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EDITED BY
Murat Yildirim,
Ağrı Ibrahim Çeçen University, Türkiye

REVIEWED BY
Francisco Manuel Morales Rodríguez,
University of Granada, Spain
Romualdas Malinauskas,
Lithuanian Sports University, Lithuania

*CORRESPONDENCE
Xiao-ling Tang
✉ tangxl_1115@sisu.edu.cn

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The impact of school climate on academic burnout of Chinese students: the mediating effect of psychological capital

Xiao-ling Tang*

College of International Education, Sichuan International Studies University, Chongqing, China

Background: Students are in their teenage years during middle school, which is a period of acceleration and transition for individual physical and mental development. Therefore, junior high school students are easily influenced by their internal and external environment, leading to academic burnout. The main activity venue for middle school students in school homework is the external environment that affects their academic performance. Psychological capital is the student's own resource and the external environment that affects their academic performance.

Aims: This study aims to explore the interrelationship among school atmosphere, psychological capital, and academic burnout, and construct a theoretical model among them. This study provides practical and feasible methods and guidance suggestions for educational institutions and teachers, helps students improve their mental health level, enhances the positive perception level of the school atmosphere, and alleviates their academic burnout.

Methods: Building upon previous research on school climate, psychological capital, and academic burnout, this study employed the following research tools: The Perceived School Climate Questionnaire (PSC), the Positive Psychological Questionnaire (PPQ), and the High School Students' Academic burnout Scale. A questionnaire survey was conducted on 1,267 students from three different regions of Chongqing, involving various types of junior high schools.

Results: The findings of this study demonstrate that both the external school climate and internal psychological capital exert an impact on academic burnout. A positive school climate can foster the development of psychological capital, subsequently enhancing academic performance. Additionally, psychological capital directly influences academic burnout. The higher the level of positivity is, the more pronounced the alleviating effect becomes. The school climate can directly affect academic burnout, and it can also indirectly affect academic burnout through the mediation of psychological capital, with psychological capital playing a partial mediating role.

Conclusion: To avoid academic burnout, schools should actively create a good school atmosphere and mobilize students' learning enthusiasm; teachers should provide targeted psychological counseling to reduce students' negative emotional perception; students should correct their learning attitude and recognize their own learning status.

KEYWORDS

academic burnout, junior high school students, mediating effect, psychological capital, school climate

1 Introduction

Currently, mental health issues such as loneliness, depression, and burnout are prevalent among junior high school students (Wiseman et al., 1995; Arkar et al., 2004; Lin and Huang, 2012). In 2020, the percentage of Chinese adolescents experiencing depressive symptoms was 24.6%, and this figure has been steadily increasing over time (Fu et al., 2021). Students' school experiences, personal lives, and emotions significantly impact their academic, cognitive, emotional, and social development (Lunenburg and Ornstein, 2013; Yoder et al., 2017). Positive academic support from teachers can enhance students' learning efficiency and resilience, thereby fostering their academic engagement (Fati et al., 2019). Furthermore, the support from the surrounding environment (Skinner et al., 2008), teachers' behavior (Skinner and Belmont, 1993), and classroom climate (Reyes et al., 2013) can influence students' attitudes toward studying. Therefore, exploring the relationship between junior high school students' positive psychological state and their perception of the environment can assist educators and parents in effectively addressing various mental challenges and school-related issues.

However, several gaps exist in the current research. Firstly, the existing literature on academic burnout predominantly centers around college students, with limited studies conducted on middle school students. Secondly, there is a dearth of research examining the relationship between school atmosphere, psychological capital, and academic burnout. Thirdly, there is a lack of studies investigating the mediating variables between school climate and academic burnout.

So, this study contains three aims: (a) to conduct a comprehensive analysis of the interplay between school climate, psychological capital, and academic burnout, thus contributing to empirical research on the factors influencing academic burnout; (b) to enhance the understanding of the relationships among research variables, thereby enriching and expanding theoretical advancements relevant to middle school students, and providing a theoretical foundation for educational institutions and teachers; and (c) to gain an in-depth understanding of the specific causes of academic burnout and other adverse circumstances in junior high school students, with the aim of improving their positive psychological wellbeing, fostering a positive perception of the school climate, mitigating the issue of academic burnout, and offering practical methods and guidance suggestions.

2 Literature review

2.1 The connotation research of school climate, psychological capital, and academic burnout

2.1.1 Academic burnout

Learning Burnout is derived from Job Burnout. Freudenberg first proposed the concept of "burnout" in 1974 when he studied the occupational stress of workers. It mainly means that individuals are under pressure for a long time, which cannot be relieved psychologically and physiologically, and therefore results in tiredness and slack in body and mind, indifference and alienation to others, and low evaluation of themselves (Freudenber, 1974). There are two views on the connotation of burnout: one sees burnout as a static process (Jiang et al., 2021), which is a manifestation of a state or symptom. For example, Maslach et al. (2001) believe that it is a negative attitude and behavior gradually appearing in the work, and a sick-like symptom of fatigue and pain (Maslach et al., 2001); the other believes that burnout is a dynamic changing process. For example, Etzion's (1987) research shows that burnout does not happen instantaneously, but is a destructive psychological fatigue that occurs after a certain critical point is accumulated in a slow process. Many studies on academic burnout have followed the connotation of occupational burnout. Academic burnout (Jiang et al., 2021) usually refers to the physical and psychological exhaustion of students in daily learning, such as decreased energy, physical and mental fatigue, usually accompanied by the avoidance behavior of learning aversion (Gao, 2023). According to Wu et al.'s (2010) research, academic burnout is a negative mental state that occurs in a group of students and is associated with learning, and it is persistent and stressful. Lian et al. (2005) believes that academic burnout is a kind of negative psychological attitude toward learning experienced by students. Due to long-term heavy academic pressure, students' enthusiasm for all learning activities disappears, accompanied by tired attitude and negative behavior (Lian et al., 2005). Therefore, academic burnout can be defined as the phenomenon that students have a negative emotion of emptiness, helplessness and exhaustion due to long-term academic pressure, which leads to students' negative treatment of learning.

