



An Exploration of the Market Opportunity for Chinese Student Mental Health Solutions

Yuhan Liu^{1,*+}, Hanlin Yang²⁺, Xiangyi Liu³

¹*Business School of Alberta, University of Alberta, Edmonton, T6G 2R6, Canada, averylyh@yeah.net*

²*Durham University Business School, Durham University, Durham, DH1 3LE, United Kingdom, rogeryang-hl@outlook.com*

³*Division of general study, University of Illinois Urbana Champaign, Urbana, 61820, USA, xl95@illinois.edu*

**Correspondence author email: averylyh@yeah.net*

+ These authors contributed equally to this work and should be considered co-first authors

Abstract

Due to the rise of globalization and social competition, Chinese students are more likely to suffer from psychological problems in recent years. The Chinese government has required that students need to take mental tests each year. However, there are many deficiencies in the current test form and social support. To explore this market and find potential improvement opportunities, the researcher conducted a cross-sectional study using an online survey and online interviews. The researcher did an online market survey of 194 people size, then narrow the target group to the students and parents. The researcher found that over 76% of 101 students would like to take the regular test or service and 78% of 66 parents were in favor of the proposal to care about their children's mental health. About 71.13% of participants announced that if services endorsed by authoritative psychological institutions could enhance their trust in the service. In the interview, the 5 interviewees all mentioned the shortages of existing test form. The researcher thinks the whole business model should include three factors to work better: cooperation with authority organizations, effective testing form, and excellent services. In response to this, the researcher improved the test into two steps: quantitative scoring questions and game-based assessments. In conclusion, a huge demand for Chinese students' mental health market exists, there are over 60% of students think they are suffering from mental issues and need treatment. Quantitative questions and game-based assessments could increase the accuracy of the test. The researcher suggested further research in terms of bigger sample size, more comprehensive information collection, and decreasing the risk of adverse selections to complete this model and keep eye on the policy of the government of China to catch more opportunities.

Keywords: *mental health, psychological test, Chinese students*

1. INTRODUCTION

Mental health conditions are increasing worldwide. This has become particularly pervasive and challenging for teenagers and children, as they are both vulnerable to external pressures and have less capacity to properly regulate their psychological states. Hence, they have a higher risk of suffering from depression and mental health issues [1]. Based on the data from World Health Organization, around 20% of the world's children and adolescents have mental health conditions [2]. In response to this situation, the Chinese government introduced the 'Programme on mental health of children and adolescents (2019-2022)' plan in 2019 [3]. This programme aims to improve China's mental health

service system and popularize mental health knowledge. The mental health test is now included in the annual physical examination of students by the Chinese Ministry of education. At the same time, the appearance of online platforms such as SIMPLE Psychology, ONE Psychology, etc. also enhanced the accessibility of mental health services for the public.

However, the development of psychological tests and services designed for children is insufficient. In 2021, diagnostic questions focused on suicide within the questionnaire aroused the concern of parents in Shanghai, and the local government was forced to stop the test [4]. At the same time, privacy concerns may undermine help-seeking by as well as proper diagnosis of mentally distressed young adults. Stigma in society can deter the

search for help by an individual suffering from mental health problems, as they fear being labeled as abnormal in society [5]. In addition, this same fear might encourage young adults to avoid answering questions accurately, thereby biasing the findings. However, timeliness and accuracy of these results are essential for mental recovery. Evidence suggests that by more quickly diagnosing mental health issues, societies can greatly improve recovery outcomes, reducing total symptoms and improving overall functioning and social functioning [6].

In this study, the researcher aimed to examine the current market demand for mental services for the student (under 22 years old) and to explore the shortcomings of current test forms and social support. In addition, the researcher explored the potential improvements for mental tests and services for the students.

