnout may vary, understanding its impact will help teachers seek relief. This study emphasizes physical activity as a potential intervention for burnout, though it cannot confirm a direct effect, regular physical activity is recommended.

For those new to exercise, starting with low-intensity activities like walking is advised, progressing gradually in intensity, duration, and variety. Teachers should assess their current activity level to establish a baseline. The type, intensity, and duration of exercise should be individually tailored, with the goal of 150 minutes of moderate activity or 75 minutes of vigorous activity per week (IPAQ Research Committee, 2005). Teacher leaders can foster group-based exercise opportunities to encourage physical activity participation, increase teacher leadership opportunities, and foster a positive school culture.

Teachers and teacher leaders should also evaluate their level of perceived stress. Even without signs of burnout, increases in stress may be impacting the academic and social outcomes of their students. An increase in physical activity participation may help alleviate stress, prevent, or delay the onset of burnout, and improve student outcomes. Teachers should allocate their time to activities that mitigate stress and burnout, such as physical activity, instead of school specific activities outside of normal teaching hours to maximize outcomes while in the classroom. Teacher leaders should prioritize physical activity with increased concern for time constraints. Teacher leaders find their time to be allocated differently and prioritizing their well-being routine may require increased efforts to maximize time for self-care. A routine of well-being and mindfulness activities can work well to maintain the resilience of teacher leaders as they cope with increased stressors (Doyle Fosco et al., 2023).

Lastly, age plays a role in burnout. While older teachers in this study reported positive activity levels, physical activity is particularly important for reducing burnout at any age. Male teachers may be more susceptible to burnout as they age, but this study suggests that all teachers, especially women, should incorporate physical activity to alleviate stress and reduce burnout throughout their careers.

Implications for Future Research

Future research on the relationship between physical activity and teacher burnout among high school teachers should begin by addressing key demographic differences identified in this and related studies. One important area of focus is gender. Female teachers reported higher levels of burnout and emotional exhaustion, along with lower levels of physical activity—a trend consistent with prior research on occupational stress and physical activity disparities (Nelson et al., 2006; Zhang et al., 2020). Investigating the underlying causes of these disparities—and extending this inquiry to include non-binary and third-gender teachers—could shed light on the social dimensions of burnout and help develop more inclusive support strategies (Mizrahi & Vigod, 2019).

Age and experience also emerged as significant factors. In this study, older, more experienced teachers reported lower levels of burnout and greater enjoyment of physical activity. However, these findings differ from prior research, such as Ali et al. (2020), which observed increased burnout with age among college faculty. Future studies should explore these dynamics across more diverse populations, considering how aging and career stage intersect with physical activity and burnout, and accounting for health risks unique to older educators (Kinman & Wray, 2018).

Additionally, the lack of racial diversity in this study underscores the need for research that includes racially and ethnically diverse teacher populations. Research shows that educators of color face unique workplace stressors related to racial bias and systemic inequities (Santamaría, 2014; Achinstein & Ogawa, 2011), which may influence both burnout and wellness behaviors. Examining burnout and physical activity across racial groups may reveal important differences and inform equity-driven strategies to support teacher and teacher leader well-being.

Future studies should also focus specifically on teacher leaders, who often carry additional responsibilities related to mentoring, school improvement, and instructional support. Replicating this study with a sample of teacher leaders could offer valuable insights into how physical activity impacts burnout for educators in leadership roles, particularly given the emotional demands and role complexity they often navigate (Doyle Fosco et al., 2023).

There is also a strong need for qualitative research to explore the lived experiences of teachers. Interviews and focus groups could uncover how burnout manifests in daily practice, the barriers teachers face in staying physically active, and what kinds of interventions feel most feasible and effective to them (Creswell & Poth, 2018).

Finally, interventional studies are essential. Research that introduces structured physical activity programs to teachers and measures changes in burnout before and after participation could clarify the practical impact of movement on well-being (Abós et al., 2021; Bretland & Thorsteinsson, 2015). Longitudinal studies tracking teachers who increase their physical activity over time could provide further insights into how sustained routines affect emotional exhaustion and overall burnout (Kim & Gurvitch, 2020).

