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STUDY ON PRIVACY PROTECTION AND MENTAL HEALTH STATUS OF PATIENTS WITH DEPRESSION

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SUMMARY

***Background**: The purpose of this research is to understand mental health status of depressed patients at different stages, and to balance the conflict between the right to use medical data and the patients' right of claim, whilst maximizing the exploitation and utilization of data on the basis of protecting patient privacy.*

***Subjects and methods:** From October 2021 to November 2021, 750 online questionnaires have been sent out to those who report being diagnosed with depressive disorder and those in a state of depression. Of the 750 questionnaires, 677 are received. To study the cognition of medical information security and its influencing factors, SPSS 26.0 has been used in this paper for frequency analysis, variance analysis, correlation analysis, and regression analysis.*

***Results**: The results show that the regression coefficient of information security policy equals 0.339 ($t = 6.377$, $P = 0.000 < 0.01$), which indicates that information security policy has a significant positive effect on security perception. Besides, the regression coefficient of privacy leakage experience equals 0.428 ($t = 7.708$, $P = 0.000 < 0.01$), implying that privacy leakage experience has a significant positive effect on security perception.*

***Conclusions**: The survey suggests that, during the treatment, patients who suffer from depression will experience different psychological changes, so that targeted nursing interventions should be given to the patients according to their psychological characteristics. Medical data sharing plays a key role in reducing medical costs and in helping patients obtain high-end diagnosis and treatment resources. However, the rights and interests of depressed patients will be greatly threatened under the circumstance of weak awareness of privacy protection for patients, lack of medical information security regulations and inadequate policy supervision measures.*

***Key words:** depression - medical big data - data sharing - the right to privacy - mental health*

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INTRODUCTION

Depressive disorder is one of the most common psychiatric illnesses. It is difficult to diagnose in clinical practice and pathological research due to its unclear etiology, complicated pathogenic factors, and unknown pathogenesis. Along with the arrival of the digital society, some organizations around the world have put a tremendous amount of effort into building information technology infrastructure, to support the management and analysis of patient data involved in clinical and translational research (Cohen & Mello 2019). Although researchers are eager to contribute to the diagnosis and treatment of depression through artificial intelligence algorithms, such widespread use of open databases depends on the level of protection of patients' private information (Xu et al. 2021). On the one hand, the main purpose of big data application is to predict the future by researching and sorting out a large amount of data and discovering the inherent laws among them (Mayer-Schönberger et al. 2013). Data related to disease information formed during diagnosis and treatment is of great significance for clinical trials and scientific research. Besides, representative large-scale data sets are not only expected to promote the development of medical artificial intelligence companies, but also the health of patients (Price & Cohen 2019). On the other hand, the "exclusive use principle" of the data economy determines that if data must be collected, it should only be used for specific purposes (Boehme-Nebler 2019). However, the advent of the medical big data era has promoted data sharing among different industries and infringement behaviors in a stealthier way, which may cause unknown damage to patient privacy and raise their concerns.

From a psychological perspective, privacy is not a state, but a complex and dynamic process, by which people decide whether and how much to open up to others, and selectively manage their personal data. The patients' right to privacy under the Internet Health refers to the personal right enjoyed by patients themselves. Medical institutions, medical personnel and all relevant personnel involved in patient information under the Internet Healthcare are required to protect patients from illegal infringement of patient privacy that is legally grasped in the whole medical process. Compared with patients' privacy information of traditional medical, depressed patients in medical big data are confronted with a special challenge in privacy protection. Such challenge is caused by the particularity of the subject of rights, the diversity of sensitive information and the incomplete supervisory system. A survey found that more than 70% of people consider the existence of privacy policies and data encryption necessary (Jiang & Li 2018). However, in academic studies on patient privacy in the context of medical big data, there are few discussions on

distinguishing the information of depressed patients. This paper focuses on understanding the mental health status of patients with depressive disorder and the importance they attach to their privacy protection, and proposes a hierarchical division of data to refine the management of medical big data, so as to protect patient privacy effectively.

RESEARCH METHOD AND OBJECT

Research object

This study is conducted from October 2021 to November 2021 for those who self-report being diagnosed with depressive disorder and those are in a state of depression. All depressed patients are informed and agree to the research background, research protocol, and the content of questionnaire.

Research method

In this survey, the self-made questionnaire is employed through an online questionnaire platform Wenjuanxing. A total of 750 online questionnaires are distributed and 677 are effectively retrieved. The questionnaire includes patients' basic information such as age, gender, education background, average monthly income, times of doctor visits per year, as well as their perception of medical information security, right to know personal information, and awareness of relevant laws and regulations. To study medical information security cognition and its influencing factors, SPSS 26.0 is conducted for frequency analysis, variance analysis, correlation analysis, and regression analysis.