2.LITERATURE REVIEW

With the rise of globalization and the ensuring increases in economic and professional competition, this has led to dramatic shifts in both social exchange as well as increasing psychological pressures in China [7]. With the effects of the COVID-19 pandemic, these changes have become particularly noticeable among Chinese students. Such problems require more public health institutions and interventions to help students deal with mental health [8]. Monitoring students' mental illnesses during the pandemic and targeting psychological counseling are necessary, and it should focus on anxiety and depression. [9]. While face-to-face treatment becomes more complicated during the worldwide epidemic, online psychotherapy would be another alternative solution. It about 72% of experts suggested they want to use virtual platforms for clients in various situations [4]. Thanks to the increased capacity of information and communications technologies (ICTs), it is increasingly convenient for people to connect with others from long distances. Online therapies involve audio and visual ways to assist clients and counselors in communicating with each other. In addition to convenience, online treatments improving in security and privacy as well. By adopting encrypted applications or platforms, people can participate in synchronous virtual conversations. [10]. Despite the growth in the demand for mental health solutions focused on young adults in China, this market faces particular challenges, including the accuracy and timeliness of test results and privacy issues.

In order to address these challenges, the researcher sought to conduct additional research to explore the desirability and feasibility of new online therapeutic services targeted at this market, which could help reduce mental health challenges and maximize the mental health benefits to society.

3.METHODOLOGY

To explore this market, the researcher surface and test the following hypotheses:

H1: Significant demand

H2: Desirability

H3: Government and parents are the ideal paying customers for the test and treatment respectively

H4: Students that take the diagnostic test will answer questions truthfully

3.1.Participants and Procedure

To test these hypotheses, the researcher conducts a series of surveys along with a follow-up interview. Due to the strict lockdown and geographical location, the researcher conducted this national, cross-sectional study using an online survey and online interviews between March 22 and March 29, 2022. The survey and interview were distributed via WeChat, a commonly used social media platform in China. Information about the study and the online survey link were posted on WeChat to recruit participants from the general public. Meanwhile, the researcher encourages the participants spread this survey via their own WeChat to expand the sample size. To avoid statistical contingency, the researcher also hired a third-party consulting agency to complete the survey via WeChat. In this way, the online survey was open to a large population of the general public. The researcher set mandatory short explanations after specific choices, and irrelevant explanations will be regarded as invalid questionnaires. A total of 196 results were received, 93 from our own channel and 103 from the agency. After deleting irrelevant explanations, a total of 194 valid questionnaires were analyzed in this study, thus, the valid response rate was 98.98%.

To improve the richness of the information collected, the researcher also interviewed five student participants, three of whom were diagnosed with depression and had been or were receiving medication.

3.2.Measurements

3.2.1.Survey

General Demographic Questions

The researcher collected age, education background and current province from all participants. For privacy reasons, gender, school ranking, family structure and family income were not collected. The researcher divided ages, education background and province into four groups respectively. The grouping forms and logic are shown in Table 1, Table 2 and Table 3.

Table 1. The grouping form and logic of age

Age	Assumption
Under 18	Students from high school and below (Stakeholder)
18-22	Students from university (Stakeholder)
Above 22 with no child	Non-stakeholder group
Above 22 with children	Parents (Stakeholder)

Table 2. The grouping form of education background

Education background
High school or below
Bachelor
Master
Ph.D.

Table 3. Group form of the province (data from the China Bureau of statistics, Hong Kong, Macao, and Taiwan are not included)

Income level	Province
High	Beijing, Shanghai
Upper middle	Zhejiang, Jiangsu, Tianjin, Guangdong, Fujian
Middle	Shandong, Liaoning, Inner Mongolia, Chongqing, Hunan, Anhui, Hubei, Jiangxi, Hainan, Hebei, Sichuan, Shaanxi, Ningxia, Jilin, Shanxi, Heilongjiang, Henan, Guangxi, Xinjiang, Qinghai, Yunnan, Tibet, Guizhou
Lower middle	Gansu

Participant Characteristics

In total, the researcher collected demographic information from 194 participants. Most (52.06%) were students and the majority (60.31%) held or were studying

for a bachelor's degree. Participants are from 25 out of 31 provinces and 91 (46.91%) are from middle-income level provinces. The demographic information for 194 participants is shown in Table 4.