Although scholars agree on the definition of academic burnout, there is no unified view on the structure of academic burnout, as shown in **Tables 1**, **2**. Based on the research results of scholars,

TABLE 1 Division of the dimensions of academic burnout by some researchers (or supporters).

Dimension partitioning	Dimension naming	Researcher (or supporter)
Single dimension	Emotional exhaustion	Shirom, 1989
Two-dimensions	Emotional exhaustion, deindividuation, and feelings of occupational inefficiency	Taris, 1999; Yan and Tang, 2003
Three-dimensions	Emotional exhaustion, depersonalization, and reduced sense of self-fulfillment	Freudenber, 1974
	Emotional exhaustion, deindividuation, and low personal accomplishment	Maslach and Jackson, 1981
	Low mood, inappropriate behavior, and low sense of accomplishment	Lian et al., 2005
	Learning alienation, learning fatigue, and low learning effectiveness	Zhang et al., 2005; Ni et al., 2009
	Exhaustion, apathy, and reduced self-efficacy	Yang, 2011
Four-dimensions	Emotional exhaustion, lack of humanity, low sense of accomplishment, and attitude of derision	
	Emotional exhaustion, learning inefficiency, alienation between teachers and students, and physiological exhaustion	Hu and Dai, 2007
	Emotional exhaustion, inefficiency, learning neglect, and lack of learning motivation	Xu et al., 2010
	Emotional exhaustion, inefficiency, attitude of derision, and cynicism	Lee et al., 2013
Five-dimensions	Psychological tension, physical tension, ineffective sense of self-evaluation, ineffective sense of others' evaluation, and alienation	Densten, 2001
Six-dimension	Emotional exhaustion, weakened will, value denial, study-weary behavior, dehumanization, and inefficiency	Cao, 2017

TABLE 2 Means, standard deviations, minimum, and maximum between all variables.

Variable	Mean	SD	Actual range	Cronbach's α
Academic burnout				
Emotional exhaustion	1.86	0.69	1–5	0.850
Inefficiency	2.76	0.91	1–5	0.826
Teacher–student alienation	1.77	0.78	1–5	0.746
Physiological exhaustion	2.16	1.00	1–5	0.826
School climate				
Teacher–student relationship	3.30	0.59	1–4	0.890
Classmate relationship	2.99	0.49	1–4	0.685
Order and discipline	2.76	0.32	1–4	0.633
Academic pressure	2.78	0.54	1–4	0.713
Development diversity	3.05	0.52	1–4	0.687
Psychological capital				
Self-efficacy	4.40	1.02	1–7	0.724
Resilience	4.58	1.12	1–7	0.740
Hope	4.72	0.93	1–7	0.676
Optimism	4.87	1.20	1–7	0.822

this study will adopt a widely used four-dimensional model for analysis. This model divides academic burnout into emotional exhaustion, inefficiency, alienation between teachers and students, and physiological exhaustion. Among them, emotional exhaustion refers to the psychological overload of individuals due to excessive external pressure (Nagamitsu et al., 2020); alienation between teachers and students means that individuals feel estranged from the teacher and their affection for the teacher is reduced, which may be due to the teacher's teaching ability and personality, or from students' excessive expectations and self-sensitivity (Kumari, 2021). Low self-efficacy refers to the inability of individuals to solve problems and the depressed state of self-denial (Savarese et al., 2019). Physiological exhaustion means that the individual suffers from physiological discomfort, feeling overdrawn and powerless (Hu and Dai, 2007).

2.1.2 School climate

Perry (1919) proposed the concept of school atmosphere as early as 1908, and then mentioned it again in his book in 1919. At present, the school climate has been studied from three independent but mutually exclusive perspectives (Capp et al., 2021). The first is the multiple measurement approach of organizational attributes, which refers to the school climate as school organizational climate (Jones and Fleming, 2021). In Halpin (1966) was the first to introduce organizational climate into the field of school and put forward the concept of personality metaphor. He compared the school climate to the personality of an individual and pointed out that a warm, inclusive and open organizational atmosphere should be established (Halpin, 1966). In Haynes et al. (1993), put forward the concept of relationship metaphor based on the theory of ecological development, emphasizing that school climate mainly refers to the interaction quality and frequency of all interpersonal relationships between all personnel inside the school and between the school and outside groups such as families and communities. And these interactions affect students' self-cognition, self-evaluation, self-psychological, and social development (Anderson, 1982). In Freiberg (1998), who put forward the concept of the air metaphor, argued that the school climate was like the air that members in the school could feel all the time, with dispersion and uncertainty (Freiberg, 1998). The second is the perception measurement of organizational attributes, which defines the school climate as the school organizational climate perceived by the organization. This research orientation

regards school climate as both an external environmental variable and an internal psychological process, emphasizing individuals' views on school (Campbell et al., 1971; Jones and Fleming, 2021). School climate is a stable and enduring feature that significantly distinguishes it from other school organizations (Hoy, 1987). The third is the perceived measurement of individual attributes, which emphasizes the individual's perception of school climate. School climate is a unique attribute of the school organization, which can be perceived by individuals (Gilman et al., 2021). It is a synthesis of the external environment, social relations and psychological feelings shared by all members (Ge and Yu, 2006). School climate is formed by the interaction between members in the school environment (Zabek et al., 2022), and the quality of social interpersonal interaction determines the positive degree of perception of atmosphere (Jones and Fleming, 2021). This research orientation emphasizes the individual's holistic view of the overall school environment (Ruddy, 2017), reflecting the interaction between the individual and the school (James and Jones, 1974).

