

Article

Academic Burden and Adolescent Mental Health Under China's "Double Reduction" Policy: The Composite Associative Pathways of Perceived Stress and Self-Efficacy

Jingcheng Sun, Bairen Ding * and Yu Yang

School of Public Administration, Hohai University, Nanjing 211100, China; hhusjc@hhu.edu.cn (J.S.); yangyu1087@163.com (Y.Y.)

* Correspondence: brding1989@hhu.edu.cn

Abstract

Background and aims: Adolescent mental health is a core component of Goal 3 “Good Health and Well-being” in the SDGs. This study explores the relationship between academic burden and adolescent mental health under China’s “Double Reduction” policy, as well as the roles of perceived stress and self-efficacy in this relationship. **Method:** Using the purposive sampling method, 842 samples of junior high school students in Nantong City, Jiangsu Province, China, were effectively collected. Statistical analyses included a common method bias test, correlation analysis, multiple linear regression and the Bootstrap method. **Results:** Studies have shown that under the “Double Reduction” policy, there are pairwise correlations between academic burden, perceived stress, self-efficacy and adolescent mental health. After controlling for sociodemographic characteristic covariates, academic burden remained significantly negatively correlated with adolescent mental health ($\beta = -0.277$, $p < 0.001$), and the negative correlation degree between in-school academic burden and mental health ($\beta = -0.295$, $p < 0.001$) was greater than that of out-of-school academic burden ($\beta = -0.070$, $p < 0.05$). Furthermore, perceived stress and self-efficacy exhibited a composite correlational linkage pattern within this relationship—simultaneously encompassing both parallel and serial multiple associative pathways. **Conclusion:** Under the “Double Reduction” policy, academic burden and Chinese adolescents’ mental health show a significant negative association, with perceived stress and self-efficacy acting as key bridges.

Keywords: adolescent mental health; academic burden; perceived stress; self-efficacy

1. Introduction

Adolescent mental health stands as a core priority within Goal 3: Good Health and Well-being of the UN Sustainable Development Goals (SDGs) and constitutes a critical component of the Healthy China Initiative. In recent years, with changes in the social environment and educational ecology, adolescent mental health problems in China have intensified, evolving from an individual-level concern into a major public health threat with profound implications for familial happiness, economic stability, and sustainable social development. Data published in the Lancet Regional Health-Western Pacific in 2025 show that the overall prevalence of mental disorders among children and adolescents in China is 8.9%, affecting around 30.8 million people. That translates to roughly one in ten young individuals living with mental health conditions, which has become an invisible barrier to the sustainable development of this generation [1]. A substantial body of relevant studies



Academic Editor: Fernando Moreira

Received: 24 June 2026

Revised: 30 July 2026

Accepted: 3 August 2026

Published: 5 August 2026

Copyright: © 2026 by the authors.

Licensee MDPI, Basel, Switzerland.

This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

also show that the detection rate of mental health problems among Chinese adolescents has remained high over the long term. Prevalent psychological and behavioral problems such as depression, anxiety and self-harm seriously undermine adolescents' physical and mental well-being, impair their academic abilities and social adaptability, and exert adverse effects on both individual growth and sustainable social development [2–6]. Therefore, properly addressing and effectively resolving this problem is of profound significance for promoting the high-quality development of adolescents.

Identifying modifiable risk factors for adolescents' mental health problems is an essential prerequisite for rolling out scientific interventions, which has made the exploration and verification of various relevant influencing factors a key research focus among academics [7]. The existing literature reveals that although relevant influencing factors mainly cover three dimensions, biological, psychological and social–environmental, academic burden, as a core social–environmental variable, exerts a marked negative predictive effect on adolescent mental health, and this conclusion has been supported by cross-cultural empirical evidence [8–10]. For example, a survey of 879 adolescents in Shanghai, China, conducted by Cai et al. indicated that adolescents who reported high academic stress and prioritized academic performance developed more severe mental health problems after the new semester began [11]. Surveys carried out by Eneogu et al. in other countries and regions likewise demonstrated that academic burden elevates the risk of psychological issues such as mental disorders, depression and anxiety, which may exert adverse impacts on students' academic performance [12].

The impact of academic burden on adolescent mental health is not a simple linear transmission but rather operates through complex psychological mechanisms [13]. From the “input” perspective, research has predominantly focused on the subjective cognitive appraisal of stressors, specifically examining how academic burden transforms into an individual's perceived stress. Karki et al. noted that stressors ranging from excessive parental expectations to heavy academic burdens increase adolescents' perceived stress, thereby negatively impacting their academic outcomes, mental health, and general well-being [14]. From the “output” perspective, studies emphasize the depleting effect of stressful contexts on psychological resources, particularly the erosive impact of academic burden on self-efficacy as a core motivational resource. Yang et al. noted that academic stress from parental educational anxiety impairs adolescent self-efficacy, thereby increasing susceptibility to issues like academic burnout. Self-efficacy was identified as a crucial mediator in the relationship between academic stress and mental health, playing a central role in stress transmission [15].

Although prior research has established a negative association between academic burden and adolescent mental health and underscored the distinct correlational roles of perceived stress and self-efficacy, most studies remain confined to static analyses within general educational contexts. Two significant limitations persist. First, extant studies have insufficiently accounted for China's unique educational ecology, particularly the association between academic burden and adolescent mental health under the current “Double Reduction” policy background. Second, systematic investigations that integrate academic burden, perceived stress, self-efficacy, and mental health into a unified framework remain scarce, leaving the “black box” of this complex associative structure unopened. To address these gaps, drawing on cross-sectional survey data from 842 valid junior high school student samples in Nantong City following the implementation of China's “Double Reduction” policy, this study aims to (1) examine the association between academic burden and Chinese adolescent mental health under the “Double Reduction” policy background and (2) construct a serial multiple associative model incorporating perceived stress and self-efficacy based on the cognitive appraisal theory of stress so as to clarify the complex

associative network between academic burden and adolescent mental health. This study not only extends applicability boundaries of the cognitive appraisal theory of stress within China's educational reform context but also provides empirical evidence for optimizing adolescent mental health services under the "Double Reduction" policy.

2. Theoretical Foundation and Research Hypotheses

2.1. Theoretical Foundation

This study introduces the cognitive appraisal theory of stress to illuminate the complex associative pathways between academic burden and adolescent mental health under the "Double Reduction" policy. Developed by Richard Lazarus and Susan Folkman in the 1980s, the cognitive appraisal theory of stress ranks among the most influential theoretical frameworks in research on stress and mental health. It posits that stress is not merely a direct product of external environmental stimuli but rather a dynamic transactional outcome arising from an individual's primary appraisal (assessing threat potential) and secondary appraisal (evaluating coping resources), which subsequently determine mental health outcomes [16,17]. This theoretical lens aligns closely with the focus of the present study. Under the "Double Reduction" policy, academic burden acts as an external stimulus that first associates with adolescents' primary appraisal—namely, perceived stress—and subsequently connects to their secondary appraisal of available coping resources, which is reflected in self-efficacy. These two types of cognitive appraisal together constitute a composite network associated with overall mental health. In summary, the cognitive appraisal theory of stress can not only systematically account for the associative landscape and multidimensional pathways between academic burden and adolescent mental health under the "Double Reduction" policy but also lays a solid theoretical foundation for examining the serial multiple associative roles of perceived stress and self-efficacy.

2.2. Research Hypotheses

2.2.1. Academic Burden and Adolescent Mental Health Under the "Double Reduction" Policy

Academic development constitutes a core developmental task during adolescence, perennially bearing the high expectations of both families and society. Shaped by the Confucian ethos that "all occupations are lowly, only scholarly pursuit is noble," coupled with the prevailing societal aspiration for children to "become dragons or phoenixes" (i.e., achieve extraordinary success), Chinese families exhibit an exceptionally intense focus on their children's education. While this cultural habitus serves to motivate achievement, it simultaneously exposes adolescents to chronic, high-intensity academic loads, thereby sowing the seeds of potential maladaptation. Peng et al. note that parental educational involvement presents a dual-edged sword for adolescent development: while beneficial, it concurrently imposes burdens, as escalating academic expectations significantly exacerbate perceived stress [18]. Since entering the 21st century, coinciding with China's strategic shift from a demographic dividend to a talent dividend, educational competition has intensified dramatically. Consequently, the issue of academic burden has grown increasingly severe, expanding beyond the scope of traditional coursework to evolve into a complex, composite burden system encompassing both in-school instruction and out-of-school tutoring. Extensive empirical studies indicate that fierce competition for educational advancement has made shadow education particularly prevalent in China. Chinese parents invest substantial financial capital in these supplementary educational services, aiming to enhance their children's academic performance and thereby increase their likelihood of gaining admission to elite secondary schools and prestigious universities [19].

