

Construction of Early Warning and Intervention Mechanisms for College Students' Mental Health Issues

Mali Quan

Henan Prosecution Vocational College, Zhengzhou, 451191, China

Abstract: *This paper aims to explore and construct an early warning and intervention mechanism for college students' mental health issues. With the popularization of higher education and increasing contemporary social pressures, college students face more and more mental health challenges, including anxiety disorders, depression, and adjustment disorders. In order to effectively address this issue, this study proposes a comprehensive warning system and targeted intervention measures through analysis. The warning system relies on real-time monitoring of multidimensional indicators such as emotional fluctuations, changes in social behavior, and academic performance, combined with data analysis technology, to achieve early identification of mental health risks. In the design of intervention measures, the paper emphasizes a tiered implementation strategy for primary, secondary, and tertiary interventions, and discusses in detail the specific content and implementation methods of each level of intervention measures. In addition, this study also establishes a set of evaluation and feedback mechanisms for intervention effects to ensure the effectiveness and continuous optimization of intervention measures. Through the implementation of this research, it is expected to provide college students with a more sound and effective psychological support system, promoting their psychological well-being and academic achievement.*

Keywords: *college students' mental health; warning mechanism; intervention measures*

1. Introduction

With the intensification of social competition and the acceleration of life pace, mental health problems among college students are becoming increasingly prominent, becoming an important factor affecting students' personal development and social stability. Faced with this challenge, it is of great significance to construct an effective mental health warning and intervention mechanism for early identification and effective intervention of mental health problems. Starting from the mental health challenges faced by contemporary college students, this paper discusses the determination of mental health warning indicators, the establishment of warning models, and the design and implementation of intervention measures, aiming to provide scientific and practical mental health management strategies for higher education institutions.

2. Characteristics and Influencing Factors Analysis of College Students' Mental Health Issues

2.1 Types and Characteristics of Mental Health Issues

In the current higher education environment, college students face complex and varied challenges to their mental health, which involve multiple dimensions of emotions, cognition, and behavior, significantly affecting students' quality of daily life and academic performance. This section delves into several major types of mental health issues and their significant characteristics, aiming to provide a solid theoretical basis for the construction of early warning and intervention mechanisms.

2.1.1 Anxiety Disorders

Anxiety disorders are prevalent mental health issues in the higher education context, characterized by individuals experiencing persistent and excessive worry and fear. This condition not only damages students' quality of daily life but also severely affects their learning efficiency and social interactions. Specific symptoms include, but are not limited to, palpitations, frequent sweating, irritability, and decreased sleep quality. Individuals with anxiety disorders may feel overly sensitive to uncertainties

about the future, leading to feelings of helplessness and despair in academics, interpersonal relationships, and career planning.^[1]

2.1.2 Depression

Depression is also common among college students, characterized by persistent low mood, loss of interest in usual activities, and significant decrease in self-worth. In severe cases, depression may lead to suicidal behavior. This condition profoundly affects students' motivation, academic performance, social activities, and daily functioning. Students in a state of depression may exhibit symptoms such as lack of energy, difficulty concentrating, and changes in appetite and weight.

2.1.3 Adjustment Disorders

Adjustment disorders reflect individuals' inability to effectively adapt to psychological stress responses when facing changes in school life (such as changes in interpersonal relationships and increased academic pressure). It manifests as anxiety, depression, and avoidance behavior, which, if left untreated, may develop into more serious mental health problems. The key to adjustment disorders lies in individuals' perception of environmental changes and the effectiveness of their coping strategies.^[2]

2.1.4 Personality Disorders

Personality disorders, including borderline personality disorder and antisocial personality disorder, typically affect individuals' interpersonal interactions and social adaptation abilities. Individuals with such disorders may experience long-term disturbances in emotional stability, self-image, interpersonal relationships, and impulse control. Personality disorders manifest in various ways and usually require comprehensive assessment and intervention through professional mental health services.

2.1.5 Eating Disorders

Eating disorders, such as anorexia nervosa and bulimia nervosa, are mainly associated with excessive concern and distorted self-perception of body image. These issues not only pose a threat to individuals' mental health but also have significant negative effects on physical health. Students with eating disorders may exhibit extreme eating behaviors, drastic changes in weight, and excessive physical activity.^[3]

The aforementioned types and characteristics of mental health issues are widely prevalent among college student populations, and they may overlap and interact with each other. Recognizing the diversity and complexity of these issues is crucial for building effective early warning and intervention mechanisms.

