

# Research on the psychological status and related factors of high school students at home under the COVID-19 epidemic

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**Abstract:** Reducing the spread of infection during the COVID-19 pandemic has prompted people to study at home. High school students bear academic pressure, and long-term loneliness can also affect their mental health as a particular group. The purpose of this study is to study and investigate the mental health level of high school students or senior high school students who have stayed at home during the epidemic. This study conducted a questionnaire survey on senior high school students who studied at home. The optimization strategy of this study starts from four aspects: students themselves, teachers, family environment and network platform construction. And this study content is based on the learning performance of senior high school students who conducted online teaching at home. The purpose of this study is to understand the learning status and the influencing factors of the learning performance of network teaching in high school students under the influence of the epidemic.

## 1. Introduction

### 1.1 Background

Since the outbreak of the COVID-19 epidemic in March 2020, the global economy has been hit hard by the pandemic. According to the World Health Organization data, as of January 4, 2022, there were 290,959,019 confirmed cases worldwide, with a total of 5,446,753 deaths [1]. In order to reduce the risk of the spread of COVID-19, the government has also formulated a series of non-pharmaceutical public health interventions, including online courses, home quarantine, and home study [2]. More and more people choose to work from home and study at home. However, in addition to the impact of the COVID-19 epidemic on human health, there is evidence that the pandemic can also affect mental health [3]. As a particular group, adolescents learning at home during the epidemic are prone to serious psychological problems such as fear, disappointment, and pessimism and exacerbate their potential psychological problems [4].

According to relevant data, the age distribution of anxiety disorders and depression among high school students is higher than that of adults [5], and the loneliness and prolonged social isolation caused by isolation and home study during the epidemic can also increase the risk of mental illness in individuals [6]. High school students' quarrels with their parents, insomnia, difficulty in online learning, and anxiety and depression at home are positively related to depression and anxiety after studying at home [7].

### 1.2 Literature review

Zhang found that Chinese teenagers report a high prevalence of depression and anxiety symptoms. Poor relations between women, urban areas, and parents may be risk factors for depression and anxiety symptoms. In addition, policymakers, schools, and families need to pay more attention to adolescents' mental health and develop responses and early interventions to reduce the prevalence of depression and anxiety among adolescents [8].

Zeng used a web-based cross-sectional survey to find that the prevalence of depression symptoms, anxiety symptoms, depression, and anxiety symptoms of ordinary high school students during the COVID-19 pandemic was 52.4%, 31.4%, and 26.8%, respectively. From moderate to severe, the

incidence and severity of depression symptoms and anxiety symptoms is higher than that of female students in 17.6% and 4.6%, respectively, and the incidence and severity of mental symptoms in first grades of senior high school students are higher than that in the other two grades [9]. Murata analysed that the main results are clinically significant depression, anxiety, and post-traumatic stress disorder (PTSD) symptoms, suicidal thoughts or behaviors, and sad reactions since COVID-19: teenagers are significantly more likely to report severe depression symptoms, anxiety disorders, suicidal thoughts, or among those who have lost their loved ones due to COVID-19, the strong grief response rate is 55%. At the same time, loneliness is the most common predictor of results. The longer it takes on social media, and the longer it comes into contact with COVID-19-related media, it can predict the depression symptoms and suicidal thoughts or behaviors of teenagers, COVID-19 pandemics, and clinically significant mental symptoms. The increase in incidence is related. Loneliness increases the risk of mental illness [10].

### **1.3 Research gap**

Through describing the psychological situation of home-based high school students in China, few articles have explored the relevant factors affecting the psychological problems of home-based high school students, which is the research gap. This study will provide a basis for formulating psychological intervention measures for home-based high school students and high school students who have been at home for a long time in the future.

Most articles mainly study the mental health of teenagers and high school students and the incidence of depression and anxiety during the COVID-19 pandemic or the mental health of ordinary high school students. As one of the most vulnerable groups, China's high school students have academic pressure and need to face the health threats brought during the COVID-19 pandemic. Few scholars have studied the psychological situation and related factors related to the special group of high school students at home.

With the stabilization of the epidemic, quarantine has been lifted. Adolescents' mental health has improved, but some high school students still need to study at home. In addition, mental health diseases may affect teenagers who study at home for a long time during the worst period of the COVID-19 pandemic.

### **1.4 Research framework**

The purpose of this article is to study the current situation of Chinese high school students studying at home, especially the characteristics of their psychological conditions, what psychological problems will be caused by long-term loneliness among teenagers. By providing optimized countermeasures, this study explores the mental health status of Chinese high school students by analysing data and surveys and providing preventive measures for the possible adverse psychological health outcomes of future high school students/at-home high school students.

