Factors Influencing Students' Mental Health in the Post-epidemic Era

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Abstract

Investigate the living conditions and psychological health of university students in Wuhan during the post-epidemic period, and explore the influence of different characteristics on psychological conditions with a multivariate design, to carry out targeted psychological interventions and build an effective psychological health education system for university students. The questionnaire was administered on an online platform in mainland China, using a combination of stratified sampling and snowball random sampling. The results show that the higher the economic level of the family, the better the psychological health of the group; the psychological health of postgraduate and doctoral students is better than that of undergraduate students; among undergraduate students, the psychological health of junior students is higher than that of senior students. What we can conclude from the statistics is that university students, as a reserve force for national construction, the government, universities, and families should work together to improve the mental health of university students.

Keywords: *Students in higher education; post-epidemic era; mental health status; life status*

1. INTRODUCTION

Since late 2019, a novel coronavirus pneumonia outbreak has swept the world, and the World Health Organization has defined novel coronavirus pneumonia as an "international public health emergency" [1]. Under the high priority of the Party and the State, the fight against the epidemic has been effective and the spread of the epidemic has been adequately controlled across the country, and Chinese society has moved from the outbreak phase of the new coronavirus in 2020 to the normalized prevention and control phase of the epidemic, the "post-epidemic era".

Studies in recent years have shown that anxiety, depression, post-traumatic stress disorder (PTSD), and other psychological problems are common in the period following a stressful event [2]. The university students are considered as a high cultural quality and a high degree of concern for social hotspots. However, they have less life experience and are prone to mood swings [3] and are therefore often considered to be a vulnerable group in society in terms of psychological aspects [4]. In 2021, the epidemic was basically under control in China, and

university students across the country returned to their universities and gradually resumed their normal studies. However, the psychological problems of students arising from the pressure of the ongoing local outbreak and the control measures in schools need urgent attention and inspection. Against this backdrop, the project team selected students from some universities in Wuhan to conduct this survey, intending to develop targeted psychological education work and an effective mental health education system for university students.

2. SURVEY METHODOLOGY AND PARAMETER DESIGN

2.1. Data sources and survey respondents

In the era of epidemics, the novel coronavirus pneumonia epidemics are sporadic and flow with localized outbreaks. Schools across the country tend to adopt control measures such as restricting access to schools and regular reporting body temperatures, and such a simplification living environment is prone to breed serious psychological problems. Against this backdrop,

the project team conducted a questionnaire survey on students' living conditions and mental health in the post-epidemic era from June 1 to June 30, 2021. The survey was conducted using the questionnaire website as the survey platform, using a combination of stratified sampling and snowball random sampling. A total of 465 samples were collected, of which 460 were valid, with an effective rate of 98.92%.

2.2. Survey Methodology

2.2.1. Basic survey

The survey was conducted by means of a self-administered questionnaire, which included gender, stage of the study, region of origin, region of family, level of living expenses, family economic status, and so on. The survey was designed to measure the relationship between the respondents' factors and their psychological status.

2.2.2. Assessment of psychological status

Psychological state is one of the basic forms of psychological activity, characterized by both psychological processes and psychological characteristics of personality, and is both temporary and stable[5]. In this survey, a self-administered questionnaire was used to assess the mental health of the respondents based on the Symptom Self-Rating Scale SCL-90 and the General Health Questionnaire GHQ-12. The self-administered questionnaire has six questions to assess psychological status, covering three areas: communication skills, psychological depression, and psychological stress. Specific questions included the content and duration of interaction with others, satisfaction with the current school state policy, and the degree of depression and irritation with the current living environment. The questions were scored and weighted according to the research on people's psychological behaviors[5], and the psychological state was measured using the comprehensive evaluation method, with a score of 1-5, with higher scores indicating a more positive psychological state of the respondents.

2.2.3. Quality control

The project team combined the world's best-known mental health test scale (Symptom Self-Rating Scale SCL90) with the General Health Questionnaire GHQ-12 self-administered questionnaire, which has good internal consistency reliability (Cronbach's a =0.94) in our population, in the questionnaire content design to improve the accuracy of psychological status assessment [6]. The questionnaire was administered using a combination of stratified and snowball random sampling to capture the psychological status of respondents from different categories of groups. In the control phase of the survey, the "Questionnaire Star" platform can ensure the completion rate of the questionnaire, and in the survey entry data, the data with obvious errors and excessive deviations can be found and eliminated in time [7].