Excessive academic burden among adolescents has long drawn widespread public scrutiny. In 2021, China introduced the most forceful “burden-reduction directive” in its history—Opinions on Further Reducing the Burden of Homework on Compulsory Education Students and the Burden of Out-of-School Training (commonly referred to as the “Double Reduction” policy)—signaling a new phase of comprehensive deepening in basic education reform. The policy aims to substantially ease students’ academic load, with clear targets mandating that “the excessive academic burden on students shall be effectively alleviated within one year, remarkable results shall be achieved within three years, and public satisfaction with education shall be significantly improved.” Empirical studies indicate that the “Double Reduction” policy has yielded notable outcomes in regulating the off-campus tutoring market, curbing household educational expenditures, and reinforcing the central role of schools in education. However, owing to the confluence of multiple factors, including the yet-to-be fundamentally transformed educational evaluation system, the sustained transmission of parental educational anxiety, the persistent recurrence of covert private tutoring despite repeated prohibitions, and the autonomous intensification of academic demands within families, adolescents’ academic burden has not been effectively alleviated. The hidden burden, in particular, remains pronounced under the high-pressure competitive atmosphere [20–22].

Although the “Double Reduction” policy has been fully implemented across China, excessive academic burden remains a major source of stress for poor psychological adaptation among adolescents [21]. According to Lazarus and Folkman’s cognitive appraisal theory of stress, academic burden—as a core stressor that is both pervasive and cumulatively intensifying among the adolescent population—is closely associated with a range of adverse outcomes in individuals’ learning, daily life, and social adaptation. It closely correlates with lowered subjective well-being, reduced self-worth, life dissatisfaction, emotional regulation difficulties, and depleted physical and psychological resources while also demonstrating strong associative ties to mental health issues including anxiety, depression, and psychological burnout [16]. Accordingly, the present study proposes the following:

Hypothesis 1. *Academic burden and adolescent mental health are negatively associated under China’s “Double Reduction” policy.*

2.2.2. Perceived Stress Serves as an Independent Bridge in the Negative Association Between Academic Burden and Adolescent Mental Health Under the “Double Reduction” Policy

Under the “Double Reduction” policy, adolescent mental health is not simply and directly associated with academic burden as an external stressor; rather, the underlying associative pathways are rooted in the individual’s cognitive appraisal system. As emphasized by Lazarus and Folkman’s cognitive appraisal theory of stress, the psychological stress associated with academic burden is not a direct product of environmental stimuli but rather a continuous cognitive processing chain that begins with primary appraisal and then extends to secondary appraisal [16].

Primary appraisal constitutes a precursor cognitive process that marks the onset of an individual’s stress response. It centers on evaluating the threat magnitude and potential implications of external stressors for the self, with perceived stress emerging as its concomitant. Perceived stress refers to the subjective appraisal of external stressful events and is typically manifested through tension, discomfort, and a sense of lost control [23]. Under the “Double Reduction” policy, although adolescents’ academic burden has been objectively curtailed in terms of time allocation, it persists as the most salient external stressor for this demographic, fitting squarely within the category of environmental stressors in the cognitive appraisal theory of stress. Following the operational logic of primary appraisal, adolescents perform an initial cognitive evaluation upon encountering academic

burden: when the burden is construed as a negative event characterized by severe threat, loss, or uncontrollability, higher perceived stress levels co-occur. Individuals with high perceived stress exhibit lowered thresholds for stress perception and heightened sensitivity to external stressors, placing them at increased risk for recurrent negative emotions such as tension, anxiety, and depression. This sustained psychological depletion progressively erodes individual psychological resilience, correlating with a decline in overall mental health. Existing studies have also verified that adolescents generally suffer from high levels of perceived stress following the implementation of the “Double Reduction” policy. Furthermore, perceived stress functions as the most direct proximal factor associated with psychological problems such as depression, and it shows a significant negative association with mental health [24–26]. In summary, perceived stress constitutes a pivotal associative pathway connecting academic burden to adolescent mental health. Accordingly, we propose the following:

Hypothesis 2. *Perceived stress independently constitutes an associative pathway within the negative association between academic burden and adolescent mental health under China’s “Double Reduction” policy.*

2.2.3. Self-Efficacy Serves as a Dual Bridge in the Negative Association Between Academic Burden and Adolescent Mental Health Under the “Double Reduction” Policy

Secondary appraisal follows primary appraisal as another core cognitive component of the individual stress-response process. Distinct from primary appraisal, which discerns the “threat magnitude of external stressors,” secondary appraisal centers on weighing one’s available coping resources, and its direct cognitive outcome is self-efficacy [27]. The concept of self-efficacy was proposed by the American scholar Bandura, referring to individuals’ judgments, beliefs, or sense of personal mastery and perception regarding their capacity to complete a given activity. It is not only associated with individuals’ choice of behaviors but also correlates with their patterns of thinking and emotional response. Specifically, individuals with high self-efficacy firmly believe in their capacity to overcome difficulties when facing stress. They tend to concentrate on task completion and problem-solving, which is associated with buffering against the negative impacts of stress and sustaining positive psychological states. In contrast, individuals with low self-efficacy tend to focus on potential failure risks and adverse consequences and concurrently present with negative psychological outcomes such as anxiety, fear and depression [28].

Since the implementation of the “Double Reduction” policy, academic burden remains a primary environmental stressor among adolescents. Based on the two-stage cognitive appraisal logic, academic burden manifests its associations not only through perceived stress generated by primary appraisal but also connects to multi-layered associative pathways via subsequent secondary appraisal [16]. Consequently, correspondingly, self-efficacy serves as both an independent associative role and a chain associative role in the negative association between academic burden and adolescent mental health. On the one hand, academic burden is directly associated with the secondary appraisal stage and shows an association with adolescent mental health. Academic burden exposes adolescents to excessive cognitive load, which hinders their academic performance and intensifies feelings of frustration. This process is consistently associated with decreased positive perceptions of personal competence and lowered self-efficacy and finally co-occurs with mental health problems [29]. On the other hand, academic burden and primary appraisal together show a synergistic reinforcing link. Excessive cognitive load accumulates alongside perceived stress from primary appraisal, further linking to lowered self-efficacy and significantly amplifying the negative spillover of stress [30]. This represents a serial associative pathway: “academic

burden (cognitive overload) → heightened perceived stress → diminished self-efficacy → impaired mental health". Accordingly, the following two hypotheses are proposed:

Hypothesis 3. *Self-efficacy independently constitutes an associative pathway within the negative association between academic burden and adolescent mental health under China's "Double Reduction" policy.*

Hypothesis 4. *Perceived stress and self-efficacy serially constitute associative pathways within the negative association between academic burden and adolescent mental health under China's "Double Reduction" policy.*

3. Method

3.1. Participants and Procedures

This study employed purposive sampling to conduct a questionnaire survey among junior secondary school students in China. To accurately reflect the actual situation under China's "Double Reduction" policy, the sample selection followed a stratified, top-down logic, progressing from macro-level regions to micro-level individuals to identify respondents at each tier. The sampling procedure was as follows: First, city selection—Nantong City, Jiangsu Province, was selected from the list of China's first nine national pilot cities for the "Double Reduction" policy designated by the Chinese government. As a front-runner in China's comprehensive basic education reform, Nantong exhibits strong typicality and exemplarity regarding policy implementation intensity and feedback mechanisms. Second, district selection—Haimen District within Nantong City was chosen as the research site. With a relatively balanced distribution of basic education resources, this district can well reflect the overall practical landscape of advancing the "Double Reduction" policy at the district-level compulsory education stage. Third, school selection—Drawing on the official directory provided by the Haimen District Education Bureau and considering factors such as school quality and the status of policy implementation, three junior secondary schools were selected. Finally, class and student selection—Following thorough communication and formal approval from school administrators and homeroom teachers, six classes (with 45–50 students per class) were selected from each school, and all students within these classes were enrolled as participants (see Table 1).

