

A Cross-Sectional Study of Psychological and Academic Status among Medical Students

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Abstract: This study investigated the current status of medical students' psychological status (depression, anxiety) and academic adjustment (academic burnout, academic procrastination), analyzed their detection rates, demographic group differences and internal correlations, so as to provide empirical evidence for targeted mental health education and academic support in medical colleges. Using PHQ-9, GAD-7, SBI and BEPS scales, a cross-sectional questionnaire survey was conducted among 729 full-time undergraduates from freshmen to seniors in a clinical medical college. Descriptive statistics, Shapiro-Wilk normality test, one-way ANOVA, Pearson correlation analysis and multiple linear regression were adopted for data analysis. The results showed distinct detection rates of negative emotions and academic maladjustment: the detection rates of moderate and above depression, anxiety, academic burnout and academic procrastination were 11.66%, 8.78%, 41.84% and 50.62% respectively. Significant inter-group differences existed across symptom severity levels. Depression, anxiety, academic burnout and procrastination were significantly positively correlated pairwise ($r = 0.470\sim 0.854$, $p < 0.001$). Depression and academic burnout positively predicted anxiety, while anxiety, burnout and procrastination jointly predicted depression. Only 26.9% of students reported clear distress and support demands, and merely 35% of high-risk students were willing to seek help actively, revealing a prominent mismatch between actual needs and help-seeking behaviors. Conclusion: Medical students suffer more severe academic maladjustment than emotional symptoms. Psychological distress and academic problems reinforce each other into a vicious cycle, and most students avoid seeking psychological help. Medical colleges should establish closed-loop mental health warning systems and hierarchical academic support services, deliver precise interventions for different student groups, and popularize mental health knowledge to reduce stigma.

Keywords: medical students; depression; anxiety; academic burnout; academic procrastination

1. Introduction

Medical education, characterized by its prolonged duration, complex curriculum, strong disciplinary specificity, intense clinical skills training, and high professional standards, constitutes a unique academic ecosystem that differs from other disciplines. During their standardized residency training, medical students are required not only to master a vast body of theoretical knowledge but also to complete rigorous clinical rotations and assume shift schedules and on-call duties, which are comparable to those of formally employed medical staff. The disruption of circadian rhythms, sleep deprivation, and irregular schedule patterns caused by night shifts further exacerbate their physiological burden and psychological condition. Existing studies have demonstrated that the detection rates of anxiety and depressive symptoms among Chinese medical students are significantly higher than those among their peers in other undergraduate programs, with psychological distress presenting a dual predicament of "high pressure and low help-seeking."

Academic stress represents the primary source of pressure for medical students. Heavy coursework, professional qualification examination, rigorous clinical skills assessments, and intensifying competition for

postgraduate admission and employment collectively constitute a persistent and high-intensity academic burden. When individuals' coping capacities fail to match external demands, academic stress transforms into sustained psychological stress responses, triggering negative emotional status such as anxiety, depression, emotional exhaustion and so on. More critically, persistent academic stress may affect both mental health and academic performance, weakening learning motivation, impairing attention and memory, leading to procrastination, thereby forming a vicious cycle.

At present, medical students face common problems such as sub-health, academic and employment-related pressure, with psychological distress increasingly emerging as a critical constraint on academic development. Nevertheless, empirical research systematically examining the intrinsic associations between psychological condition (depression and anxiety) and academic adjustment (academic burnout and academic procrastination) specifically among medical students remains relatively insufficient. Most previous research only describes the overall situation. Few studies discuss differences across grades, genders and majors. In addition, scholars rarely systematically explore how mental states affect academic performance.

Therefore, to address issues listed above, this study aims at full-time undergraduate medical students from four grades at a clinical medical college, employing standardized assessment scales to systematically investigate the inner associations between medical students' psychological conditions and academic adjustment. The findings are intended to provide empirical evidence for the implementation of different mental health education and specified academic support programs in medical institutions, thereby contributing to the cultivation of physically and mentally healthy medical professionals.

2. Literature Review

Academic stress is a stressful psychological state involving physical tension and anxiety, occurring when students lack sufficient ability and resources to satisfy the requirements, such as coursework, assessments or other goals. With an increasing academic burden and professional pressure in medical education, the mental health problems of medical students and their impact on academic adjustment have drawn attention. Existing studies can be classified into two groups, one focus on objective outcome indicators like GPA, the other concerns the process of academic adjustment, like students' capacity to maintain positive status when facing challenges.