Reliability

In this paper, SPSS 26.0 data analysis tool has been used to test the reliability of the questionnaire with Cronbach's Alpha coefficient. According to the convention, when the value of coefficient α is between 0.7 and 0.8, the questionnaire has good reliability; when the value of coefficient α is between 0.8 and 0.9, the questionnaire has high reliability. When the value of coefficient α is greater than 0.7, the reliability analysis results can pass the consistency test, when the value of coefficient α is less than 0.7, the reliability test results of the scale are not ideal and cannot pass the consistency test. As shown in Table 1, the Cronbach's Alpha coefficient of this scale is 0.863, indicating that the scale has high reliability and there is strong consistency and correlation between items.

Table 1. Cronbach Reliability Analysis

Option	Value
Number of terms	0.786
Sample size	9035.821
Cronbach's alpha	171

Validity

The validity of the scale has been tested, and the KMO value and the significance of the Bartlett Sphericity Test has been comprehensively analyzed. If the KMO value is higher than 0.8, it indicates a high validity of the scale. Besides, if the value is between 0.7 and 0.8, it suggests that the validity is good. When the value is between 0.6 and 0.7, it indicates an acceptable validity. If the value is less than 0.6, it indicates a poor validity. Bartlett test is required for validity analysis (corresponding *P* value should be less than 0.05), and specific analysis results are shown in Table 2.

Table 2. KMO and Bartlett's Test

Option	Value
KMO	0.786
Approximate Chi-square	9035.821
df	171
P	0.000

As can be seen from the above table, the KMO value is 0.786, greater than 0.5. Besides, the significance of Bartlett's sphericity test is 0.000, and sphericity test is significant, which indicates that the scale has good validity and strong correlation of various items.

Characteristics of sample population

The characteristics of the sample population have been analyzed. As shown in Table 3 and Figure 1, moderate depression accounts for the highest proportion (46.53%) in the sample population, followed by mild depression, accounting for 39.29%. 5.91% of the population have no depressive symptoms, and 8.27% suffer from severe depression.

Table 3. Results of frequency analysis of psychological status

Name	Option	Frequency	Percentage (%)	Cumulative Percentage (%)
Depressive State	No Depressive Symptoms	40	5.91	5.91
	Mild Depression	266	39.29	45.20
	Moderate Depression	315	46.53	91.73
	Severe Depression	56	8.27	100.00
	Total	677	100.0	100.0

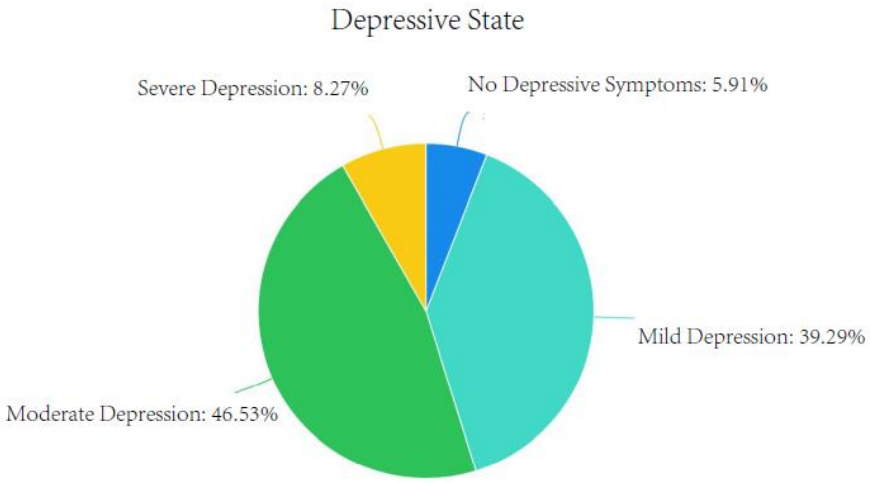

Figure 1. Proportion of depressive state

RESULTS

Diagnostic criteria of mood disorders in patients with depression

Depression is a mood disorder, also known as an affective disorder. The occurrence of depression is characterized by psychological symptoms such as a feeling of guilt and depression, accompanying physiological symptoms such as palpitations, nausea, numbness of limbs and chest tightness (Karyotaki 2021). In very severe cases, patients can appear suicidal behavior, which can cause serious consequences if left untreated. Descriptive statistics of the SDS depression scale are shown in Table 4.