After identifying participants in Nantong, one of the pilot cities for the "Double Reduction" policy, questionnaire surveys were conducted between 1 April and 30 June 2022. During the survey, an Informed Consent Form for Survey on Students' Study and Living Conditions in Nantong City, Jiangsu Province, China, Under the "Double Reduction" Policy was distributed to students and parents in the target classes, which clearly stated the research objectives, data confidentiality rules and the principle of voluntary participation. Upon obtaining informed consent from participants, homeroom teachers were entrusted with disseminating the Wenjuanxing (Questionnaire Star) survey link via established home-school communication platforms (e.g., QQ groups, WeChat groups), allowing respondents to complete the questionnaire at their convenience. A total of 852 questionnaires were distributed. After rigorous screening to exclude incomplete responses, straightlining responses and other invalid submissions, 842 valid questionnaires were retained, yielding an effective response rate of 98.83%. Among the surveyed students, 382 were in Grade 7 (45.37%), 385 in Grade 8 (45.72%), and 75 in Grade 9 (8.91%); 390 were male (46.32%) and 452 were female (53.68%). The age range was 12–15 years old. In total, 373 were only children (44.30%) and 469 were non-only children (55.70%); 744 were urban students (88.36%) and 98 were rural students (11.64%); and 758 were local students (90.02%) and 84 were non-local students (9.98%).

Furthermore, it should be noted that two limitations warrant particular attention. First, this study employed purposive sampling, with the survey site restricted to urban junior high schools in Haimen District, Nantong—a “Double Reduction” pilot city. Consequently, the majority of participants (88.36%) were urban students, and ninth-grade students were underrepresented (accounting for only 8.91% of the total sample). These constraints in sampling method and sample distribution may somewhat limit the generalizability of the findings. Second, the questionnaire survey was conducted in the first half of 2022. Although the COVID-19 pandemic was effectively contained in Haimen District at the time, with partial restoration of social order and a gradual return to normalcy in primary and secondary education, this special contextual background may still have affected the robustness and precision of the results to some extent.

Table 1. Sampling process and sample selection.

Data Collection Phase	Detailed Content Introduction
Sampling Procedure	Purposive Sampling: A multistage stratified approach was adopted, with participants progressively selected across four tiers: city, district, school, and class/student.
Step 1: City Selection	Nantong City was purposively selected from the roster of nine national pilot cities for the “Double Reduction” policy.
Step 2: District Selection	Haimen District, characterized by balanced educational resources and initial policy success, was chosen as the research site within Nantong.
Step 3: School Selection	Three junior high schools in Haimen District were selected based on schools’ operation levels, implementation of the “Double Reduction” policy, and institutional permission for research.
Step 4: Class and Student selection	Six classes from each junior high school were selected after consulting school administrators and homeroom teachers, with all students in these selected classes included in the survey.
Sample Composition	Valid responses: 842/852 (98.83%).
Inclusion Criteria	Students were officially registered in the selected classes; students possessed the cognitive capacity to complete the questionnaire independently; active informed consent must be provided by both students and their parents/guardians.
Exclusion Criteria	Incompleteness (e.g., withdrawal during the survey); response errors; patterned responses; ineligible status (e.g., lack of official student registration).

3.2. Measures

3.2.1. Academic Burden

Academic burden was measured using the Academic Burden Questionnaire originally developed by Zhang et al. [31] and revised by Fu et al. [32]. The instrument comprises two dimensions, in-school academic burden and out-of-school academic burden, with a total of 8 items. The dimension of in-school burden includes 5 items such as “After the implementation of the Double Reduction Policy, how well do you adapt to the following school courses?”, “How well do you adapt to the after-school services provided by the school?”, and “What do you think of the homework assigned by teachers?”. The dimension of out-of-school burden comprises 3 items including “After the implementation of the Double Reduction Policy, what subjects of extracurricular tutoring do you participate in?”. The EFA results indicated that the KMO value for the academic burden scale was 0.79, and Bartlett’s test of sphericity was significant ($p < 0.05$), indicating that the data were suitable for factor analysis. Further analysis revealed that all items loaded above 0.55 on their respective factors, with no cross-loadings exceeding 0.30. The cumulative variance explained was 61.00%. These results suggest that the scale demonstrates adequate structural validity.

Items are scored on a 2-point scale, where 0 indicates “adapted” and 1 indicates “not adapted”, with higher scores reflecting greater academic burden. In the present study, Cronbach’s coefficient for the whole questionnaire was 0.71. Cronbach’s α coefficient for the in-school academic burden dimension was 0.84; Cronbach’s α coefficient for the out-of-school academic burden dimension was 0.60. Therefore, all scales except the out-of-school academic burden subscale surpassed the 0.70 cutoff, showing acceptable internal consistency. Despite certain limitations, referencing standard disciplinary criteria, the off-campus academic burden subscale’s α fell within 0.60–0.70, a marginally acceptable range. Item diagnostics also revealed CITC values of 0.33–0.50 for all three items, all above the 0.30 cutoff, indicating good item–dimension homogeneity. Moreover, deleting any item did not raise α noticeably (range: 0.38–0.62), confirming no items needed removal. This is probably the result of multiple converging factors—few items on the subscale, uneven sampling, and potential comprehension biases under the “Double Reduction” policy.

3.2.2. Perceived Stress

Perceived stress was measured using the Perceived Stress Scale (PSS-4) developed by Cohen et al. [33]. It contains four items such as “Since the implementation of the ‘Double Reduction’ policy, I have felt overwhelmed by my studies” and “I have felt better adapted to school life”. The EFA results indicated that the KMO value for the Perceived Stress Scale was 0.73, and Bartlett’s test of sphericity was significant ($p < 0.05$), indicating that the data were suitable for factor analysis. Further analysis revealed that most items loaded above 0.80 and the cumulative variance explained was 58.00%. These results suggest that the scale demonstrates adequate structural validity.

Items are scored on a 5-point scale, where 1 indicates “strongly disagree” and 5 indicates “strongly agree”, with higher scores reflecting greater perceived stress. Several items of the scale were slightly revised, for instance, the item “Since the implementation of the Double Reduction Policy, I have felt overwhelmed by my studies”, to better assess adolescents’ perceptions of academic stress under the background of the Double Reduction policy. In the present study, Cronbach’s α coefficient of the scale is 0.72, which exceeds the acceptable threshold of 0.70, indicating good internal consistency.

3.2.3. Self-Efficacy

Given that the full version of the Self-Efficacy Scale contains a large number of items, the simplified version was adopted to reduce respondents’ answering burden and improve questionnaire data quality. In addition, the simplified Self-Efficacy Scale has been widely used among Chinese adolescents. Therefore, this study employed the simplified Self-Efficacy Scale originally developed by Moliterni et al. [34] and revised by Lu et al. [35] for measurement. It comprises two dimensions, academic ability self-efficacy and academic behavioral self-efficacy, with a total of six items. The academic ability self-efficacy dimension consists of three items such as “I can learn new knowledge quickly”, while the academic behavioral self-efficacy dimension includes three items such as “Even if I feel slightly unwell, I will still try my best to go to school”. The EFA results indicated that the KMO value for the Self-Efficacy Scale was 0.83, and Bartlett’s test of sphericity was significant ($p < 0.05$), indicating that the data were suitable for factor analysis. Further analysis revealed that all items loaded above 0.70 and the cumulative variance explained was 63.00%. These results suggest that the scale demonstrates adequate structural validity.

Items are scored on a 5-point scale, where 1 indicates “strongly disagree” and 5 indicates “strongly agree”, with higher scores reflecting stronger self-efficacy. In the present study, Cronbach’s α coefficient of the scale was 0.88, which exceeds the acceptable threshold of 0.70, indicating good internal consistency.