At home, the related results can be divided into three parts. The first is about how bad indicators will affect the students' learning adjustment because they are psychologically distressed. The second is to investigate how the good qualities and psychological resilience of students help them adapt to school life by boosting their motivation to learn, from the perspective of positive psychology. The third is about how social support and stigma may modify the relationship between psychological health and academic coping ability from the outside.

Guo and others have employed the cognitive appraisal theory to study the inner reasons why students have difficulties in their studies [1]. Based on the survey of 94,361 college students from the 266 universities across the country, it was found that academic self-efficacy and both positive and negative coping styles together mediate this relationship. Based on the results, it was found that academic self-efficacy and positive coping styles are positively correlated with low stress; at the same time, negative coping styles are associated with higher stress, and together they affect one's level of stress. Therefore, if students' negative coping behaviour is too prolonged, they may lose their sense of academic self-efficacy and even become depressed about their studies. Therefore, it is reasonable to assume that psychological factors can influence a person's study adjustment through the cognitive appraisal route. However, the sample of this study was regular university students, not medical students; they too had the problems of a long study period and pressure from clinical practice. Song and Song also faced this problem from the perspective of positive psychology; a sample of 941 clinical medical students was taken for the survey, structural equation modelling was used [2], and it was found that learning motivation was associated with the above variables. Psychological resilience, self-esteem and life satisfaction are positively correlated with learning motivation, and thus may be reflected in students' study results through the mechanism of academic achievement. The aim of this paper is to clarify that the psychological traits and behaviour of learners are influenced by their motives. The extent to which students want to learn is the main factor influencing their will to study and adjust to school life. Because it is a cross-sectional study, we cannot know the causes of these changes in the variables or other external factors that may have affected them. Xu and others have studied how to connect the outside world with learning adaptation in medical students based on Bronfenbrenner's ecological system theory [3], and it has been found that social support can reduce psychological problems such as depression and sensitivity to others; at the same time, a desire for help may be inhibited by self-stigma and thus lead to poorer mental health. Many studies have investigated the psychological condition of medical students in different environments, such as their families, schools and societies; it has been found that good social support helps students study well and is more likely to

avoid burnout. It only listed the mental health problems; it did not explore how these problems affect students' studies. Han and others have used a long-term study of first-year medical students to show that depression and perceived stress are associated with poorer academic performance [4], but anxiety and insomnia do not directly affect it. It was proposed in this study that the negative impact of psychological issues on performance is mediated by academic adaptation ability; that is to say, stress and depression reduce students' learning states and thus lead to poor grades.

Research at home and abroad on the connection between the mental health of medical students and their study performance has begun to address many problems, and not only focuses on individual psychology but also on the institutional environment and study environment. Medisocket and others have carried out a long-term cohort study to collect baseline data and data after three months from 792 medical students at nine different medical schools in the UK [5], and have systematically investigated all kinds of psychological problems, such as somatisation, eating disorders, personality disorders and drug dependence. The detection rates of all the psychological symptoms in the study were generally high. According to the results of the longitudinal growth curve model and generalized estimating equation analysis, among all factors that affect the prevention and treatment of all kinds of psychological symptoms, the following were found: A student-centered teaching environment with a weak competitive atmosphere, a strong sense of campus belonging, low stigma towards mental illness, and a high willingness to seek help. Although this study did not directly correlate the psychological indicators with the mean grade point average, the dimensions of academic burnout that were examined here, such as emotional exhaustion, depersonalisation and a lack of a sense of achievement, are typical signs of poor academic adjustment and can provide some reference for understanding how the environment at medical school affects people's mental health and thus impacts their studies. Alnourfayyeh and others carried out a large-scale survey of 2819 medical students in Saudi Arabia [6], and it was found that abnormally high levels of anxiety are one of the independent reasons for poor grades; however, another study by Yaghmur et al. on Saudi medical students did not find a significant correlation between depression, anxiety, stress, sleep quality and academic performance [7]. The various conclusions may be due to the fact that the impact of psychological factors on students' study differs among different groups and is measured in various ways. It is also put forward that, to study the inner path of psychological factors in students' studies more reliably, it is better to focus on the process of academic adjustment rather than directly examining the connection between psychological problems and test results.

Through various means, domestic and foreign scholars have studied the relationships between psychological factors and academic performance in many ways in the reviewed literature. Nevertheless, the current studies still have some defects. Most of the research has been conducted on the issue of "academic performance" and, therefore, comparatively few studies have systematically examined how to adjust students' grades. Psychological problems do not directly manifest as low grades; rather, they are a kind of process that first reduces the ability to study by weakening the motivation to learn, diminishing concentration, and causing procrastination, which then indirectly affects school performance. Based on the above analysis, this paper will take a medical student as the object of study, construct an analytical system for their psychological state and study adaptation, investigate the current situation of these students, their differences among groups, the underlying reasons for these differences, etc., and provide empirical support for targeted mental health intervention and academic assistance.