Table 4. Descriptive statistics of SDS depression scale

Name	Sample Size	Minimum	Maximum	Mean	Standard Deviation	Median
1. I feel down in the dumps.	677	1.000	4.000	2.520	1.105	2.000
2. I think the morning is the best time of a day.	677	1.000	4.000	2.520	1.118	2.000
3. I burst into tears or feel like crying in fits and starts.	677	1.000	4.000	2.496	1.126	3.000
4. I don't sleep well at night.	677	1.000	4.000	2.511	1.095	3.000
5. I eat as much as usual.	677	1.000	4.000	2.461	1.115	2.000
6. I enjoy close contact with the opposite sex as much as ever.	677	1.000	4.000	2.507	1.104	2.000
7. I notice that I am losing weight.	677	1.000	4.000	2.504	1.104	2.000
8. I have trouble with constipation.	677	1.000	4.000	2.555	1.143	3.000
9. My heart is beating faster than usual.	677	1.000	4.000	2.547	1.143	3.000
10. I feel tired for no reason.	677	1.000	4.000	2.493	1.137	2.000
11. My mind is as clear as usual.	677	1.000	4.000	2.495	1.076	2.000
12. I don't think it is difficult to do things that I always do.	677	1.000	4.000	2.483	1.098	2.000
13. I feel anxious and restless.	677	1.000	4.000	2.477	1.117	2.000
14. I have hope for the future.	677	1.000	4.000	2.532	1.114	3.000
15. I get angry and excited more easily than usual.	677	1.000	4.000	2.449	1.112	2.000
16. I find it easy to make the decision.	677	1.000	4.000	2.482	1.118	2.000
17. I feel I am a useful person, and someone needs me.	677	1.000	4.000	2.505	1.161	3.000
18. My life has been very interesting.	677	1.000	4.000	2.583	1.122	3.000
19. I think if I die, others will live better.	677	1.000	4.000	2.527	1.124	3.000
20. I'm still interested in things I've always been interested in.	677	1.000	4.000	2.397	1.113	2.000
Scale Score	677	44.000	81.000	62.690	6.704	63.000

According to the Chinese Classification of Mental Disorders Version 3 (CCMD-3), the diagnostic criteria for mood disorder are as follows:

Criteria for symptom: The core symptom is

depression. And the main manifestations are various, such as easy to be sad, always in a gloomy, downbeat and negative mood, often complaining about being in a bad mood, and cannot be happy in any way. Aside from feeling dejected or down, patients will have at least four of the following symptoms: lack of interest and pleasure, loss of energy or a sense of fatigue; psychomotor retardation or agitation, low self-evaluation, self-reproach or guilt; difficulty in association or decline in conscious thinking ability, recurrent thoughts of death or suicidal or self-injurious behavior, sleep disorders, including insomnia, early awakening or excessive sleep; decreased appetite or significant weight loss; decreased libido.

Criteria for Severity: The mood disorder will contribute to the impaired social function, or cause pain or adverse consequences to oneself.

Criteria for the Course of Disease: The patient has met the criteria for symptoms for at least 2 weeks. There may be some schizophrenia symptoms, but these symptoms are not compatible with a clinical diagnosis of schizophrenia. If the symptom criteria for schizophrenia are met at the same time, the depressive episode criteria should be met for at least 2 weeks after the symptomatic relief of schizophrenia.

Correlation and regression analysis perceptions and influencing factors of medical information security

In the field of psychology, privacy is a critical psychological resource. Privacy creates space for social subjects to escape from social supervision and surveillance, ensuring that, amidst social tensions, we enjoy the right to private information and private space, which is necessary for survival (Shaw et al. 2011). From this perspective, privacy is a "mental-breathing space". However, in the context of medical big data, privacy concerns may reduce patients' willingness to share information (Friedrich 2017). When patients inform physicians of all the relevant information about their condition based on trust, medical staff, medical institutions and relevant application platforms related to treatment should have certain restrictions in collecting various data from patients. Data that is not associated with disease diagnosis and has certain medical value cannot be freely accessed.

As can be seen from Table 5, correlation analysis has been employed to study the correlation between security perception and other four items, including the sensitivity of privacy protection, voluntary disclosure of privacy, privacy leakage experience and information security policy. The Pearson correlation coefficient has been used to indicate the potential correlation.

From the specific analysis, it can be seen that there is a significant relationship between security perception and all the four items (sensitivity of privacy protection, voluntary disclosure of privacy, privacy leakage experience and information security policy). The correlation coefficients are 0.316, 0.354, 0.174, and 0.166 respectively, which are all greater than 0. It means that there is a positive correlation between security perception and the four items.

