



# An Analysis of College Students' Emotional States and Environmental Attribution Factors After COVID-19 Pneumonia Outbreak

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**Abstract.** The study measured the emotional state of 589 university students after the COVID-19 epidemic using the Brief Profile Of Mood States (BPOMS) and summarized the environmental attribution factors that affected their mood. The results of the study showed that: (1) the emotional state of college students after the epidemic was poor, showing a significant deterioration trend compared with the pre-epidemic period; (2) Post-epidemic college students' emotional state was significantly related to their grades, psychiatric history, as well as employment status and pressure of further education.

**Keywords:** Post-epidemic; Brief Profile Of Mood States (BPOMS) ; Emotional attributions

## 1 Introduction

### 1.1 Background to the Study

Since January 8, 2023, the reclassification of the new coronavirus infection marks the conclusion of China's three-year control and prevention of the Category A epidemic. The impact of panic, anxiety, depression, and other psychosocial crises during major epidemics follows distinct stage characteristics<sup>1</sup>. Due to material and economic challenges, college students, as a vulnerable group, are more likely to experience psychological impact and mental health issues<sup>2</sup>. Consequently, there is urgent to understand the psychological and emotional state of college students after the epidemic.

Emotion is defined from various perspectives by scholars. Izard and Malatesta define it as "a special combination of neural processes"<sup>3</sup>. In past health crises, College students, a vulnerable group, are highly susceptible to mental health challenges during public health emergencies, as highlighted in the 2022 China Mental Health Report.

## 1.2 Purpose of the Study

Emotional attribution involves interpreting others' emotions and their causes, focusing on oneself or others/environmental factors<sup>4</sup>. This paper identifies seven variables affecting undergraduates' emotional state post-epidemic, reflecting significant changes in this new era.

Research on undergraduates' emotions during the epidemic focuses on the prevention and control period, neglecting the post-epidemic phase. Building on previous studies, we utilized the Profile Of Mood States (POMS) to survey college students nationwide, developed by American psychologists McNair<sup>5</sup> et al. The POMS scoring results are unaffected by stress and are suitable for measuring relatively persistent mood states<sup>6</sup>. The Brief Profile Of Mood States (BPOMS) condenses the 65 items of the POMS into 40, simplifying its use. Many Chinese scholars have confirmed its reliability and applicability<sup>7-9</sup>. Grove et al. quantified mood as Total Mood Disturbance (TMD), a higher TMD score indicates a more negative mood state, reflecting disorganization, annoyance, or dysfunction<sup>10</sup>.

This paper uses BPOMS for a survey on post-epidemic college students' emotional state, analyzing environmental factors, exploring their relationship with demographics, and constructing a regression model to guide psychological interventions and mental health education.

## 2 Objects and Methods

### 2.1 Objects

Convenience sampling targeted undergraduate students using the Questionnaire Star platform. 589 valid responses (96.24%) were obtained from 612 collected questionnaires after eliminating abnormal responses.

### 2.2 Methods

The General Situation Questionnaire, compiled by the project team, includes general information and factors influencing respondents' moods, with 7 options for each, while the Brief Profile Of Mood States Scale (BPOMS) demonstrates high reliability in measuring respondents' emotional states.

SPSS 27.0 was used to analyze emotional status, participant characteristics, and their relationships, with a significance level at  $p < 0.05$ .

## 3 Results

### 3.1 General Information about the Study Population

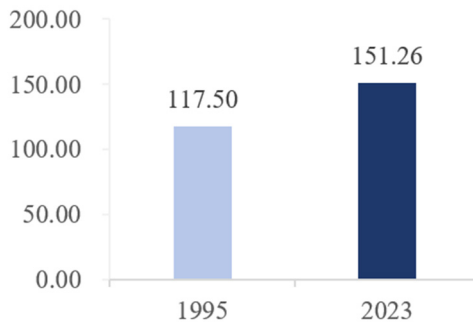
Out of the 589 valid questionnaires, their backgrounds vary. Descriptive statistics of the sample are presented in Table 1.