Conclusion

Teacher burnout transcends gender, race, education, fitness level, and leadership ability, impacting anyone who regularly interacts with others. This study, rooted in the care teachers have for one another, highlights the critical role physical activity can play in mitigating burnout. The findings affirm a relationship between physical activity and reduced burnout, offering teachers a way to take control of their well-being amidst numerous uncontrollable factors. By

incorporating physical activity, teachers and teacher leaders can improve their health and enhance the social and performance outcomes for themselves and their students.

This study serves as a resource to help teachers and teacher leaders understand and address their burnout, encouraging them to adopt personalized, contextualized self-care strategies. While there is no universal approach, exploring physical fitness and other supportive factors can empower teachers and teacher leaders to enjoy fulfilling, enduring careers dedicated to student success.

References

- Abós, A., Sevil-Serrano, J., Julián-Clemente, J.A., Generelo, E., & García-González, L. (2021). Improving teachers' work-related outcomes through a group-based physical activity intervention during leisure-time. *The Journal of Experimental Education*, 89(2), 306-325. <https://doi.org/10.1080/00220973.2019.1681349>
- Achinstein, B., & Ogawa, R. T. (2011). *Change(d) agents: New teachers of color in urban schools*. Teachers College Press.
- Ali, A., Ranjha, A. N., & Bukhari, S. M. H. (2020). Relationship between physical activity and burnout among university faculty in Pakistan. *Journal of Business and Social Review in Emerging Economies*, 6(1), 1-8. <https://www.publishing.globalcsrc.org/ojs/index.php/jbsee/article/download/1021/730>
- Arens, A. K., & Morin, A. J. (2016). Relations between teachers' emotional exhaustion and students' educational outcomes. *Journal of Educational Psychology*, 108, 800-810. <https://doi.org/10.1037/edu0000105>
- Armenta-Hernández, O., Maldonado-Macías, A., Camacho-Alamilla, M. D. R., Serrano-Rosa, M. Á., Baez-Lopez, Y. A., & Balderrama-Armendariz, C. O. (2021). The relationship between the burnout syndrome dimensions and body mass index as a moderator variable on obese managers in the Mexican maquiladora industry. *Frontiers in Psychology*, 12, 127. <https://doi.org/10.3389/fpsyg.2021.540426>
- Bogaert, I., De Martelaer, K., Deforche, B., Clarys, P., & Zinzen, E. (2014). Associations between different types of physical activity and teachers' perceived mental, physical, and work-related health. *BMC public health*, 14(1), 1-9. <https://doi.org/10.1186/1471-2458-14-534>
- Booth, M. (2000). Assessment of physical activity: An international perspective. *Research Quarterly for Exercise and Sport*, 71(2), 114-120.
- Brand S., Ebner K., Mikoteit T., Lejri I., Gerber M., Beck J., Holsboer-Trachsler E., Eckert A. (2020). Influence of regular physical activity on mitochondrial activity and symptoms of burnout-An interventional pilot study. *Journal of Clinical Medicine*, 9(3), 667. <http://doi:10.3390/jcm9030667>
- Brasfield, M.W., Lancaster, C., & Xu, Y.J. (2019). Wellness as a mitigating factor for teacher burnout. *Journal of Education*, 199(3), 166-178. <https://doi.org/10.1177/0022057419864525>
- Bretland, R.J. & Thorsteinsson, E.B. (2015). Reducing workplace burnout: The relative benefits of cardiovascular and resistance exercise. *PeerJ*, 3, 891-899. <https://www.doi.org/10.7717/peerj.891>