In view of the above three research approaches, school climate should be seen as a collection of all external environment and individual internal characteristics related to school activities, and integrate the three metaphorical viewpoints of school organizational atmosphere, which should be regarded as including not only the static performance of school structure, physical environment, facilities, and rules, but also the dynamic interaction between people, people and things, and between things (Kupchik et al., 2022). In addition, the school atmosphere can be perceived as the overall feeling after individual abstraction, and the large differences in cognition and personality between different students will produce different perception degrees (Jones and Fleming, 2021). Therefore, the study and measurement of school climate should begin with the perspective of individuals, and it is necessary to emphasize the individual perception of school climate (Ellis et al., 2022).

Moos (1979) divided the dimensions of school climate into three: relational dimension, individual development dimension, system maintenance and change dimension. The relational dimension means that students can obtain close friendship, help each other, participate in school or class activities actively, and form a close relationship with teachers. The individual development dimension means whether the overall goal set by the school emphasizes the implementation of task plans, whether it attaches importance to students' scores, encourages competition, praises students, and so on. System maintenance and change dimensions mean whether there are clear rules and regulations, good environmental order, reasonable teacher control in the external environment of the school, and whether the school carries out reform and innovation to promote its own development. Haynes et al. (1993) focused on the quantity and quality of interpersonal interactions in school climate, exploring teacher–student and student–student relationships, parental involvement, fairness and management of order, and resource sharing. Schmitt et al. (1999) put more emphasis on students' learning behavior, academic performance, and values. Loukas and Robinson's (2004) research on the relationship between school climate and adolescents' early social adjustment focuses on such issues as conflict, competition and cooperation, belonging, and satisfaction. Although different researchers lay different emphasis on the study of school climate, they have not gone beyond the three dimensions proposed by Moss.

2.1.3 Psychological capital

The concept of psychological capital was initially introduced in 1998 as the cumulative manifestation of individual psychological traits that significantly enhance personal productivity and yield positive behavioral outcomes (Goldsmith et al., 1998). Seligman, the father of positive psychology, posited that psychological factors influencing positive psychological behavior in individuals can be regarded as components of psychological capital (Seligman and Csikszentmihalyi, 2000). In Luthans et al. (2005) provided a clear definition of psychological capital as the stable and fundamental inner psychological elements within an individual, which is manifested as a positive mental state reflected in one's actions. Following the revision in 2007, psychological capital came to be understood as a constructive psychological strength encompassing specific dimensions such as self-efficacy, hope, optimism, and resilience (Luthans et al., 2007a,b), and in 2015, these dimensions were further explained as (1) efficacy: also known as confidence, referring to an individual's belief in being able to stimulate motivation, mobilize cognitive resources, and take necessary actions to successfully complete a specific task in a specific context; (2) hope: a positive motivational state formed on the basis of experiences generated by the intersection of successful motivations and paths; (3) optimism: a positive explanatory or attributive style. Optimists attribute positive events to their own, persistent, and universal causes, while negative events are attributed to external, temporary, and situational reasons; and (4) resilience: the ability to actively adapt in major difficult or dangerous situations, the ability to recover from challenging situations, and the ability to surpass ordinary willpower (Luthans et al., 2015). Tösten and Özgan (2015) expanded the dimensions of psychological capital by incorporating "extroversion" and "self-confidence." Chinese scholars conceptualize psychological capital as an internal positive psychological strength that enables individuals to effectively cope with pressures and challenges, thereby enhancing academic performance and life satisfaction (Hao et al., 2021).

2.2 The relationship between school climate, psychological capital, and academic burnout

2.2.1 The relationship between school climate and academic burnout

Adolescence is an inevitable stage that every junior high school student goes through, and their learning and psychological development will be affected by the current environment. School atmosphere has a direct impact on every student in it, and therefore plays an important role in the formation of the student's daily habits and the establishment of their academic achievements (Roeser and Eccles, 1998). In addition, it also has a broader impact on the cultivation of students' emotional aspirations, creative development, and formation of values and social behavior patterns (McEvoy and Welker, 2000).

From the forementioned literatures, we can see that there are few studies on academic burnout from the perspective of school climate, and the number of effective data is extremely limited, which brings inconvenience to the research. Due to various factors, schools in different parts of China cannot implement the national education system to the same degree. Due to this factor,

the development degree of campus culture is also very different. Therefore, the research on the influence of school climate on junior high school students' academic burnout must take uniqueness of the students' school and the school climate into account (Gao, 2023). By studying the correlation between the two, we can get a detailed understanding of the degree of cultural construction in this school.

2.2.2 The relationship between psychological capital and academic burnout

Studies on psychological capital of junior high school students have confirmed that psychological capital has significant differences in most population variables, and the level of psychological capital is especially affected by school situational factors such as academic pressure and parenting style (Hong, 2016). Unlike college students (Virga et al., 2020; Barratt and Duran, 2021), high school students (Dong, 2011), and junior high school students (Mei et al., 2015) all demonstrated that psychological capital is an important factor significantly predicting academic burnout.

