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Observational Study

Estimated prevalence and sociodemographic correlates of mental disorders in medical students of Hebei Province, China: A cross-sectional study

Lu WT *et al*. Mental disorders estimated prevalence of medical students.

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Abstract

BACKGROUND

In China, the identification rate and treatment rate of mental disorders are low, and there are few surveys on the prevalence of mental disorders among college students using diagnostic tools such as Mini-International Neuropsychiatric Interview (MINI), so the prevalence and treatment of mental disorders among college students are unclear.

AIM

To estimate prevalence of mental disorders among medical students in Hebei Province, and provide guidance for improving their mental health.

METHODS

This was a cross-sectional study based on an Internet-based survey. Three levels of medical students in Hebei Province were randomly selected (by cluster sampling) for

screening. Using the information network assessment system, the subjects scanned the 2D code with their mobile phones, clicked to sign the informed consent, and answered a scale. A self-designed general status questionnaire was used to collect information about age, gender, ethnicity, grade, and origin of students. The MINI 5.0. was used to investigate mental disorders. Data analysis was performed with SPSS software. Statistically significant findings were determined using a two-tailed P value of 0.05.

RESULTS

A total of 7117 subjects completed the survey between October 11 and November 7, 2021. The estimated prevalence of any mental disorders within 12 mo was 7.4%. Mood disorders were the most common category (4.3%), followed by anxiety disorders (3.9%); 15.0% had been to psychological counseling, while only 5.7% had been to a psychiatric consultation, and only 10% had received drug therapy in the past 12 mo.

CONCLUSION

Although the estimated prevalence of mental disorders in medical students is lower than in the general population, the rate of adequate treatment is low. We determined that improving the mental health of medical students is an urgent matter.

Core Tip: College students' mental health is important to national mental health. In most previous studies of medical students, there have been few investigations using Mini-International Neuropsychiatric Interview (MINI) as a diagnostic tool to assess the prevalence of mental disorders. In this study, MINI 5.0 was used to investigate the prevalence of mental disorders among medical students in Hebei province, representing the largest series of mental disorders among medical students in China ever reported. Based on these data, the prevalence and treatment of mental disorders among medical students in Hebei were introduced.

INTRODUCTION

From a sociological perspective, college students have a variety of social roles: they continue to seek knowledge, while developing social and interpersonal skills, and face more complex roles in society, personal relationships, and employment. With a growing number of college students in China, there is an increasing pressure in terms of learning, interpersonal relationships, and career decisions. Psychological health of college students has gradually become a focus of attention. In 2021, the General Office of the Ministry of Education issued a "Notice to Strengthen the Management of Students' Mental Health," which required the construction of a psychological counseling service platform. That year, the report "Exploring the Characteristic Service Plan for Prevention and Treatment of Depression" was issued by the General Office of the National Health Commission of China. This requires that depression screening should be included in students' physical examination.

Compared to the general population, college students have the ability to assess their own mental health, and most will turn to the psychological counseling center at their school when they suspect that they have psychological problems[1]. The prevalence of depression and anxiety among college students has increased compared with before the coronavirus disease 2019 (COVID-19) pandemic. According to a survey by Hong Kong researchers, the fraction of students with moderate to higher levels of depression was significant (40.0%), including general anxiety (50.7%)[2]. Kavvadas *et al*[3] found that depression and anxiety in college students increased in the past 2 years. Hossain *et al*[4] conducted a 15-mo longitudinal study of 1140 college students. They found that, with time, there was a 22.5% and 27.1% increase in depression and anxiety, respectively. Mental disorders have increased each year, suggesting the importance of regular assessment of mental health issues.

Despite many studies on students' mental health, most had shortcomings, such as small sample size or lack of complete and structured diagnostic interviews. Huang *et al*[5] conducted a nationwide survey on the prevalence of mental disorders, without inclusion of college students. There has been no large sample study on the mental health of medical

students in Hebei Province. This study screened the prevalence of mental disorders among medical students and analyzed the psychosocial risk factors. This will provide some direction for college student mental health services in the future.

MATERIALS AND METHODS

Study design and sampling

This was a cross-sectional study based on the Internet. We screened medical undergraduates at a university in Hebei Province from October to November 2021, which was a relatively stable period for the COVID-19 pandemic in Shijiazhuang, and randomly selected three levels of students by cluster sampling. Freshmen (grade 1), sophomores (grade 2), and juniors (grade 3) were concentrated at school, and we selected two of the above three grades for random evaluation. Most students in the senior and fifth grades had completed internships and were scattered among several hospitals, and their grades were randomly selected for evaluation.