3.2.4. Adolescent Mental Health

Consistent with the measurement strategy adopted for self-efficacy, considering that the simplified CES-D is highly correlated with its full version and exhibits good applicability among Chinese adolescents, and to reduce respondents' response burden, the simplified Center for Epidemiologic Studies Depression Scale (CES-D), developed by Radloff [36] and revised by Xi Wei and Ma Liping [37], was used for measurement. The scale covers positive and negative affective domains and contains five items, including "After the implementation of the Double Reduction Policy, does the following statement match your mood?—Anxiety (e.g., worrying about worse academic performance)." The EFA results indicated that the KMO value for Self-Efficacy Scale was 0.73, and Bartlett's test of sphericity was significant ($p < 0.05$), indicating that the data were suitable for factor analysis. Further analysis revealed that most items loaded above 0.81 and the cumulative variance explained was 56.00%. These results suggest that the scale demonstrates adequate structural validity.

Items are scored on a 5-point scale, where 1 indicates "does not apply at all" and 5 indicates "applies very well". Following reverse scoring of certain items, scores were summed, with higher total scores indicating better adolescent mental health. In the present study, Cronbach's α coefficient of the scale was 0.77, which exceeds the acceptable threshold of 0.70, indicating good internal consistency.

3.3. Control Variables

The sociodemographic characteristics of adolescents were treated as control variables, including gender (0 = female, 1 = male), grade (1 = Grade 7, 2 = Grade 8, 3 = Grade 9), only-child status (0 = non-only child, 1 = only child), household registration type (0 = rural student, 1 = urban student), household registration location (0 = local student, 1 = non-local student), and perceived evaluation of the "Double Reduction" policy (1 = very poor, 2 = fairly poor, 3 = neutral, 4 = fairly good, 5 = very good).

3.4. Data Analysis

Data analysis proceeded in two stages. First, SPSS 26.0 was employed for data management and statistical analysis, encompassing common method bias testing, descriptive statistics, correlation analysis, and multiple linear regression analysis. Second, the SPSS Process 3.5 plug-in developed by Andrew F. Hayes was utilized to construct the associative model (i.e., Model 6) [38], and the Bootstrap method was further utilized to test the serial multiple associative pathways of perceived stress and self-efficacy [39]. Specifically, the Bootstrap method refers to a resampling technique based on the original sample. This method takes the observed sample as a proxy for the population and conducts sampling with replacement from the sample to generate a new sample of size n . The process is repeated k times to yield k resamples. An estimate of the indirect association is computed for each resample, generating k estimates that form an empirical sampling distribution. Typically, a minimum of 1000 resamples ($k = 1000$) is required, while 5000 resamples are recommended. To address potential bias in the confidence interval (CI) estimation, bias-corrected and accelerated (BCa) 95% CIs were computed. Indirect associations were considered statistically significant if the 95% CI did not include zero [39].

4. Results

4.1. Common Method Bias Testing

Given that the data in this study were primarily collected via self-report measures at a single time point, the potential for common method bias (CMB) poses a significant concern. To mitigate this risk, procedural and statistical remedies were implemented. Therefore, during the data collection phase, we adhered to established psychometric proto-

cols by emphasizing anonymity, ensuring confidentiality, and incorporating reverse-coded items—procedures consistent with prior research [40]. After data collection, Harman’s single-factor test was employed to assess common method bias. An unrotated exploratory factor analysis was conducted on all variables in the present study, revealing four factors with eigenvalues greater than 1. Crucially, the first factor accounted for 29.114% of the cumulative variance explained, which falls considerably below the critical threshold of 40% [41]. These results indicate that CMB is unlikely to be a serious issue in this study, thus supporting the robustness of the proposed model.

4.2. Descriptive Statistics and Correlation Analysis

As shown in Table 2, there were significant pairwise correlations among all major variables ($p < 0.05$). Specifically, academic burden (including in-school academic burden and out-of-school academic burden) was significantly negatively correlated with self-efficacy and adolescent mental health and significantly positively correlated with perceived stress. Perceived stress was significantly negatively correlated with both self-efficacy and adolescent mental health, while self-efficacy was significantly positively correlated with adolescent mental health.

Table 2. Descriptive statistics and correlation analysis of major variables.

Variable	1	2	3	4	5	6
1 Adolescent mental health	1					
2 Academic burden	−0.475 ***	1				
3 In-school academic burden	−0.505 ***	0.893 ***	1			
4 Out-of-school academic burden	−0.068 *	0.475 ***	0.029	1		
5 Perceived stress	−0.737 ***	0.470 ***	0.545 ***	−0.022	1	
6 Self-efficacy	0.471 ***	−0.446 ***	−0.524 ***	0.034	−0.524 ***	1
<i>M</i>	18.394	2.529	1.830	0.698	9.791	23.982
<i>SD</i>	3.838	2.097	1.846	0.944	3.009	4.237

Note: * $p < 0.05$, *** $p < 0.001$.

4.3. Testing of Composite Multiple Associative Pathways

After establishing the basic associations among major variables, this study employed multiple linear regression and the Bootstrap method to further examine the association between academic burden and adolescent mental health under the “Double Reduction” policy, as well as the bridging role played by the dual cognitive appraisal process—indexed by perceived stress and self-efficacy—within these associations. The analytical procedure consists of three interrelated progressive steps. The first stage tests the direct association between academic burden and adolescent mental health. A multiple linear regression model was constructed with adolescent mental health as the dependent variable, academic burden (including in-school academic burden and out-of-school academic burden) as the independent variable, and sociodemographic characteristics such as gender, grade, and only-child status as control variables in order to examine the relationship between academic burden and its sub-dimensions with adolescent mental health. As shown in Table 3, the standardized regression coefficient of academic burden was -0.277 ($p < 0.001$), suggesting that academic burden was significantly negatively associated with adolescent mental health. Moreover, the negative association of in-school academic burden (standardized regression coefficient $\beta = -0.295$, $p < 0.001$) was markedly stronger than that of out-of-school academic burden (standardized regression coefficient $\beta = -0.070$, $p < 0.05$). Hypothesis 1 was therefore supported.

Table 3. Multiple linear regression of academic burden on adolescent mental health.

Variable Type	Adolescent Mental Health		Adolescent Mental Health		Adolescent Mental Health	
	β	t	β	t	β	t
Sociodemographic characteristics						
Gender	0.044	1.600	0.048	1.748 *	0.036	1.236
Grade	−0.015	−0.533	−0.002	−0.011	−0.024	−0.847
Only-child status	0.003	0.101	0.001	0.052	0.011	0.388
Household registration type	0.004	0.136	−0.002	−0.087	0.022	0.741
Household registration location	−0.072	−2.576 **	−0.074	−2.656 **	−0.095	−3.282 ***
Perceived evaluation of the “Double Reduction” policy	0.423	13.680 ***	0.396	12.266 ***	0.550	19.163 ***
Independent variable						
Academic burden	−0.277	−8.909 ***	—	—	—	—
In-school academic burden	—	—	−0.295	−9.082 ***	—	—
Out-of-school academic burden	—	—	—	—	−0.070	−2.432 *
R^2	0.373		0.375		0.318	
F	70.941 ***		71.591 ***		55.655 ***	

Note: The β values in parentheses in Table 3 are standardized regression coefficients; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The second step preliminarily explores the internal pathways underlying the negative association between academic burden and adolescent mental health. Using Model 6 of the SPSS PROCESS 3.5 plug, this study examined the bridging role played by perceived stress and self-efficacy. As shown in Table 4, academic burden was positively associated with perceived stress (standardized regression coefficient $\beta = 0.212$, $p < 0.001$), negatively associated with self-efficacy (standardized regression coefficient $\beta = -0.241$, $p < 0.001$), and negatively linked to adolescent mental health (standardized regression coefficient $\beta = -0.130$, $p < 0.001$). Perceived stress was negatively associated with self-efficacy (standardized regression coefficient $\beta = -0.383$, $p < 0.001$) and negatively linked to adolescent mental health (standardized regression coefficient $\beta = -0.579$, $p < 0.001$). Self-efficacy is positively linked to adolescent mental health (standardized regression coefficient $\beta = 0.075$, $p < 0.01$). Accordingly, following the analytical steps for complex multiple associative pathways [42], perceived stress and self-efficacy form an integrated complex associative structure combining parallel and sequential associative pathways between academic burden and adolescent mental health. Meanwhile, based on the above estimation outputs, Figure 1 visually displays this composite associative structure along with its standardized path coefficients. Hypotheses 2, 3, and 4 were therefore supported.