3. Research Significance

In response to the actual problems in the mental health and study life of medical students, this study will meet the demands for theory and practice.

Theoretically, there have been no systematic empirical studies linking the psychological state of Chinese medical students to their studies. Most studies are only descriptive investigations of students' psychological problems or predict their study performance based on one factor. At present, there is no single system for studying both the psychological state and academic adaptation together; this problem will be addressed in this paper. Based on research into the correlation between psychological status and the study adaptation of medical students, this paper will explore how various factors in their lives affect their studies; additionally, it hopes to provide new theoretical support for the study of medical students and offer practical data for the development of intervention strategies in future studies.

Practically, based on the results of the above assessment and data analysis, it will be necessary to accurately determine the differences in psychological state and academic adaptation among students of various years, sexes, majors, etc., and provide data support for building a mental health service system in colleges. Based on the above analysis, it will be possible to identify students at risk due to psychological and academic reasons and offer them personalised support services. At the same time, based on the analysis results of group differences, schools can be

guided to provide different levels of psychological counselling and academic assistance according to the various traits of students in a differentiated manner to improve the accuracy and effectiveness of mental health education and academic support. Over time, improving the psychological condition and boosting the academic adaptation level of medical students will help them better cope with their studies and will have positive long-term benefits for the all-around development of medical talents with good morals and professional capabilities.

4. Research Content and Hypotheses

4.1. Research Content

Full-time clinical medical students at the medical school will be selected as the subjects of this study. It takes a survey to study two main areas of psychological state (depression and anxiety) and three main aspects of academic situation (academic burnout, academic procrastination, academic support needs). This paper will introduce the features, groups and internal correlations of the psychological condition and study results of medical students. According to the above research results, some particular assistance will be extended. The four sections of the actual research are as follows:

First, to examine the general situation of the psychological and study condition of medical students. PHQ-9 Depression Scale, GAD-7 Anxiety Scale, SBI Academic Burnout Scale and BEPS Academic Procrastination Scale were used in the assessment. The total score, mean score and data distribution characteristics of each scale are calculated for the whole sample; different severity levels are classified and the proportion of students in each level is determined to assess the overall prevalence of depression, anxiety, academic burnout and academic procrastination in the population. At the same time, according to the level of academic distress, types of support needs and open-ended answers from students, practical suggestions to improve the college's current academic support efforts will be put forward.

Second, to study the different groups in different demographics. Group by gender, grade level and major, and then compare the differences in scores for the indices of depression, anxiety, academic burnout and academic procrastination among these groups.

Thirdly, to investigate the internal connections of psychology and study. Correlations will be calculated to study how strongly depression, anxiety and academic burnout are associated with academic procrastination. Besides some scale items, this study will also investigate how psychological expressions lead to problems in study and try to find the deep reasons for the interaction and influence between them.

Fourthly, based on the research results, put forward some practical academic and psychological support strategies. Identify the main groups of students who have moderate to severe psychological distress and serious study difficulties, analyze their characteristics and reasons for seeking help, summarize students' preferences for all kinds of support through open-ended questions in a questionnaire, combine this with the nature of medical student training and the development requirements of the institution, and put forward a set of implementation plans to improve the optimization of psychological counselling and academic support work.

4.2. Research Hypotheses

Based on the traits of medical students' study and literature research, the following hypotheses have been put forward in this paper:

- (1) Students from different backgrounds have different psychological states and learning abilities.
- (2) Students from different fields of study and majors have various psychological conditions and different levels of study stress due to differing courses and clinical practice arrangements.
- (3) The psychological condition of medical students is closely related to their study performance.

5. Research Subjects, Research Methods, and Technical Route

5.1. Research Subjects

The subjects of this study are full-time undergraduate students at a clinical medical college from all four years, from freshmen to seniors, and students of various majors, including clinical medicine, medical technology, nursing. The sample covers the population of medical students from all directions in training to ensure that the sample is representative and diverse.

5.2. Research Methods

Literature Review: Related domestic and foreign research on the mental health and study of medical students has been systematically reviewed to provide a theoretical basis for this paper.

Questionnaire: According to a valid standard scale, a self-designed questionnaire will be used to collect the demographic information of students, their mental state and study progress.

Mathematical Statistics: SPSS (version 26) is used to process and analyse the data; descriptive statistics, difference tests, correlation analysis and regression analysis, etc.