Assessment tools

The screening tool for this study was an information network evaluation system developed by Saitron Information Co. Ltd. (Cangzhou, Hebei, China). Subjects scanned the QR code and clicked to sign the informed consent. For screening information so stay confidential, subjects logged into the system with a virtual student number and their initials. A one-to-one correspondence between the virtual student number and the actual student number was kept by the instructor. Subjects could check screening results on their mobile phones, and physicians interpreted screening results on site. This allowed subjects to know their mental health status at any time.

A self-designed status questionnaire was used to collect the subjects' basic information: age, gender, nationality, grade, and region were included. The Mini-International Neuropsychiatric Interview (MINI) was translated into Chinese by Sheehan et al[6]. MINI is a structured interview that assesses 16 categories of mental disorders.

Research shows that it has good reliability, validity, and high consistency among different studies. The version used in this study was MINI 5.0.

Quality control

The screening staff comprised physicians and medical students from the Mental Health Center of Hebei Medical University. Before participating in the survey, screening personnel were trained with standardized guidelines, developed to ensure consistency of survey results. Some students were randomly selected for pretesting before formal screening. We summarized and revised ambiguities, using PowerPoint to explain subjects' biases, and to reduce biased screening.

Statistical analysis

Quantitative data were expressed as mean ± SD, and qualitative data were described by numbers and percentages. Comparison between groups with theoretical frequency T ≥ 5 was tested by Pearson's c^2 test; comparison between groups with theoretical frequency < 5 but ≥ 1 was tested by continuity correction c^2 test; and comparison between groups with theoretical frequency < 1 was tested by Fisher's exact test. All data were analyzed using SPSS version 26.0 (SPSS, Chicago, IL, United States). The statistical significance of our findings was assessed with a two-tailed P value of 0.05.

Ethical approval

This study was approved by the Ethics Committee of the First Hospital of Hebei Medical University (approval No: 20210354).

RESULTS

A total of 7555 undergraduates from three grades were selected for MINI assessment; 218 refused to participate in the screening and 7337 were screened. A total of 163 students with incomplete data and 57 with inaccurate data caused by careless attitudes in answering questions were excluded. Finally, 7117 students were included in the

statistical analysis. The average age was 19.9 ± 2.06 years, with 36.7% males and 63.3% females. There were 3471 sophomores, 2974 juniors and 672 seniors (Table 1).

Among medical students in Hebei Province, 7.4% suffered from at least one mental disorder in the past 12 mo, 15.0% had psychological counseling, 5.7% went to a psychiatric hospital, and only 10% received drug treatment. Mood disorders were the most common category, followed by anxiety disorders. Lifetime estimated prevalence of each subcategory of mood disorders ranged from 0.5% to 4.9%, with the 12-mo estimated prevalence ranging from 0.2% to 3.5%. Major depressive disorder (MDD) was the most prevalent mood disorder (lifetime estimated prevalence 4.9% with 12-mo estimated prevalence of 3.5%), followed by bipolar disorder (0.5% and 0.4%) and dysthymia (12-mo estimated prevalence of 0.2%). Obsessive–compulsive disorder (OCD) was the most common anxiety disorder (12-mo estimated prevalence of 2.1%), followed by generalized anxiety disorder (1.7%) and social phobia (1.4%). The estimated prevalence of other anxiety disorders was < 1%, with the lowest estimated prevalence being agoraphobia without panic disorder (0.1%). The 12-mo estimated prevalence of substance disorders ranged from < 0.1% to 0.4%, with alcohol abuse the most prevalent (0.4%) and substance abuse the lowest (< 0.1%). The estimated prevalence of any alcohol disorder was higher than that of any drug disorders (0.6% *vs* < 0.1%). Lifetime estimated prevalence of any type of schizophrenia was 0.2% and 30-d estimated prevalence was 0.1%. The 12-mo estimated prevalence of any eating disorder or antisocial personality disorder was < 0.1 (Table 2).

Among mood disorders, the estimated prevalence of MDD was 4.3% in males, and was higher than 3.1% in females. The estimated prevalence of bipolar disorder was 0.6% in males and 0.2% in females, with a significant difference. Among anxiety disorders, the estimated prevalence of OCD was 2.8% in males and 1.6% in females. For individual substance disorders, the estimated prevalence of alcohol abuse and dependence was higher in males than in females (0.5% *vs* 0.1% for alcohol dependence, 0.7% *vs* 0.2% for alcohol abuse). There was no significant gender difference for other diseases, except MDD (Table 3).