## **2. Methods**

This study uses convenient sampling methods to collect and extract data from high school students (first to the third year of senior high school) in Ganzhou City, Jiangxi Province. Online surveys are carried out using self-filled questionnaires sent through the Internet. The criteria are high school students who voluntarily participate in mental health assessment or senior high school students who have studied at home.

Use questionnaire stars for SCL-90 questionnaires) SCL-90 questionnaires are widely used in many fields (6). The SCL-90 scale consists of 90 self-reporting items, divided into nine scales (somatization, obsessive-compulsive disorder, interpersonal sensitivity, depression, anxiety, anger and hostility, fear anxiety, paranoia, and mental illness) and a different scale to measure appetite and sleep disorders. Each item uses a 5-point score (1-5; 1 = no at all; 5 = very). We add up all the items to calculate the total psychological distress score. The higher the SCL-90 score, the more serious the psychiatric

symptoms. The total score of the SCL-90 scale is more than 160 points, indicating that the subjects have positive mental health problems.

A total of 1,000 questionnaires were distributed, 962 were recovered, and 905 valid questionnaires were issued, of which 488 were boys, and 417 were girls, with an average age of 17.2 (SD=0.96)

The SPSS 22.0 statistical analysis software package is used for statistical analysis. It is statistically significant to take  $P < 0.05$ .

### 3. Result

Learning performance refers to learners' learning performance and benefits when they complete a certain task at a certain time and under certain conditions. High school students are at the peak of development, great changes have taken place both physically and mentally. Under the influence of the epidemic, students may experience anxiety, panic, and lack of concentration in study. Student home network learning is different from the original school, family environment, personal factors, teachers' style and preparation condition, the influence of the school, and the teacher in charge of the supervision mode. In addition, it affects students' learning efficiency online learning. The efficiency level directly reflects the home-based students' grasp of learning content, learning quality, and other aspects affecting learning efficiency. Learning efficiency, quality, quantity, and benefit mentioned above are the main manifestations of learning performance.

#### 3.1 Resilience and validity of the test tool

##### 3.1.1 Reanimate analysis

The semi-subdivision correlation coefficient of the 4 factors is between. The overall half-point correlation between 76 and 0.92 (after correction) is 0.83. The internal consistency analysis of Kud Richardson (K-R20) found that the internal consistency of each factor was between 0.67 and 0.88, and the full scale was 0.94. This survey has good reliability.

##### 3.1.2 Efficiency analysis

The validity is tested by factor analysis. After second-order factor analysis and orthogonal rotation, the cumulative contribution rate of the four factors reaches 79.2%. The factor load of each factor is between 0.37 and 0.66, indicating that the structural efficiency of SCL-90 is relatively good.

Table 1. The number of high school students' SCL-90 scale factor points'  $\geq 2$ ,  $\geq 3$  and their percentage.

Score of the factor	$\geq 2$					
	Male		Female		Total number	
	Number Of people	%	Number of people	%	Number of people	%
Depression	21	2.3	25	2.7	46	5.0
Anxiety	30	3.3	31	3.4	61	6.7
Horrible	29	3.2	28	3.1	57	6.3
Loneliness	21	2.3	26	2.8	47	5.2
Total number	101	11.1	110	12.1	211	23.3
	$\geq 3$					
	Male		Female		Total number	
	Number of people	%	Number of people	%	Number of people	%
Depression	1	0.1	2	0.2	3	0.3
Anxiety	2	0.2	3	0.3	5	0.5
Horrible	3	0.3	6	0.6	9	0.9
Loneliness	3	0.3	5	0.5	8	0.8
Total number	9	0.9	16	1.7	25	2.7

### 3.2 Psychological status of high school students

#### 3.2.1 Mental health problem detection rate of senior high school students

It can be seen from Table 1 that of the 905 high school students, 211 are more than or equal to 2, of which 101 are boys, 110 are girls, 25 are greater than or equal to 3, 9 are boys, and 16 are girls. There is no significant difference between male and female students by rank combination test. It can be seen from the above that 23.3% of high school students have mental health problems, and 2.7% have obvious mental health problems.

#### 3.2.2 Gender differences in mental health problems of senior high school students

From Table 2, it can be found that the average depression score of boys is higher than that of girls, and there are statistical differences in the results, and there are no obvious differences in others.

Table 2. Gender differences in SCL-90 for senior high school students.

Statistical magnitude	Male(n=488)		Female(n=417)		Z
	M	SD	M	SD	
Depression	1.878	0.621	1.795	0.601	3.31*
Anxiety	1.867	0.634	1.822	0.645	1.12
Horrible	1.832	0.643	1.796	0.592	1.94
Loneliness	1.833	0.598	1.866	0.623	0.97

(Note: \*P<.05)

During the COVID-19 pandemic, this study analysed the psychological reactions and related factors of high school students at home and high school students who have studied at home during the COVID-19 pandemic. This survey shows that 23.3% of high school students in Ganzhou City, Jiangxi Province, have mental health problems, and 2.7% have obvious mental health problems. This study's prevalence of depression is significantly higher than that of high school students before studying at home [11]. Most of students in a state of depression or anxiety are mild or moderate, and a few are severe.