Table 4. Analysis of the associative roles of perceived stress and self-efficacy.

Variable Type	Perceived Stress		Self-Efficacy		Adolescent Mental Health	
	β	t	β	t	β	t
Independent Variable						
Academic burden	0.212	7.405 ***	−0.241	−7.289 ***	−0.130	−4.751 ***
Perceived stress			−0.383	−9.885 ***	−0.579	−17.665 ***
Self-efficacy					0.075	2.710 **
Sociodemographic characteristics	Controlled		Controlled		Controlled	
R^2	0.468		0.334		0.574	
F	104.740 ***		52.129 ***		124.450 ***	

Note: The β values in parentheses in Table 4 are standardized regression coefficients; ** $p < 0.01$, *** $p < 0.001$.

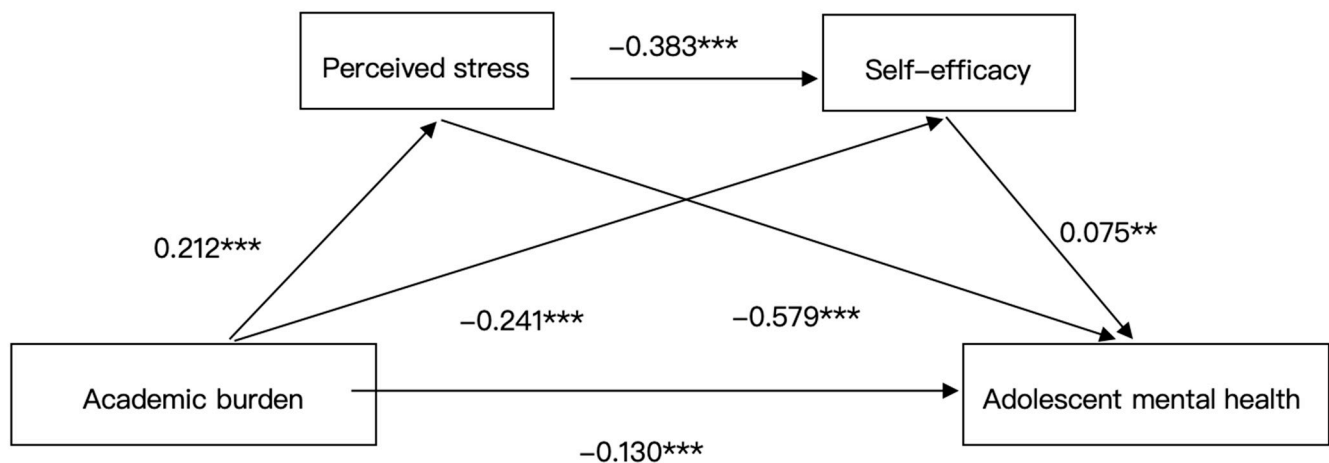


Figure 1. The composite multiple associative model of perceived stress and self-efficacy. Note: ** $p < 0.01$, *** $p < 0.001$.

Step 3 involved further characterizing the associative pathways linking academic burden and adolescent mental health. A bias-corrected non-parametric percentile Bootstrap approach (with 5000 Bootstrap samples) served to investigate the composite multiple associative architecture [39]. As shown in Table 5, the 95% confidence intervals for all pathways excluded zero, indicating that perceived stress and self-efficacy constitute a significant composite associative architecture within this network. The aggregated standardized pathway coefficient for this structure was -0.147 , accounting for 53.07% of the total strength of the association between academic burden and mental health. This structure comprises three distinct linkages: (1) the pathway from academic burden to adolescent mental health via perceived stress (Indirect Pathway 1), contributing 44.40%; (2) the pathway from academic burden to adolescent mental health via self-efficacy (Indirect Pathway 2), contributing 6.50%; and (3) the serial pathway from academic burden to adolescent mental health via perceived stress and subsequently self-efficacy (Indirect Pathway 3), contributing 2.17%.

Table 5. Bootstrap results of total association, direct association, and indirect association.

Type	β	SE	95% CI
Total pathway	-0.277	0.057	$[-0.389, -0.165]$
Direct pathway	-0.130	0.050	$[-0.228, -0.032]$
Indirect pathway	-0.147	0.022	$[-0.190, -0.105]$
Indirect pathway 1: Academic burden $\rightarrow$ Perceived stress $\rightarrow$ Adolescent mental health	-0.123	0.020	$[-0.161, -0.085]$
Indirect pathway 2: Academic burden $\rightarrow$ Self-efficacy $\rightarrow$ Adolescent mental health	-0.018	0.008	$[-0.036, -0.004]$
Indirect pathway 3: Academic burden $\rightarrow$ Perceived stress $\rightarrow$ Self-efficacy $\rightarrow$ Adolescent mental health	-0.006	0.003	$[-0.012, -0.001]$

Note: The β values in parentheses in Table 5 are standardized regression coefficients; 95% CI = $\beta \pm 1.96 \times SE_{\beta}$.

5. Discussion

Mental health constitutes a core dimension of adolescent well-being. It is pivotal not only to the accumulation of individual human capital but also to the sustainable development of the economy and society, as well as to overall human welfare. For adolescents in the critical stage of socialization, educational quality—especially the level of academic burden—acts as a key environmental correlate of their mental health status. This issue has attracted extensive global attention and is explicitly incorporated into the United Nations Sustainable Development Goals (SDGs), featuring prominently in the core agendas of

SDG 3 (Good Health and Well-being) and SDG 4 (Quality Education) [43]. Against this macro-backdrop, China's ongoing "Double Reduction" reform serves not merely as a direct response to excessive academic burden but as a strategic initiative aimed at cultivating well-rounded individuals with sound mental and physical health, thereby laying a robust foundation for sustainable social development. Grounded in the cognitive appraisal theory of stress, this study elucidates the association between academic burden and adolescent mental health, clarifying the complex associative pathways involving perceived stress and self-efficacy. The findings provide empirical evidence to enhance adolescent well-being and promote the coordinated sustainable development of educational and social systems.

First, the empirical findings of this study indicate that academic burden is negatively associated with adolescent mental health under China's "Double Reduction" policy. Notably, the magnitude of this association is more pronounced for in-school burden than for out-of-school burden. This finding is congruent with prior evidence obtained from general educational contexts, as well as recent domestic research conducted after the launch of the "Double Reduction" policy. The former, such as the study by Shilpa et al., reports that academic stress is negatively associated with mental health, and the correlations between academic stress and anxiety, depression and distress are highly statistically significant [44]. The latter, represented by Zeng and Zhang, points out that students still face substantial academic burden after the rollout of the "Double Reduction" policy, which is negatively correlated with their physical and mental development [22]. As illustrated by the cognitive appraisal theory of stress, academic burden, the primary objective stressor for adolescents, constitutes an external environmental stimulus. Sustained exposure to this stimulus disrupts individuals' cognitive processing systems, continuously depletes their internal psychological resources, and objectively limits their autonomy of psychological choice, all of which are closely associated with a range of adverse mental states including anxiety, irritability, psychological burnout, fear and depression. Among them, in-school academic burden, which primarily takes the form of prescribed subjects of study, homework, and examinations, is more coercive in nature than out-of-school tutoring regulated by policy, rendering it difficult for students to proactively avoid [29]. As existing research has noted, the average homework duration among Chinese adolescents already exceeds the upper limit of written assignments stipulated by the Ministry of Education, and prolonged exposure to such overloaded stress conditions is significantly and positively correlated with adolescents' physical and psychological exhaustion [45], both of which are in turn negatively associated with mental health. Accordingly, sustained attention to adolescents' academic burden and mitigation of excessive academic pressure amid educational reform are highly practically necessary. From a macro perspective of sustainable development, excessive academic burden not only impedes adolescents' long-term personal growth but also creates latent risks to stable economic operation and sustainable social development through channels such as reducing the productivity of the future workforce and raising public health expenditure.

