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The Relationship between Physical Self-efficacy and Physical Activity in the Workplace of Physical Education Teachers: The Mediating Role of Psychological Resilience and the Moderating Role of Occupational Well-being

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Abstract: Physical activity in the workplace (WPA) among physical education (PE) teachers is crucial for promoting student engagement and learning outcomes. Grounded in Social Cognitive Theory and the Conservation of Resources Theory, this study investigates the mechanisms linking physical self-efficacy (PSE) to WPA, incorporating psychological resilience (PR) as a mediator and occupational well-being (OWB) as a moderator. A sample of 196 Chinese primary and secondary school PE teachers completed measures of PSE, WPA, PR, and OWB. Results from moderated mediation analysis (PROCESS Macro) revealed a significant direct effect of PSE on WPA ($\beta = 0.578$, $SE = 0.096$, 95% CI [0.389, 0.767]), supporting H1. Contrary to H2, the mediating role of PR was not significant (indirect effect = 0.002, $SE = 0.059$, 95% CI [-0.108, 0.144]). However, OWB significantly moderated the model. It strengthened the direct effect of PSE on WPA (Interaction $\beta = 0.393$, $SE = 0.115$, $p < .01$), with the effect being most substantial at high OWB ($\beta =$

0.877, 95% CI [0.679, 1.076]) and non-significant at low OWB. Furthermore, OWB moderated the path from PR to WPA (Interaction $\beta = -0.427$, SE = 0.118, $p < .001$), with PR positively predicting WPA at low OWB (Effect = 0.335, 95% CI [0.027, 0.643]) and negatively predicting it at high OWB (Effect = -0.315, 95% CI [-0.629, -0.001]). Theoretically, this study clarifies the boundary conditions of OWB within resource transformation processes, contributing to a more nuanced understanding of the PSE-WPA link. Practically, it highlights the importance of enhancing both PSE and OWB through targeted professional development and improved school support systems to promote teacher health and instructional quality.

Keywords: physical self-efficacy, workplace physical activity, psychological resilience, occupational well-being, physical education teachers.

Introduction

In the current educational landscape of China, characterised by the national “Healthy China 2030” strategy and the deepening implementation of the “Double Reduction” policy, the role of physical education (PE) has been elevated to unprecedented importance (CPC Central Committee and State Council, 2016). These policies explicitly call for ensuring the quality of campus sports activities and safeguarding the physical and mental health of both students and educators. Consequently, the occupational health and professional efficacy of PE teachers, as the core implementers of these policies, have become a critical concern for educational administrators and researchers alike. Despite this heightened focus, PE teachers frequently report issues such as occupational burnout, high work pressure, and declining job satisfaction (Wang, 2005; Zhou, 2024; Warr, 1994). A crucial yet underexplored aspect of their professional life is their Workplace Physical Activity (WPA) – the physical exertion inherent in teaching demonstrations, training sessions, and classroom management. Maintaining high WPA is essential not only for effective teaching but also for the teachers’ own long-term health and career sustainability. However, the psychological mechanisms that drive WPA remain poorly understood, creating a significant gap between policy goals and on-the-ground reality. This is particularly pressing, as studies have shown a declining trend in teachers’ subjective well-being over the past two decades (Xin et al., 2021), highlighting the urgent need for interventions that address both the psychological and physical aspects of teachers’ work lives. This study addresses this pressing issue by investigating the motivational drivers of WPA among PE teachers, a specific population whose well-being is directly tied to the successful execution of national health and education initiatives. The societal benefit lies in providing evidence-based strategies to improve teacher retention, instructional quality, and student health outcomes. Scientifically, this research contributes by integrating multiple psychological constructs into a coherent model to explain health behaviours within a specific occupational context, an area that is currently underdeveloped. While self-efficacy is a known predictor of general health behaviours (Horcajo et al., 2022), its application to the specific domain of occupational physical activity among PE teachers, and its interaction with resilience and well-being, constitutes the new knowledge this study seeks to generate.

As core implementers of school sports programs and promoters of students’ physical health, the occupational health status of physical education teachers not only affects their personal quality of life but also directly impacts the quality and effectiveness of school sports instruction (Ji, 2015). Workplace physical activity (WPA) refers explicitly to various physical activities conducted by teachers in the workplace, including classroom teaching demonstrations, organising training sessions, leading recess drills, providing protection and assistance, etc. These activities of *Broussonetia papyrifera* constitute a significant part of the physical exertion in the profession of physical education teachers and are also a key factor in maintaining their physical endurance and teaching vitality (Inês & Dina, 2023; Whittemore et al., 2018). Maintaining high levels of workplace physical activity is not only an inherent requirement of physical education teachers’ professional roles but also essential for sustaining their teaching dynamism and professional efficacy.

However, physical education teachers in reality generally face issues such as occupational burnout, high work pressure, and declining job satisfaction. Their workplace physical activity levels are not static but are influenced by a complex interplay of internal and external factors. Traditional health behaviour models, such as the Health Belief Model and the Theory of Planned Behaviour, emphasise the decisive role of cognitive factors in behaviour. Building on this, Bandura's (1977) Self-Efficacy Theory posits that individuals' confidence in their ability to complete specific behavioural tasks (i.e., self-efficacy) serves as the core driving force for initiating and maintaining healthy behaviours. For physical education teachers, physical self-efficacy (PSE) refers to their confidence in their physical capabilities and sports skills, which may be a key intrinsic cognitive factor driving them to maintain high levels of physical activity in the workplace. Teachers who firmly believe in their physical stamina and ability to demonstrate movements accurately are more likely to seek and engage in more workplace physical activities proactively.

The theoretical integration of PSE, PR, and OWB is grounded in Hobfoll's (1989, 2011) Conservation of Resources (COR) Theory and Bandura's (1986) Social Cognitive Theory. COR theory posits that individuals strive to acquire, retain, and protect resources. PSE and PR can be viewed as key personal resources. The loss or gain of these resources influences stress and motivational states, which can subsequently impact behavioural outcomes, such as WPA. Social Cognitive Theory provides the mechanism for how the cognitive resource of PSE translates into behaviour through processes of self-regulation and outcome expectancies. Furthermore, Fredrickson's (2001) Broaden-and-Build Theory illuminates the role of OWB (a source of positive emotion) in expanding thought-action repertoires and building enduring personal resources, thus explaining its potential moderating role. This multi-theoretical framework offers a robust foundation for hypothesising the complex interactions between these variables.