In addition, there is a close relationship between junior high school students' positive psychological capital and emotion regulation strategies, among which self-efficacy will also affect students' external academic performance by changing the individual's internal motivation and cognitive style (Xin, 2013). Studies show that psychological capital is negatively correlated with learner pressure, and students with more psychological capital can deal with tension and crisis situations more effectively (Khajavy et al., 2019). At the same time, students often experience stress and burnout, which can be addressed by enhancing their personal psychological capital (Jacobs and Dodd, 2003). In view of this, having an optimistic attitude toward learning plays a positive role in promoting students' initiative to love learning.

2.2.3 The relationship between school climate and psychological capital

Researches of school climate and psychological capital show that there is a significant positive correlation between school climate and psychological capital, and psychological capital plays a partial mediating role between school climate and academic burnout (Xie and Mei, 2019). School environment and teacher support can promote the development of students' positive psychological capital (Deli et al., 2020). There is a significant negative correlation between school climate perceived by junior high school students and individual academic achievement. Self-efficacy of psychological capital also plays an intermediary role between school climate and academic burnout in junior high school (You, 2016); in practical intervention, problems such as academic burnout can be prevented and solved by improving teenagers' sense of self-efficacy (Bao et al., 2016).

2.3 The present study

Relevant studies have confirmed that there is a negative correlation between school climate and academic burnout, there is a positive correlation between school climate and psychological capital, and psychological capital and academic burnout are significantly negatively correlated; however, there are few comprehensive studies on school climate, psychological capital and academic burnout, and no studies have proved that psychological capital plays an intermediary role in the relationship between school climate and academic burnout. In addition, most of the previous researches on academic burnout focused on high school students and college students, whose development is relatively stable in all aspects. However, junior high school students are still in a semi-stable, semi-dependent state, immature psychological development, unable to withstand temptation, and easy to produce bad behavior, and therefore are more worthy of scholars' attention. Therefore, on the basis of the conclusions of previous studies, this study takes junior high school students as the subject, and attempts to explore the interrelationship among school atmosphere, psychological capital, and academic burnout, and verify whether psychological capital can serve as a mediator between school atmosphere and academic burnout. If psychological capital has a mediating effect, whether it is a complete or partial mediating effect, in order to construct a theoretical model between the three. This study proposes practical policy recommendations to effectively reduce academic burnout among students.

3 Materials and methods

3.1 Procedures

This study utilizes a comprehensive investigation approach to examine the entire population of junior high school students from three different areas in Chongqing. The selected schools for the study include W School, S School, and H School. These schools differ significantly in terms of student demographics, training programs, and environmental factors. W School, located in the city center, is a prominent junior high school primarily serving students residing in close proximity to the school. S School, on the other hand, is a comprehensive school accommodating students from primary, junior, and senior grades, with a majority of students boarding on campus, resulting in a more diverse student population. H School, situated in a town, is a key junior high school within the district. The three schools selected for this study belong to different types and have their own educational characteristics, which can represent different types of Chinese junior high schools. A total of 1,420 questionnaires were distributed, of which 1,387 were successfully collected, yielding a recovery rate of 97.68%. After eliminating invalid questionnaires, the final sample comprised 1,267 valid responses, corresponding to an effective recovery rate of 94.27%.

3.2 Participants

According to **Table 2**, the subjects of this study include S School (520 students, 41.0%), W School (419 students, 33.1%), and H School (328 students, 25.9%). The total number of the students is 1,267, including 427 (33.7%) junior high school students, 431 junior high school students (34.0%), and 409 junior high school students (32.3%). There are 667 and 600 male and female students, accounting for 52.6% and 47.4%, respectively.

3.3 Instruments

3.3.1 Academic burnout scale for middle school students

For this study, the "Academic Burnout Scale for Middle School Students" developed by Hu and Dai (2007) of Zhejiang Normal University in 2007 was employed. This scale measures the level of academic burnout among students, with higher scores indicating greater burnout. The scale consists of four dimensions: emotional exhaustion, inefficiency, teacher–student alienation, and physiological exhaustion, encompassing a total of 21 questions. Specifically, emotional exhaustion comprises 8 questions (1–8), such as "I have many learning problems, but I am becoming increasingly indifferent." Learning inefficiency involves 5 questions (9–13), such as "I feel that studying cannot stimulate my potential." Teacher–student alienation includes 4 questions (14–17), such as "I don't trust the teacher's words." Physiological exhaustion encompasses 4 questions (18–21), such as "My sleep is getting worse and worse." The scale employs a 5-point scoring system, where responses range from "never" to "always" and are assigned scores from 1 to 5. It is important to note that the dimension of learning inefficiency is reverse-scored. The internal consistency coefficient (Cronbach's α) of the overall scale was 0.90, and the McDonald's ω coefficient was 0.763, indicating high reliability. Furthermore, the Cronbach's α coefficient for the individual dimensions were 0.88 for emotional exhaustion, 0.83 for inefficiency, 0.76 for teacher–student alienation, and 0.70 for physiological exhaustion, demonstrating good reliability.

3.3.2 Perceived school climate of junior high school students

This study utilized the Questionnaire on Perceived School Climate of Junior High School Students (PSC), developed by Ge and Yu (2006). The PSC measures the perceived school climate, with higher scores indicating a more positive perception of the school environment. This questionnaire adopts the theoretical framework of the human-environment dichotomy proposed by Moos. This framework has been widely applied in the examination of school reform and student development, making it a suitable tool for assessing the psychological environment of junior high school students.