**Table 1.** Summary of Sample Distribution

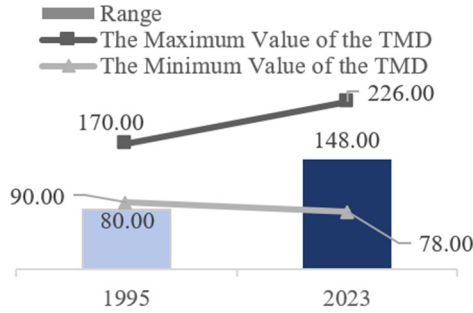
Demo- graphic Variables	University Area						$\chi^2$	p
	Tier 1 cities	new Tier 1 cities	Tier 2 cities	Tier 3 cities	Other cities	Total		
Grade								
Freshman	31% (36)	23% (37)	14% (27)	18% (14)	21% (7)	21% (121)	28.71 (12)	0.004
Sophomore	39% (45)	50% (80)	59% (117)	48% (38)	47% (16)	50% (296)		
Junior	18% (21)	21% (34)	21% (42)	29% (23)	29% (10)	22% (130)		
Senior	13% (15)	5% (8)	7% (13)	6% (8)	3% (1)	7% (42)		
Gender								
Female	55% (64)	60% (95)	56% (111)	56% (45)	62% (21)	57% (336)	1.20 (4)	0.879
Male	45% (53)	40% (64)	44% (88)	44% (80)	38% (13)	43% (253)		
Psychiatric History								
Yes	17% (20)	24% (38)	22% (43)	16% (13)	15% (5)	20% (119)	3.71 (4)	0.447
No	83% (97)	76% (159)	78% (156)	84% (67)	85% (29)	80% (470)		

### 3.2 Emotional Status of College Students

The survey found that the overall TMD mean score of the sample is 151.26, with the highest and lowest values being 226 and 78, with a range of 148(See Fig. 1). In a survey conducted by Professor Zhu Beili at the end of the last century<sup>7</sup>, the TMD mean score was 117.50, with a range of 80 (See Fig. 2). This suggests that the emotional state of undergraduate students is less optimistic at this stage, with a tendency towards polarized emotional states compared to the pre-epidemic period.



**Fig. 1.** Comparing College Students' Emotional State Before and After the Epidemic



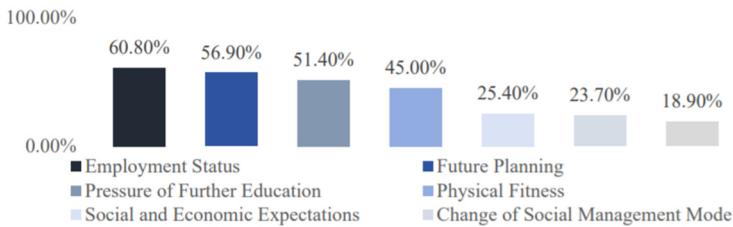
**Fig. 2.** Comparing Extreme Emotional State Values Before and After the Epidemic Among College Students

Males had slightly lower TMD scores than females. Lower-grade college students showed worse emotional states than upper-grade students. And students with a history of psychiatric disorders exhibited significantly worse emotional states. See Table 2 for specific data.

**Table 2.** Variable TMD Score Statistics

Variable Name		TMD Sores
Gender	Female	150.13
	Male	152.75
Grade	Lower	153.15
	Higher	146.67
University Area	Tier 1 Cities	150.05
	New Tier 1 Cities	152.33
	Tier 2 Cities	150.64
	Tier 3 and other Cities	152.55
Psychiatric History	Yes	165.13
	No	147.74

### 3.3 Environmental Influences on College Students' Emotional Deterioration



**Fig. 3.** College Students' Emotional Influences

More than half of the respondents identified the employment status (60.80%), future planning (56.90%), and pressure of further education (51.40%) as the main factors contributing to emotional deterioration. These influencing factors exhibit diverse and concentrated characteristics. See Fig.3 for specific data.

### 3.4 Relationship between Emotional State and Demographic Variables

The analysis showed significant negative correlations between grade level and psychiatric history with TMD scores, while gender and university area had weaker correlations, as seen in Table 3.

**Table 3.** Correlation Coefficient Matrix (Demographic Variables)

	Mean	SD	1	2	3	4	5
<b>1 Grade</b>	2.16	0.829	1	0.095*	0.045	-0.001	-0.096*
<b>2 Gender</b>	1.43	0.495		1	-0.012	-0.016	0.046
<b>3 University Area</b>	2.58	1.123			1	0.021	0.015
<b>4 Psychiatric History</b>	1.80	0.402				1	-0.247*
<b>5 TMD Scores</b>	151.26	28.266					1

\*,\*\*.At the 0.05 level (two-tailed),0.01 level (two-tailed) the correlation is significant.