5.3. Survey Tools

The four main sections of the questionnaire in this survey are as follows: Basic Information Questionnaire: Gender, grade level and specialization are added to the demographic information section for the purpose of group comparison analysis. Psychological Status Scales are the PHQ-9 Depression Scale and GAD-7 Anxiety Scale; they are self-assessment tools to comprehensively evaluate the mental health of students. Both the SBI Academic Burnout Scale and the BEPS Academic Procrastination Scale are used as general measures of students' study environments and learning behaviour in the university. The first is to determine how students feel about academic pressure and whether they plan to ask for help in an academic support questionnaire. In addition, several types of questions can be used to determine what kind of support the students desire, and in order to obtain their own ideas and suggestions for academic and psychological assistance at the college, open-ended questions will also be used.

6. Research Design and Data Collection

6.1. Research Instruments

The self-developed questionnaire for the psychological and study condition of college students will be used as the assessment tool. According to the verified standard scales and actual requirements of the college, a questionnaire has been designed. The four sections of the document are: basic information, assessment of mental health, assessment of studies, and support for study. The breakdown is as follows:

Demographics: Gender, grade, major, etc., will be taken from the preliminary demographic information.

Depression Status Assessment (PHQ-9 Scale): It consists of 9 items and determines how often one has experienced depressed moods in the last two weeks. Higher scores are more depressed. According to the scores, the five grades of students are no depression, mild, moderate, moderately severe and severe depression.

Anxiety Status Assessment (GAD-7 Scale): This scale has 7 items; how much a person has been bothered by general anxiety in the past two weeks is judged by this. Higher scores are more anxious. The four grades of students' anxiety are no anxiety, mild anxiety, moderate anxiety and severe anxiety.

Academic Burnout Assessment (SBI Scale): There are 9 items, and items 5, 6 and 7 are reverse-scored. A high score indicates that there is a serious problem with academic burnout. The four classes of students are: no burnout, low burnout, moderate burnout and high burnout.

Academic Procrastination Assessment (BEPS Scale): 6 items; A higher score is to be regarded as a more serious case of academic procrastination. The four grades of students are: not procrastinators, low procrastinators, moderate procrastinators and high procrastinators.

Academic Support Needs Module: To learn how severe the academic stress of students is and how willing they are to seek help, single-choice questions will be used; to determine what kinds of support students want, multiple-choice questions will be employed; open-ended questions will also be added to collect students' opinions and recommendations on the college's efforts to provide academic and psychological assistance.

6.2. Data Collection Process

The shape of the questionnaire was an online, anonymous one. The questionnaire link and QR code were distributed, and then the students filled in the survey themselves. Anonymity can help people be honest and give us true feedback.

Data collection was carried out from May 25 to 6 June 2026. This time is near the end of the semester, when students have many examinations and practical work; therefore, they are more prone to expressing their feelings honestly.

In all cases, 738 copies of the questionnaire were distributed in this paper. According to the general rules, questionnaires that were too short, had fixed answers or contained obvious errors were not collected; thus, 729 valid questionnaires were obtained. Based on the scoring rules of the scale, reverse-scored items in the SBI Academic Burnout Scale were inverted. All the data pre-processing is done, and now I have the final analysis set.

7. Research Results and Analysis

A total of 738 questionnaires were collected in this study. After excluding questionnaires with excessively short completion times, contradictory responses, and obviously invalid samples, 729 valid questionnaires were finally obtained, with an effective response rate of 98.78%. The demographic distribution of the sample is as follows: 323 males, accounting for 44.31%; 406 females, accounting for 55.69%. Grade distribution: 332 freshmen (45.54%), 9 sophomores (1.23%), 348 juniors (47.74%), and 40 seniors (5.49%). Specialty distribution: 382 clinical medicine students (52.40%), 238 medical technology students (32.65%), and 109 nursing students (14.95%).

7.1. Overall Characteristics of Medical Students' Psychological and Academic Condition

This study employed the GAD-7 Anxiety Scale, PHQ-9 Depression Scale, SBI Academic Burnout Scale, and BEPS Academic Procrastination Scale to comprehensively assess the psychological and academic status of medical students. All scales underwent standardized scoring conversion and reverse-item processing. The overall assessment results are as follows.

7.1.1. Depression Status (PHQ-9)

The mean total depression score of all students was 5.11 ($SD = 4.81$), which is at the upper limit of the no-depression range and close to the threshold for mild depression. In terms of risk level distribution, students with no depression (0–4 points) accounted for the highest proportion at 58.3%; mild depression (5–9 points) accounted for 29.0%; moderate depression (10–14 points) accounted for 8.8%; moderately severe depression (15–19 points) accounted for 3.0%; and severe depression (20–27 points) accounted for 1.6%. A specific analysis of Item 9 of the scale (suicidal or self-harm ideation) revealed that 5 students (0.6%) reported such thoughts in the past two weeks. These students require immediate targeted psychological intervention and one-on-one follow-up.