2.3. Data processing and model building

The questionnaire data was aggregated and read by using pandas (Python Data Analysis Library) to check the basic situation of the dataset, transform the overall data in the dataset, and binaries the discrete text data features in the dataset using scikit-learn (Machine Learning in Python). The data set is checked for missing data, the missing values and outliers are dealt with, the missing data is predicted and filled in using a random forest model, the outliers are corrected and finally, a weighted average is used to calculate the psychological feelings as the last part of the data to be placed in the file.

The dependent variable in the data is the students' psychological health status, and the score of the comprehensive evaluation ranges from 1 to 5, with higher scores indicating a more positive psychological status of the respondents. The respective variables are categorical variables and the sample size meets the basic requirements of multiple regression, so this study adopts an ordered logistic regression analysis.

The specific data processing and model building steps are as follows.

Step 1: Aggregate data and read data using the pandas library in Python and perform data type conversion

Step 2: Binarize the discrete text data features using the scikit-learn library in Python

Step 3: Predict and fill in missing data using a random forest model

Step 4: Calculate psychological perception scores using the weighted average

Step 5: Use the univariate analysis for each variable and remove some irrelevant predictor variables

Step 6: Use multi-factor analysis to further identify and remove confounding factors

Step 7: Analyze the effect of each factor on psychological status using ordered logistic regression analysis

3. RESULTS

3.1. Students' mental health status

Of the 460 students surveyed, 2(0.5%) had a psychological feeling of level 1, 7(1.6%) had a level 2, 155(33.7%) had a level 3, 276 (60.0%) had a level 4 and

20 (4.6%) had a level 5. The results of the self-administered questionnaire are shown in Table I below.

TABLE I.   MENTAL HEALTH STATUS STATISTICS

Scores		1	2	3	4	5
Gender	Male	1	2	71	126	11
	Female	1	5	84	150	9
Grade	Freshman and Sophomore	2	4	56	77	1
	Junior and above	0	2	58	95	0
	Postgraduate	0	0	24	64	0
	Doctor	0	1	17	40	0
Location	Rural	0	4	51	81	5
	Suburban	0	1	47	94	3
	Urban	2	2	57	101	12
Cost of living/month	<=1000	0	1	8	10	2
	1000-1500	0	3	42	56	6
	1500-2000	1	2	58	112	5
	2000-3000	0	0	34	59	2
	>=3000	1	1	13	39	5
economic status	Low	0	1	8	2	1
	Average	0	0	39	34	7
	Moderately well-off	0	1	68	137	5
	Middle class	1	4	28	87	6
	Wealthy	1	1	12	16	1

The result of this survey shows that the mental health of university students is at a relatively good level in the post-epidemic era, with 56.53% of respondents indicating that they did not have negative emotions in the past month, and even more 17.83% indicating that they could have better self-organized time, with only 19.56% indicating that they were inefficient when studying and researching online. This indicates that a significant proportion of university students are at a good level of mental health. Some other researchers have shown that the detection rates of depression and anxiety symptoms among university students under the new coronary pneumonia epidemic were 39.0% and 26.9% respectively[8], while the results of this survey showed that only 16.95% of respondents had similar symptoms, which indicates that the level of students' ability to regulate their psychological condition has improved under the regular prevention and control of the epidemic for more than a year, while the percentage of respondents who spent more than one hour a day communicating with others The percentage of respondents who communicate with others for more than one hour a day is 67.39%, which indicates that communication is the main method to solve psychological problems.

3.2. Students' mental health status

Different gender, grade, family's geographical location, cost of living level, and family's economic status have different sizes of influence on the mental status of university students in this survey. And among them, there is no statistically significant difference between different genders and the geographical area where the family lives on the mental health condition. The results are shown in Table 2.