However, the relationship between these two factors may not be a simple direct cause-and-effect connection. There might be an interactive influence of psychological mechanisms and situational conditions. First, psychological resilience (PR), as a form of positive psychological capital, refers to an individual's ability to effectively adapt and bounce back when facing work pressure, setbacks, and adversity. Teachers with high bodily self-efficacy may better handle teaching challenges (such as difficult students or high-intensity training sessions), thereby maintaining higher levels of psychological resilience. This positive psychological adaptation state can further encourage them to engage more willingly and persistently in physical activities (Fletcher & Sarkar, 2013). Therefore, psychological resilience may serve as a mediating factor between bodily self-efficacy and workplace physical activity. Second, this mediating process may be reinforced by individuals' positive emotional states (Aditya et al., 2024). Occupational Well-being represents teachers' comprehensive, positive evaluation of their professional quality of life, encompassing multiple dimensions such as job satisfaction, emotional engagement, and fulfilment (Seligman, 2011; Zheng, 2023). Teachers with high occupational well-being experience greater joy and achievement from work. This positive emotion acts like a "catalyst," enhancing the transformation of their psychological resilience resources into proactive behaviours (such as high levels of workplace physical activity) (Xiong et al., 2020). In other words, for teachers who feel happy, their psychological resilience has a more substantial promoting effect on workplace physical activity. This suggests that occupational happiness may play a moderating role in the latter half of the mediation path.

A systematic analysis of existing literature reveals a significant gap. While numerous studies have established the link between general self-efficacy and health behaviours (Williams & French, 2011), and some have explored PSE in athletes (Chen et al., 2021), its application to PE teachers' occupational behaviours is novel. Furthermore, findings on the role of resilience as a mediator between self-efficacy and behaviour are inconsistent across contexts (Fletcher & Sarkar, 2013), and the potential moderating role of well-being in this specific chain remains largely unexamined. International comparative research is also scarce; most studies are situated in Western contexts, and their findings may not fully translate to the unique pressures and cultural environment of the Chinese education system under recent policy shifts (Hascher &

Waber, 2021; Zhou, 2024). This study aims to fill these gaps by providing a systematic, theory-driven investigation within this specific population and context. The proposed complex moderated mediation model is justified by this interplay of theories and the identified gaps, aiming to disentangle the conditions under which PSE translates into WPA.

Building on the discussion above, this study constructs a moderated mediation model to examine systematically:

- (1) the direct impact of physical self-efficacy on physical activity in the workplace among physical education teachers;
- (2) the mediating role of psychological resilience in this process; and
- (3) the moderating effects of occupational well-being through both direct and mediated pathways.

The research not only sheds light on the psychological mechanisms underlying health behaviours among PE teachers but also provides theoretical foundations and practical references for educational administrators to develop targeted interventions and enhance teachers' occupational well-being.

Literature review and hypothesis proposal

Physical self-efficacy and physical activity at work

The concept of self-efficacy originates from social cognitive theory, focusing not on specific skills themselves, but rather on an individual's judgment and confidence in their ability to organise and execute particular tasks (Bandura, 1977). Physical self-efficacy extends this concept into the realm of physical movement, encompassing confidence in bodily capabilities (such as strength, endurance, and coordination) and athletic performance (Ryckman et al., 1982). For physical education teachers, physical self-efficacy serves not only as a core component of their professional identity but also as the psychological foundation for addressing pedagogical challenges.

In this study, workplace physical activity is operationally defined as all moderate-to-vigorous physical activities conducted by physical education teachers in their daily work environment, required by their professional roles. This differs from recreational sports activities during leisure time, explicitly referring to teaching-related tasks such as continuous action demonstrations, leading students in physical training, and frequent classroom management movements (Inês & Dina, 2023).

Extensive research confirms that self-efficacy stands as one of the most stable and powerful psychological predictors for various health behaviours (such as physical exercise and healthy eating) (Williams & French, 2011). According to Social Cognitive Theory, individuals with high self-efficacy tend to set higher behavioural goals, demonstrate greater perseverance when facing challenges, and perceive difficulties as opportunities to conquer rather than threats (Ulrica et al., 2016). Building on this, physical education teachers with strong bodily self-efficacy are confident in delivering instructional demonstrations and managing classroom activities. Consequently, they are more likely to proactively create and engage in physically active teaching scenarios rather than adopting passive avoidance strategies (e.g., over-reliance on verbal explanations instead of physical demonstrations). Moreover, they view high-intensity PE classes as opportunities to showcase their capabilities rather than burdens, thereby maintaining higher levels of physical activity in the workplace. This positive relationship has been observed in international contexts, such as among Swedish workers (Ulrica et al., 2016) and UK adolescents (Cameron et al., 2020). However, direct evidence within the PE teacher population is limited. Based on this, we propose the first hypothesis of this study:

H1: Physical self-efficacy of physical education teachers has a significant positive predictive effect on their workplace physical activity level.

The mediating role of psychological resilience

Psychological resilience does not mean an individual is immune to stress, but rather refers to the psychological capacity to adapt and recover when facing adversity, trauma, threats, or other significant stressors (Luthar et al., 2000). In school environments, physical education teachers face multiple stressors, including pressures from curriculum reform, concerns about student safety, and academic assessments. Teachers with high psychological resilience can effectively manage these pressures by leveraging both internal and external resources, thereby maintaining their mental health and professional functioning (Mansfield, 2020). This is particularly important, as studies indicate that occupational stress can lead to burnout through mechanisms such as rumination and negative emotions (Li et al., 2025).

There is a close connection between physical self-efficacy and psychological resilience. Bandura (1997) posited that self-efficacy serves as a crucial foundation for psychological resilience. When individuals believe they possess the ability to handle challenges (i.e., high self-efficacy), they experience less anxiety and helplessness, thereby demonstrating greater resilience in facing difficulties. Empirical studies also indicate that athletes' physical self-efficacy significantly predicts their psychological resilience (Chen et al., 2021). However, some studies have found this relationship to be weaker or non-significant in non-athlete populations facing chronic work stress (Peng & Li, 2019), suggesting context dependency. Recent research on PE teachers has explicitly highlighted the multidimensional mechanisms linking occupational stress and burnout, emphasising the role of cognitive-affective processes (Li et al., 2025). Transferring this concept to the teaching field, a PE teacher with strong confidence in their physical capabilities will have more "backbone" to tackle various physical and skill-related challenges in the classroom. This sense of control translates into stronger psychological adaptability and stress resistance, essentially resulting in higher psychological resilience.