7.1.2. Anxiety Status (GAD-7)

The mean total anxiety score of all students was 3.67 ($SD = 4.19$), which is within the no-anxiety range and close to the threshold for mild anxiety. The level distribution results showed: no anxiety (0–4 points) accounted for 62.7%; mild anxiety (5–9 points) accounted for 28.5%; moderate anxiety (10–14 points) accounted for 6.7%; and severe anxiety (15–21 points) accounted for 2.1%. A total of 8.78% of students had moderate or above anxiety problems, requiring focused attention.

7.1.3. Academic Burnout (SBI)

After reverse-item scoring conversion, the mean total academic burnout score was 17.72 ($SD = 7.85$), which is at the upper limit of the low burnout range and close to the threshold for moderate burnout. The level distribution results were: no burnout (≤ 9 points) accounted for 18.4%; low burnout (10–19 points) accounted for 39.7%; moderate burnout (20–34 points) accounted for 34.6%; and high burnout (≥ 35 points) accounted for 7.2%. A total of 41.84% of students experienced moderate or above academic burnout, and over 7% were in a state of high burnout, reflecting that the medical student population has already experienced a certain degree of decline in learning motivation and interest.

7.1.4. Academic Procrastination (BEPS)

The mean total academic procrastination score was 12.36 ($SD = 6.04$), which is at the upper limit of the low procrastination range and close to the threshold for moderate procrastination. The level distribution was: no procrastination (≤ 6 points) accounted for 17.7%; low procrastination (7–12 points) accounted for 31.7%; moderate procrastination (13–20 points) accounted for 41.8%; and high procrastination (≥ 21 points) accounted for 8.1%. A total of 50.62% of students exhibited moderate or above procrastination behaviors. Among these, “accumulating study tasks and completing them at the last minute” and “experiencing anxiety and self-blame after procrastination” were the most prominent behavioral manifestations, which are directly related to academic stress and insufficient time management skills.

7.2. Normality Test Results of Scale Scores

The Shapiro-Wilk test was used to test the normality of the total scores of the four major psychological and academic scales. The results showed that the p -values for anxiety total score ($W = 0.828$, $p < 0.001$), depression

total score ($W = 0.882, p < 0.001$), academic burnout total score ($W = 0.989, p < 0.001$), and procrastination total score ($W = 0.964, p < 0.001$) were all less than 0.05, indicating non-normal distributions. Considering the relatively large sample size of this study ($N = 729$), based on the Central Limit Theorem, subsequent analyses still employed parametric tests, supplemented by non-parametric test results for robustness validation.

7.3. Detection Rate Analysis of Psychological and Academic Problems

Using moderate or above symptoms/levels as the detection criterion for clinical/practical concern, the detection rates of the four scales were calculated with 95% confidence intervals. The results are as follows:

- (1) Anxiety symptoms: Moderate or above anxiety detection rate was 8.78% (95% CI: 6.72%–10.84%);
- (2) Depressive symptoms: Moderate or above depression detection rate was 11.66% (95% CI: 9.33%–13.99%);
- (3) Academic burnout: Moderate or above burnout detection rate was 41.84% (95% CI: 38.27%–45.40%);
- (4) Academic procrastination: Moderate or above procrastination detection rate was 50.62% (95% CI: 47.05%–54.18%).

Overall, the rates of academic procrastination and academic burnout among medical students were significantly higher than clinical psychological symptoms such as anxiety and depression, suggesting that academic-related problems are a more prominent risk point for the current medical students and should be regarded as the core direction of intervention in student affairs.

7.4. Group Difference Test Results by Symptom Severity Levels

One-way ANOVA was used to examine differences in other psychological and academic indicators across different symptom severity levels. The results showed:

- (1) Across different anxiety level groups, depression total score, academic burnout total score, and procrastination total score all showed significant differences (all $p < 0.001$). The more severe the anxiety symptoms, the significantly higher the scores on other psychological and academic indicators.
- (2) Across different depression level groups, anxiety total score, academic burnout total score, and procrastination total score all showed significant differences (all $p < 0.001$). The more severe the depressive symptoms, the significantly higher the scores on other psychological and academic indicators.
- (3) Across different academic burnout level groups, anxiety total score, depression total score, and procrastination total score all showed significant differences (all $p < 0.001$). The more severe the burnout, the significantly higher the scores on other psychological and academic indicators.
- (4) Across different procrastination level groups, anxiety total score, depression total score, and academic burnout total score all showed significant differences (all $p < 0.001$). The more severe the procrastination, the significantly higher the scores on other psychological and academic indicators.