Table 4. Demographic characteristics of the participants (n=194)

Variable		Sample(n=194)	Percentage(%)
Age	Under 18	24	12.37
	18-22	77	39.69
	Above 22 with no child	27	13.92
	Above 22 with children	66	34.02
Education background	High school or below	57	29.38
	Bachelor	117	60.31
	Master	19	9.79
	Ph.D.	1	0.52
Provinces	High level	29	14.95
	Upper middle level	70	36.08
	Middle level	91	46.91
	Lower middle level	4	2.06

Student and Non-stakeholder Questions

The researcher set eight items for student and non-stakeholder groups to measure social attention, self-awareness, and willingness to accept service. Question 1, 2, 3, 4 and 6 are two-choice questions (yes or no). Short explanations were required for the answer 'no' to Question 3. Question 5 is a five-choice question ('study', 'family', 'personal development', 'social', and 'other').

Question 7 is a four-choice question ('I do not have mental health problems', 'I do not trust third-party institutions', 'I consider it would lead to social difficulties', and 'I am afraid to face mental health problems'). Question 8 is a three-choice question ('cooperate with the government', 'cooperate with the authority' and 'cooperate with the school'). The question structure is shown in Figure 1.

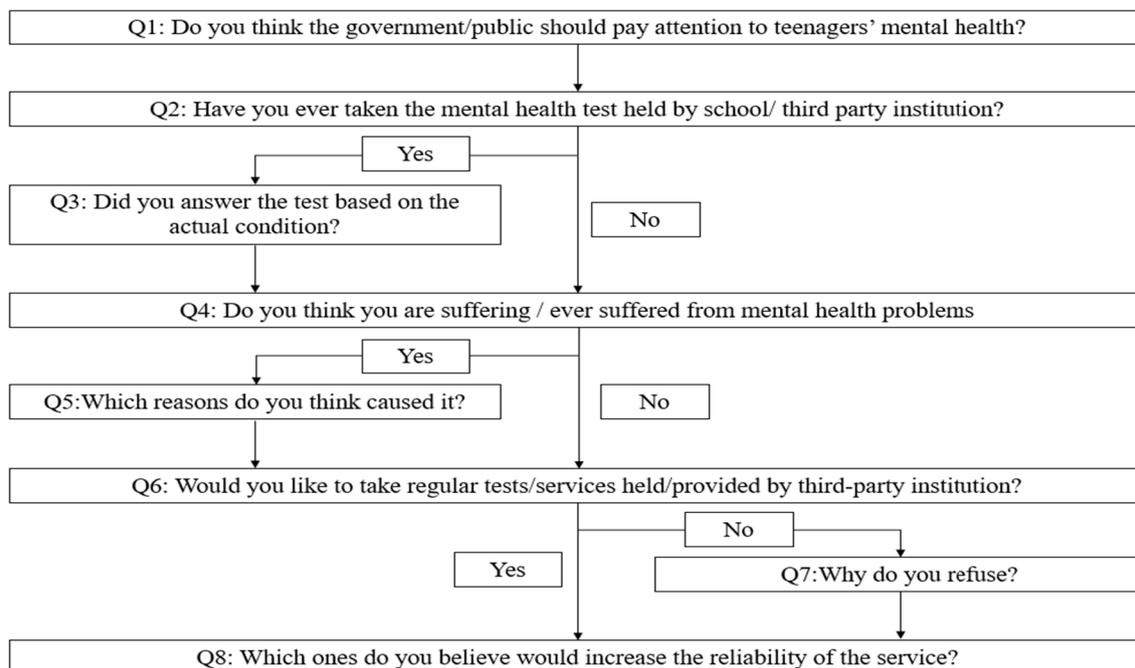


Figure 1. Question Structure for Student and Non-stakeholder

Parent Questions

The researcher set seven items for the parent group to measure social attention, degree of concern, willingness to accept service and willingness to pay. Question 1, 2, 3, 4 and 6 are two-choice questions (yes or no). Short explanations were required for the answer 'no' to

Question 3 and 4. Question 5 is a four-choice question ('0-¥100', '¥100-¥500', '¥500-¥1,000 and 'whatever until cured'). Question 7 is a three-choice question ('cooperate with the government', 'cooperate with the authority' and 'cooperate with the school'). The question structure is shown in Figure 2.