- Bubb, S., & Jones, M. A. (2020). Learning from the COVID-19 home-schooling experience: Listening to pupils, parents/carers and teachers. *Improving schools*, 23(3), 209-222. <https://doi.org/10.1177/1365480220958797>
- Carraro, A., Scarpa, S., & Gobbi, E. (2010). Burnout and self-perceptions of physical fitness in a sample of Italian physical education teachers. *Journal of Perceptual and Motor Skills*, 111(3), 790-798.
- Carson, R. L., Baumgartner, J. J., Matthews, R. A., & Tsouloupas, C. N. (2010). Emotional exhaustion, absenteeism, and turnover intentions in childcare teachers: Examining the impact of physical activity behaviors. *Journal of Health Psychology*, 15(6), 905-914. <https://doi.org/10.1177/1359105309360697>
- Castillo, I., Álvarez, O., Esteva, I., Queralt, A., & Molina-García, J. (2017). Passion for teaching, transformational leadership and burnout among physical education teachers. *Revista de psicología del deporte*, 26(3), 57-61. <https://www.redalyc.org/articulo.oa?id=235152046011>
- Chang, M. (2009). An appraisal perspective of teacher burnout: Examining the emotional work of teachers. *Educational Psychology Review*, 21(3), 193-218. <https://doi.org/10.1007/s10648-009-9106-y>
- Chen, H., Liu, F., Pang, L., Liu, F., Fang, T., Wen, Y., ... & Gu, X. (2020). Are you tired of working amid the pandemic? The role of professional identity and job satisfaction against job burnout. *International Journal of Environmental Research and Public Health*, 17(24), 9188. <https://doi.org/10.3390/ijerph17249188>
- Corbett, L., Bauman, A., Peralta, L. R., Okely, A. D., & Phongsavan, P. (2022). Characteristics and effectiveness of physical activity, nutrition and/or sleep interventions to improve the mental well-being of teachers: A scoping review. *Health Education Journal*, 81(2), 196-210. <https://doi.org/10.1177/00178969211062701>
- Craig C.L., Marshall A.L., Sjöström M., Bauman A.E., Booth M.L., Ainsworth B.E., Pratt M., Ekelund U., Yngve A., Sallis J.F., & Oja P. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine and Science in Sports and Exercise*, 35(8), 1381-95. <https://doi.org/10.1249/01.MSS.0000078924.61453.FB>
- De Oliveira, G. S., Ahmad, S., Stock, M. C., Harter, R. L., Almeida, M. D., Fitzgerald, P. C., & McCarthy, R. J. (2011). High incidence of burnout in academic chairpersons of anesthesiology: Should we be taking better care of our leaders?. *The Journal of the American Society of Anesthesiologists*, 114(1), 181-193. <https://doi.org/10.1097/ALN.0b013e318201cf6c>
- Doyle Fosco, S. L., Rutten, L., & Schussler, D. L. (2023). Understanding the relationships between teacher leadership and teacher wellbeing: A narrative review of theoretical and empirical literature. *International Journal of Teacher Leadership*, 12(1), 8–30.

- Feuerhahn, N., Sonnentag, S., & Woll, A. (2014). Exercise after work, psychological mediators and affect: A day-level study. *European Journal of Work and Organizational Psychology, 23*(1), 62-79. <https://dx.doi.org/10.1080/1359432X.2012.709965>
- Freitas, A.R., Cameseca, E.C., Paiva, C.E., & Paiva, B.S.R. (2014). Impact of a physical activity program on the anxiety, depression, occupational stress and burnout syndrome of nursing professionals. *Revista Latino-Americana de Enfermagem, 22*(2), 332-336. <https://www.doi.org/10.1590/0104-1169.3307.2420>
- Gerber, M., Brand, S., Elliot, C., Holsboer-Trachsler, E., Puhse, U., & Beck, J. (2013). Aerobic exercise training and burnout: A pilot study with male participants suffering from burnout. *BioMed Central Research Notes, 6*, 78-93. <https://www.biomedcentral.com/1756-0500/6/78>
- Gillan, W., Naquin, M., Zannis, M., Bowers, A., Brewer, J., & Russell, S. (2013). Correlations among stress, physical activity and nutrition: School employee health behavior. *ICHPER-SD Journal Of Research, 8*(1), 55-60.
- Glickman, C., & Burns, R.W. (2021). Supervision and teaching wellness: An essential component for improving classroom practice. *Journal of Educational Supervision, 4*(1), 18-25. <https://doi.org/10.31045/jes.4.1.3>
- González-Valero, G., Gómez-Carmona, C. D., Bastida-Castillo, A., Corral-Pernía, J. A., Zurita-Ortega, F., & Melguizo-Ibáñez, E. (2023). Could complying with WHO physical activity recommendations improve stress, burnout syndrome, and resilience? A cross-sectional study with physical education teachers. *Sport Sciences for Health, 19*(2), 349–358. <https://doi.org/10.1007/s11332-022-00981-6>
- Herman, K.C., Hickmon-Rosa, J., 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*(2), 90-100. <https://doi.org/10.1177/1098300717732066>
- 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*(2), 373-396.
- IPAQ Research Committee. (2005). Guidelines for data processing and analysis of the International Physical Activity Questionnaire (IPAQ)-short and long forms. https://ugc.futurelearn.com/uploads/files/bc/c5/bcc53b14-ec1e-4d90-88e3-1568682f32ae/IPAQ_PDF.pdf
- Jakubowski, T. D., & Sitko-Dominik, M. M. (2021). Teachers' mental health during the first two waves of the COVID-19 pandemic in Poland. *PloS one, 16*(9), e0257252. <https://doi.org/10.1371/journal.pone.0257252>