Meanwhile, psychological resilience serves as a crucial factor in promoting positive behaviours. According to the Protective-Preventive Model, psychological resilience, as an adaptive capacity, enables individuals to adopt proactive strategies (such as active coping and seeking support) to manage stress and enhance health (Fletcher & Sarkar, 2012). Physical education teachers with high psychological resilience can recover more quickly from work-related stress while maintaining abundant energy and positive emotional engagement in their professional duties (Du et al., 2025). This naturally translates into higher workplace participation and physical activity levels. They are more likely to view physical activities at work as dynamic interactions rather than exhausting labour. Yet, the direct link from resilience to specific occupational behaviours like WPA is not always straightforward and may be influenced by other factors like job context or emotional state (Xanthopoulou et al., 2009), highlighting the need to test this mediating pathway.

In conclusion, physical self-efficacy may indirectly promote teachers' physical activity in the workplace by improving their psychological resilience. Therefore, the second hypothesis is proposed:

H2: Psychological resilience mediates the relationship between physical self-efficacy and physical activity in the workplace.

The moderating effect of occupational well-being

Occupational well-being refers to teachers' comprehensive, positive evaluation of their occupational quality of life in the workplace, encompassing dimensions such as job satisfaction, emotional engagement, and fulfilment of purpose (Diener et al., 1985; Seligman, 2011). For physical education teachers,

occupational well-being stems not only from external working conditions and compensation but also from intrinsic factors, such as teaching passion, positive interactions with students, realisation of professional autonomy, and recognition of their career value (Hascher & Waber, 2021; Wang, 2005). As a positive psychological resource, occupational well-being is not merely a reflection of work achievements but plays a crucial role in helping individuals cope with job demands and stimulate proactive behaviours (Zheng & Li, 2019; Bakker et al., 2023). A meta-analysis confirmed that psychological capital significantly contributes to teachers' happiness and well-being (Bertieaux, D. et al., 2024).

According to Fredrickson's Broadening-and-Building Theory (Fredrickson, 2001), positive emotions can expand individuals' immediate cognitive-action domains (e.g., stimulating more creative teaching behaviours and increased willingness to engage in physical interactions with students) while building enduring personal resources (such as enhanced psychological resilience and broader social support networks). This suggests that teachers with high occupational well-being maintain an expansive mental state, actively exploring environments, engaging in challenging activities, and constructing resources (Dong, 2023; Sun, 2016). Conversely, teachers with low occupational well-being may operate in a narrow, self-protective, defensive state, exhibiting behavioural patterns that prioritise risk avoidance and reduced energy expenditure (Bakker & Demerouti, 2014). This theoretical perspective provides a strong rationale for expecting OWB to act as a boundary condition that enhances the translation of personal resources (PSE, PR) into active behaviours (WPA). Therefore, this study proposes the following hypotheses:

H3a: Occupational well-being moderates the effect of physical self-efficacy on physical activity in the workplace.

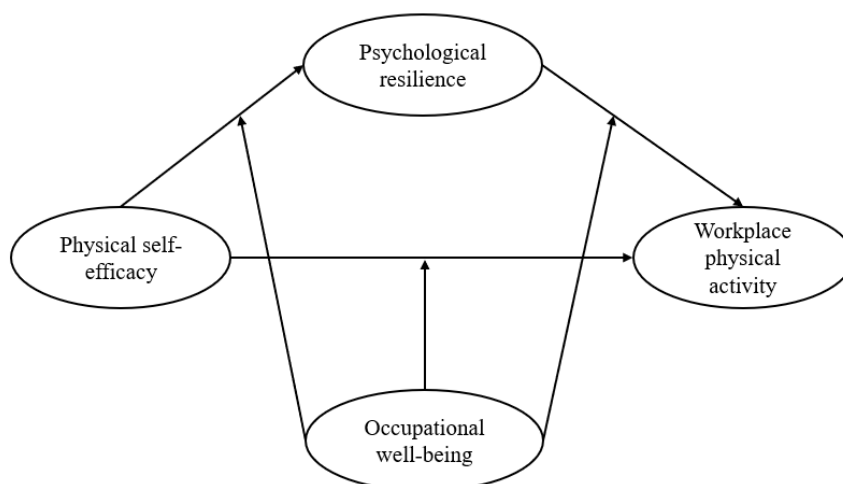
H3b: Occupational well-being moderates the effect of physical self-efficacy on psychological resilience.

H3c: Occupational well-being moderates the effect of psychological resilience on physical activity in the workplace.

Building upon the hypotheses above, this study constructed a moderated mediation model as illustrated in Figure 1. The model systematically examines how physical self-efficacy influences workplace physical activity through psychological resilience, while moderating the role of occupational well-being within this mechanism. This framework not only deepens our understanding of the psychological mechanisms behind physical activity among physical education teachers in the workplace but also provides a theoretical foundation for future intervention research.

Figure 1

Research path model



Methods

Subjects and procedures

This study selected primary and secondary school physical education teachers in Beijing as the research subjects. A priori power analysis was conducted using G*Power 3.1 to determine the minimum sample size required for testing the proposed moderated mediation model. Based on a linear multiple regression model (fixed model, R^2 deviation from zero) with an anticipated medium effect size ($f^2 = 0.15$), $\alpha = 0.05$, and 8 predictors (including control variables and interaction terms), the analysis indicated a required sample size of 109 for 95% power. Our final sample of 196 valid responses exceeds this requirement, ensuring sufficient statistical power to detect both direct and interaction effects. The questionnaires were distributed through a combination of online platforms (Questionnaire Star) and offline methods (distributed by local teaching researchers). A total of 242 questionnaires were issued, with 196 valid responses recovered, yielding an effective response rate of 80.9%.