Table 5. Pearson correlation analysis

Option	Security Perception	Sensitivity of Privacy Protection	Voluntary Disclosure of Privacy	Privacy Leakage Experience	Information Security Policy
Security Perception	1	-	-	-	-
Sensitivity of Privacy Protection	0.316**	1	-	-	-
Voluntary Disclosure of Privacy	0.354**	0.224**	1	-	-
Privacy Leakage Experience	0.174**	0.304**	0.170**	1	-
Information Security Policy	0.166**	0.153**	0.611**	0.084*	1

*$P < 0.05$, **$P < 0.01$

Information security policy, privacy leakage experience, voluntary disclosure of privacy, and sensitivity of privacy protection are used as independent variables, while the security perception has been used as the dependent variable for linear regression analysis. It can be seen from Table 6 that the model formula is: security perception = 0.448+0.339* information security policy +0.428* privacy leakage experience +0.052* voluntary disclosure of privacy -0.094* sensitivity of privacy protection. And the model R-squared value is 0.191. It means that 19.1% of the variation in security perception could be explained by information security policy, privacy leakage experience, voluntary disclosure of privacy, and sensitivity of privacy protection can explain. When performing an F test on the model, it is found that the model passed the *F* test ($F = 39.776$, $P = 0.000 < 0.05$), which means that at least one of the four items (information security policy, privacy leakage experience, voluntary disclosure of privacy, and sensitivity of privacy protection) will have an impact on the security perception. In addition, the multicollinearity of the model has been tested. It is found that the VIF values in the model are all less than 5, implying that there is no collinearity. And the D-W value is around number 2. It indicates that this model is well designed, with no autocorrelation and no correlation between the sample data.

Then, the specific analysis shows that the regression coefficient of information security policy is 0.339 (t = 6.377, P = 0.000 < 0.01), implying that information security policy will have a significant positive correlation with security perception. Secondly, the regression coefficient of privacy leakage experience is 0.428 (t = 7.708, P = 0.000 < 0.01), indicating a significant positive relationship between privacy leakage experience and security perception. Thirdly, the regression coefficient of voluntary disclosure of privacy is 0.052 (t = 1.391, P = 0.165 > 0.05), which means that voluntary disclosure of privacy will not affect security perception. Fourthly, the regression coefficient of sensitivity of privacy protection is -0.094 (t = -1.933, P = 0.054 > 0.1), demonstrating that privacy protection sensitivity is negatively correlated with security perception.

Table 6. Regression coefficients of perception and impact of medical information security (n = 677)

Impact	Unstandardized Coefficients		Standardized Coefficients	t	P	95% CI	VIF
	B	Standard Error	*Beta*				
Constant	0.448	0.245	-	1.828	0.068	-0.032 - 0.928	-
Information Security Policy	0.339	0.053	0.236	6.377	0.000**	0.235 - 0.444	1.141
Privacy Leakage Experience	0.428	0.056	0.345	7.708	0.000**	0.319 - 0.537	1.661
Voluntary Disclosure of Privacy	0.052	0.037	0.051	1.391	0.165	-0.021 - 0.125	1.116
Information Security Policy	-0.094	0.049	-0.085	-1.933	0.054	-0.189 - 0.001	1.598

Note: Dependent Variable: Security Perception
*P < 0.05, **P < 0.01

In brief, it can be concluded that security perception is positively correlated with the three items, information security policy, privacy leakage experience and sensitivity of privacy protection. In contrast, voluntary disclosure of privacy will not affect security perception. However, it is worrying that in the information security policies we found, the protection of patient privacy still remains in principle. There is a lack of practical and effective regulations that can be implemented in detail, such as the protection scope of patient privacy and legal liability. Some scholarly analysis of the readability of privacy policies has shown that the vast majority of privacy policies can only be understood by people with a college degree (Jones et al. 2017). The lack of clarity may limit people's understanding of privacy policies. In addition, with regard to the management of medical institutions, the collection channels of medical big data in China are relatively loose. And there is no integrated standard system and supervision system in the medical industry, so that the protection of patient privacy cannot be implemented in accordance with uniform standards.

Evaluation of the current status of medical information security

Firstly, answers of "Yes" or "No" account for 50% respectively to the following questions: "During the consultation you have experienced, will the doctor inform the patient's condition in detail and respect the patient's decision?", "Will the doctor obtain the patient's explicit consent when dealing with patients' private information?", "When doctors deal with the private information of depressed patients, will they clearly explain the purpose, method and scope of the information?". It suggests that there is still a significant amount of improper use of patients' medical information.