The questionnaire comprises 38 questions, categorized into five dimensions: teacher–student relationship (9 questions, such as "Teachers genuinely care about their classmates"), classmate relationship (7 questions, such as "Get along harmoniously among classmates"), order and discipline (7 questions, such as "The school is quite noisy"), academic pressure (8 questions, such as "Extra extracurricular activities or extra classes added by the school"), and development diversity (7 questions, such as "The school encourages students to participate in activities that interest them"). A 4-point scoring method is employed, where choosing "completely inconsistent" corresponds to a score of 1, and selecting "completely consistent" corresponds to a score of 4. Notably, the academic pressure dimension is scored in reverse. The overall reliability of the questionnaire demonstrated good internal consistency, as evidenced by a Cronbach's α coefficient of 0.86 and a McDonald's ω coefficient of 0.911. Furthermore, the individual dimensions exhibited satisfactory reliability, with Cronbach's α coefficient of 0.87 for teacher–student relationship, 0.82 for classmate relationship, 0.82 for academic pressure, 0.66 for order and discipline, and 0.80 for development diversity.

3.3.3 Positive psychological capital scale

For this study, the Positive Psychological Capital Scale (PPQ) developed by Zhang et al. (2010) was employed. The PPQ assesses an individual's positive mindset and psychological capacity, with higher scores indicating greater positivity and stronger psychological abilities. The scale comprises 26 questions involving four dimensions: self-efficacy (7 questions, such as "Many people appreciate my talent"), hope (6 questions, such as "I am working hard to achieve my goals"), resilience (7 questions, such as "When faced with setbacks, I can quickly recover"), and optimism (6 questions, such as "I always see the good side of things").

A 7-point Likert scale was utilized, ranging from 1 to 7, where responses ranged from "completely inconsistent" to "completely consistent." Notably, items 8, 10, 12, 14, and 25 were reverse-scored. The scale demonstrated high internal consistency, with a Cronbach's α coefficient of 0.93 and a McDonald's ω coefficient of 0.891 for the overall scale. Moreover, the Cronbach's α coefficients for each dimension were 0.86 for self-efficacy, 0.80 for hope, 0.76 for optimism, and 0.83 for resilience, meeting the requirements for reliable measurement.

3.4 Data analysis

Descriptive statistics and correlation analysis of academic burnout, psychological capital, and school climate were analyzed using SPSS 20.0. It was considered statistically significant when $p < 0.05$ (two-tailed test). A path analysis with Analysis of Moment Structures (AMOS) was adopted for testing our hypothetical model. A bias-corrected percentile bootstrap was used to test the mediating effect of psychological capital, with a 95% CI (confidence interval) not containing 0 representing statistical significance.

3.5 Research hypotheses and the theoretical model

In this study, we aimed to test three research hypotheses.

> H1: Junior high school students' perception of school climate can negatively affect academic burnout, that is, the perception of a poor school climate will increase academic burnout, while a better school climate will reduce academic burnout.

> H2: Psychological capital level of junior high school students can negatively affect the degree of academic burnout, that is, the higher the score of psychological capital, the lower the level of academic burnout of the students.

> H3: Psychological capital can play a mediating role between school climate and academic burnout.

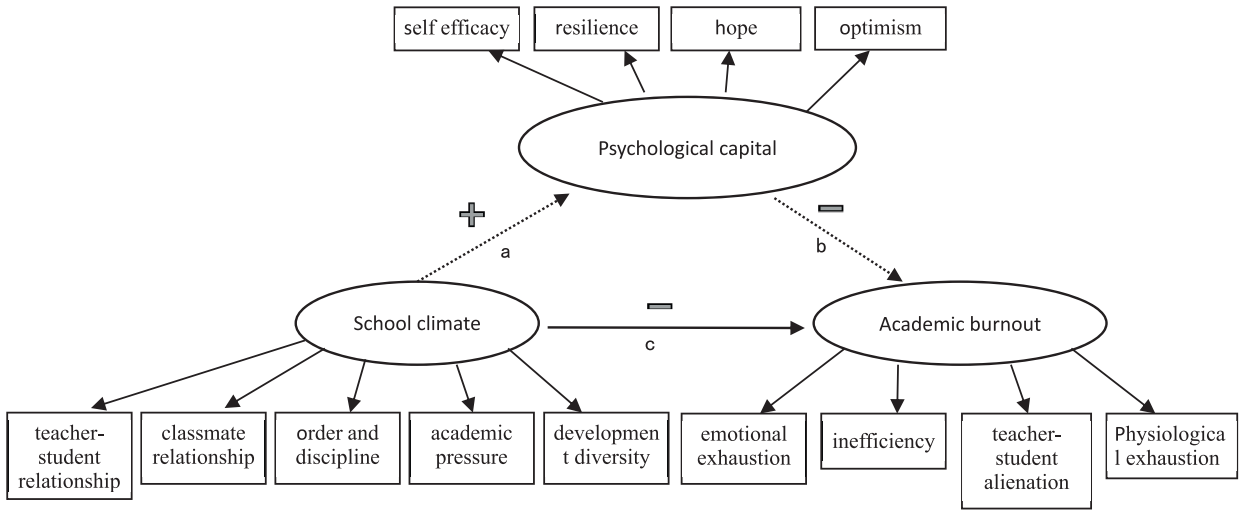

FIGURE 1
The theoretical model for correlation among academic burnout, psychological capital, and school climate.