The sampling strategy employed a multi-stage convenience sampling approach to enhance representativeness. First, we targeted districts in Beijing known for diverse school types (urban, suburban, rural) to capture variability in school environments. Second, within each district, we contacted school principals and physical education department heads to recruit teachers across different grade levels (primary vs. secondary) and professional titles. Although not entirely random, this approach was justified by the exploratory nature of the study and the practical challenges of accessing a nationally representative sample of PE teachers. Efforts were made to include teachers with varying years of experience, educational backgrounds, and gender to improve the generalizability of findings.

The valid sample included 125 male teachers (63.8%) and 71 female teachers (36.2%), with an average age of 30.8 years ($SD=8.2$) and teaching experience averaging 8.7 years ($SD=7.8$). Educational background showed 3.5% had associate degrees or below, 84.7% held bachelor's degrees, and 11.6% possessed master's degrees or higher. Professional titles included 60.9% at the junior level, 31.5% at intermediate levels, and 7.6% at senior levels. The sample distribution aligns with the general characteristics of physical education teachers in Chinese primary and secondary schools.

Research tools

All scales used the Likert 5-point scale (1= "not at all", 5= "very much"), with higher scores indicating higher levels of the measured construct. To minimise the influence of potential confounding variables, teachers' gender, age, teaching experience, educational background, and professional title were included as control variables in all subsequent analyses, as these factors have been shown to influence both psychological constructs and occupational behaviours in prior research.

The Physical Self-Efficacy Scale was adopted from the Chinese version developed by Ryckman et al. (1982) and revised by researchers. Comprising 22 items, it includes two dimensions: body competence confidence (12 items) and body performance confidence (10 items). A sample item reads: "I am confident in mastering any complex sports skill." In this study, the Cronbach's α coefficient of this scale was 0.93. Confirmatory Factor Analysis (CFA) confirmed the two-factor structure ($\chi^2/df = 2.15$, CFI = .93, TLI = .92, RMSEA = .077), demonstrating good construct validity.

The workplace physical activity measurement employed the Workplace Physical Activity Scale, developed by Ghobadi et al. (2023) and subsequently translated and revised by the researchers. The translation process involved forward translation, back-translation, and committee review to ensure conceptual equivalence. A pilot study ($n = 30$) confirmed the clarity and relevance for PE teachers. Comprising eight items, it assesses the frequency and duration of moderate-to-vigorous physical activities

at work. A representative example reads: “How often during my past weeks’ work did I engage in activities that increased heart rate and deepened breathing (e.g., rapid demonstration exercises, group running sessions)?” In this study, the Cronbach’s α coefficient for this scale was 0.88. CFA supported a single-factor structure ($\chi^2/\text{df} = 2.48$, CFI = .95, TLI = .93, RMSEA = .087).

The psychological resilience measurement was based on the Chinese version of the Cognitive-Dimensional Resilience Scale (CD-RISC), developed by Connor and Davidson (2003) and revised by Hu and Gan (2008). The scale consists of 25 items across three dimensions: resilience, strength, and optimism. A representative example item reads: “I can adapt to changes.” In this study, the Cronbach’s α coefficient for this scale was reported as 0.95. CFA validated the three-factor structure ($\chi^2/\text{df} = 2.31$, CFI = .94, TLI = .93, RMSEA = .082).

The occupational well-being assessment employed a revised version of “Happiness Index Scale” developed by Diener et al. (1985), which was adapted to incorporate characteristics specific to teaching professions. The scale comprises nine items across three dimensions: job satisfaction, positive emotions, and negative emotions (measured using reverse scoring). A representative example reads: “Overall, my teaching work closely aligns with my ideal state.” In this study, the Cronbach’s α coefficient for this scale reached 0.90. CFA confirmed the three-factor structure ($\chi^2/\text{df} = 2.67$, CFI = .95, TLI = .94, RMSEA = .093).

To minimise standard method bias inherent in self-report surveys, procedural remedies were employed during data collection: ensuring respondent anonymity, emphasising there were no right or wrong answers, and using different scale anchors where possible (Podsakoff et al., 2003). Statistically, Harman’s single-factor test was conducted post-hoc.

Data processing and analysis

The data for this study were analysed using SPSS 27.0. Initially, the data underwent a standard method bias test and descriptive statistical analysis. Key assumptions for regression-based analyses were tested: normality was examined via Skewness and Kurtosis (all variables were within ± 1.0 , indicating acceptable univariate normality); linearity was assessed via partial regression plots; homoscedasticity was verified via scatterplots of residuals versus predicted values; and multicollinearity was evaluated using Variance Inflation Factors (VIFs), all of which were below 2.0, indicating no concerning multicollinearity.

To facilitate interpretation for non-statistical audiences, effect sizes are reported where appropriate (e.g., f^2 for regression effects), and confidence intervals are provided for all key estimates. The bias-corrected percentile Bootstrap approach (5,000 resamples) was utilised to assess the significance of the mediating effect of psychological resilience and the moderating effect of occupational well-being, providing robust estimates for indirect and conditional effects.

Results

Common method bias and confirmatory factor analysis

Since all data were derived from teachers’ self-reports, a Harman single-factor test was employed to examine common method bias. The results revealed that the first factor accounted for 29.307% of the total variance, which is below the critical threshold of 40%, indicating that common method bias was not a serious concern in this study.

Subsequently, this study conducted confirmatory factor analysis (CFA) to examine the discriminant validity of four core variables. As shown in Table 1, the mean values (M) of physical self-efficacy, workplace physical activity, psychological resilience, and occupational well-being ranged from 3.937 to 4.055, with standard deviations (SD) between 0.762 and 0.900. These data indicate that all variables were distributed

within moderate ranges without extreme concentration or dispersion. The criterion for discriminant validity typically follows the Fornell-Larcker rule, which requires that the square root of the average variance extracted (AVE) of each latent variable (shown on the diagonal of the correlation coefficient matrix) should exceed its correlation coefficients with any other latent variables. While all variables demonstrated significant positive correlations ($p < 0.01$), their correlation coefficients remained moderate ($r = 0.562$ to 0.692). Notably, all correlation coefficients were well below the strict threshold of 0.85 , indicating that although there was a conceptual association between the variables, no severe multicollinearity issues occurred. This preliminary evidence confirms that they measure distinct theoretical constructs.