Secondly, in response to the question "Do you think that people with mild depression have a greater degree of privacy protection than people with major depression?", only around 30% of the respondents agree with this statement. Finally, only about 30% of the respondents are aware of this information in response to the question "Do you know that Chapter 2, Section 2 of the *Personal Information Protection Law,* officially implemented on November 1 this year, provides special regulations on the processing rules of sensitive personal information?" (Table 7).

The study indicates that depressed patients' awareness of privacy protection needs to be improved. Some patients with mild depression do not have a strong need to maintain their privacy. Conversely, patients with severe depression are more concerned about sensitive information related to their illness and thus require hospitals and medical staff to keep their information confidential from others. Although participants' understanding of laws and policies related to privacy protection has been investigated, the relationship between these leading factors and privacy has not been researched. There is evidence that understanding regulations can reduce privacy issues (O'Loughlinab et al. 2019). For example, one study reports that "Once relevant protective measures are discussed with patients, privacy concerns will be reduced (Jones et al. 2017)." Therefore, privacy issues are positively related to the perceived need for data governance as well as accountability mechanisms. And this need for supervision is put forward in qualitative research.

Table 7. Results of frequency analysis

Name	Option	Frequency	Percentage (%)	Cumulative Percentage (%)
During the consultation you have experienced, will the doctor inform the patient's condition in detail and respect the patient's decision?	Yes	336	49.6	49.6
	No	341	50.4	100
Will the doctor obtain the patient's explicit consent when dealing with patients' private information?	Yes	352	52	52
	No	325	48	100
When doctors deal with the private information of depressed patients, will they clearly explain the purpose, method and scope of the information?	Yes	356	52.6	52.6
	No	321	47.4	100
Do you think that people with mild depression have a greater degree of privacy protection than people with severe depression?	Yes	251	37.1	37.1
	No	426	62.9	100
Do you know that Chapter 2, Section 2 of the Personal Information Protection Law, officially implemented on November 1st this year, provides special regulations on the processing rules of sensitive personal information?	Yes	229	33.8	33.8
	No	448	66.2	100
Total	-	677	100.0	100.0

Psychological conditions of depressed patients at different times

As shown in Table 8, the analysis of variance (known as the one-way analysis of variance) is conducted to examine the variability of three items during the treatment period, including depressive status, quality-of-life scores and nursing satisfaction. And the following conclusions can be drawn.

Firstly, at the stage Before Treatment, there is a significance level at 0.01 for Depressive State (F = 166.562, P = 0.000). By comparison, the results of mean vales in groups with significance difference are: Before Treatment > After Treatment; Before Treatment>After Recovery; After Treatment>After Recovery". Secondly, during the treatment period, there is a significance level at 0.01 for Quality-of-life Score (F = 147.607, P = 0.000). Through comparison, the results of mean vales in groups with significance difference are: "After Treatment > Before Treatment; After Recovery > Before Treatment. After Recovery > After Treatment". Thirdly, in the treatment period, there is a significance level at 0.01 for Nursing Satisfaction (F = 136.374, P = 0.000). Through comparison, the results of mean vales in groups with significance difference are: "After Treatment > Before Treatment; After Recovery > Before Treatment; After Recovery > After Treatment".

Table 8. Results of variance analysis

Option	Treatment Period (mean value ± standard deviation)			F	P
	Before Treatment (n = 212)	After Treatment (n = 250)	After Recovery (n = 215)		
Depressive State	2.11±0.51	1.56±0.61	1.06±0.65	166.562	0.000**
Quality-of-life Score	1.90±0.62	2.73±0.99	3.42±1.06	147.607	0.000**
Nursing Satisfaction	2.23±1.06	2.91±1.04	3.77±0.78	136.374	0.000**

*P < 0.05, **P < 0.01

In conclusion, samples at different treatment periods shows significance (P < 0.05) for depressive status, quality-of-life score and nursing satisfaction. This means that there is variability in depressive status, quality-of-life score, and nursing satisfaction across the treatment periods in the sample (Figure 2). In the early stages of treatment, patients with depression usually feel abandoned, hoping to be valued and accepted again. During medical treatment, patients will have more severe tension, unfamiliarity and insecurities than ordinary patients. As for severe cases, feelings of despair, guilt and self-blame, and even suicidal thoughts may appear. During the period when the depressive symptoms are relieved through treatment and care, patients are usually eager to acquire relevant knowledge and medications of their depression, along with a sense of inferiority in the process of recovery. When the patient has recovered from depressive symptoms after a considerable period of treatment, the following psychological characteristics will appear, including fear of the recurrence of depression, lack of confidence to adapt to future life smoothly, and a desire to acquire further knowledge of depression.