TABLE II.   SINGLE-FACTOR ANALYSIS OF MENTAL HEALTH STATUS

Project	χ^2	DF	P-value
Gender	0.009	1	0.923
Grade	10.550	3	0.014
Location	1.490	2	0.475
Cost of living	2.650	4	0.618
Economic status	12.721	4	0.013

3.3. Multi-factor analysis of factors influencing the psychological status

An ordered logistic regression analysis was used to analyze the mental health status (scale 1-5) as the dependent variable and the five variables of gender, stage of schooling, geographical location of the family, cost of living level, and family economic status as covariates. (Table 3 for variable assignments.) The results showed that the likelihood ratio test showed a significant level of 0.027 for the ordered logistic model, indicating that the model fitted well and the simulation results were reliable. (Table 4)

TABLE III. MULTI-FACTOR ANALYSIS VARIABLES AND ASSIGNMENTS

Variables	Assignment
Gender (X1)	Male =1, Female =2
Grade (X2)	Freshman and Sophomore =1, Junior and Above =2, Postgraduate =3, Doctor =4
Location (X3)	Rural =1, Suburban =2, Urban =3
Cost of living (X4)	<=1000/month =1, 1000-1500/month, 1500-2000/month =3, 2000-3000/month=4, >=3000/month =5
economic status (X5)	Low (annual income < ¥50,000)=1, Average (¥50,000 < annual income < ¥100,000)=2, Moderately well-off (¥100,000 < annual income < ¥500,000)=3, Middle class (¥500,000 < annual income < ¥1000,000) =4 Wealthy (annual income > ¥1,000,000)=5

| Psychological Status Score (Y) | Psychological Status Level 1-5 | | | |

TABLE IV. RESULTS OF ORDINAL LOGISTIC REGRESSION MODEL

Variables	C	SE	P-value	OR
Grade= Freshman and Sophomore	0.632	0.322	0.049	0.531
Grade =Junior and Above	0.427	0.315	0.033	1.028
Grade = Postgraduate	0.503	0.350	0.948	1.008
economic status=Low	0.275	0.751	0.002	1.017
economic status=Average	1.874	0.675	0.005	0.154
economic status = Moderately well-off	2.202	0.660	0.001	0.111
economic status = Middle class	1.894	0.670	0.005	0.150

Firstly, the stage of study has a significant impact on the mental health status of university students. According to the results of the regression model, the psychological condition of those who are in their third year of study and above is the most sensitive, probably because the group with "Year = Third year and above" has more contact with the Internet, but their minds are not yet mature and their ability to resist stress is weak, and their confusion about their future choices makes them pay more attention to social environment factors, which eventually leads to psychological anxiety and even very high psychological stress [9]. Even the psychological pressure is very high [9].

Secondly, the influence of students' family economic status on the mental health of university students is significant, in which the regression coefficient of "family economic status = low income" is 0.275 and the dominance ratio is 1.017, indicating that the group of "family economic = low income" is more likely to be in a state of psychological stress than the group of "family economic = low income". The regression coefficient for "household economic status = low income" was 0.275 and the dominance ratio was 1.017. This suggests that the mental health of students from more average families is worse than that of students from better-off families. Possible reasons for this are that students from less well-off families tend to be more diligent in high school, but when they enter university, grades become less of a part of their lives, and the psychological satisfaction that

comes from serious study diminishes. Moreover, in the post-epidemic era, when various sectors of society receive shocks and impacts, there is a greater sense of disparity due to the inadequacy of their family situation, which can lead to anxiety, depression, and poorer psychological health [10].

Thirdly, the effects of gender, family location, and the level of living expenses at school on psychological status were not significant. The effect of gender on psychological status is not significant, indicating that there is no significant difference in the ability of students to adjust to psychological stress between male and female gender differences; the effect of the geographical location of students' families on psychological status is not significant, indicating that students in different geographical areas may have different means of adjusting their psychological status.

4. INFLUENCING FACTORS AND CAUSES OF FORMATION

4.1. Influence from the stage of the study

According to the data from the research study, the mental health status of postgraduate and doctoral students is better compared to undergraduate students. In contrast, compared to their junior year and above, students in the lower years of university have a certain advantage in terms of their mental health status.

Postgraduate and doctoral students have experienced longer periods of research and social contact, and are more resilient, able to regulate, have a more rational perspective and way of thinking, and therefore have better mental health. Students in the lower years of university are still at a preliminary stage of social awareness and are less able to withstand psychological stress [11]. However, with a long time to go before they graduate from university, they face less stress and are therefore in a better psychological state [12]. The senior students, on the other hand, are more mature mentally, but their choices for the future make them more concerned about social and environmental factors. The impact of the epidemic made them feel confused about the future, which led to the development of psychological problems. Senior students are under pressure to graduate because of the difficulty of economic recovery in certain industries after the impact of the epidemic, and they easily feel anxious because of the fierce competition [13].