According to literature review and research hypotheses, this study established a theoretical model (Figure 1). The variable school atmosphere includes five dimensions: teacher–student relationship, classmate relationship, order and discipline, academic pressure, and development diversity. The variable psychological capital consists of four dimensions: emotional exhaustion, inefficiency, teacher–student alienation, and physiological exhaustion. The variable academic burnout contains four dimensions: self-efficacy, hope, resilience, and optimism. The school climate has a positive impact on psychological capital and a negative impact on academic burnout. Psychological capital negatively affects academic burnout. Path a represents the direct impact of school climate on psychological capital, and path b represents the direct impact of psychological capital on academic burnout, and path c represents the direct impact of school climate on academic burnout.

4 Results

4.1 Descriptive statistics of academic burnout, psychological capital, and school climate

Table 2 presents the participants' descriptive statistics of academic burnout, psychological capital, and school climate. Overall, the level of academic burnout among middle school students is not high, with three indicators below the average level of 2.5 and only inefficiency score above 2.5 (2.76 ± 0.91). Middle school students perceive a good school atmosphere, with each indicator above the average of 2. Teacher–student relationship (3.30 ± 0.59) score is the highest, and order and discipline score is the lowest (2.76 ± 0.32). Psychological capital scores are also good, with optimism scoring the highest (4.87 ± 1.20), and self-efficacy scoring the lowest (4.40 ± 1.02).

4.2 Correlation analysis

Pearson correlation analysis was conducted on the relationship between academic burnout and school climate among junior high school students, as well as the levels of various dimensions. The results are shown in Table 3.

There is a very significant negative correlation between the school climate of the students and the total score of their academic burnout ($p < 0.01$). The dimensions of order and discipline are significantly positively correlated with academic burnout and various dimensions ($p < 0.01$), indicating that the stricter the perceived order and discipline within the school is, the more likely it is to lead to academic burnout. There is a significant negative correlation between teacher–student relationship, classmate relationship, academic pressure, developmental diversity, and the overall level and various dimensions of academic burnout ($p < 0.01$). The correlation between the teacher–student relationship dimension of school atmosphere and the teacher–student alienation dimension of academic burnout is the highest (-0.545), because they are the most closely related.

A correlation analysis was conducted on the total score and various dimensions of psychological capital and academic burnout, and the correlation matrix was obtained, as shown in Table 3. There is a very significant negative correlation ($p < 0.01$) between psychological capital and the total score and all dimensions of academic burnout, and the correlation between all variables is significant ($p < 0.01$). The correlation value between the hope dimension of psychological capital and the low efficiency dimension of academic burnout is -0.468, which has the highest correlation, indicating that the more promising students are in the future, the better their self-efficacy will be.

An analysis was conducted of the correlation between the total score and various dimensions of school climate perceived by middle school students and the total score and dimensions of psychological capital, as shown in Table 4. There is a significant positive

TABLE 3 Correlation analysis of various dimensions of academic burnout and other variables.

	Emotional exhaustion	Inefficiency	Teacher–student alienation	Physiological exhaustion	Academic burnout
Teacher–student relationship	−0.309**	−0.342**	−0.545**	−0.370**	−0.511**
Classmate relationship	−0.308**	−0.298**	−0.361**	−0.306**	−0.429**
Academic pressure	−0.295**	−0.258**	−0.414**	−0.386**	−0.447**
Order and discipline	0.277**	0.166**	0.320**	0.313**	0.360**
Development diversity	−0.218**	−0.292**	−0.363**	−0.253**	−0.371**
School climate	−0.326**	−0.365**	−0.514**	−0.386**	−0.524**

**$p < 0.01$.

TABLE 4 Correlation analysis between various dimensions of school climate and psychological capital.

	Teacher–student relationship	Classmate relationship	Academic pressure	Order and discipline	Development diversity	School climate
Self-efficacy	0.347**	0.354**	0.220**	−0.214**	0.255**	0.350**
Resilience	0.345**	0.303**	0.299**	−0.269**	0.253**	0.352**
Hope	0.343**	0.357**	0.188**	−0.127**	0.262**	0.356**
Optimism	0.407**	0.422**	0.197**	−0.160**	0.295**	0.407**
Psychological capital	0.439**	0.435**	0.279**	−0.241**	0.323**	0.446**

**$P < 0.01$.

TABLE 5 Final model path check.

Path	Non-standardized coefficient	Standardized coefficient	SE	C.R.	*p*	Label
a	0.795	0.519	0.048	16.704	***	a
b	−0.287	−0.534	0.021	−13.870	***	b
c	−0.340	−0.413	0.029	−11.696	***	c

***$P < 0.001$.

correlation ($p < 0.01$) between the total score of psychological capital of middle school students and their perceived level of school atmosphere, and the correlation between all variables is significant ($p < 0.01$). The dimensions of order and discipline are significantly negatively correlated with the total score and various dimensions of psychological capital ($p < 0.01$), indicating that the better the perceived order and discipline of the school, the lower the psychological capital. This may suggest that the higher the external constraints, the lower the positive perception within oneself. The other dimensions of school atmosphere are significantly negatively correlated with all dimensions of psychological capital ($p < 0.01$). The correlation between the classmate relationship dimension of school atmosphere and the optimistic dimension of psychological capital is the highest ($r = 0.422$).