Second, the empirical results of this study indicate that, under the context of the "Double Reduction" policy, perceived stress is negatively correlated with adolescent mental health and serves as a crucial connecting role between academic burden and mental health, forming the core relational pathway of "academic burden → perceived stress → adolescent mental health". Notably, this pathway accounts for 44.40% of the total variance observed in this study, representing the most substantial explanatory component among the multiple associations examined. These observations align with the primary appraisal logic of the cognitive appraisal theory of stress and resonate with the existing literature, which identifies subjective stress perception as a critical point of connection between objective environmental stressors and mental health status [7]. From the primary

appraisal reasoning embedded within the cognitive appraisal theory of stress, adolescents' subjective perceptions of academic burden, rather than objective academic stimuli, serve as the core factor linked to their mental health conditions. When academic burden is perceived as a threatening or demanding event, individuals tend to experience intense feelings of loss of control, alongside manifestations of suboptimal psychological adjustment [16]. From the existing literature, the correlational pattern of perceived stress acting as an earlier associative connector demonstrates remarkable consistency across diverse cultural contexts and age cohorts [13]. For example, Neveu et al. recorded that academic burden aligns with higher probabilities of elevated perceived stress, which correlates with reduced positive psychological functioning and lower life satisfaction among student samples [46]. Consequently, within the objective educational milieu shaped by academic load, perceived stress emerges as a central internal correlate of the inverse association between academic burden and adolescent mental health. It shows a strong correlation with the trajectory of adolescents' character development, cultivation of comprehensive competencies, and long-term physical–mental cultivation.

Finally, the empirical findings of this study reveal the structural position of self-efficacy within the negative correlation between academic burden and adolescent mental health. Self-efficacy not only serves as an independent associative pathway but also forms a sequential associative pathway together with perceived stress (the product of primary appraisal). This pattern aligns with the core arguments of the cognitive appraisal theory of stress and furnishes empirical evidence for interpreting sustainable educational advancement and adolescents' long-term well-being [17]. Regarding the independent associative pathway (academic burden → self-efficacy → adolescent mental health), its core logic closely aligns with the secondary appraisal process described by the cognitive appraisal theory of stress. As a subjective evaluative indicator reflecting individuals' assessments of their coping capabilities and accessible resources, self-efficacy is strongly associated with academic burden. Excessively heavy academic workloads tend to be associated with adolescents' lower self-efficacy and poorer mental health [47]. From the perspective of sustainable educational development, self-efficacy serves as a vital intrinsic protective resource for individuals navigating stress, maintaining a stable correlation with adolescent physical and mental health, and standing as one of the pivotal indicators for gauging the psychological resilience and developmental potential of future social participants. Regarding the sequential associative pathway (academic burden → perceived stress → self-efficacy → adolescent mental health), its core logic fully encapsulates the dual appraisal processes central to the cognitive appraisal theory of stress. According to this theoretical framework, intense perceived stress and perceptions of environmental lack of control formed during primary appraisal bear a restrictive correlational link to cognitive judgments made in secondary appraisal [48]. This corresponds to lower self-efficacy, which in turn is associated with poorer adolescent mental health. This observation resonates with prior scholarly work confirming that self-efficacy acts as a critical correlational bridge between individuals' subjective perceptions of environmental stress and their emotional experiences [49], carrying potential correlational relevance to adolescent and societal sustainable development.

6. Conclusions

Adolescent mental health constitutes a vital subject closely tied to individual and family well-being, with far-reaching correlational links to sustainable social development. As a core environmental stressor correlated with mental health risks among this population, academic burden has attracted extensive attention from academic researchers and policy-makers. Unlike prior empirical studies mostly conducted under conventional educational contexts, this research is situated against the backdrop of China's "Double Reduction"

policy and examines the correlational patterns between academic burden and adolescent mental health. Grounded in the cognitive appraisal theory of stress, this study delineates complex statistically modeled pathways of perceived stress and self-efficacy within this correlational framework. Three core observations are drawn from the analysis: First, under the “Double Reduction” policy, significant pairwise correlations exist across the four variables of academic burden, perceived stress, self-efficacy and adolescent mental health, jointly forming an interconnected correlational network of mental health risks. Second, after controlling for sociodemographic covariates, academic burden still maintains a prominent negative correlation with adolescent mental health. The magnitude of correlation between in-school academic burden and mental health surpasses that of out-of-school academic burden. This pattern aligns with the fundamental premises of the cognitive appraisal theory of stress: as a chronic environmental stressor, both the objective intensity and subjective experience of academic burden hold tight correlational ties to adolescents’ psychological adjustment status. Third, statistical modeling results based on the Bootstrap method reveal that perceived stress and self-efficacy construct compound multiple indirect correlational pathways within the association system linking academic burden and mental health. Specifically, three statistically derived indirect correlational chains are identified in the model: two separate parallel correlational chains, namely “academic burden → perceived stress → adolescent mental health” and “academic burden → self-efficacy → adolescent mental health”, alongside one sequential correlational chain, “academic burden → perceived stress → self-efficacy → adolescent mental health”. These indirect correlational chains collectively account for 53.07% of the total correlational magnitude (44.40% for the perceived stress chain, 6.50% for the self-efficacy chain, and 2.17% for the sequential chain). This finding indicates that these two cognitive appraisal processes act as pivotal correlational bridges connecting academic burden and adolescent mental health.

Compared with the existing literature, this study exhibits distinct advantages in the following aspects: First, this study focuses on a distinctive educational ecological environment and obtains first-hand large-sample data within this context. Closely aligned with China’s macro-level educational policy environment in the new era—the “Double Reduction” policy implemented in 2021—this study conducted systematic questionnaire surveys in Nantong City, Jiangsu Province (a pilot city for the policy), during the critical window following policy implementation, yielding 842 valid questionnaires. This large sample size lays a solid data foundation for exploring the association between academic burden and adolescent mental health within this policy context while also facilitating the timely capture of the current authentic profile of adolescent mental health in China, thereby furnishing a strong practical reference for safeguarding their health and well-being. Second, this study advances multi-layered analysis of the correlational system linking academic burden and adolescent mental health. At the variable operationalization stage, academic burden is subdivided into two dimensions: in-school academic burden and out-of-school academic burden. Guided by the cognitive appraisal theory of stress, perceived stress and self-efficacy are simultaneously incorporated into a unified analytical framework. This research design not only verifies the coexistence and sequential connection of the dual cognitive appraisal processes (primary appraisal → secondary appraisal) within the correlation between academic burden and mental health but also identifies compound multiple indirect correlational pathways formed jointly by the two variables. The findings deepen scholarly understanding of the hierarchical correlational structure: objective academic load → subjective cognitive appraisal → adolescent psychological status. Third, this research prioritizes rigorous statistical modeling and refined decomposition of correlational pathways. A progressive modeling strategy is adopted to analyze correlations between academic burden and adolescent mental health. Multiple regression analysis is first applied

to conduct a preliminary exploration of basic correlational patterns among variables. The Bootstrap method is then employed to construct and validate a compound multiple indirect correlational pathway model. This statistical approach enables simultaneous estimation of contributions from direct correlations and multiple indirect correlational chains within a single model, alongside bias correction for all pathway coefficients. As a result, this study not only confirms the existence of indirect correlations but also precisely quantifies the relative proportion of each correlational chain, furnishing more granular statistical evidence to support theoretical construction.

Drawing on the aforementioned strengths of this research, the observational outcomes of the present study carry substantial theoretical value and practical implications. Theoretically, this study conducts empirical analysis against the backdrop of China's "Double Reduction" policy, broadening the interpretive scope of the cognitive appraisal theory of stress and extending its applicable context from generalized educational environments to specific educational policy contexts. Through statistical modeling of compound multiple indirect correlational pathways, this study quantifies the relative arrangement and explanatory proportion of primary and secondary appraisal processes within the correlational system linking academic burden and mental health. It further enriches academic understanding of the hierarchical correlational structure: objective academic burden–multi-layered subjective cognitive appraisal–adolescent mental health. Practically, the correlational patterns identified in this research deliver empirical evidence for educational policymakers and school practitioners. First, the observed correlations indicate that the long-term implementation of the "Double Reduction" policy should not merely focus on cutting academic load. Greater attention should be paid to adolescents' subjective cognitive appraisal of academic burden, as well as the preservation and cultivation of individuals' intrinsic psychological resources. Second, the model outputs demonstrate that correlational chains corresponding to in-school academic burden and perceived stress account for the largest share of the total correlational magnitude. This pattern clarifies the priority of reducing academic pressure within campuses and establishing regular school-based psychological support systems. In summary, the findings of this study bear far-reaching significance for advancing high-quality education, safeguarding the sound physical and mental development of adolescents, and facilitating the sustainable development of education and society.