To establish discriminant validity, this study calculated the average variance extracted (AVE) of each latent variable. The analysis revealed that the AVE square roots were 0.816 for physical self-efficacy, 0.798 for workplace physical activity, 0.831 for psychological resilience, and 0.809 for job satisfaction. Notably, all AVE square roots significantly exceeded their respective row-column correlation coefficients (e.g., psychological resilience AVE $0.831 >$ job satisfaction correlation 0.692 ; job satisfaction AVE $0.809 >$ psychological resilience correlation 0.692). These results fully satisfy the Fornell-Larcker criterion, demonstrating strong discriminant validity for the four core variables identified as distinct constructs. This validation enables subsequent hypothesis testing and analysis.

Moreover, the reliability analysis results indicate that all Cronbach's alpha values for the latent variables are greater than 0.7 , indicating that the measurement items within the latent variables are consistent and meet statistical requirements.

Table 1

Descriptive statistics and correlation analysis (N=196)

variable	M	SD	1	2	3	4
1=Physical self-efficacy	3.944	0.810	(0.816)			
2=Workplace physical activity	3.937	0.900	0.621**	(0.798)		
3=Psychological resilience	4.055	0.785	0.654**	0.583**	(0.831)	
4=Occupational well-being	4.028	0.762	0.634**	0.562**	0.692**	(0.809)

Note: M: mean; SD: variance; bold parts on the diagonal are the square root of AVE estimates; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Moderated mediation tests

To explore how physical self-efficacy influences workplace physical activity, this study employed SPSS Macro Process for moderated mediation analysis. During the analysis, control variables including gender, teaching experience, educational background, professional title, and income were controlled, while examining the mediating role of psychological resilience and the moderating effect of occupational well-being.

The results of the mediation analysis are presented in Table 2. Physical self-efficacy (PSE) demonstrated a significant and substantial direct effect on workplace physical activity (WPA) (Effect = 0.578 , SE = 0.096 , 95% CI [0.389 , 0.767]). This represents a large effect size ($f^2 = 0.36$), indicating that a teacher's confidence in their physical abilities is a robust direct predictor of their engagement in physical activity at work. Hypothesis H1 was strongly supported. Contrary to H2, the indirect effect of PSE on WPA through psychological resilience (PR) was not significant (Effect = 0.002 , SE = 0.059 , 95% CI [-0.108 , 0.144]). The

near-zero effect size indicates that psychological resilience did not function as a mediating mechanism in this model. A comprehensive discussion of this null finding is provided in Section 5.2.

Table 2

Test of the mediation effect

Path	Effect	SE	95% CI	
			Lower	Upper
Direct effect	0.578	0.096	0.389	0.767
Indirect effect	0.002	0.059	-0.108	0.144

The moderated mediation analysis revealed that occupational well-being (OWB) significantly moderated two key paths in the model. The overall regression model for the outcome (WPA) showed excellent fit, explaining a significant proportion of variance ($R^2 = .692$, $F(5, 190) = 41.573$, $p < .001$). The detailed coefficients are presented in Table 3.

Table 3

Test of the moderated mediation effect

Variable (N=196)		Overall fitting coefficients					
Outcome variables	Predictive variables	R	R-sq	F	Effect	SE	t
Psychological resilience		0.932	0.869	154.762			
	Physical self-efficacy				0.208	0.047	4.410***
	Teacher occupational well-being				0.755	0.052	14.543***
	Physical self-efficacy × Teacher occupational well-being				-0.028	0.021	-1.321
Workplace physical activity		0.832	0.692	41.573			
	Physical self-efficacy				0.578	0.096	6.039***
	Psychological resilience				0.010	0.129	0.077
	Teacher occupational well-being				0.320	0.137	2.333*
	Physical self-efficacy × Teacher occupational well-being				0.393	0.115	3.403**
	Psychological resilience × Teacher occupational well-being				-0.427	0.118	-3.604***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Control variables (gender, teaching age, educational background, title, income) are included in the model but not shown for brevity. *

Moderation of the Direct Effect (Testing H3a): The interaction term PSE × OWB was significant ($\beta = 0.393$, $p < .01$). This supports H3a, indicating that occupational well-being strengthens the positive relationship between physical self-efficacy and workplace physical activity. As illustrated in Figure 2, simple slope analysis showed that the effect of PSE on WPA was strongest for teachers with high OWB (+1 SD: $\beta = 0.877$, 95% CI [0.679, 1.076]), moderate for those with average OWB ($\beta = 0.578$), and non-significant for those with low OWB (-1 SD: $\beta = 0.279$, 95% CI [-0.024, 0.582]). In practical terms, this means that initiatives aimed at boosting WPA by enhancing PSE will be most effective for teachers who already experience a

supportive and fulfilling work environment (high OWB). For teachers with low well-being, high self-efficacy alone may not be sufficient to drive high levels of workplace activity.

Moderation of the Mediation Path (Testing H3b and H3c): The interaction term PSE $\times$ OWB on the mediator (PR) was not significant ($\beta = -0.028$, $p > .05$), leading to the rejection of H3b. However, the interaction term PR $\times$ OWB on the outcome (WPA) was highly significant ($\beta = -0.427$, $p < .001$), supporting H3c. This suggests that occupational well-being moderates the relationship between psychological resilience and physical activity at the workplace.

Moderation analysis through mediation revealed that teachers' occupational well-being moderates effects through two pathways: the first involving physical self-efficacy's influence on workplace physical activity, and the second regarding psychological resilience's impact. The specific moderation values are presented in Table 3. This finding confirms the validity of hypotheses H3b and H3c, while rejecting H3a.