4.3 Test of the hypothesized model

Based on results obtained through correlational analyses, a hypothesized mediation model was tested, with school climate as the independent variable, psychological capital as the mediator, and academic burnout as the dependent variable. Due to the poor fitting effect of directly using this model, this study used an MI correction, added the relationship between "order and discipline" and "academic pressure" to the path diagram. In fact, the order and discipline of schools are related to the academic pressure of students. The amount of homework, number of exams, and excellent evaluations set by the order and discipline of schools can have an impact on the academic pressure of students. If the amount of homework is too large or the number of exams is too many, it will increase the pressure on students. The modified fit indicators are CMIN/DF = 14.327, GFI = 0.897, CFI = 0.886, AGFI = 0.846, RMSEA = 0.103, and the model fit is within an acceptable range.

From Table 5, it can be seen that the three pathways, from school climate to psychological capital, from psychological capital to academic burnout, and from school climate to academic burnout, are significant at the 0.001 level, indicating that all previous hypotheses are valid. According to the definition, if path a, b and c were significant, there would be partial mediating effect, that is, school climate affects academic burnout through psychological capital. Therefore, this study adopts Bootstrap method, and samples 2,000 times under 95% CI to test mediator effect.

According to Table 6, the deviation correction interval for the total effect is between −0.645 and −0.500, excluding 0, and the significance $p = 0.001$, lower than 0.05, indicating the existence of the total effect. The range of direct effects is −0.418 to ∼−0.268 and −0.414 to ∼−0.267, both of which do not include 0, and the significance $p = 0.001$, lower than 0.05, indicating the existence of direct effects. The range of mediating effect (indirect effect) of psychological capital is −0.292

TABLE 6 Summary of intermediary, direct, and total effects.

Effect	Point estimation	Coefficient multiplication			Bootstrapping				p	Proportion (%)
		Product of coefficients			Bias-corrected 95% CI		Percentile 95% CI			
		SE	Z		Lower	Upper	Lower	Upper		
Total effect	−0.568	0.037	−15.351		−0.645	−0.500	−0.645	−0.500	0.001	
Mediator effect	−0.228	0.031	−7.355		−0.292	−0.170	−0.291	−0.170	0.001	40.14
Direct effect	−0.340	0.038	−8.947		−0.418	−0.268	−0.414	−0.267	0.001	59.86

to ∼−0.170 and −0.291 to ∼−0.170, both of which do not contain 0, and the significance p = 0.001, lower than 0.05, Mediating effect (indirect effect) exists. To sum up, both Mediating effect (indirect effect) and direct effect exist, and their respective effects account for 40.14% and 59.86%. Therefore, psychological capital plays a partial mediating role between school climate and academic burnout.

5 Discussion

5.1 The current status of school climate, psychological capital, and academic burnout of junior high school students

According to the findings of the above research, the academic burnout level among junior high school students in Chongqing is generally average, primarily manifested in emotional exhaustion and a sense of low efficacy. The lower the level of academic burnout among students is, the more positive their perception of learning is. In recent years, Chongqing has actively responded to the "Double Reduction Policy" issued by the state, and tried to achieve student-centered goals, so that students have more freedom to allocate time, so the level of academic burnout is not high (Zhang, 2021). In addition, various schools in Chongqing carry out interest courses other than basic courses, allowing students to achieve comprehensive development while enhancing their learning enthusiasm.

This study found that the overall school climate perceived by middle school students is relatively positive, with the best teacher–student relationship, the worst perception of order and discipline, and average student relationships. Previous studies have found that teachers in most schools in Chongqing provide more care and attention to students' growth, forming a good teacher–student relationship (Zhang, 2021). Middle school students are currently in adolescence, with a growing sense of self-awareness and a strong curiosity and rebelliousness. They exhibit a more individual-centered approach to doing things, which can lead to more social adaptability issues (You, 2016). They often have the idea of violating school rules and regulations, believing that school order and discipline are unreasonable constraints. In addition, gang groups began to emerge in middle school, and the relationships between classmates were relatively average.

This study also found that the overall level of psychological capital among middle school students is relatively high. The scores of psychological capital dimension from high to low are resilience, self-efficacy, optimism, and hope. In Peng et al.'s (2022) research on the psychological capital of middle school students, the score of psychological capital is relatively low. The reason for the differences may be the current emphasis on mental health education. In recent years, the primary and secondary schools in China have increased their investment in mental health education (Zhang, 2021), constantly carried out activities to improve mental health literacy, and helped junior high school students improve their mental health (Luo et al., 2023). Secondly, the development of the social economy has brought abundant living conditions, and parents attach

greater importance to investing money in their children's education (Savarese et al., 2019). Junior high school students have participated in various interest classes since childhood, with an outgoing and confident personality (Zhang et al., 2023).

5.2 The relationship among school climate, psychological capital, and academic burnout

The external environment has a significant impact on burnout. The researchers found that fear of COVID-19 and coronavirus stress significantly positively predicted COVID-19 burnout (Chen et al., 2023; Yıldırım and Ashraf, 2023; Yıldırım et al., 2023a).This is consistent with our research findings. Our results indicate that both school climate and psychological capital significantly negatively predict academic burnout. The more positive the school climate in which junior high school students are situated, the lower the level of academic burnout, and the higher the level of psychological capital, the lower the level of academic burnout.