## 4. Discussion

Relevant analysis shows that the research effect is closely related to depression and anxiety symptoms. High school students face too much academic pressure in the college entrance examination. In terms of grades, high school is a risk factor for depression and anxiety symptoms; the higher the level, the higher the prevalence of depression and anxiety symptoms [12]. According to the analysis results of this article, the most common symptom of depression is anxiety, which may worsen due to long-term study at home.

### 4.1 Students

In investigating students' factors that affect students' learning performance, subjective factors (such as personal self-control and learning attitude, etc.) have the greatest influence on learning performance. The difference in students' online learning status is great, which is caused by students' subjective factors, so it is inevitable to improve their autonomous learning ability. Students with better independent learning ability will constantly optimize their factors in the network teaching to continuously score points in learning performance to make themselves better in the best. However, students with poor independent learning ability may be left behind in future studies, and their factors make their home-based online teaching effect not good. Improving students' independent learning ability needs the joint efforts of students themselves, schools, teachers, and families.

### 4.2 Teachers

In the investigation of teacher factors influencing students' learning performance, teachers' teaching level and lesson preparation level, teachers' strict requirements, the difficulty of classroom content, teachers' teaching style, and other factors greatly influence learning performance. In the network

environment, students' dominant position in learning is particularly prominent, requiring teachers to respect students' dominant position in the teaching process fully. So pay more attention to the student-centered design of education and teaching activities based on full lesson preparation and teaching of classroom knowledge.

The screen separates In-network teaching, teachers, and students, and the way of communication between teachers and students is changed from face-to-face to voice or text communication. In the study, "group presentations" and "face-to-face video discussions" were the most popular. The way of communication between teachers and students affects students' learning performance in online teaching. Increasing the interaction of classroom activities can fully mobilize students' enthusiasm in learning, make students integrate into the classroom efficiently, and improve their learning performance.

### **4.3 Family**

In the investigation of family factors affecting students' learning performance, the warm state of the family environment is the main factor affecting students' learning performance. What kind of family tradition, children have what kind of spiritual outlook. The sweet condition of the domestic environment is the reflection of domestic style. Therefore, strengthening online home-school cooperation becomes the way of home-school communication in online teaching.

Through online home visits, the head teacher and the course teacher can understand the situation of students under the influence of the epidemic and their family living environment. Only in this way can the home and school form a joint educational force, find out the shortcomings of students in online learning, and better provide suggestions for students' learning to improve students' learning performance at home. In the post-epidemic era of home-school cooperation, schools should adopt online and offline home-school communication methods to form a "two-line" home-school synergy and build an equal and democratic atmosphere.

### **4.4 Network and platform construction**

Network and electronic equipment are the essential factors that affect the learning performance of network teaching. In the study, network fluency is the main factor affecting the learning performance of network equipment. China is in the early stage of the development of network teaching. The network construction is not mature. Network congestion and server inability to simultaneously support a large number of students online are the main problems existing in online teaching under the epidemic situation, affecting the quality of teachers' teaching and students' listening and further affecting students' learning performance. Therefore, it is essential to strengthening and perfect network construction in network teaching. In the "post-epidemic era", with the development of science and technology and the continuous improvement of online platforms, the online teaching model will gradually develop and expand and enter more deeply into students' learning life.

## **5. Conclusions**

This study focuses on the psychological situation of high school students during home study. It concludes that social isolation and specific isolation measures are likely to lead to psychological problems and exacerbate the existing psychological problems of high school students. During the pandemic of home study, high school students are more likely to feel horrified, which will lead to the probability of anxiety and depression increasing.

It can be seen from the analysis of the investigation and research that China is in the early stage of network teaching. The status of students in network teaching is uneven, and their learning performance deserves attention. Students' learning performance in network teaching is not only affected by their own factors, but also by teachers, family environment, network platform construction, and other external factors. The key to improving the learning performance of network teaching is improving students' independent learning ability. In addition, how to improve teachers' online teaching level, create a good family atmosphere, form home-school cooperation, and improve the construction of

network platforms are also issues that teachers need to consider in the post-epidemic era. Online teaching has become one of the normal learning methods for students. Combining online and offline hybrid learning modes will broaden students' horizons, open the door for personalized learning, make courses endless, and help life-long learning. The findings can provide important guidance for the formulation of psychological support strategies for high school students studying at home, especially those who have not returned to school.

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