4.2. Influence of family economic status

Research studies have shown that the higher the economic level of the family, the better the psychological situation in the post-epidemic period. Among low-income families, only 25% had a mental health status

level three or above; among families with average economic status, 51.3% had a mental health status level three or above; among families with modest and middle-class economic status, the figures were 64.9% and 69.04%, indicating that higher family economic status has a positive impact on students' mental health status. This is in line with other researchers' findings that "university students from economically disadvantaged families are more likely to have adverse psychological problems"[14]. College students with relatively poor family circumstances are more likely to have suboptimal psychological health in several areas. Most of these students worked hard in high school and were at the top of their studies. However, upon entering university, grades become less of a part of their lives, and the psychological satisfaction that comes from serious study gradually diminishes. And in the post-epidemic era, when various sectors of society receive shocks and impacts, the lack of family status can create a greater sense of disparity, which can cause a psychological loss of balance and a reluctance to confide in and share with others [15]. Parents with average family finances often have higher demands and expectations of their children, and are more likely to experience anxiety and irritability in the face of the differences between their family situation and their surroundings and the pressures brought on by their families [16].

5. RECOMMENDATIONS

China is in a critical period of social and economic development transition, and in this increasingly complex international and ecological environment, the frequency of public health emergencies and accidents has increased. As a reserve force for national construction, the mental health of university students plays an important role in their future development and is particularly crucial to the future development of the country. Educating students to establish a correct outlook on life and values, improve their psychological quality capabilities and build an effective mental health education system should be improved as soon as possible. Through the research group's project survey, the stage of study and family economic factors have a greater impact on university students in the post-epidemic era. The following suggestions are made to address both aspects.

5.1. Ways to address the psychological problems of the schooling stage factor

After the project team's research, the psychological health of postgraduate and doctoral students is better compared to undergraduate students. Compared to junior and above students, junior students have a certain advantage in terms of mental health status. The main reason for this is that freshers and sophomores have a long time to go before school, so they are less susceptible

to stress, while other students face future pressures that can lead to psychological anxiety and psychological problems. At the university level, education on goal planning and the current situation of society should be strengthened for junior students to enhance their awareness of the crisis of future development. Students in their third and fourth years are under pressure to choose their future, and those on the verge of graduate school and those who are unemployed are under even greater mental pressure, and the epidemic's closure policy and the interactions between students make psychological relief even more difficult. School teachers and counselors should give students the right guidance so that they have a way to vent their stress and tension in the post-epidemic era and to relieve all aspects of their psychological problems, so that they can arrange their time rationally and always maintain good psychological health.

5.2. Ways to address the psychological problems of the schooling stage factor

In the post-epidemic era, the fight against the epidemic has been effective and the spread of the epidemic has been adequately controlled across the country. However, university students, as a more vulnerable group in society in terms of mental health, are prone to mental health problems such as anxiety and anxiety. China is in a critical period of socio-economic transformation, and university students, as the future reserve of the country, should cultivate comprehensive quality along with psychological adjustment ability. This study aims to investigate the situation of university students in the post-epidemic era and to make feasible suggestions for psychological interventions for the university student population. Most of the respondents in this study were in a relatively healthy psychological condition, but it is still necessary to develop targeted psychological intervention work and build an effective psychological health education system. The state and government should introduce relevant policies, universities should actively cooperate to establish and improve the psychological support system, and families should also adjust their education methods to ensure the psychological health of university students. In the subsequent research, the application of statistics in the issues of students' daily mental health and future development planning can be further explored, with a view to proposing feasible solutions for the comprehensive development of university students.

6. CONCLUSION

In the post-epidemic era, the fight against the epidemic has been effective and the spread of the epidemic has been adequately controlled across the country. However, university students, as a more vulnerable group in society in terms of mental health, are

prone to mental health problems such as anxiety and worry. China is in a critical period of social economic transformation, and university students, as the future reserve of the country, should cultivate comprehensive quality along with psychological adjustment ability. This study aims to investigate the situation of university students in the post-epidemic era and to make feasible suggestions for psychological interventions for the university student population. Most of the respondents in this study are still in a relatively healthy psychological condition, but it is still necessary to develop targeted psychological intervention work and build an effective mental health education system. The state and government should introduce relevant policies, universities should actively cooperate to establish and improve the psychological support system, and families should also adjust their education methods to ensure the psychological health condition of university students. Subsequent research can further explore the application of statistics in issues such as students' daily mental health and future development planning, to propose feasible solutions for the all-around development of university students' moral, intellectual, physical, and aesthetic well-being.

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