Meanwhile, this study has several limitations that can be further addressed in future research: First, this study adopted a purposive sampling design, and the survey samples were only collected from junior high school students from urban schools in Nantong City, a pilot city for China's "Double Reduction" policy. Although the sample can reflect correlational patterns between adolescents' academic burden and mental health in this region following policy implementation to a certain extent, the overall sample coverage and representativeness remain limited. Future studies may adopt more generalizable sampling frameworks such as stratified multistage sampling, expand the geographical scope of surveys and enlarge sample sizes so as to further improve the external representativeness of samples and the generalizability of research conclusions. Second, this paper employed a cross-sectional survey design, which only captures static correlational characteristics of all variables at a single time point. Therefore, it cannot fully present dynamic correlational trends between academic burden and adolescent mental health across the rollout of the "Double Reduction" policy. Subsequent research may introduce longitudinal tracking study designs, combined with econometric analytical tools including difference-in-differences (DID) models and fixed-effects models, to conduct continuous observation and verification of correlational features among variables across time sequences. Third, all observational data in this study were collected via self-reported questionnaires completed by adolescents. Although a common method bias test was conducted to mitigate interference from data

bias, single-source data may still entail common-method variance, which potentially compromises the stability of observational results across all correlational chains. Future research may integrate multi-source and multi-faceted data, incorporating external corroborative information such as teacher ratings, parental feedback and objective academic records. Alternatively, long-term longitudinal tracking designs may be adopted to further verify the robustness of multiple correlational pathways identified in the present study. Last but not least, although this study drew upon established scales for measuring the main variables, the operational implementation remains relatively crude and warrants further refinement. For instance, the out-of-school academic burden subscale contains a relatively small number of items—a limitation linked to both the current landscape of extracurricular educational participation among Chinese parents and students and prevailing interpretations of out-of-school academic burden under China’s “Double Reduction” policy, which may in turn affect the estimation results.

Author Contributions: B.D. designed the study, performed the statistical analysis, and contributed to writing the manuscript. J.S. also contributed to writing the manuscript. Y.Y. proofread the English expression and reviewed the manuscript. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported by National Social Science Foundation Program of China (22CSH087).

Institutional Review Board Statement: This study was approved by the Department of Sociology at Hohai University (L2022–0522), approved on 22 May 2022. All of the procedures were performed in accordance with the Declaration of Helsinki and relevant policies in China.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author.

Acknowledgments: Thanks to all the participants and the funding of the National Social Science Foundation Program of China (22CSH087).

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Dong, W.; Liu, Y.; Bai, R.; Zhang, L.; Zhou, M. The prevalence and associated disability burden of mental disorders in children and adolescents in China: A systematic analysis of data from the Global Burden of Disease Study. *Lancet Reg. Health–West. Pac.* **2025**, *55*, 101486. [[CrossRef](#)] [[PubMed](#)]
2. Zhou, Z.X.; Kou, C.G.; Qi, T. A network analysis of depressive symptoms and externalizing problems in Chinese adolescents. *Psychiatry Res.* **2026**, *360*, 117110. [[CrossRef](#)] [[PubMed](#)]
3. Wang, J.; Yang, Y.; Chen, Y.; Lin, H.; Wang, T.; Wang, Z.; Chen, X.; Fu, C. Loneliness, internalizing and externalizing problems, and suicidal ideation among Chinese adolescents: A longitudinal mediation analysis. *J. Adolesc. Health* **2025**, *76*, 96–104. [[CrossRef](#)] [[PubMed](#)]
4. Zhang, C. Absence and compensation: Social and emotional logic of adolescent mental health problems. *China Youth Study* **2025**, *10*, 64–72. (In Chinese) [[CrossRef](#)]
5. Rao, W.W.; He, F.; Qi, Y.J. Mental health among school children and adolescents in China: A comparison of one-child and multiple-children families from a nationwide survey. *Asian J. Psychiatry* **2024**, *100*, 104130. [[CrossRef](#)] [[PubMed](#)]
6. Li, F.H.; Cui, Y.; Li, Y.; Guo, L.; Ke, X.; Liu, J.; Luo, X.; Zheng, Y.; Leckman, J.F. Prevalence of mental disorders in school children and adolescents in China: Diagnostic data from detailed clinical assessments of 17,524 individuals. *J. Child Psychol. Psychiatry* **2022**, *63*, 34–46. [[CrossRef](#)] [[PubMed](#)]
7. Steare, T.; Gutiérrez, C.; Sullivan, A.; Lewis, G. The association between academic pressure and adolescent mental health problems: A systematic review. *J. Affect. Disord.* **2023**, *339*, 302–317. [[CrossRef](#)] [[PubMed](#)]
8. Xu, T.; Zuo, F.Q.; Zheng, K. Parental educational expectations, academic pressure, and adolescent mental health: An empirical study based on CEPS survey data. *Int. J. Ment. Health Promot.* **2024**, *26*, 93–103. [[CrossRef](#)]