Table 4

Regulatory effects of different levels of psychological resilience

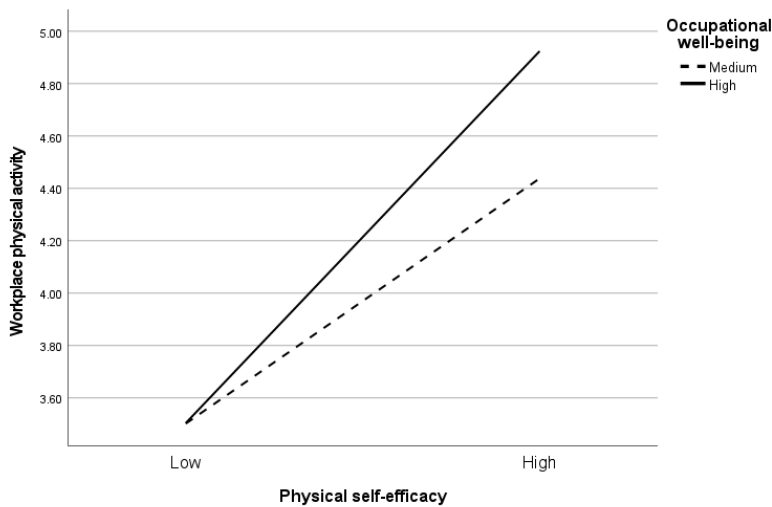
	OWB	Effectiveness value	standard error	95% confidence interval
PSE $\rightarrow$ WPA	M-1SD	0.279	0.154	[- 0.024, 0.582]
	M	0.578	0.096	[0.389, 0.767]
	M+1SD	0.877	0.101	[0.679, 1.076]
PR $\rightarrow$ WPA	M-1SD	0.335	0.156	[0.027, 0.643]
	M	0.010	0.129	[-0.245, 0.265]
	M+1SD	-0.315	0.159	[-0.629, -0.001]

PSE: physical self-efficacy, WPA: workplace physical activity, PS: psychological resilience, OWB: occupational well-being

Further simple slope analysis showed that when teachers' occupational happiness was at a low level (M-1SD) (see Figure 3), the effect value of physical self-efficacy on workplace physical activity was 0.279, SE was 0.154, and the 95% confidence interval was [-0.024, 0.582]. However, since the confidence interval includes 0, the moderating effect is not statistically significant when teachers' occupational well-being is at low levels. When teachers' occupational well-being is at moderate or high levels (M), physical self-efficacy significantly predicts occupational physical activity with effect sizes of 0.578 and 0.877, standard errors of 0.096 and 0.101, respectively, and a 95% confidence interval of [0.389, 0.767] and [0.679, 1.076]. A comparison of the slopes between the two lines reveals that under high levels of well-being, the moderating effect of physical self-efficacy on teachers' occupational well-being is more significant than under moderate well-being. In conclusion, physical self-efficacy has a positive moderating effect on the relationship between occupational well-being and workplace physical activity among teachers. Practically, this means that initiatives aimed at boosting WPA through enhancing PSE will be most effective when teachers already experience a supportive and fulfilling work environment (high OWB).

Figure 2

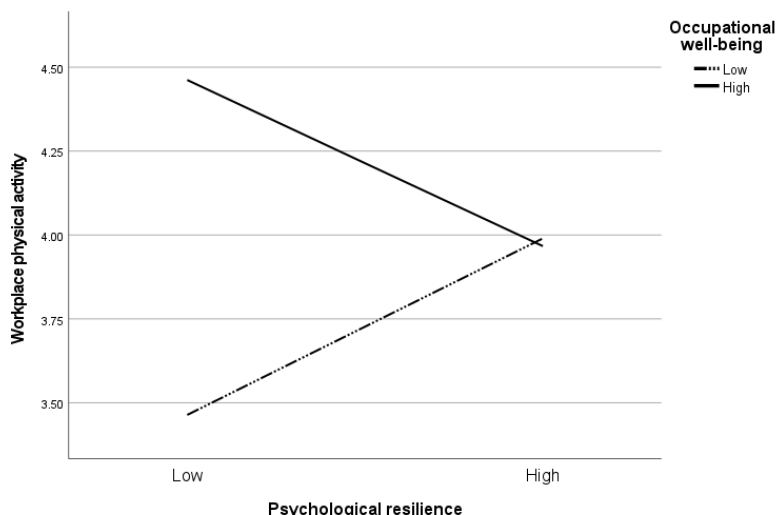
The moderating effect of teachers' occupational well-being between workplace physical activity and physical self-efficacy



When teachers' occupational well-being is at a low level (M-1SD) (see Figure 4), the effect size of psychological resilience on workplace physical activity is 0.335, with a standard error of 0.156 and a 95% confidence interval of [0.027,0.643]. This indicates that psychological resilience has a significant positive moderating effect when teachers' well-being is low. Conversely, when teachers' well-being is at a high level (M+1SD), psychological resilience negatively predicts workplace physical activity, with an effect size of -0.315, a standard error of 0.159, and a 95% confidence interval of [-0.629,0.001].

Figure 3

The moderating role of teacher job happiness between psychological resilience and occupational physical activity



This counterintuitive finding suggests that for teachers who are already highly satisfied, higher levels of resilience may paradoxically lead to a strategic reduction in unnecessary physical exertion, perhaps by working more efficiently or delegating tasks. In contrast, for those struggling (low OWB), resilience is a crucial resource that drives active engagement. In conclusion, teachers' occupational well-being exerts an

adverse moderating effect on the relationship between psychological resilience and workplace physical activity.

Discussion

This study, grounded in the Conservation of Resources (COR) theory (Hobfoll, 2011) and Social Cognitive Theory, investigates how physical self-efficacy influences physical activity in the workplace among physical education teachers. It specifically examines the mediating role of psychological resilience and the moderating effect of teacher job satisfaction. Through data analysis of 196 primary and secondary school PE teachers, the research partially validates initial hypotheses while revealing complex interaction mechanisms between variables. The following discussion integrates empirical findings with theoretical frameworks.

Direct effects of physical self-efficacy on workplace physical activity

The findings of this study demonstrate that physical self-efficacy significantly predicts positive workplace physical activity ($\beta=0.578$, $p < 0.001$). This large effect size ($f^2 = 0.36$) underscores that a PE teacher's confidence in their physical capabilities is a paramount driver of their active engagement in job-related physical tasks. This finding aligns closely with Bandura's (1986) social cognitive theory, which emphasises self-efficacy as a crucial cognitive driver of individual behaviour. The results indicate that individuals with more substantial confidence in their physical capabilities are more likely to engage in workplace physical activities actively. For physical education teachers, high levels of self-efficacy translate to greater confidence in completing professional physical tasks such as instructional demonstrations and training guidance, thereby motivating them to participate in workplace physical activities proactively. This conclusion also resonates with Cameron and Johann's (2020) research findings, who identified physical self-efficacy as a key predictor of physical exercise behaviour.