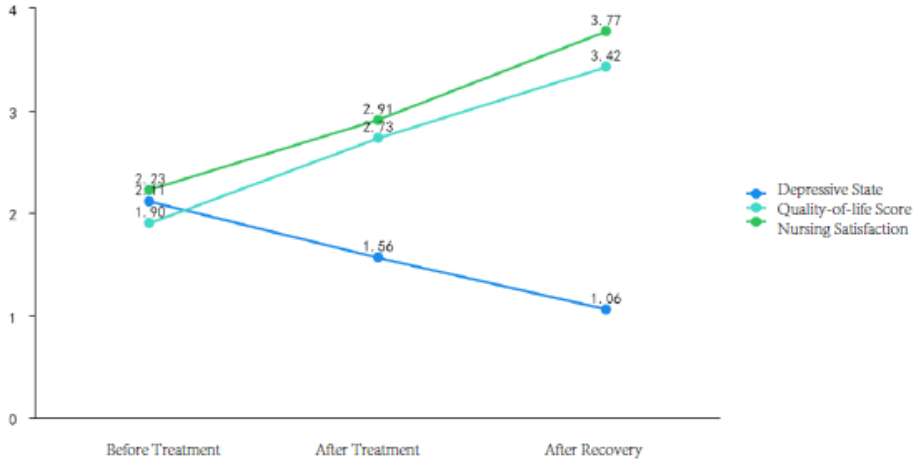

Figure 2. State of different treatment periods

The results demonstrate that patients with targeted nursing intervention have higher quality-of-life-scores, lower depression scores, and higher nursing satisfaction. It can be seen that the implementation of targeted nursing interventions for depressed patients has a positive effect, and is worthy of popularizing in clinical practice.

Psychological interventions for patients with depression

At the initial stage of treatment, doctors can eliminate patients' tension, unfamiliarity or fear by means of psychological support and guidance. It is necessary to rely on communication skills and keen observation to understand the inner world of depressed patients, and analyze their degree of depression. Besides, it should be noted that physicians should avoid mentioning sensitive topics during communications with patients, and use gentle language instead of offensive language, whilst observing the patient's emotional response in the process. While listening, doctors should provide adequate psychological support and comfort for patients, to improve their compliance with treatment.

When symptoms are alleviated, the paramedics should firstly help patients establish a scientific concept that depression is a kind of affective disorder so as to eliminate the sense of inferiority. Secondly, with patients' symptoms gradually disappearing, the nursing staff should help the patient to confirm the fact that the disease is being cured, and provide psychological counseling and positive psychological hints to help patients get rid of depression psychologically. Furthermore, caregivers can encourage patients to vent their inner distress and anxiety through positive psychological suggestions and verbal support. At this point, caregivers should listen patiently and give scientific answers to their questions.

During rehabilitation, doctors can satisfy patients' desire for further knowledge of depression, according to patients' psychological characteristics, and inform them that adherence to medication as prescribed by the doctor is of great importance in preventing the recurrence of depression. This is to ensure that patients will come for the follow-up visit, will not arbitrarily cut the dosage, stop their medication or switch to other medications. Patients can be encouraged to return to their routine work when the dosage is minimized. Meanwhile, nursing staff should strengthen the psychological quality of patients, so that they can develop an open-minded and optimistic personality, with which they could learn to manage their emotions, add spice to their life, and deal with interpersonal relationships properly.

DISCUSSION

In the course of treatment, the subject of the right to know of patients in medical big data has several rights, including the right to obtain all kinds of information related to the patient's disease through legal channels, and the right to directly access to patient's body to examine his or her physiological and pathological state as well as physical defects, etc. Based on the trust in the hospital and to protect their basic right to life and health, patients are bound to abide by the hospital's regulations, inform medical staff of their personal information, physical and psychological characteristics and other general information. Then, the doctor will record and summarize the information in a data-based way, to form the final diagnosis. In this process, patient data will inevitably be cross-transmitted and viewed by multiple people. It can be seen that, living in the era of big data, people will inevitably violate patients' right of privacy while obtaining information more efficiently and conveniently.