9. Wu, Z.; Wang, B.; Xiang, Z. Increasing trends in mental health problems among urban Chinese adolescents: Results from repeated cross-sectional data in changsha 2016–2020. *Front. Public Health* **2022**, *10*, 829674. [[CrossRef](#)] [[PubMed](#)]
10. Jayanthi, P.; Thirunavukarasu, M.; Rajkumar, R. Academic stress and depression among adolescents: A cross-sectional study. *Indian Pediatr.* **2015**, *52*, 217–219. [[CrossRef](#)] [[PubMed](#)]
11. Cai, T.Y.; Li, X.R.; Chen, S.J.; Wang, X.; Liu, Y.; Zhang, K.; Wu, G.; Qu, Y. The impact of school reopening on Chinese adolescents' mental health during COVID-19: Considering the role of academic stress and academic orientation. *J. Adolesc. Health* **2024**, *75*, 560–568. [[CrossRef](#)] [[PubMed](#)]
12. Eneogu, N.D.; Ugwuanyi, C.K.; Ugwuanyi, C.S. Efficacy of cognitive behavioral therapy on academic stress among rural community secondary school economics students: A randomized controlled evaluation. *J. Ration.-Emotive Cogn.-Behav. Ther.* **2024**, *42*, 245–262. [[CrossRef](#)]
13. Wang, J.; Wang, Z.; Yang, Y.; Wang, T.; Lin, H.; Zhang, W.; Chen, X.; Fu, C. Academic burden and emotional problems among adolescents: A longitudinal mediation analysis. *J. Adolesc.* **2025**, *97*, 989–1001. [[CrossRef](#)] [[PubMed](#)]
14. Karki, R.; Tamang, A.; Kaphle, M. Perceived academic stress and its correlates among secondary school adolescents in Kathmandu, Nepal. *Public Health Chall.* **2026**, *5*, e70186. [[CrossRef](#)] [[PubMed](#)]
15. Yang, L.; Shrestha, S.; Zhan, S.; Cheng, F. Parents' education anxiety and adolescents' academic burnout: The role of parenting style and academic self-efficacy. *Personal. Individ. Differ.* **2025**, *238*, 113082. [[CrossRef](#)]
16. Folkman, S.; Lazarus, R.S.; Gruen, R.J.; DeLongis, A. Appraisal, Coping, Health Status, and Psychological Symptoms. *J. Personal. Soc. Psychol.* **1986**, *50*, 571–579. [[CrossRef](#)] [[PubMed](#)]
17. Majeed, M.; Naseer, S. Is workplace bullying always perceived harmful? The cognitive appraisal theory of stress perspective. *Asia Pac. J. Hum. Resour.* **2021**, *59*, 618–644. [[CrossRef](#)]
18. Peng, S.; Li, H.; Xu, L.; Chen, J.; Cai, S. Burden or empowerment? A double-edged sword model of the efficacy of parental involvement in the academic performance of chinese adolescents. *Curr. Psychol.* **2024**, *43*, 3786–3797. [[CrossRef](#)] [[PubMed](#)]
19. Dai, C.N.; Zhou, Y.Z. Rank, peer achievement, and shadow education: Evidence from secondary school students in China. *Econ. Educ. Rev.* **2025**, *108*, 102682. [[CrossRef](#)]
20. Liu, X.; Zhang, Y.; Ran, F.; Zeng, J.; Liu, Y. Longitudinal effects of academic stress on life satisfaction in Chinese adolescents: A moderated mediation model. *Child. Youth Serv. Rev.* **2026**, *180*, 108663. [[CrossRef](#)]
21. Zhao, C.J.; Du, M.X.; Yu, Y.Q.; Chen, J.H.; Wu, A.M.-S.; Du, D.; Wang, D.B.; Lau, J.T.; Yu, G.; Zhang, G. The roles of classmate support, smartphone addiction, and leisure time in the longitudinal relationship between academic pressure and social anxiety among Chinese adolescents in the context of the “double reductio” policy. *Child. Youth Serv. Rev.* **2024**, *160*, 107542. [[CrossRef](#)]
22. Zeng, X.; Zhang, Y. Has students' academic pressure been reduced under the “double reduction” policy? A survey of 30 counties (cities, districts) in 6 provinces in the eastern, middle and western regions of China. *J. Hebei Norm. Univ. (Educ. Sci.)* **2023**, *25*, 93–100. (In Chinese) [[CrossRef](#)]
23. Sun, Q.; Yan, J.; Yao, J.; Yang, X.; Liu, H. The effect of childhood trauma on depression in senior high school students: The mediating effect of stress perception. *Chin. J. Clin. Psychol.* **2022**, *30*, 81–84. (In Chinese) [[CrossRef](#)]
24. Zeng, Y. A review of empirical studies of the effects of double reduction policy. *Sci. Insights Educ. Front.* **2025**, *27*, 4517. [[CrossRef](#)]
25. Liu, Z.; Zheng, K.; Chu, J.; Ding, Z.; Song, Q.; Wang, Y.; Yi, J. The mediation of resilience and neuroticism on the relationship between perceived stress and depression: Based on path analysis. *Chin. J. Clin. Psychol.* **2021**, *29*, 352–356. (In Chinese) [[CrossRef](#)]
26. Yu, Y.; Yao, Z. Educational anxiety of parents in the context of “double reduction” and the path to its elimination. *J. Xinjiang Norm. Univ.* **2022**, *43*, 39–49. (In Chinese) [[CrossRef](#)]
27. Sperry, J.M.; Nicki, R.M. Cognitive appraisal, self-efficacy, and cigarette smoking behavior. *Addictv. Behav.* **1991**, *16*, 381–388. [[CrossRef](#)] [[PubMed](#)]
28. Bandura, A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol. Rev.* **1977**, *84*, 191–215. [[CrossRef](#)]
29. Sun, C. Academic burden of primary and secondary school students from the perspective of cognitive load. *Educ. Explor.* **2016**, *36*, 31–32. (In Chinese) Available online: <https://d.wanfangdata.com.cn/periodical/jyts201604008> (accessed on 1 July 2026).
30. Altaf, Z.; Riaz, A.; Abbasi, P.N. Impact of self-efficacy on mental health literacy: Moderated by perceived stress among young adults. *Pak. Soc. Sci. Rev.* **2025**, *9*, 653–665. [[CrossRef](#)]
31. Zhang, F.; Deng, C.; Shen, M. Development of the academic burden attitude scale for secondary school students. *J. Psychol. Sci.* **2004**, *27*, 449–452. (In Chinese) [[CrossRef](#)]
32. Fu, W.; Hu, Y. Can improving the quality of after-school services under the background of “double reduction” alleviate the academic burden on primary and secondary school students? Based on a survey of 11139 students from 7 provinces of eastern, central, and western China. *J. Cent. China Norm. Univ. (Humanit. Soc. Sci.)* **2025**, *64*, 162–174. (In Chinese) [[CrossRef](#)]
33. Cohen, S.; Kamarck, T.; Mermelstein, R. A global measure of perceived stress. *J. Health Soc. Behav.* **1983**, *24*, 385–396. [[CrossRef](#)]
34. Moliterni, P.; Stasio, S.D.; Carboni, M.; Di Chiacchio, C. Motivational and self-regulated learning components of classroom academic performance. *J. Educ. Psychol.* **1990**, *82*, 33–40. [[CrossRef](#)]

35. Lu, Y.; Yin, W. The impact of family economic investment on academic achievements in shadow education: An empirical analysis based on CEPS data. *J. Sichuan Univ. Sci. Eng. (Soc. Sci. Ed.)* **2023**, *38*, 53–65. (In Chinese) [[CrossRef](#)]
36. Radloff, L.S. The CES-D scale: A self-report depression scale for research in the general population. *Appl. Psychol. Meas.* **1977**, *1*, 385–401. [[CrossRef](#)]
37. Xi, W.; Ma, L. Influence factors and group difference in adolescents' mental health: A multilevel analysis based on CEPS data. *J. Stat. Inf.* **2018**, *33*, 116–123. (In Chinese) [[CrossRef](#)]
38. Hayes, A.F.; Rockwood, N.J. Conditional process analysis: Concepts, computation, and advances in the modeling of the contingencies of mechanisms. *Am. Behav. Sci.* **2020**, *64*, 19–54. [[CrossRef](#)]
39. Preacher, K.J.; Hayes, A. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav. Res. Methods* **2008**, *40*, 879–891. [[CrossRef](#)] [[PubMed](#)]
40. Guo, L.L.; Pi, L.Y. Relationship between peer friendship quality and problematic smartphone use among college students: A moderated mediation model. *China J. Health Psychol.* **2025**, *33*, 1386–1391. (In Chinese) [[CrossRef](#)]
41. Harmon-Jones, E.; Abramson, L.Y.; Nusslock, R.; Sigelman, J.D.; Urosevic, S.; Turonie, L.D.; Alloy, L.B.; Fearn, M. Effect of bipolar disorder on left frontal cortical responses to goals differing in valence and task difficulty. *Biol. Psychiatry* **2008**, *63*, 693–698. [[CrossRef](#)] [[PubMed](#)]
42. Yuan, D.L.; Wu, J.L.; Hu, M.L. Effects of perceived stress on anxiety levels in medical staff: A composite multiple mediation model. *Chin. J. Clin. Psychol.* **2022**, *30*, 814–819. (In Chinese) [[CrossRef](#)]
43. Brymer, E.; Lacaze, A. An overview of SDG 3. In *The Routledge Handbook of Sport and Sustainable Development 2021*; Routledge: London, UK, 2021. [[CrossRef](#)]
44. Shilpa, D.M.; Sulochanadevi, B.C.; Shashirekha, B. Influence of academic stress and home environment on adolescent mental health. *J. Ecophysiol. Occup. Health* **2025**, *25*, 113–120. [[CrossRef](#)]
45. Zhao, L.; Yuan, H.; Wang, X. Impact of homework time on adolescent mental health: Evidence from China. *Int. J. Educ. Dev.* **2024**, *107*, 103051. [[CrossRef](#)]
46. Neveu, D.; Doron, J.; Visier, L.; Boiché, J.; Trouillet, R.; Dujols, P.; Ninot, G. Students perceived stress in academic programs: Consequences for its management. *Rev. Epidémiologie Santé Publique* **2012**, *60*, 255–264. [[CrossRef](#)] [[PubMed](#)]
47. Bandura, A. Self-efficacy and health. *Behav. Res. Ther.* **1985**, *23*, 437–451. [[CrossRef](#)] [[PubMed](#)]
48. Li, T.; Xie, Q. Effects of college students' perceived stress on anxiety in the time of COVID-19: The chain mediation role of psychological resilience and regulatory emotional self-efficacy. *Int. J. Ment. Health Promot.* **2022**, *24*, 263–276. [[CrossRef](#)]
49. Karademas, E.C.; Kalantzi-Azizi, A. The stress process, self-efficacy expectations, and psychological health. *Personal. Individ. Differ.* **2004**, *37*, 1033–1043. [[CrossRef](#)]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.