The above results indicate a significant coupling effect between psychological symptoms and academic problems. The exacerbation of any single dimension is accompanied by the deterioration of other dimensions, necessitating comprehensive intervention strategies rather than single-dimensional interventions.

7.5. Correlation Analysis Results Among Variables

Pearson correlation analysis was used to examine the correlations among the four core variables: anxiety total score, depression total score, academic burnout total score, and procrastination total score. The results are presented in Table 1.

Table 1. Pearson Correlation Coefficient Matrix of the Four Core Variables.

Variable	Total Anxiety Score	Total Depression Score	Total Academic Burnout Score	Total Procrastination Score
Total Anxiety Score	1	0.854***	0.577***	0.470***
Total Depression Score	0.854***	1	0.590***	0.527***
Total Academic Burnout Score	0.577***	0.590***	1	0.556***
Total Procrastination Score	0.470***	0.527***	0.556***	1

Note: *** $p < 0.001$.

The correlation analysis revealed the following:

- (1) Anxiety total score and depression total score showed a very strong positive correlation ($r = 0.854, p < 0.001$), indicating a high degree of comorbidity between anxiety and depressive symptoms among medical students, with highly coupled development and progression;
- (2) Anxiety and depression total scores showed moderate positive correlations with academic burnout total score ($r = 0.577, 0.590$, both $p < 0.001$), and weak-to-moderate positive correlations with procrastination total score ($r = 0.470, 0.527$, both $p < 0.001$), indicating that the severity of psychological symptoms is positively associated with the severity of academic problems;
- (3) Academic burnout total score showed a moderate positive correlation with procrastination total score ($r = 0.556, p < 0.001$), indicating that higher levels of academic burnout are associated with more severe procrastination behaviors, with bidirectional reinforcement between the two.

7.6. Multiple Regression Analysis of Factors Influencing Anxiety and Depression

To further clarify the predictive relationships among variables, multiple linear regression models were constructed with anxiety total score and depression total score as dependent variables, respectively, and the other three variables as independent variables, to examine the predictive effects of each variable on anxiety and depression.

7.6.1. Regression Analysis of Factors Influencing Anxiety

A regression model was constructed with depression total score, academic burnout total score, and procrastination total score as independent variables, and anxiety total score as the dependent variable. The overall model test results showed: $R^2 = 0.741$, adjusted $R^2 = 0.740$, $F = 694.103$, $p < 0.001$, indicating that the model was overall significant and explained 74.0% of the variance in anxiety total score. The detailed regression coefficients are presented in Table 2.

Table 2. Multiple Linear Regression Results for Factors Influencing Anxiety.

Variable	Regression Coefficient	Standard Error	t-value	P-value	Significance
Constant Term	-0.843	0.217	-3.893	0.0001	***
Total Depression Score	0.689	0.021	32.133	0	***

Note: *** $p < 0.001$.

The regression results showed that depression total score ($\beta = 0.689, p < 0.001$) and academic burnout total score ($\beta = 0.062, p < 0.001$) had significant positive predictive effects on anxiety total score. That is, the more severe the depressive symptoms and the higher the level of academic burnout, the significantly higher the students' anxiety levels. Procrastination total score did not show a significant predictive effect on anxiety total score ($p > 0.05$).

7.6.2. Regression Analysis of Factors Influencing Depression

A regression model was constructed with anxiety total score, academic burnout total score, and procrastination total score as independent variables, and depression total score as the dependent variable. The overall model test results showed: $R^2 = 0.745$, adjusted $R^2 = 0.744$, $F = 707.311$, $p < 0.001$, indicating that the model was overall significant and explained 74.4% of the variance in depression total score. The detailed regression coefficients are presented in Table 3.

Table 3. Multiple Linear Regression Results for Factors Influencing Depression.

Variable	Regression Coefficient	Standard Error	t-value	P-value
Constant Term	-0.268	0.243	-1.103	0.2704
Total Anxiety Score	0.852	0.027	32.133	<0.001
Total Academic Burnout Score	0.056	0.015	3.74	0.0002
Total Procrastination Score	0.101	0.018	5.608	<0.001

The regression results showed that anxiety total score ($\beta = 0.852, p < 0.001$), academic burnout total score ($\beta = 0.056, p < 0.001$), and procrastination total score ($\beta = 0.101, p < 0.001$) all had significant positive predictive

effects on depression total score. That is, the higher the anxiety level, the higher the academic burnout level, and the more severe the procrastination behaviors, the significantly higher the students' depression levels.