How to minimize the loss for both sides by

applying the criteria of the proportionality principle

The proportionality principle can be referred to in terms of dealing with the issue of the right to use patient data and patients' claim for privacy, to reconcile the contradiction between exploitation of data and protection of patient privacy. Meanwhile, on the basis of protecting the legitimate rights of patients, medical staff should make maximum use of patients' private data and promote the progress of medical technology. It should be noted that when applying this principle, the degree of necessity must be measured. Even in cases where disclosure of patient privacy cannot be avoided, the damage to patient privacy should be minimized. In addition, the protection of patient privacy should be reduced and restricted to some extent when interest of a third party and the public interest are involved in private medical data of patients.

Classify and categorize data of depressed patients

In addition to recording the basic personal data of depressed patients, medical big data involves more of their sensitive information. According to the characteristics of data in different protection levels, patient data can be classified longitudinally as follows. To begin with, the first level can be classified as low sensitivity, which is a category of data with low personal nature, low sensitivity, and low value after horizontal classification. And the leakage of such data will cause slight damage to the patient's personal life or property. Then, the second level is relatively sensitive, which mainly includes data with certain sensitivity or value. Such information, once leaked, will cause more severe damage to the legitimate rights and interests of patients or related subjects. Besides, the third level can be regarded as sensitive. This kind of data carries the private information of patients with high personal specificity, which is of high utilization value for medical enterprises and can bring economic benefits. If leaked, it will cause serious damage to patients, third parties and even the society. Moreover, the fourth level is of highly sensitivity, whose data is of the highest level and the highest value. Once leaked, the damage to social order and public interests is particularly serious, and even poses a serious threat to national security.

Implement different levels of protection for patient data with different levels of sensitivity

The delineation of the scope of personal sensitive data is not static, and it changes with various factors such as socioeconomic conditions and public attitudes towards data sensitivity. In practice, de-identification of data is frequently used. Most of the information hidden in this way is general data in the horizontal classification, such as non-disease-related data (Kayaalp 2018). Given that there are already established technical methods to protect such data in practice, this paper argues that in the protection of depressed patients, the main focus should be on sensitive data and unique data with very personal characteristics. It is because patient's identity can be easily analyzed during the process of data mining, resulting in privacy leakage. Therefore, the protection of data at different levels can be refined through the use of relevant management systems in terms of information access measures (e.g., restriction of access rights, restriction of access locations, restriction of access contents, and informed consent of patients), to build a large-scale and unified data management model among regions and form a comprehensive industry standard.

CONCLUSIONS

Currently, the treatment of depression is mainly based on medication and supplemented by psychotherapy. However, medication has several physiological side effects, such as easy to form drug dependence, and easy to relapse after stopping medication. However, after receiving psychotherapy, patients can improve their psychological and social adjustment ability through self-regulation. It can be seen that psychotherapy is relatively effective and stable, capable of helping doctors conduct targeted nursing interventions for patients with psychological characteristics. It plays an essential role in theoretical research and clinical work of psychotherapy for depression. Along with the treatment, depressed patients will experience different psychological changes, so that targeted nursing interventions should be offered according to their psychological characteristics. In addition, faced with the problems of vague data types and lack of information security regulations in Internet medical treatment, depressed patients should enjoy the right to protect their private information from illegal infringement. However, our findings highlight the deficiencies in information security policy. In order to deal with the risk of disclosure of medical data, reasonable restrictions should be adopted, conflicts should be weighed, and more strict and specific protection path should be proposed for the privacy of patients with depression.

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Conflict of interest*: None to declare.*

References

1. *Boehme-Nebler V: Privacy: a matter of democracy. Why democracy needs privacy and data protection. International Data Privacy Law 2016; 6:222-229*
2. *Cohen IG & Mello MM: Big data, big tech, and protecting patient privacy. JAMA Network 2019; 322:1141-1142*
3. *Friedrich M: Depression is the leading cause of disability around the world. JAMA Network 2017; 317:1517*
4. *Jiang Y & Li X: Privacy protection and mode selection of patients with medical big data in China. Medicine and Law 2018; 4:1-7*
5. *Jones RD, Sabolch AN, Aakhus E, Spence RA, Bradbury AR & Jagsi R: Patient perspectives on the ethical implementation of a rapid learning system for oncology care. Journal Oncology Practice 2017; 13:163-175*
6. *Karyotaki E, Efthimiou O, Miguel C, Bermpohl FMG, Furukawa TA, Cuijpers P, Riper H, Patel V, Mira A, Gemmil AW, Yeung AS, Lange A, Williams AD, Mackinnon A, Geraedts A, Van Straten A, Meyer B, Björkelund C, Knaevelsrud C & Forsell Y: Internet-based cognitive behavioral therapy for depression: a systematic review and individual patient data network meta-analysis. JAMA Psychiatry 2021; 78:361-371*
7. *Kayaalp M: Patient privacy in the era of big data. Balkan Medicine Journal 2018; 35:8-17*
8. *Mayer-Schönberger V, Cukier K & Zhou T: Big data: a revolution that will transform how we live, work, and think. Zhejiang People's Publishing House 2013; 24:51-305*
9. *O'Loughlinab K, Nearybc M, Elizabeth C, Stephen A & Schuellerbc M: Reviewing the data security and privacy policies of mobile apps for depression. Internet Interventions 2019; 15:110-115*
10. *Price WN II & Cohen IG: Privacy in the age of medical big data. Nature Medicine 2019; 25:37-43*
11. *Shaw NT, Kulkarni A & Mador RL: Patients and health care providers' concerns about the privacy of electronic health records: a review of the literature. Electronic Journal of Health Informatics 2011; 6:80-84*
12. *Xu X, Peng H, Bhuiyan MZA, Hao Z, Liu L, Sun L & He L: Privacy-preserving federated depression detection from multi-source mobile health data. IEEE Transactions on Industrial Informatics 2021; 9:1-3*