The estimated prevalence of MDD was 3.8% in sophomores, 2.9% in juniors, and 4.9% in seniors. There were significant differences between junior and senior college students.[10] There was no significant difference in the estimated prevalence of some diseases among medical students from different areas of origin. Regarding the experiences of left-behind children, results showed that the estimated prevalence of individual substance disorders had different etiologies. The estimated prevalence of alcohol dependence in left-behind children was higher than in children without being left-behind (1.0% *vs* 0.2%). There were also significant differences in drug dependence and eating disorders, but the estimated prevalence of these diseases was < 0.1%.

For treatment, the rate of medical students who were in psychological counseling varied between 14.4% and 36.4%, whereas 36.4% of students with dysthymia had counseling, and 35.3% of medical students with psychotic symptoms had counseling. Moreover, 25% of patients with agoraphobia without history of panic disorder, 20% with panic disorder, 18.4% with compulsive disorders, and 16.4% with MDD had counseling. The proportion of students who visited a psychiatric hospital varied between 3.9% and 33.3%; of which 23.5% were for psychotic disorders, 20.0% for post-traumatic stress disorder (PTSD), 18.2% for MDD, 13.2% for bipolar disorder, and 8.8% for OCD. The rate of treatment in 12 mo varied between 9.1% and 33.3%, with 26.7% for PTSD, 33.3% for substance dependence, 15.8% for bipolar disorder, and 9.6% for MDD (Table 4).

DISCUSSION

The rapid development of the Chinese economy, along with a change in the learning and employment environment, may have caused an increase in pressure on college students. Medical students are a special group – as compared to college students, as they have more academic pressure, take a longer time to obtain a degree, and have less diversity, which can lead to pressure and increased mental disease. As such, it is critical to investigate such disorders among medical students.

It was also found that 7.4% of medical students in Hebei had suffered from one mental disorder over the past 12 mo, but only a few sought help with a healthcare

professional, and fewer received adequate medication within 12 mo – contrary to previous results. The World Health Organization-World Mental Health International Undergraduate Program conducted an Internet-based self-assessment questionnaire among freshmen at 19 universities in eight countries. It included screening for the 12-mo prevalence of six common Diagnostic and Statistical Manual of Mental Disorders-IV psychiatric disorders (MDD, mania/hypomania, generalized anxiety disorder, panic disorder, alcohol use disorder, and substance use disorder). It was shown that 31% of students had at least one of these disorders within 12 mo, with 16.4% receiving psychiatric treatment[7]. Compared to this study, Winkler *et al*[8] found that the 12-mo prevalence was higher, possibly related to the survey population, the survey time, or the assessment tools. Previous studies found that depression and other diseases were more common in freshmen than for those in other grades. This study did not include freshmen, so prevalence could more easily be reduced[9].

Unlike the findings of many western scholars, the estimated prevalence of drug abuse and eating disorders in this study was low[10,11]. This may have something to do with the differences between Chinese and western cultures. In terms of drug abuse, China has strict supervision on addictive drugs, so students have less exposure to addictive drugs. Moreover, medical students have some understanding of pharmacology and are more aware of the harm of drug abuse[12-14]. In terms of eating disorders, most medical students focus on finishing school and pay less attention to habitus index, so fewer of them lose weight through excessive dieting, which may explain the lower incidence of anorexia[15]. Medical students understand nutritional metabolism and the importance of regular diet, which may also explain the low prevalence of eating disorders[16].

The proportion of students seeking treatment was lower in this study compared to others. It mirrors national conditions in China: patients tend to have an insufficient appreciation of diseases associated with stigma, resulting in lower diagnosis and treatment rates[17,18]. In the future, it will be necessary to increase publicity about mental diseases and increase their understanding, so that individuals can objectively evaluate diagnosis and treatment rate. In previous studies, the 12-mo rate in the Chinese

population was 9.3%, which was higher than in this study. This may be because the population was aged 18-24 years and did not include any other age groups. In addition, Yueqin et al[5] found that those aged 50-64 years had the highest prevalence of mental health problems. However, medical subjects with psychiatric symptoms, substance abuse, and other diseases that affect social function was consistently lower than for social personnel, with an overall prevalence slightly lower as well.