Furthermore, it corroborates international studies, such as those by Horcajo et al. (2022) on self-efficacy and performance and Inês & Dina (2023) on the organisational benefits of workplace activity, confirming the cross-cultural relevance of self-efficacy in predicting occupational physical activity. Furthermore, the results support Hobfoll's (2001) resource conservation theory, showing that physical self-efficacy serves as an essential personal resource that facilitates greater investment in workplace physical activity resources. These findings underscore the importance of enhancing physical self-efficacy among physical education teachers to promote their physical activity behaviours in the workplace.

The mediating effect of psychological resilience

Although theoretical models suggest psychological resilience may mediate the relationship between physical self-efficacy and workplace physical activity, data analysis reveals no significant mediating effect ($\beta=0.002$, 95% CI [-0.108, 0.144]). This non-finding is a critical result. A comprehensive discussion of potential reasons is warranted. First, it could be a matter of domain specificity. PSE is a particular belief about physical capability directly tied to behavior (WPA), creating a strong, direct path that may not require mediation by a more general trait, such as resilience. Second, methodological factors may play a role; the measure of PR used, while valid, assesses a global trait and might not capture domain-specific resilience related to physical teaching challenges, which could be a more proximal mediator. It is worth noting that recent meta-analytic findings have shown that family socioeconomic status (SES) has varying effects on different educational outcomes (Song et al., 2025), suggesting that contextual and domain-specific factors are crucial in educational research. Third, the sample characteristics are essential: PE teachers as a group may possess a naturally high and restricted range of resilience due to the demands of their profession (Peng & Li, 2019), which limits their variability and thus their ability to act as a mediator. Finally, PR may operate less as a mediator and more as a parallel resource or a moderator of other relationships, as the subsequent moderation finding suggests. This result adds nuance to the theoretical model, indicating that the translation

of physical confidence into action for PE teachers is direct and potent, rather than being filtered through general adaptive capacity. This finding may stem from two factors. The notably high direct effect of physical self-efficacy (PSE) on workplace physical activity (WPA), coupled with the non-significant mediating role of psychological resilience (PR), invites a deeper theoretical examination. This pattern of results suggests that PSE and PR, while positively correlated, may function as parallel rather than sequential resources in driving occupational behaviours among PE teachers.

Primarily, this can be attributed to the domain-specificity of the constructs involved. PSE represents a context-specific belief about one's physical capabilities directly tied to the professional task itself. For PE teachers, demonstrating a skill or leading an exercise is the core of their job. Therefore, the path from believing "I can do this physical task" to actually performing it is likely short, direct, and highly efficient, requiring little mediation by a more generalised capacity, such as resilience. Psychological resilience, in contrast, is a domain-general resource that facilitates adaptive coping with a wide array of stressors and adversities (Fletcher & Sarkar, 2013). It may help teachers manage work pressure and avoid burnout, thereby sustaining their overall professional functioning (Mansfield, 2020). Still, it may not directly govern the frequency of discrete physical acts within a specific class session.

Furthermore, methodological considerations may also contribute to the null finding. The measure of psychological resilience used, though valid and reliable, assesses a global trait. It might not capture domain-specific resilience — for instance, the ability to bounce back from a failed lesson demonstration or to maintain enthusiasm despite disruptive students—which could be a more proximal mediator between PSE and WPA. The use of a general measure might have overlooked the nuanced ways resilience operates within the physical education context.

Finally, the unique characteristics of our sample must be considered. PE teachers as a group likely possess a higher baseline level of psychological resilience due to the self-selective and demanding nature of their profession (Peng & Li, 2019). This restricted range in resilience scores could have attenuated its potential to function as a mediating variable. The mediating role of PR might be more pronounced in samples with greater variability, such as one comparing novice and experienced teachers.

In conclusion, the absence of a mediating effect does not diminish the importance of psychological resilience; rather, it clarifies its role. For PE teachers, confidence in one's physical abilities (PSE) is a powerful and proximal driver of workplace behaviour, operating through a direct pathway. Psychological resilience, meanwhile, may function as a crucial stabilising resource that protects overall well-being and job performance, potentially moderating the relationship between other variables, as our subsequent findings on moderation indeed suggest.

The moderating role of occupational well-being

This study reveals that teacher occupational well-being moderates the relationship through two pathways. First, it regulates the impact of physical self-efficacy on workplace physical activity. Simple slope analysis shows stronger predictive power of physical self-efficacy for physical activity under high well-being conditions ($\beta=0.877$, $p<0.001$), while this effect becomes insignificant under low well-being conditions ($\beta=0.279$). This finding supports Fredrickson's (2006) extended-construct theory, which posits that positive emotions expand individuals' immediate cognitive-action scope and build enduring personal resources. This demonstrates that occupational well-being enhances the driving effect of physical self-efficacy on workplace physical activity. This aligns with international research by Bakker et al. (2023) on the Job Demands-Resources model, showing that resources (like PSE) are most effectively utilised in the presence of other motivating resources (high OWB). The importance of institutional support for teacher well-being is increasingly recognised in educational policy initiatives (Inner Mongolia Department of Education, 2025). Second, it moderates the relationship between psychological resilience and physical activity. Analysis

reveals significant positive effects of OWB on physical activity under low resilience conditions ($\beta = 0.335$, $p < 0.05$), an intriguing finding likely related to Bakker and Demerouti's (2014, 2023) Job Demand-Reward Model (JD-R). The model suggests that when individuals possess excessive resources without corresponding challenges, this may lead to resource waste.

