The Current Mental Status of Adolescent Students in High Schools in China and School Life-related Factors that Influence Their Mental Status

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Abstract: Suicide is an important mental-health-related problem in East Asian countries. In recent years, there is an increasing trend in this social problem in China. China has a huge number of students and fewer teaching resources, which leads to greater competitive stress. It is of our interest to see whether there is a strong relationship between the deterioration of high school students' mental health status and the pressure from homework and exams.Although there has been much research on the relationship between depression and learning among college and graduate students, but there is a lack of research on adolescent high school students. Therefore, the objective of the current study was to evaluate the current mental health status of adolescents studying in high school in China and source of stress.

Keywords: Adolescences, depression, suicide rate

1.   Introduction

Objective: Suicide caused by depression among Chinese adolescence has become a more and more severe social problem[1]. It is suggested that the prevalence of suicide attempts among Chinese adolescents was 2.94% (95% CI: 2.53%-3.41%) in 2015.[2] Statistics also showed that the detection rate of depression among Chinese adolescents was 24.6%, of which mild depression was 17.2% and severe depression was 7.4%, which is only slightly better than that in Korea and Japan.[3] It is also worth noting that the first peak in suicide rates in China is between the ages of 15-24, rather than 25-34 in other societies. [4]There is evidence that the rate of those who committed suicide among adolescents aged 10-19 years was 44.1% for those with mental disorders.[5] Stress from school life is considered an important factor affecting the mental health of Chinese adolescents and it is suggested higher academic degrees are generally leading to poorer mental status. The objective of the current study was to evaluate the current mental health status of adolescents studying in high school in China and explore the level and source of stress. It is of our interest to see whether there is a strong relationship between the deterioration of high school students' mental health status and the pressure from homework and exams.

Methods: An online questionnaire was used to collect relevant information from high school students in different parts of China. Data analyses (e.g. descriptive analysis and statistical modeling) were conducted using Stata 17.0.

Results: Among the 183 participants, there are 34 participants (18.5%) reported a score that could be considered depressive. Our results suggested that there is no significant difference in the prevalence of mild depression by gender. Those who study in the northern part of China and those who studied in higher grades demonstrated a higher prevalence of mild depression. In addition, the occurrence of depression in students is likely to be associated with voluntary study time length, although the p-value (0.057) only indicates a borderline statistical significance.

Conclusion: Students who have the shortest length of voluntary study time tend to have a higher chance of depression. Attention should be paid to students who show little interest in studies and thus study the least amount of time, as these students are very likely to have study-induced mild depression.

2. Methods

2.1. Study Design

From March 14, 2022, to April 14, 2022, a cross-sectional study was conducted, with data collected from high school students (from Grade 9 to 12) coming from different provinces in China. Participants were recruited using a convenient sampling method. The questionnaire was designed through an online crowdsourcing platform called Wenjuanxing.[6]

2.2. Measurement

The questionnaire collected information on the following variables: sex, grade, average sleeping time per day (22:00-23:00, 23:00-24:00, 24:00-1:00, after 1:00), mandatory time length that is required to spend on studying (4h,4-5h, 6h and above) and independent study time (0-1h,1-2h,3h and above).

Apart from these, items that measure the level of stress perceived by students were included. Participants were asked to self-measure their condition at school. The following variables were included to determine the depressive mood score: level of difficulty in falling asleep (ranging from not difficult at all to suffering from insomnia), self-measurement of appetite for food (always hungry and eating too much, normal, lost interest to food, other), ways to wake up (usually alarm clock, sometimes waking up before alarm rings, always waking up before alarm rings), the frequency of crying and anxiety about the future, feelings of tiredness, levels of self-confidence, self-assessed emotional condition (e.g. usually calm and peaceful, being mad most of the time), sudden weight gain or loss.

All items that measure the level of stress were rated on a 4-point Likert scale, with 4 being the lightest degree and 1 being the most severe. For each multiple choice question, obtaining a score of two or more represents a healthy mental state whereas a score of less than two indicates a relatively poor mental state.

Participants whose overall score is below 25 are considered as having mild depression. The rationale of this score calculation for depression was referred to Self Rating Depression Scale by William W.K.Zung.

2.3. Data Anlysis

The data were analyzed using Stata 17.0 software. Categorical variables were summarized using absolute numbers and percentages. Continuous variables were described using mean and standard deviation (SD). Chi-squared test and logistic regression model were used to analyze the relationship between depression and other factors such as grade, region, and sleeping time.