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ANALYSIS AND INTERVENTION OF COLLEGE STUDENTS' MENTAL ILLNESS IN THE POST-EPIDEMIC ERA

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SUMMARY

Background: *The COVID-19 epidemic has had an immeasurable impact on all sectors of society and has led to anxiety, depression, fear and other negative psychological reactions among college students. Therefore, it is imperative to investigate, analyze and intervene in such phenomenon.*

Subjects and methods: *In this study, 2,000 college students from a certain university in Zhejiang province are selected as interviewees. Questionnaires are used to summarize and analyze the psychological problems of this group. Besides, statistical methods are conducted to compare the actual effects of different treatments on college students with psychological diseases, so as to find the most appropriate way to alleviate their symptoms.*

Results*: Statistical analysis shows that the main psychological problems affecting college students during the epidemic are anxiety and depression, which account for far more than other possible psychological symptoms. The results of SCL-90 scale test shows that Physical Exercise has the most significant effect (R = 67), while Painting Therapy has the highest stability (σ = 11.898), compared with the mainstream psychotherapy.*

Conclusions*: The efficacy and stability of different therapies are different. Therefore, when choosing treatment methods, therapists need to analyze both the validity and stability, and consider whether the therapy is easy to operate into practice. The idea of conducting multiple therapies comprehensively deserves further study.*

Key words**:** *post-epidemic era - college students - mental illness - treatment*

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INTRODUCTION

The post-epidemic era refers to the era when the epidemic fluctuates from time to time and may break out on a small scale at any time. And the epidemic may return from foreign countries and regions, with a seasonal outbreak. It will last for a prolonged period of time and cause far-reaching effects on all sectors (Chen et al. 2020). At the Conference of Shenzhen Hospital in 2020, Lin Lu, an academician of The Chinese Academy of Sciences, pointed out that COVID-19 pandemic is a stressful event for the public. People may experience various physical and psychological stress responses such as depression, anxiety, fear and insomnia (Sato 2020). Existing research results have proved that the incidence of psychological disorders increases dramatically in conflict environments, which can produce a more significant burden of illness (Jiang et al. 2021).

As a special social group, college students are in a period when their minds are not yet fully mature, and they are extremely vulnerable to external emergencies (Chang et al. 2020). In the post-epidemic era, the recurrence of the epidemic has led to dramatic changes in learning and lifestyle of college students. Nowadays, the majority of universities have shifted their classroom teaching into online teaching. In this case, students must complete tasks such as online assignment submission simultaneously during their studies, and such a complicated procedure has led to a serious sense of discomfort among many college students (Morote et al. 2020). At the same time, communication among college students has decreased. It is because, to prevent and control the epidemic, schools have set restrictions on students' outdoor activities. Although students can connect with their families and friends through existing social platforms by means of video, voice and text, the intimacy given by these electronic devices is far less effective than direct face-to-face contact in the process of emotional communication (McDonnell et al. 2021). In addition, college students at this stage are also faced with problems such as, adapting to new learning environments and tasks, subject selection, conflicts between ideals and reality, dealing with interpersonal relationships, and future careers. The current situation in the post-epidemic era has exacerbated the impact of all these stressful events, causing more extensive and severe psychological effects on college students. Therefore, seeking scientific and effective mitigation and treatment methods has become an urgent issue to be solved (Grubic et al. 2020).

SUBJECTS AND METHODS

Research subjects

In this study, 2,000 college students enrolled in a university in Zhejiang province have been selected as the research objects.