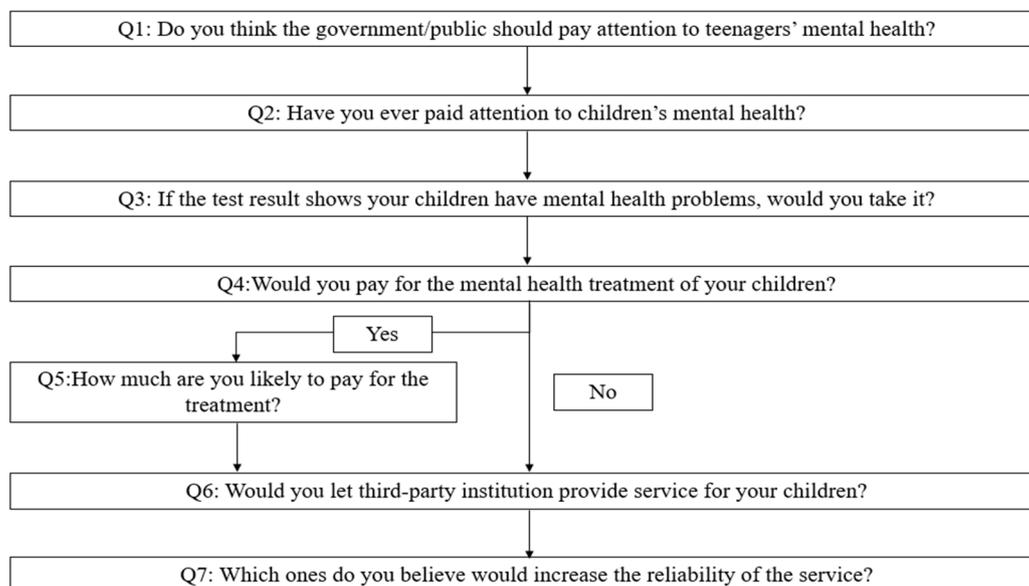


Figure 2. Question Structure for Parent

3.3. Statistical Analysis

The researcher used descriptive statistics including percentages and frequency to describe the demographic characteristics, service demand and willingness to accept the service of the participants. All statistical analyses were performed using Excel.

3.4. Interview

The researcher interviewed participants on peer tolerance, school support, existing test form and family understanding, etc. Due to different personal situations, the interview contents are not the same. Interviewees can answer freely according to their self-perception.

4. RESULTS

4.1. Survey

4.1.1. Social Attention

The researcher found that 162 participants (83.50%) believe the government and the public should pay attention to the mental health of teenagers. Participants whose education background is high school or below had a lower rate of concern (80.70%). There were 81 out of 128 participants (63.28%) from student and non-stakeholder groups who stated that they have taken the mental health test before. There was no significant difference in the income level of their current province. From the parent group, there were 57 out of 66 participants (86.36%) who stated they had cared about the mental health of their children. There was no significant difference in the income level of their current province and education background. The result is shown in Table 5 and Figure 3.

Table 5. Results of Q1 and Q2

Question	Answer	Distribution	Percent (%)
		(n=194)	
Question 1 (student and non-stakeholder & parent)	Yes	162	83.50
	No	32	16.50
Question 2 (student and non-stakeholder)		(n=128)	
	Yes	81	63.28
	No	47	36.72
Question 2 (parent)		(n=66)	
	Yes	57	86.36
	No	9	13.64