### 3.5 Relationship between Emotional State and Environmental Factors

The Pearson correlation analysis reveals that the employment status and the pressure for further education are significantly negatively correlated with the TMD scores, as seen in Table 4.

**Table 4.** Correlation Coefficient Matrix (Environmental Attribution Factors)

	Mean	SD	1	2	3	4	5	6	7	8
<b>1</b>	0.45	0.50	1	0.136*	0.014	-0.057	0.019	-0.022	0.037	0.033
<b>2</b>	0.57	0.50		1	-0.31	0.094*	0.034	0.012	-0.008	0.064
<b>3</b>	0.61	0.50			1	-0.042	0.002	0.037	-0.056	0.113**
<b>4</b>	0.51	0.50				1	0.006	0.138*	0.096*	0.103*
<b>5</b>	0.24	0.43					1	0.081*	0.141*	0.066

6	0.25	1.1	1	0.159*	-
		2			0.005
7	0.19	0.4	1	0.024	
		0			
8	151.2	28.	1		
		6		3	

\*,\*\*.At the 0.05 level (two-tailed),0.01 level (two-tailed) the correlation is significant.  
 1 Physical Fitness; 2 Future Planning; 3 Employment Status; 4 Pressure of Further Education; 5 Change of Management Mode; 6 Social & Economic Expectations; 7 Influence of Multi-Channel Information; 8 TMD Scores

### 3.6 Regression Analysis of Factors Influencing College Students' Emotional State after the Epidemic

Significant variables, including employment status, pressure for further education, grade, and psychiatric history, were used as explanatory variables (X), with the TMD score of college students after the epidemic as the dependent variable (Y). These results are shown in Table 5.

Table 5. Linear Regression Model

Y	X	beta	t	R <sup>2</sup>	Ad-justed R <sup>2</sup>	F	p	Dur-bin-Watson	VIF
TMD scores	X <sub>1</sub>	-0.095	-2.388**	0.084	0.078	13.410***	0.000 <sup>b</sup>	1.812	1.010
	X <sub>2</sub>	0.076	-1.899**						1.024
	X <sub>3</sub>	-0.095	-2.388**						1.001
	X <sub>4</sub>	0.229	5.695***						1.029
***,**.Represent 1%, 5%, significance levels, respectively; b. Predictor Variables: (Constant), X <sub>1</sub> , X <sub>2</sub> , X <sub>3</sub> , X <sub>4</sub>									
X <sub>1</sub> Employment Status, X <sub>2</sub> Pressure of Further Education, X <sub>3</sub> Grade, X <sub>4</sub> Psychiatric History									

The linear regression equation obtained from the analysis was:

$$TMD\ scores = 192.679 - 5.492 * X_1 - 4.301 * X_2 - 3.225 * X_3 - 16.090 * X_4 \quad (1)$$

The selected variables—employment status, pressure for further education, grade, and psychiatric history—significantly impact college students' emotional state post-epidemic, explaining 7.8% of the variance with an adjusted R<sup>2</sup> value of 0.078. In the field of Social Behavior and Psychology, an R<sup>2</sup> of 4% or more is considered statistically valid, indicating a satisfactory fit for the linear regression model.

## 4 Discussion

### 4.1 Research Conclusions

The survey reveals that post-epidemic, college students' emotional state deteriorates due to the profound impact of public health emergencies on society. Men's emotional state was slightly worse than women's, and lower-grade students and those with psychiatric disorders faced greater challenges. Employment status, academic pressure, and future plans mainly affected the emotional state. Overall, the study found a significant worsening of students' emotional state post-epidemic, mainly driven by employment status, future planning, and the pressure of further education, while also highlighting specific correlations with grade level, psychiatric history, and employment status.

### 4.2 Recommendations

Individuals should utilize appropriate ways to release stress and improve emotional expression to reduce negative emotions. Appropriate emotional expression is conducive to reducing psychological pressure, promoting mental health and reducing the occurrence of mental illness. Secondly, colleges and universities should give full play to their nurturing function and provide support for students' employment and further studies. Finally, promote the construction of crisis intervention mechanism and build a post-epidemic psychological service relief system. Pay attention to the psychological health of college students, increase the strength of mental health education, and optimize the growth environment of students.

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