2.2 Factors Influencing College Students' Mental Health Issues

The etiology of mental health issues among college students is a complex and multidimensional phenomenon, involving the interaction of numerous intrinsic and extrinsic factors. A thorough understanding of these factors is crucial for constructing effective mental health early warning and intervention mechanisms.

2.2.1 Intrinsic Factors

Genetic Predisposition: Modern psychology and genetics research reveal that certain mental health issues, such as depression and anxiety disorders, may be influenced by genetic factors. Genetic predisposition, as an aspect of individual susceptibility, is associated with specific genetic variations, which may increase the risk of developing mental health problems.^[4]

Personality Traits: Individual personality composition influences how individuals perceive and cope with stress and challenges in life. For example, individuals with introverted personalities may find it more difficult to feel comfortable in social situations, while those with high neuroticism may be more susceptible to emotional fluctuations and psychological pressure.

Cognitive Styles: Individuals' cognitive styles, including how they interpret surrounding events and personal experiences, significantly impact mental health. Negative thinking patterns, such as catastrophizing (expecting the worst outcome) and overgeneralization (inferring all similar events from one event), can exacerbate psychological distress and emotional issues.

2.2.2 Extrinsic Environmental Factors

Academic Pressure: In the higher education environment, students often face daunting academic

tasks and competitive exam pressures. This pressure, coupled with the uncertainty about future career paths, constitutes a significant source of psychological stress, which may lead to anxiety, depression, and other mental health issues.

Interpersonal Relationships: The quality of interpersonal relationships directly influences individuals' psychological well-being. Tense or distant relationships with classmates, friends, and family members may weaken the perception of social support, thereby increasing the risk of mental health problems.

Socio-Cultural Factors: Societal definitions of success, stigmatization of mental health issues, and other cultural factors profoundly influence college students' psychological states. This socio-cultural background may exacerbate individuals' psychological stress, especially when they feel unable to meet expected social standards.

Internet and Media Influence: In the digital age, excessive use of social media and online resources may pose a range of mental health challenges. Information overload, cyberbullying, distorted self-worth, and detachment from real-life experiences can all threaten college students' mental health.^[5]

In conclusion, the causes of mental health issues among college students are multifaceted, involving various aspects such as individuals' genetic backgrounds, personality traits, cognitive styles, and the socio-cultural environments in which they reside. Only through comprehensive understanding of these factors can effective early warning and intervention mechanisms be constructed to address and alleviate college students' mental health problems.

3. Construction of Early Warning Indicator System for Mental Health Issues

3.1 Determination of Early Warning Indicators

3.1.1 Emotional Fluctuations

The indicator of emotional fluctuations focuses on significant and rapid changes in students' emotional states, such as sudden onset of low mood or unusually elevated mood, which may serve as early warnings of psychological stress or mental health issues. This indicator is monitored through regular psychological assessments and self-report scales to identify trends in emotional stability.

3.1.2 Changes in Social Behavior

Changes in social behavior reflect variations in students' adaptability and preferences in social interactions. A significant decrease in social activities may indicate tendencies towards isolation, depression, or anxiety, while an abnormal increase in social activities may mask overcompensating psychological mechanisms. Tracking and evaluating these changes can be effectively achieved through social activity records and social network analyses.

3.1.3 Changes in Academic Performance

Sudden changes in academic performance, especially unexplained declines in grades or lack of interest in studying, often foreshadow potential mental health issues. This indicator is assessed by analyzing academic achievements, attendance rates, and classroom participation data to early detect abnormalities in learning motivation and cognitive function.

3.1.4 Changes in Sleep and Dietary Habits

Changes in sleep and dietary habits directly reflect individuals' physiological and psychological health statuses. Irregular sleep patterns, significant decreases in sleep quality, or abnormal changes in appetite may indicate increased psychological burden. Comprehensive assessment of this area's health status can be achieved through sleep diaries, dietary records, and monitoring of relevant physiological indicators.

3.1.5 Verbal and Behavioral Cues

Verbal cues of despair, self-blame, or self-harm, as well as increased impulsivity or risky behaviors exhibited in daily interactions, serve as important warning signs of psychological crises. In-depth analysis of the content and frequency of these verbal and behavioral cues, combined with professional psychological assessments, is crucial for identifying high-risk individuals and implementing timely interventions.

By conducting in-depth analysis and comprehensive application of these early warning indicators, a multidimensional and highly sensitive mental health early warning system can be constructed, providing college students with more targeted and timely psychological health support and intervention services. This not only helps reduce the incidence of mental health issues but also promotes students' overall well-being and academic achievements.