Wu et al. (2012) studied the relationship between school climate and academic burnout of middle school students and found that school climate among environmental factors has a certain impact on academic burnout of middle school students. Burnout arises from long-term pressure, and high learning pressure is the source of academic burnout (Xie and Mei, 2019; Yıldırım and Ashraf, 2023; Yıldırım et al., 2023b). School is the main activity place for students, and its atmosphere constantly affects their learning status (Yan et al., 2012). The more positive the perceived school climate, the more harmonious the teacher–student relationship, and the more harmonious the classmate relationship, the less likely it is for academic fatigue to occur (Yoder et al., 2017; Yıldırım et al., 2023c); on the contrary, if the learning atmosphere is depressed, school life is boring, and academic burnout easily occurs (Zabek et al., 2022).

A study examined the predictive effects of resilience and external motivation on burnout and found that resilience has a negative predictive effect on burnout (Yıldırım and Ashraf, 2023). Unlike this, our study examines the predictive effect of psychological capital on burnout, and resilience is only one element of psychological capital. The negative impact of psychological capital on academic burnout among junior high school students means that the lower the level of psychological capital, the higher the degree of academic burnout. This is mainly manifested in the low sense of learning efficacy of students, which is prone to alienation and physiological exhaustion (Virga et al., 2020); the higher the level of psychological capital, the lower the level of academic burnout, which is mainly manifested as a higher sense of learning efficacy, abundant learning energy, good teacher–student relationship, and less likely to lead to alienation. Liu's (2021) research also indicates that students have a low sense of learning efficacy and may perceive learning as a difficult task, leading to academic burnout. Students with high levels of psychological capital have a more positive and optimistic mindset, are able to solve learning difficulties in appropriate ways (You, 2016), possess perseverance in learning, and have good psychological qualities, resulting in a lower level of academic burnout (Zhang et al., 2023). Similar conclusions were drawn by Zhou and Luo's (2011) research: as psychological capital continues to improve, positive emotional experiences in academic pursuits also increase.

5.3 Psychological capital plays a partial mediating role between school climate and academic burnout

This study employed a structural equation modeling (SEM) approach aiming to explore the mediation of psychological capital between academic engagement and academic burnout, and attempted to explain empirically the links between school climate and academic engagement, positing that psychological capital could function as a mediator. It found that psychological capital played a mediating role between school climate and academic burnout, which supported our hypothesis. The findings demonstrated that the effect of positive junior high school climate on decreasing academic burnout maybe enhanced by strengthening their school students' psychological capital (Hong, 2016). Positive school climate can help students cope with these negative effects, which can increase psychological capital and alleviate academic burnout (Zhang et al., 2023). Therefore, our study indicated psychological capital was an important antecedent variable for junior high school students to cope with negative academic burnout via psychological capital. The mediating effect of psychological capital provided new perspectives on reducing junior high school students' academic burnout. To enhance students' perception of the school climate, schools need to establish clear and fair rules and regulations to constrain every internal member (Luo et al., 2023). Only when members feel fair, equal, and reliable can they have a high evaluation of the environment they are in, but it is not advisable to adopt strong administrative measures (Lu, 2016). In such a supportive and safe school climate, students can feel treated fairly, reduce their sense of oppression and pressure, and thus can reduce the occurrence of academic burnout (Koth et al., 2008; Sipahioğlu et al., 2023).

6 Limitation and future directions

There are still some shortcomings in this study, such as a somewhat singular research method that only uses questionnaire survey methods. Students' academic burnout, psychological capital, and perception of the school atmosphere are relatively complex, making it difficult to rely solely on questionnaire surveys to obtain the true status. Moreover, the questionnaire survey method has certain limitations, and the research objects are not likely to express their true views. Academic burnout is an important influencing factor that affects middle school students' dropout (Alarcon et al., 2011). In the future, it is necessary to conduct in-depth research on academic burnout, explore its influencing factors, and propose corresponding solutions to help students avoid the troubles of academic burnout. Firstly, future research can be conducted using multiple methods, including quantitative and qualitative research, to ensure more scientific and objective research results. Secondly,

corresponding intervention research can be continued based on the results of this study, such as offering relevant courses to guide junior high school students to correctly view and cope with difficulties, improving frustration tolerance, and enhancing psychological capital levels, in order to reduce the probability of academic burnout. Thirdly, there are many factors that affect academic burnout. Future research should consider the impact of family, school, and society on academic burnout among junior high school students, in order to create a relaxed and pleasant environment for junior high school students and more effectively intervene in the issue of academic burnout (Alarcon et al., 2011).

7 Conclusion

This study constructed a relationship model among school atmosphere, psychological capital, and academic burnout based on existing research results. School atmosphere has a negative predictive effect on academic burnout, and the level of psychological capital is negatively correlated with academic burnout. Psychological capital is a mediating variable and plays a mediating role between school atmosphere and academic burnout. This study successfully validated the research hypothesis through a large number of samples, enriched the empirical research on the influencing factors of academic burnout, and provided some practical and feasible methods and guidance suggestions for improving the psychological positivity level of junior high school students, enhancing their good perception of the school atmosphere, and reducing the problem of academic burnout. At the school level, students mainly engage in various learning activities in school, which can have a subtle impact on them. This study provides a basis for how to build a good school atmosphere in the future. At the teachers level, this study can help teachers gain a deeper and systematic understanding of the overall state of junior high school students, provide targeted mental health counseling, reduce the occurrence of negative emotional perception and academic burnout, and make students fall in love with learning. At the individual level of students, it is possible to correct their self-awareness, correct their learning attitude, correctly recognize their learning status, establish correct learning and attitude views, and determine their learning goals.

Data availability statement

The original contributions presented in this study are included in this article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

XT: Conceptualization, Formal analysis, Funding acquisition, Methodology, Project administration, Supervision. Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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