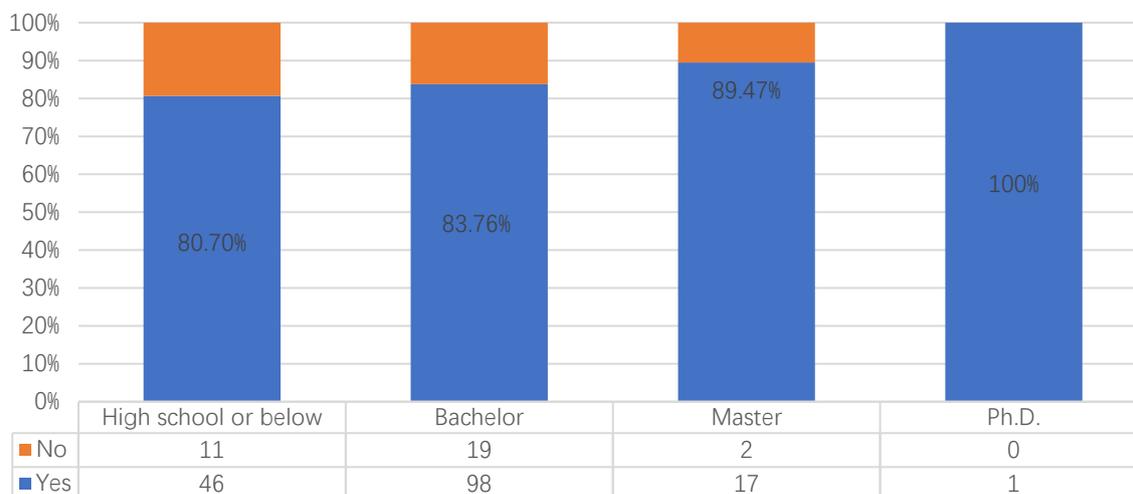


Figure 3. The result of Q1 from all groups

Willingness to Accept Service

Among the student group, there were 77 out of 101 participants (76.24%) stated they would like to take the regular test or service provided by third-party institutions. The reasons for rejection are mainly that they do not

believe they have problems, and they distrust the institutions. Among the parent group, the researcher found that 45 out of 66 (68.18%) participants expressed the willingness to let children receive services. The result is shown in Table 6.

Table 6. Results of Q6 and Q7

Question	Answer	Distribution	Percent (%)
Question 6 (student and non-stakeholder)		(n=101)	
	Yes	77	76.24%
	No	24	23.76%
Question 7 (student and non-stakeholder)		n=24	
	I do not have mental health problems	7	29.17
	'I consider it would lead to social difficulties	2	8.33
	I do not trust third-party institutions	10	41.67
	I am afraid to face mental health problems	5	20.83
Question 6 (parent)		(n=66)	
	Yes	45	68.18
	No	21	38.82

Willingness to Pay

Among the 66 parents, there were 50 (75.76%) participants who stated they could accept their children having mental problems. The majority (78.79%) of the parents believed they are willing to pay for the treatment

of their children. The median amount is over ¥500 (about \$80). The reasons for rejection are mainly about the distrust of the third-party institutions. The result is shown in Table 7.

Table 7. Result of Q3, Q4 and Q5

Question	Answer	Distribution	Percent (%)
Question 3 (parent)		(n=66)	
	Yes	50	75.76
	No	16	24.24
Question 4 (parent)		(n=66)	
	Yes	52	78.79
	No	14	21.21
Question 5 (parent)		n=52	
	¥ 0-100	3	5.77
	¥ 100-500	10	19.23
	¥ 500-1,000	12	23.08
	Whatever until cured	27	51.92

Credit Enhancement Method

Among the 194 participants, the researcher found that most (71.13%) believed cooperation with authoritative

psychological institutions could enhance their trust in services. Cooperation with school is the option which the least (22.68%) chose.

Table 8. Results of Q7 and Q8

Question	Answer	Distribution (n=194)	Percent (%)
Question 8 (student and non-stakeholder) & Question 7 (parent)	Cooperate with the government	79	40.72
	Cooperate with the authority	138	71.13
	Cooperate with the school	44	22.68

Comparison of Self-Awareness and Test Authenticity

Among the 128 participants from students and non-stakeholders, there were 78 people (60.93%) who consider they used to or were suffering from mental problems. The researcher found that 53 of them had taken the mental test before and 7 people did not complete the

test under actual conditions. Based on their self-awareness, the study and social pressure are the main reasons. The limitations of the existing tests and the avoidance of external attention are the main factors affecting the authenticity of the test.