Conversely, under high psychological resilience conditions, this effect becomes negative ($\beta = -0.315$, $p < 0.05$), indicating that occupational well-being modifies the impact of psychological resilience on workplace physical activity — the direction of action. A more convincing theoretical explanation for this pattern draws on COR theory's principle of resource investment. Under low OWB (a resource-deficient condition), teachers high in resilience are motivated to invest their resilience resources in actively coping and engaging in high WPA to improve their situation. However, under high OWB (a resource-rich condition), teachers may feel more secure and satisfied. Those high in resilience might not feel the need to invest effort in high physical engagement constantly and may instead use their resilience to work smarter, not harder, perhaps by optimizing demonstrations or managing student activity more efficiently, leading to a strategic decrease in personal physical output. This represents a sophisticated, context-dependent use of personal resources. This complex moderation effect underscores the importance of developing tailored interventions that address both individual and organisational factors to support teacher well-being and performance (Liu & Xie, 2025). These findings demonstrate that teachers' occupational well-being not only amplifies the impact of physical self-efficacy on workplace physical activity but also moderates the relationship between psychological resilience and such activities, highlighting its boundary role in resource transformation processes. Rafiei et al. (2024) similarly found that self-efficacy (a personal resource) interacts with environmental conditions (like stress) to predict outcomes, supporting the complex interplay observed here. Xanthopoulou et al. (2009) further confirmed that work resources interact with each other, where different combinations of resource types produce distinct effects. This discovery offers a new perspective on understanding the psychological mechanisms underlying teachers' workplace behaviours and provides theoretical foundations for subsequent intervention studies (Preacher & Hayes, 2007; Deci & Ryan, 2008).

Theoretical Contributions and Practical Implications

Theoretical Contributions: First, this study extends the research on physical self-efficacy from the general field of physical exercise to specific occupational behaviour domains, enriching the application boundaries of self-efficacy theory. Second, by constructing and validating a moderated mediation model, it clearly reveals the “black box” mechanism through which physical self-efficacy influences workplace physical activity. Through psychological resilience and its conditional role—specifically, its requirement for high occupational well-being—it deepens the understanding of complex relationships between variables, providing an integrative theoretical framework for subsequent research. Third, it makes a significant contribution by identifying the critical boundary condition of Occupational Well-being. The finding that OWB potentiates the effect of PSE and alters the function of PR provides a more nuanced understanding of how these psychological resources interact, moving beyond simple direct or mediating effects. This addresses a gap in the literature regarding the contextual factors that influence these relationships. Finally, the unexpected finding that PR can negatively predict WPA under high OWB conditions challenges simplistic views of resilience as always positively linked to engagement and opens new avenues for theorising about the strategic application of personal resources.

Practical Implications: The research findings offer multifaceted insights for enhancing the occupational health and teaching quality of physical education teachers. At the individual level, teachers should adopt a lifelong learning approach through continuous professional development and physical training to enhance both physical fitness and instructional capabilities, thereby strengthening their sense of bodily efficacy. They should also proactively learn stress management strategies and psychological adjustment techniques to

cultivate mental resilience. At the institutional level, educational authorities and school administrators must recognise the importance of teachers' emotional well-being, moving beyond task-oriented management.

Specifically, to boost PSE, schools should organise regular teaching competitions, model lessons, physical fitness assessments, and related activities to provide platforms for teachers to showcase their talents and gain recognition. To foster resilience, schools should establish supportive environments through mentorship programs that offer emotional and professional guidance to new faculty members. Additionally, creating mental health service centres with Employee Assistance Programs (EAPs) can enhance stress management capabilities. To improve well-being, evaluation systems should be reformed to reduce administrative burdens while granting teachers greater autonomy in instruction. Furthermore, improving working conditions, enhancing compensation packages, and establishing principal incentive mechanisms are crucial for overall teacher satisfaction. The fund gives timely and sincere recognition and encouragement to teachers' efforts. More team-building activities are organised to create a harmonious, mutually aiding, and positive teaching and research group culture, aiming to improve teachers' occupational well-being fundamentally.

The key practical takeaway is that interventions must be synergistic. Efforts to increase PSE will have the most significant impact on WPA if conducted in parallel with initiatives designed to enhance overall OWB through improved school leadership and organisational support.

Conclusions and Prospects

Research conclusions

Structured by the research objectives, the main conclusions of this study are as follows:

- (1) Physical self-efficacy is a significant positive predictor of workplace physical activity among PE teachers, confirming the direct posited pathway.
- (2) Contrary to the hypothesis, psychological resilience did not mediate the relationship between physical self-efficacy and workplace physical activity, suggesting a more direct or parallel relationship between these resources.
- (3) Occupational well-being acts as a significant moderator: It potentiates the direct effect of physical self-efficacy on workplace physical activity (i.e., the effect is more potent when OWB is high), and it also moderates the second stage of the indirect path, altering the effect of psychological resilience on workplace physical activity from positive under low OWB to negative under high OWB.

Theoretical contributions lie in integrating COR and Social Cognitive theories to elucidate the resource-based mechanisms and boundary conditions governing the workplace behaviours of PE teachers.

Suggestions for Future Research

This study has certain limitations that highlight directions for future research. Firstly, while the cross-sectional design enabled the verification of causal relationships through theoretical derivations and statistical methods, it cannot establish definitive causal inferences. Future studies could employ longitudinal tracking designs or experimental interventions (such as training programs to enhance physical self-efficacy or occupational well-being) to validate the causal connections between variables. Specific longitudinal research questions could include: "How do fluctuations in monthly occupational well-being predict subsequent week-to-week changes in workplace physical activity?" and "Does an increase in physical self-efficacy lead to a sustained increase in resilience and well-being over a school year?"

Secondly, since the data were all self-reported, there may be social desirability bias. Future research could combine objective measurement methods, such as using accelerometers and other wearable devices, to more accurately measure teachers' workplace physical activity levels, or adopt a multi-source data approach, including colleague evaluations and student evaluations. This points to the value of mixed-methods approaches, which combine quantitative data from wearables with qualitative interviews to gain a deeper understanding of the context and reasoning behind the patterns observed in the quantitative data (e.g., why highly resilient teachers with high OWB might exhibit lower WPA).

Finally, the sample of this study is mainly from primary and secondary schools, and the universality of the conclusions among college physical education teachers or other subject teachers needs to be further tested. Future research can expand the sample scope and conduct cross-group and cross-cultural comparative studies to enhance our understanding further further. We specifically recommend comparative studies across different educational contexts (e.g., comparing well-funded vs. under-resourced schools, or comparing Chinese teachers with those in other countries with different educational policies) to test the generalizability of the moderated mediation model.

Despite the above limitations, this study is the first to integrate four variables: physical self-efficacy, psychological resilience, occupational well-being, and workplace physical activity, and reveals the internal psychological mechanisms of workplace health behaviours among physical education teachers, providing a valuable empirical basis for promoting teacher development and improving educational quality.

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Conflict of interest

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