It is well-known that increasing targeted treatment for mental disorders (e.g., anxiety disorders, affective disorders, and alcohol and drug abuse) is a recognized issue in academic circles. In this study, 58 (16.4%) of the 354 patients with depression had psychological counseling, 17 (4.8%) visited psychiatric hospitals, and 34 (9.6%) received adequate medication. Lu et al[19] examined the prevalence and treatment of depression in China in 2021 and found that of 1007 participants with a 12-mo history of depression, only 84 (weighted 9.5%) had received treatment at any facility: 38 (3.6%) were in specialized mental health groups, 20 (1.5%) in general medicine, two (0.3%) in public services, and 21 (2.7%) in complementary/alternative medicine. Only 12 (0.5%) of 1007 patients with depression received adequate treatment. In the medical student population, treatment was higher than in the general population. This may be attributed to how the school attends to students' mental health, with sufficient awareness of the disease. Premedical students better understand depression and take the initiative for both diagnosis and treatment. Yet, compared to other physical diseases, these measures are still low.

The 12-mo estimated rate of depression, OCD, and other mental diseases was higher in males than females, similar to the research of Li et al[20]. This could be a function of adolescent males being more likely to show symptoms of the MINI diagnosis, such that prevalence would gradually decrease with age. While comparing different grades, we found the detection rate of depression in seniors to be higher than in juniors, confirming results of previous research. It may be that the pressure of graduation, plus postgraduate entrance examinations, in tandem with COVID-19, may have led to increased depression in the population and in undergraduate students as well[21].

We found that the estimated prevalence of alcohol dependence and abuse was higher in males than in females. This is consistent with previous research. It may be that males make friends more quickly when drinking at parties, and drinking with a greater preference for alcohol[22-24]. We also found that the estimated prevalence of alcohol dependence among those who were left-behind was higher than among people who did not have that experience. Left-behind children deal with emotional neglect and are more likely to engage in behaviors such as smoking and drinking, and then develop alcohol dependence[25].

The 12-mo estimated prevalence of mental disorders, according to MINI (7.4%), is low, considering that the recognition and acceptance of mental disorders among medical students is higher than among other undergraduates. College students are the future of any nation, with a responsibility to promote social development, so that more attention is given to mental health; this also coincides with implementing effective intervention measures.

Our study had some limitations. First, subjects were medical students, excluding other college students, and there was also some selection bias in overall estimation of college students. Second, this study was cross-sectional, so that there may have been recall bias that affected the lifetime prevalence of mental disorders.

CONCLUSION

Our study provided supplemental data on mental health disorders in the medical students, not investigated by Huang *et al*[5]. College students' mental health is important to national mental health. The purpose of this study was to establish mental health records for students, and psychiatrists were involved in the whole screening process. Our mental health department has opened a convenient channel for students diagnosed with mental diseases by MINI 5.0. Students can voluntarily go to the hospital for treatment, and psychiatrists will give more comprehensive examination and evaluation at any time. We will thus expand our research in exploring the prevalence of mental disorders in other

college students, followed by more information on mental health care for Chinese students in general.

ARTICLE HIGHLIGHTS

Research background

In China, the identification rate and treatment rate of mental disorders are low, and there are few surveys on the prevalence of mental disorders among college students using diagnostic tools such as Mini-International Neuropsychiatric Interview (MINI), so the prevalence and treatment of mental disorders among college students are unclear.

Research motivation

To clarify the prevalence and treatment of mental disorders in college students, and to provide protection for their mental health.

Research objectives

This study firstly conducted diagnostic assessment for medical students to understand the estimated prevalence and treatment of medical students, so as to provide protection for the mental health of medical students.

Research methods

MINI 5.0 was used in this study to evaluate medical students in Hebei and collect their treatment information, which can provide a more accurate understanding of the prevalence and treatment rate of mental disorders.

Research results

Among medical students in Hebei Province, 7.4% suffered from at least one mental disorder in the past 12 mo, 15.0% had psychological counseling, 5.7% went to a psychiatric hospital, and only 10% received drug treatment.

Research conclusions

The results of screening for prevalence using MINI have high confidence. The estimated prevalence rate of mental disorders among medical students in Hebei is lower than that of the general population, but the treatment rate is also lower. In the future, it is necessary to increase the awareness of medical students to mental diseases and improve the treatment rate, so as to ensure their mental health.

Research perspectives

In the future, the scope of screening should be gradually expanded to more than one university, so as to comprehensively understand the prevalence of mental disorders among college students, and contribute to the development of mental health field.

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