Table 9. Results of Q3, Q4 and Q5

Question	Answer	Distribution	Percent (%)
Question 3 (student and non-stakeholder)		(n=81)	
	Yes	71	87.65
	No	10	12.35
Question 4 (student and non-stakeholder)		(n=128)	
	Yes	78	60.94%
	No	50	39.06%
Question 5 (student and non-stakeholder)		(n=78, Multiple choice)	
	Study	46	58.97%
	Family	38	48.72%
	Personal development	36	46.15%
	Social	41	52.56%
	Other	3	3.85%

Interview

All 5 participants considered that early counseling is essential for avoiding psychological problems. At the same time, four people (three diagnosed) believe that the traditional test cannot fully reflect their problems, and the current support of the school is insufficient. The three diagnosed participants believed that friends and family had given enough help in the process of rehabilitation and did not discriminate against them.

4.2. DISCUSSION

In this study, the researcher investigated the market demand of students for mental health services and the factors that influence the reliability among the public. Approximately 76.24% of the students reported they would like to take regular tests and services and 71.13% of the participants believed cooperation with the authority would increase reliability. At the same time, the researcher verified the shortcomings of existing testing and social support.

4.3. Business model

This study suggested that existing test forms need to be improved to better meet the needs of students. For our business model, the researcher would divide the test into two steps.

Step 1

The first step is to let the participant give ratings or scores on 8 items of 8 scales.

Table 10. Scales of the questions

Study	Family
Peer	Self-blaming
Personal development	Impulsive
Insomnia days	Random question (based on previous result)

Through quantitative methods, the researcher can comprehensively infer the source of students' potential psychological problems. The correlation between each individual scale would be set to test validity. The scales are shown in Table 10.

Step 2

Based on the rating results, students would then play the games under specific scenario and their reactions will be used to help diagnose. Traditional assessment can represent a response to a question, but the process by which the assesses arrived at that response is neither captured nor considered. The game-based assessment could record and monitor the processes and changes of the players pursuing individual choices in the complex and interactive game space [11]. The enrichment of data sources will improve the accuracy of diagnosis and avoid overtreatment or neglect of treatments.

For different age groups, the researcher would set appropriate scenarios to avoid potentially misleading or negative psychological cues.

After test

To avoid additional external social pressure, the students would decide whether and who the results would be shared with. The researcher recommend regular game testing to ensure the timeliness of the results.

The students and parents could choose whether purchase further services based on the test result.

4.4. Market analysis

In 2019, the government of China has promulgated a new policy for the Chinese teenagers, mental health of teenagers become a required testing indicator for medical examinations. This policy indicates that in the future the mental tests market will have over 145 million fixed

young users. It's a good opportunity to build a new business model for mental health care field of the teenager group.

In the mental health care industry, there are three main care providers in the market of China: public hospitals, private clinics, and third-party companies. These care providers tend to focus on one of two extremes. On the one hand, they offer highly professionalized medical diagnostics. And on the other hand, different providers focus on simple personality tests. In other words, the market tends to focus on either people who have already been ill or people who do not care about mental health. Our business is for people who are at risk of mental issues and need advanced intervention or prevention. The researcher aim to solve the problem experienced by parents: to help them take care of their children's mental states. And the researcher will satisfy the needs of the government and schools to save money by providing professional services.

The ultimate beneficiary of our business are the students who are under 22 years old. Our tests and services will indirectly involve the parents and schools. Since teenagers may not have enough knowledge and income for paid quizzes, the researcher target the government and schools as our buyer in the market of China. For the young parents who have school-aged children, they have experienced the frustrations associated with the old education style of the last generation and realize the growing importance of mental health. According to our survey, these parents are willing to pay for the diagnostic treatment. However, both parents and students hope the products and services can be endorsed by authority organizations, such as public hospitals and professional mental health insitutiitions. Therefore, the main partner would be these medical establishments.



Figure 4. SWOT analyse

4.5. Limitations and Future Directions

Firstly, although our sample contained a sufficient number of students and parents to conduct our analysis, studies involving an even larger sample and covering a wider area are possible in the future and would be more representative. Secondly, the relevant factors such as school ranking and family income are not collected. The current finding may be flawed with wider application. Thirdly, due to the limitation, adverse selection factors may greatly interfere with the research results.