3.2 Establishment of Early Warning Model

The early warning model integrates multidimensional early warning indicators to accurately predict the risk level of mental health issues among college students, thereby facilitating effective early intervention measures.^[6]

3.2.1 Data Collection and Integration

The foundation of the early warning model lies in comprehensive and accurate data collection and integration. This process involves not only traditional questionnaire surveys and psychological assessments but also extends to emerging data sources such as academic records, social media behavior analysis, and biological markers. Through comprehensive analysis of these multi-source data, more comprehensive indicators of mental health status can be obtained. Additionally, advanced data cleaning and preprocessing techniques are necessary during data integration to ensure data quality and consistency, providing accurate inputs for the model.

3.2.2 Model Selection and Development

Selecting an appropriate statistical or machine learning model is crucial for constructing the early warning system. Model selection should be based on the characteristics of the data and the prediction goals. Common methods include logistic regression, random forest, support vector machine (SVM), and deep learning neural networks. Advanced models like deep learning are particularly effective in handling complex data features and large datasets but also require significant computational resources and expertise. Each model has its strengths and limitations; therefore, choosing the most suitable model requires considering predictive performance, interpretability, and practicality.

3.2.3 Feature Engineering

Feature engineering is a critical step in the model development process, involving the extraction, selection, and transformation of features from raw data to improve the model's predictive ability. Effective feature engineering can significantly enhance the accuracy of the model in identifying mental health risks. This may include identifying and handling missing data, feature standardization, dimensionality reduction techniques such as principal component analysis (PCA), and feature selection algorithms, ensuring the model focuses on the most predictive variables.

3.2.4 Model Training and Validation

When developing the early warning model, training the model using historical data is crucial. This process includes parameter tuning, model fitting, and cross-validation steps to ensure the model's generalization ability on unknown data. Techniques like cross-validation help evaluate the model's robustness and predictive accuracy, thereby optimizing the model's performance. Additionally, continuous model updates and optimizations are necessary to adapt to changes in data and the environment.

3.2.5 Results Interpretation and Application

Finally, translating the model's predictive results into specific intervention recommendations is crucial for achieving the goal of early intervention. Identification of high-risk groups should trigger personalized intervention plans, including but not limited to psychological counseling, social support, and lifestyle adjustments. The interpretability of the model emphasizes the importance of translating technical results into practical applications, ensuring that intervention measures are both scientifically grounded and humane.

Through the above steps, an efficient, dynamic, and predictive mental health early warning model can be constructed, providing timely and effective psychological health intervention support for college students, thereby promoting their overall well-being and academic success.

4. Design and Implementation of Psychological Health Intervention Strategies

4.1 Classification and Design of Intervention Measures

In constructing an early warning and intervention mechanism for college students' psychological health issues, meticulous delineation and careful design of intervention measures are crucial. This study categorizes intervention measures into three levels: primary intervention, secondary intervention, and tertiary intervention, each targeting different stages of psychological health needs, aiming to build a comprehensive and multi-level support system.

4.1.1 Primary Intervention: Popularization and Prevention

The core of primary intervention lies in disseminating psychological health knowledge, raising awareness of the importance of psychological health among the general public, thus preventing the occurrence of psychological health problems. This level of intervention includes not only traditional psychological health education lectures and courses but also encompasses workshops on emotional management and stress management. To enhance its coverage and impact, psychological health education materials can be disseminated through social media platforms and school websites, using formats such as short videos and interactive quizzes to engage student participation and attention. Additionally, by organizing campus psychological health days and themed activities, a supportive campus culture can be fostered, further enhancing students' psychological resilience and ability to cope with stress.

4.1.2 Secondary Intervention: Early Identification and Intervention

Secondary intervention focuses on early identification of students at risk of psychological health issues but who have not yet developed serious problems, providing timely and effective intervention. In addition to regular psychological screenings and counseling services, psychological health self-help groups should be established to encourage students to share experiences and support each other. To enhance the specificity and effectiveness of interventions, personalized psychological intervention plans can be introduced, such as workshops addressing specific stressors (e.g., exam anxiety, interpersonal conflicts). Furthermore, by utilizing mobile applications and online platforms, low-threshold, highly accessible psychological support services can be provided to ensure that every student in need receives timely attention and intervention.

4.1.3 Tertiary Intervention: Professional Treatment and Rehabilitation

For students diagnosed with psychological health disorders, tertiary intervention offers individualized and professional treatment plans. This level of intervention includes not only professional psychological therapy (such as cognitive-behavioral therapy, psychodynamic therapy), and necessary pharmacological treatments but also long-term psychological rehabilitation services and support. The development of treatment plans requires collaboration across multidisciplinary teams, including psychologists, psychiatrists, social workers, etc., to ensure comprehensive and holistic support. Additionally, to support students' successful recovery and return to campus life, continuous psychological counseling, career planning guidance, and social skills training should be provided.