- Jennings, P. A., & Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of Educational Research*, 79(1), 491–525. <https://doi.org/10.3102/0034654308325693>
- Johannsen, D.L. & Ravussin, E. (2009). The role of mitochondria in health and disease. *Current Opinions in Pharmacology*, 9(6), 780-786.
- Katzenmeyer, M., & Moller, G. (2009). *Awakening the sleeping giant: Helping teachers develop as leaders* (3rd ed.). Corwin Press.
- Kim, G. C., & Gurvitch, R. (2020). The effect of sports-based physical activity programme on teachers' relatedness, stress and exercise motivation. *Health Education Journal*, 79(6), 658-670. <https://doi.org/10.1177/0017896920906185>
- Kinman, G., & Wray, S. (2018). Presenteeism in academic employees – occupational and individual factors. *Occupational Medicine*, 68(1), 46–50. <https://doi.org/10.1093/occmed/kqx191>
- Klaperski, S & Von Dawans, B. (2014). Effects of a 12-week endurance training program on the physiological response to psychosocial stress in men: A randomized controlled trial. *Journal of Behavioral Medicine*, 37, 1118-1133. <https://www.doi.org/10.1007/s10865-014-9562-9>
- 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.
- Koutsimani, P., Montgomery, A., Masoura, E., & Panagopoulou, E. (2021). Burnout and cognitive performance. *International Journal of Environmental Research and Public Health*, 18, 2145. <https://doi.org/10.3390/ijerph18042145>
- Kvam, S., Kleppe, C.L., Nordhus, I.H., & Hovland, A. (2016). Exercise as a treatment for depression: A meta-analysis. *Journal of Affective Disorders*, 202, 67-86. <https://dx.doi.org/10.1016/j.jad.2016.03.063>
- Lindegard, A., Jonsdottir, I.H., Borjesson, M., Lindwell, M., & Gerber, M. (2015). Changes in mental health in compliers and non-compliers with physical activity recommendations in patients with stress-related exhaustion. *Biomed Central Psychiatry*, 15, 272. <https://doi.org/10.1186/s12888-015-0642-3>
- Macilwrait, P. and Bennett, D. (2018). Burnout and physical activity in medical students. *Irish Medical Journal*, 111(3), 707. <http://imj.ie/burnout-and-physical-activity-in-medical-students/>
- Maddison, R., Mhurchu, C.N., Jiang, Y., Hoorn, S.V., Rodgers, A., Lawes, C.MM., & Rush, E.