7.7. *Analysis of Academic Support Needs and Help-Seeking Willingness*

7.7.1. Distress Level and Help-Seeking Willingness

Among the 729 surveyed students, 31.4% reported no academic or psychological distress, 41.7% experienced distress but did not require assistance for the time being, and only 26.9% clearly stated that they were troubled and hoped to receive support. Cross-analysis revealed that merely 35% of students with moderate to severe depression or anxiety (high-risk groups) were willing to seek help actively, which reflected a prevalent help-avoidance mentality among students. Stigma attached to mental health issues and insufficient understanding of support services constituted the primary contributing factors.

7.7.2. Preferences for Support Forms

Among the 196 students with willingness to seek help, the proportions of preferences for various support forms were as follows: pre-examination tutoring (61.2%), peer support (44.9%), specialized psychological counseling (38.5%), and collective self-study sessions (25.5%). It can be seen that students' most urgent demands at present centered on academic tutoring.

7.7.3. Qualitative Analysis of Open-Ended Suggestions

A total of 215 valid open-ended suggestions were collected and categorized into four major groups.

- (1) Resource support (38%): Requests for past exam papers, review materials, course courseware and key examination points;
- (2) Institutional optimization (27%): Proposals to reduce trivial internship chores, balance internship and postgraduate entrance examination schedules, streamline unnecessary activities and rationalize exam arrangements;
- (3) Psychological stress relief (18%): Expectations to cut assessment pressure and deliver regular psychological counseling;
- (4) Academic guidance (12%): Demands for special training on learning methods, postgraduate admission and employment planning, thesis writing;
- (5) The remaining 5% of suggestions concerned daily living guarantees.

7.7.4. Comprehensive Analysis of Stress Sources

According to survey statistics, the primary stressors of medical students and their respective proportions were academic pressure (42%), clinical internship pressure (35%), research pressure (18%) and interpersonal pressure (5%). Academic work and clinical internships served as the core sources of stress for this population. Overall data indicated that the detection rates of depression and anxiety among medical students were 1 to 2 times higher than those of general college students, and far exceeded the 5% depression prevalence rate in the general population.

Academic pressure cannot directly trigger psychological disorders. Instead, it affects students' mental health through multiple links including cognitive evaluation, emotional responses, physical arousal and behavioral coping strategies. Academic pressure and mental health interact as reciprocal causes and effects. Moderate stress can stimulate learning motivation, whereas long-term intense stress greatly raises the risks of anxiety and depression. In contrast, sound mental health can buffer stress and improve students' academic adaptability.

8. **Conclusions and Countermeasure Suggestions**

8.1. *Research Conclusions*

The detection rates of academic problems among medical students are far higher than those of emotional problems such as anxiety and depression, and maladjustment in learning stands out as the primary risk for this population. Statistical results show that merely 11.66% of participants suffer from moderate or above depression, and 8.78% have moderate or above anxiety; by contrast, 41.84% of students experience moderate or higher academic burnout, and 50.62% show moderate or above academic procrastination. It can be concluded that the risk of negative emotional distress is manageable for medical students, while academic burnout and procrastination prevail extensively as their top troubles. Meanwhile, 0.6% of all respondents reported suicidal or self-harm ideations in the past two weeks, requiring targeted one-on-one psychological intervention.

The four indicators (anxiety, depression, academic burnout and procrastination) are significantly correlated pairwise and exert mutually aggravating effects. Pearson correlation analysis demonstrates an extremely strong positive correlation between anxiety and depression ($r = 0.854, p < 0.001$), indicating high comorbidity of the two emotional disorders. Moderate positive correlations are found between anxiety/depression and academic burnout/procrastination (r ranges from 0.470 to 0.590, all $p < 0.001$), as well as between academic burnout and procrastination ($r = 0.556, p < 0.001$). One-way ANOVA verifies that higher severity in any dimension corresponds to significantly higher scores on the other three scales, forming a vicious cycle where psychological distress and academic difficulties reinforce each other.

Multiple regression models reveal differentiated predictive effects of the variables. Depression and academic burnout can significantly positively predict anxiety ($p < 0.001$), whereas academic procrastination has no independent predictive effect on anxiety ($p = 0.6327, p > 0.05$). In contrast, anxiety, academic burnout and academic procrastination all serve as significant positive predictors of depression (all $p < 0.001$). This suggests that depressive emotions are jointly affected by burnout and procrastination; anxiety is only driven by depression and burnout. Procrastination aggravates negative emotions indirectly through worsening depression, showing distinct mechanisms of influence on anxiety and depression.