In designing intervention measures, innovation and practicality are essential. Adopting an interdisciplinary approach, integrating the latest findings from psychological health research, and utilizing information technology tools (such as online psychological counseling, psychological health apps, big data analysis, etc.), can not only enhance the efficiency and coverage of intervention measures but also ensure the cultural adaptability and inclusivity of interventions, meeting the specific needs of students from different backgrounds. Through such multidimensional, multi-level, and comprehensive intervention measures, this study aims to build a more robust and effective psychological health support system for college students, promoting their psychological well-being and overall development.

4.2 Evaluation and Feedback of Intervention Effects

4.2.1 Evaluation of Intervention Effects

This study employs diversified scientific methods to evaluate the effects of interventions, including quantitative questionnaire surveys, qualitative in-depth interviews, behavioral observations, and measurements of physiological indicators. Questionnaire surveys utilize a pre-post comparison method to assess changes in college students' psychological health status, such as alterations in anxiety and

depression levels, as well as improvements in psychological resilience and self-efficacy. In-depth interviews and behavioral observations aim to capture more subtle behavioral and emotional changes, providing rich background information and interpretive insights for the data. The measurement of physiological indicators, such as heart rate variability and skin conductance response, provides objective evidence for evaluating the physiological effects of psychological interventions.

4.2.2 Establishment of Feedback Mechanism

To ensure the adaptability and continuous improvement of intervention measures, this study establishes a dynamic feedback mechanism, encouraging all stakeholders, including students, teachers, and psychological health experts, to participate. A wide range of feedback information is collected through online surveys, regular feedback meetings, and open-day activities. After summarizing and analyzing this information, it will be used to assess the acceptability, engagement, and overall satisfaction of the intervention measures, as well as to identify issues and potential improvement areas during the intervention process.

The feedback results and improvement suggestions will be promptly and transparently disseminated to campus community members through channels such as campus networks, email lists, and social media platforms. This not only increases the transparency and trustworthiness of the intervention measures but also fosters a positive atmosphere of collective participation and continuous improvement in psychological health intervention measures campus-wide.

Through carefully designed evaluation of intervention effects and dynamic feedback mechanisms, the intervention measures are ensured to be highly targeted, effective, and capable of continuous improvement. This not only provides effective solutions for current psychological health issues among college students but also lays a solid foundation for future research and practice in psychological health intervention.

5. Conclusion

This study has successfully constructed an early warning and intervention mechanism for addressing psychological health issues among college students, providing a new approach and method for early identification and effective intervention. Through real-time monitoring and data analysis of multidimensional warning indicators, timely identification of potential psychological health risks has been achieved. Meanwhile, the tiered intervention strategy designed in this study, ranging from popularizing psychological health knowledge to providing professional psychological therapy, has formed a comprehensive and systematic intervention system. The establishment of an evaluation and feedback mechanism for intervention effects ensures the effectiveness and continuous improvement of intervention measures. In summary, this study provides a practical set of psychological health management tools for higher education institutions, which is of significant importance for promoting the psychological well-being and overall development of college students. Future research could further explore the application of emerging technologies in psychological health warning and intervention to continuously optimize and innovate psychological health support services.

References

- [1] Xiong, M. (2023). *Research on the Early Warning and Scientific Intervention Mechanism of Psychological Problems in College Students*. *Journal of Heilongjiang Institute of Teacher Development*, 42(04), 134-137.
- [2] Wang, Q. (2021). *Research on the Early Warning and Intervention System of Psychological Crisis for College Students Based on Big Data Technology*. *Computer Knowledge and Technology*, 17(32), 169-170+173.
- [3] Zhang, Z. (2011). *Preliminary Exploration on Constructing the Psychological Crisis Early Warning System for College Students*. *Academic Theory*, (21), 191-192.
- [4] Shen, X., & Wang, J. (2010). *Discussion on the Construction of Psychological Crisis Early Warning and Intervention System for College Students*. *Xiangchao (Bi-monthly)*, (03), 32-33.
- [5] Yang, Q. (2009). *Discussion on Psychological Health Issues of College Students and Countermeasures*. *China's Extracurricular Education*, (S3), 186+224.
- [6] Chen, H., & Yang, Z. (2009). *Paying Attention to Crisis, Warning Crisis, and Interfering Crisis—Constructing the Early Warning and Intervention Mechanism for College Students' Psychological Crisis*. *China Forestry Education*, 27(S1), 169-172.