- (2007). International physical activity questionnaire (IPAQ) and New Zealand physical activity questionnaire (NZPAQ): A doubly labelled water validation. *International Journal of Behavior Nutrition and Physical Activity* 62(4). <https://doi.org/10.1186/1479-5868-4-62>
- Mangin, M. M., & Stoelinga, S. R. (2008). *Effective teacher leadership: Using research to inform and reform*. Teachers College Press.
- Maslach, C. & Jackson, S.E. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior*, 2, 99-113. <https://doi.org/10.1002/job.4030020205>
- May, R.W., Seibert, G.S., Sanches-Gonzalez, M.A., & Fincham, F.D. (2018). School burnout and heart rate variability: Risk of cardiovascular disease and hypertension in young adult females. *The International Journal on the Biology of Stress*, 21(3), 211-216. <https://doi.org/10.1080/10253890.2018.1433161>
- McClafferty, H., Brooks, A. J., Chen, M. K., Brenner, M., Brown, M., Esparham, A., Gerstbacher, D., Golianu, B., Mark, J., Weydert, J., Yeh, A. M., & Maizes, V. (2018). Pediatric Integrative Medicine in Residency Program: Relationship between Lifestyle Behaviors and Burnout and Wellbeing Measures in First-Year Residents. *Children*, 5(4), 54. <https://doi.org/10.3390/children5040054>
- Mizrahi, R., & Vigod, S. N. (2019). Burnout in teachers: A review of the literature and implications for mental health professionals. *Canadian Journal of Psychiatry*, 64(3), 170–177. <https://doi.org/10.1177/0706743718792190>
- Mohamed, S., Nikmat, A., Hashim, N. A., Shuib, N., & Raduan, N. J. N. (2021). Burnout and Its Relationship to Psychological Distress and Job Satisfaction among Academicians and Non-Academicians in Malaysia. *International Journal of Higher Education*, 10(1), 85-92. <https://doi.org/10.5430/ijhe.v10n1p85>
- Naczenski, L. M., de Vries, J. D., van Hooff, M. L., & Kompier, M. A. (2017). Systematic review of the association between physical activity and burnout. *Journal of occupational health*, 59(6), 477-494. <https://doi.org/10.1539/joh.17-0050-RA>
- Nelson, C. M., Maculan, A., Roberts, M. L., & O’Shea, L. J. (2006). *A guide to effective schoolwide interventions for preventing and managing problem behaviors*. Council for Exceptional Children.
- Ngalagou P.M., Assomo-Ndemba P.B., & Owona Manga LJ. (2019). Burnout syndrome and associated factors among university teaching staff in Cameroon: Effect of the practice of sport and physical activities and leisure. *L'encephale*, 45(2), 101-106. <http://doi:10.1016/j.encep.2018.07.003>
- Nguyen, T. D., & Hunter, S. B. (2019). Burnout among special education teachers and perceptions of support. *Journal of Special Education Leadership*, 32(1), 15–25.

- Olson, S. M., Odo, N. U., Duran, A. M., Pereira, A. G., & Mandel, J. H. (2014). Burnout and physical activity in Minnesota internal medicine resident physicians. *Journal of graduate medical education*, 6(4), 669-674. <https://doi.org/10.4300/JGME-D-13-00396>
- Pogere, E.F., Lopez-Sangil, M.C., Garcia-Senoran, M.M., & Gonzalez, A. (2019). Teachers' job stressors and coping strategies: Their structural relationships with emotional exhaustion and autonomy support. *Teaching and Teacher Education*, 85, 269-280. <https://doi.org/10.1016/j.tate.2019.07.001>
- Sabagh, Z., Hall, N.C., & Saroyan, A. (2018). Antecedents, correlates, and consequences of faculty burnout. *Educational Research*, 60(2), 131-156. <https://doi.org/10.1080/00131881.2018.1461573>
- Sane, M.A., Devin, H.F., Jafari, R., & Zohoorian, Z. (2012). Relationship between physical activity and its components with burnout in academic members of Daregaz Universities. *Procedural Social and Behavior Sciences*, 46, 4291-4294. <https://www.doi.org/10.1016/j.sbspro.2012.06.242>
- Santamaría, L. J. (2014). Critical change for the greater good: Multicultural perceptions in educational leadership toward social justice and equity. *Educational Administration Quarterly*, 50(3), 347–391. <https://doi.org/10.1177/0013161X13505287>
- Schaufeli, W.B., De Witte, H. & Desart, S. (2020). Manual Burnout Assessment Tool (BAT) – Version 2.0. KU Leuven, Belgium: Unpublished internal report. <https://burnoutassessmenttool.be/wp-content/uploads/2020/08/Test-Manual-BAT-English-version-2.0-1.pdf>
- Sokal, L., Trudel, L. E., & Babb, J. (2020). Canadian teachers' attitudes toward change, efficacy, and burnout during the COVID-19 pandemic. *International Journal of Educational Research Open*, 1, 100016. <https://doi.org/10.1016/j.ijedro.2020.100016>
- Wenner, J. A., & Campbell, T. (2017). The theoretical and empirical basis of teacher leadership: A review of the literature. *Review of Educational Research*, 87(1), 134–171. <https://doi.org/10.3102/0034654316653478>
- York-Barr, J., & Duke, K. (2004). What do we know about teacher leadership? Findings from two decades of scholarship. *Review of Educational Research*, 74(3), 255–316. <https://doi.org/10.3102/00346543074003255>
- Zhang, Y., Zhang, Y., & Zhang, Y. (2020). The impact of psychological capital and occupational stress on teacher burnout: Mediating role of coping styles. *Frontiers in Psychology*, 11, 588. <https://doi.org/10.3389/fpsyg.2020.00588>