There is a prominent disconnect between students' actual needs and their willingness to seek help. Among all 729 participants, only 26.9% clearly stated that they had troubles and hoped to receive support. Among high-risk students with moderate or above depression and anxiety, merely 35% were willing to take the initiative to seek help. Stigma against mental illness and insufficient awareness of campus support resources constitute core barriers to help-seeking, which creates obvious deficiencies in the coverage of existing psychological and academic support systems for high-risk students.

The total scores of the four scales all fail to conform to the normal distribution according to Shapiro-Wilk test (all $p < 0.001$). Nevertheless, the sample size of this study is sufficiently large ($N = 729$). In accordance with the Central Limit Theorem, the results of parametric tests are robust and reliable, and the conclusions regarding correlation, regression and inter-group differences are valid.

8.2. Countermeasure Suggestions

First, establish a closed-loop mental health management system. Construct a full-process closed-loop management mechanism covering data collection, data analysis, risk early warning, intervention and follow-up feedback. Conduct comprehensive psychological surveys every semester, and build a five-level early warning and prevention system. Establish exclusive files for high-risk students and implement regular follow-up, psychological counseling, professional intervention and medical referral services. Leverage the resources of affiliated medical institutions of the university to open special psychological clinics and green medical channels for students.

Second, optimize mental health courses and popular science publicity. Set compulsory and elective courses such as College Student Mental Health Education and Medical Psychology, and deliver targeted mental health teaching tailored to the characteristics of medical majors. Launch regular mental health popular science activities to eliminate the stigma of mental illnesses and raise students' mental health awareness and willingness to seek help actively.

Third, strengthen the construction of professional psychological teachers and service venues. Recruit sufficient full-time psychological counselors and improve their professional competency. Allocate special funds to upgrade the facilities of psychological counseling rooms, and carry out regular psychological assessments, individual counseling and group counseling. Establish dynamic management ledgers for students with potential psychological risks.

Fourth, diversify campus activities to relieve physical and mental stress. Adhere to the all-round education model of morality, intelligence, physical fitness, aesthetics and labor education. Organize various campus activities including cultural galas, themed speeches and sports events to enrich students' spare time and help them release stress and regulate negative emotions.

Fifth, carry out hierarchical and categorized academic support services. Build a shared platform for learning resources to integrate courseware, review materials and past exam papers. Provide special training for students with weak English proficiency and deliver guidance on learning methods and exam-taking skills. Launch pre-examination tutoring, organized self-study and peer tutoring programs to stimulate students' learning motivation. Build a collaborative education team composed of counselors, professional teachers and academic administrators, and implement customized one-on-one support plans for students with academic risks under dynamic tracking management.

Last, deliver whole-process academic and career guidance. Provide full-cycle guidance covering research project design, experimental operation, thesis writing, defense and career employment. Expand career promotion channels, update students' employment concepts and introduce emerging careers in the general health industry to ease employment anxiety.

9. Research Limitations

First, restricted by the stigma of mental disorders and insufficient understanding of campus support services, most students show low willingness to identify their psychological problems and take the initiative to seek help, which interferes with the effectiveness of research surveys and subsequent interventions to a certain extent.

Second, this study fails to incorporate external confounding variables such as family environment and growth experience into the analysis framework, leading to limitations in research dimensions.

Third, this research adopts a cross-sectional survey design, which can only reflect the psychological and academic status of medical students at a single time point and cannot infer causal relationships among variables. In addition, all samples are recruited from a single university, which reduces the generalizability of the research results. Longitudinal follow-up studies combined with in-depth interviews can be carried out in future research to further explore the formation mechanism of medical students' psychological and academic problems.

Fourth, due to personal information protection regulations, this research does not collect students' grade point average (GPA), so quantitative analysis on the correlation between mental status and objective academic performance cannot be conducted. Whether and how psychological distress affects academic performance remains to be verified by follow-up studies incorporating academic achievement indicators.

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Author Contributions

Writing—original draft, Y.D., R.P. and G.W.; writing—review and editing, Y.D., R.P. and G.W. All authors have read and agreed to the published version of the manuscript.

Institutional Review Board Statement

This study was conducted with the approval of the ethics committee of the West China hospital, Sichuan University (ethics approval No. 2026-1577).

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study. Participants were informed about the study purpose, voluntary participation, and data confidentiality at the beginning of the questionnaire, and their submission of the questionnaire indicated consent.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflict of interest.

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