5. CONCLUSIONS

The researcher confirmed that the business plan which cooperates with the government will help parents prevent their children from mental issues is quite feasible in the market in China. The researcher have a sample size of 194 people in total to research the mental health market of the students. The research showed that people have a high willingness to pay, meanwhile, the researcher need to enhance the methodology of testing and cooperate with professional institutions to solve problems more effectively. The advantages the researcher have: First, our group are consistent of Chinese students who have been through mental issues but have not received helpful prevention and cure. The researcher understood how paint this problem caused. Second, the researcher did the research among not only the students but also the parents, completing the users' groups to make sure the market is highly demanding. The shortages are that the researcher had some research limitations in terms of the researcher do not have enough sample size, lack of diversified factors, and contain the risk of adverse selection bias. The researcher strongly recommends collecting much more data from larger sample size and different groups, coming into all kinds of considerations to understand the market comprehensively, and keeping eye on the government to catch up on any policy tendencies. In the end, the researcher suggested that you may provide better products for the existing medical institutions to indirectly join this industry at less cost.

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REFERENCES

- [1] Wright, D. R., Katon, W. J., Ludman, E., McCauley, E., Oliver, M., Lindenbaum, J., & Richardson, L. P. (2016). Association of Adolescent Depressive Symptoms With Health Care Utilization and Payer-Incurred Expenditures. *Academic pediatrics*, 16(1), 82–89. <https://doi.org/10.1016/j.acap.2015.08.013>
- [2] World Health Organization: https://www.who.int/health-topics/mental-health#tab=tab_2. 2022.04.06.
- [3] The Government of China Official Website: http://www.gov.cn/xinwen/2019-12/27/content_5464437.htm. 2019.12.27. The Official Notice on the issuance of a Healthy China Action on Mental Health of Children and Adolescents (2019-2022).
- [4] Java, S., Mohammed, H., & Bhardwaj, A. B. (2021). Psychological Analysis of Online Counselling Platforms Offering Mental Health Support. 2021 12th International Conference on Computing Communication and Networking Technologies (ICCCNT), Computing Communication and Networking Technologies (ICCCNT), 2021 12th International Conference On, 1–7. <https://doi.org.proxy2.library.illinois.edu/10.1109/ICCCNT51525.2021.9579871>.
- [5] Byrne, Rory, Morrison, & Anthony P. (2010). Young people at risk of psychosis: a user-led exploration of interpersonal relationships and communication of psychological difficulties. *Early Intervention in Psychiatry*, 4(2), 162–168. <https://doi.org/10.1111/j.1751-7893.2010.00171.x>
- [6] Marshall M, Lewis S, Lockwood A, Drake R, Jones P, Croudace T. Association Between Duration of Untreated Psychosis and Outcome in Cohorts of First-Episode Patients: A Systematic Review. *Arch Gen Psychiatry*. 2005;62(9):975–983. doi:10.1001/archpsyc.62.9.975
- [7] Dzator, J., Dzator, M., Asante, F., & Ahiadeke, C. (2016). Common Mental Disorders, Economic Growth and Development: Economic Consequences and Measurement Issues. *The Journal of Developing Areas*, 50(5), 13–26.
- [8] Zhao, S., Zhang, J., Peng, L., & Yang, W. (2021). Mental Health Outcomes among Chinese College Students over a Decade. *INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH*, 18(23). <https://doi-org.proxy2.library.illinois.edu/10.3390/ijerph182312742>
- [9] Liang, Z., Kang, D., Zhang, M., Xia, Y., & Zeng, Q. (2021). The Impact of the COVID-19 Pandemic on Chinese Postgraduate Students' Mental Health. *INTERNATIONAL JOURNAL OF*

ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH, 18(21). <https://doi-org.proxy2.library.illinois.edu/10.3390/ijerph182111542>

- [10] Khan, S., Shapka, J. D., & Domene, J. F. (2022). Counsellors' experiences of online therapy. *British Journal of Guidance & Counselling*, 50(1), 43–65. <https://doi-org.proxy2.library.illinois.edu/10.1080/03069885.2021.1885009>
- [11] Landers, R. N., Armstrong, M. B., Collmus, A. B., Mujcic, S., & Blaik, J. (2021). Theory-driven game-based assessment of general cognitive ability: Design theory, measurement, prediction of performance, and test fairness. *Journal of Applied Psychology*. Advance online publication. <https://doi.org/10.1037/apl0000954>

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