3.   Results

3.1.   Characteristics of the Study Participants

The detailed characteristics of the study participants were presented in Table 1. In total, we collected information from 183 high school students (Grade 9 to Grade 12) coming from 14 different provinces in China. Among them, there are 75 male (21.3%) and 108 female participants (78.7%).

In general, females and males showed roughly equal percentages of having mild depression. Participants in the northern part of China reported a higher rate of mild depression than that in the southern region. Non-boarding students had a higher chance of mild depression compared to boarding students. Students in a lower grade (e.g. 10th-grade students reported a relatively lower rate of mild depression (11.7%) compared to students in higher grades (11th and 12th grade), which are about 20%. In terms of non-mandatory time spent on studying, participants that studied the longest time showed the lowest rate of mild depression, while those that study the shortest time reported the highest rate. Moreover, participants that reported having the latest sleeping time have the highest rate of mild depression (50%), and those who reported having the earliest sleeping time have the lowest rate (15.2%).

3.2.   Tables

Table 1: Characteristics of the study participants

Variable	Overall (n = 183)	Mild depressed (n =)	No depression (n =)
Sex			
male	75	16 / 0.213	59
female	108	21 / 0.194	87
Region			
Northern	78	18 / 0.23	60
South	105	16 / 0.15	89
Lodging			
Yes	92	14 / 0.15	78
No	91	20 / 0.219	71
Grade			
10th	17	2 / 0.117	15
11th	74	15 / 0.202	59
12th	91	17 / 0.187	74
Non-mandatory time spend on studying			
0 - 1 h	17	7 / 0.411	10
1 - 2 h	62	10 / 0.16	52
2 - 3 h	73	14 / 0.191	59
> 3 h	31	3 / 0.096	28
Mandatory study time length			
0 - 4 h	32	8 / 0.25	24
4 - 5 h	52	13 / 0.25	39
5 - 6 h	33	6 / 0.181	27
> 6 h	66	7 / 0.106	59
Sleeping time			
22:00 - 23:00	59	9 / 0.152	50
23:00 - 24:00	90	15 / 0.167	75
24:00 - 1:00	30	8 / 0.267	22
After 1:00	4	2 / 0.5	2
Depression score	Mead (SD)	Mean (SD)	Mean (SD)
	28.29891		

4.   Discussion

Our study suggested that study time was negatively associated with the chance of developing mild depression. Participants who had the shortest length of independent and mandatory study time showed the highest probability of mild depression and the probability of mild depression decreases with increasing study time.

In addition, there were only small differences in the prevalence of mild depression between male and female students. In contrast, this difference was 8% between students who study in the North and South regions. This may be due to the uneven distribution of educational resources in the northern and southern parts of China. For example, while the two top domestic universities, Tsinghua University and Peking University, are in Beijing, the rest of the eight universities are in the south. Among the 15 non-national key universities in the top 20 of the 2022 SoftTech China University Rankings, 11 are located in the south, except Yanshan University in Hebei[7]. The universities in southern China are more evenly distributed in Shanghai, Guangdong, Zhejiang, Jiangsu, and Hubei. This is likely to bring much pressure on students who study in the northern part of China as they face fierce competition.

Furthermore, boarding students are less likely to have mild depression than boarding students. This is possibly due to factors such as routine school life, which guarantees enough sleep time. This is considered quite beneficial for emotional stability.

In terms of grade, students in higher grades (e.g. Grade 11 and 12) reported a higher prevalence of mild depression than students in lower grades, providing evidence supporting our hypothesis that stress from the study (including excess homework and intensive preparation for exams) is likely to result in mild depression.

As for the length of study, both correlated independent variables, the length of autonomous and non-self-occupied study, were positively correlated with the participants' chance of developing mild depression. The shorter the length of study, the higher the scores on the questionnaire. This may be because mild depression affects memory capacity and concentration ability, leading to a decrease in the number of hours students spend studying due to poor academic performance. The reason for this is consistent with the fact that depressed patients are impaired in their functioning on cognitive, including impaired learning and memory, reduced attention and concentration, and lower processing speed[8]. This means that the cause of a student's short learning time may not be due to a subjective decrease in willingness to learn, but objectively due to a decrease in cognitive function.

The participants who filled in the latest bedtime showed the highest probability of mild depression, but because only two participants filled in the period and one of them scored below 25, the evidence of this argument is not strong enough. However, the fact that mild depression and sleep length are somehow associated should be considered. The most prominent advantage of our study is that the sample of this questionnaire includes students from all provinces in China except Tibet and Xinjiang, so the sample is relatively representative from a national level. However, a non-negligible limitation of the current study is the small sample size, which may potentially lead to high heterogeneity and spontaneity in the results. Further studies with a larger sample size are expected to be carried out to address these issues.

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