

Research on the Mechanism and Path of AI Empowered Psychological Crisis Intervention for College Students

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Abstract

In the emerging era of AI empowerment today, artificial intelligence has become increasingly integrated into daily life. As for the group of college students, due to the influence of factors such as the times and functions, their psychological problems face a special situation of complex and changing external environment, and existing intervention mechanisms are difficult to effectively solve the problems. Therefore, with the empowerment of artificial intelligence, it is particularly necessary to build a comprehensive intervention system that includes mechanisms for aggregation, selection, conversion, and feedback. Therefore, we should have a correct understanding of the historical practice of empowering college students with artificial intelligence in psychological crisis intervention. Starting from the collaborative construction of early warning forms, careful shaping of technological ecology, and efforts to construct subject literacy, we should fully activate the inherent potential of artificial intelligence and promote the intelligent transformation of psychological crisis intervention towards stability and improvement.

Keywords

Artificial intelligence, Psychological crisis intervention, Intelligent transformation.

1. Introduction

In recent years, due to complex interpersonal relationships, increased academic burden, sluggish employment situation, increased social pressure, and high incidence of psychological disorders, the current situation of psychological crisis among college students has attracted much attention. The Chinese Academy of Sciences has carried out a follow-up survey on the psychological crisis of more than 80000 college students and released the 2022 Chinese National Mental Health Report. The results show that the detection rate of depression is 21.48%, and the detection rate of anxiety risk is 45.28%. In May 2023, the Ministry of Education, in conjunction with sixteen departments, conducted a survey and research to strengthen and improve students' mental health work, and issued the "Special Action Plan for Comprehensively Strengthening and Improving Students' Mental Health Work in the New Era (2023-2025)", which highlights the urgent need to enhance the mental health literacy of college students.

With the rapid development of artificial intelligence technology, taking the opportunity of the rise of AI tools such as ChatGPT developed by OpenAI, ERNIE Bot of Baidu, Spark of iFLYTEK, Tongyi Qianwen of Ali, etc., the method based on natural language processing (NLP) has gradually entered people's vision. The efficiency, usability, and development of NLP methods make it possible for artificial intelligence to empower college students with psychological crisis intervention. By collecting multimodal data, behavioral data, and social interaction data, natural language text information published on social media platforms is transformed into a form that can be processed by computers using artificial intelligence technology and natural

language processing methods. This enables computers to read, understand, and analyze the information, ultimately generating warning information or providing intervention suggestions, thereby effectively improving the effectiveness of psychological crisis intervention for college students.

2. The Dilemma of Psychological Crisis Intervention for College Students

2.1. The dimension of the times: the complexity of contemporary college students' psychological crisis situations is becoming increasingly prominent

In the era of digitization, college students are immersed in a more complex environment. While information technology provides them with convenient, rich, and efficient learning and lifestyle, it also leads to a stronger concealment and diversity in their personal opinions and behavior. During this special period, college students face conflicts with themselves and others, leading to a state of conflicting self-awareness and imbalanced psychological development [1]; On the other hand, it bears multiple pressures from society, schools, and families, carries high expectations from all three parties, and is deeply embroiled in conflicts between ideological and cultural values, with relatively weak resilience [2]. In addition, the current psychological crisis among college students presents significant characteristics such as diversity, suddenness, and concealment. This not only poses a serious threat to students' physical and mental health, but may also endanger their life safety. At the same time, it also has a negative impact on the stable order of schools and the harmonious development of society.

2.2. Functional dimension: A review of the inadequacy of existing psychological crisis intervention mechanisms for college students in solving current problems

In the context of psychological crisis intervention for college students, it is crucial to accurately explore the blind spots in the campus crisis intervention system, in order to avoid directional deviations and missed intervention priorities when empowered by artificial intelligence. This plays a key role in the success or failure of AI enabled psychological crisis intervention for college students [3]. At present, there are many problems with the psychological crisis intervention mechanism in universities. On the one hand, at the internal mechanism level, due to the lack of professional training in the intervention team, the handling ability is insufficient. In terms of procedures, there is a lack of attention to developmental crises and the intervention system is not perfect. At the same time, there are blind spots such as the failure to effectively help students establish the concept of "helping others and self-help" in guiding values; On the other hand, there is an imbalance in the overall system construction and resource allocation, manifested by significant differences in resources between universities. Insufficient budget leads to a shortage of teaching staff, and lack of innovation in educational content and methods results in low student participation. There are still situations such as insufficient cultural sensitivity, limited application of information technology, and prominent privacy protection issues, which make it difficult for existing intervention mechanisms to effectively solve the difficulties faced in practice.

3. Mechanism of AI Empowering Psychological Crisis Intervention for College Students

General Secretary Xi Jinping emphasized that "those who do not plan for the future are not enough to plan for the moment; those who do not plan for the overall situation are not enough to plan for one domain." "We must adhere to a systematic approach," "plan and solve problems

from a systematic perspective, comprehensively coordinate and promote various fields of work and socialist modernization construction [4]." AI enabled mental health interventions for college students also need to implement a systematic approach, based on natural language processing technology, comprehensively collect, select, identify, process, warn and output materials, establish and improve a comprehensive, efficient, and effective psychological intervention mechanism, and provide strong support for building a safe and stable university environment.

3.1. Aggregation mechanism -- the data collection capability of artificial intelligence meets the timeliness requirements of psychological crisis intervention

Artificial intelligence plays an important role in promoting accelerated technological progress, industrial transformation and upgrading, accelerating the shaping of new quality productivity, and achieving high-quality development. In this context, artificial intelligence has shown diversity in the application of real-time collection of student information, covering both software and hardware [5]. The popularity of smart wearable devices such as smartwatches and wristbands can effectively record and monitor physiological parameters such as students' sleep quality. In addition, smart devices in the classroom, such as smart whiteboards, cameras, and sensors, can monitor students' attendance and class performance. Artificial intelligence also captures physical information such as facial expressions, eye contact, and behavior of students through image recognition technology. Track students' life trajectories and behavior patterns through positioning technologies such as Wi Fi and Bluetooth beacons. By analyzing students' dynamic and historical records on social media, further information on their online behavior can be collected.

3.2. Selection mechanism - The data filtering capability of artificial intelligence supports the accuracy requirements for psychological crisis intervention

Data preprocessing is the cornerstone of data analysis and is crucial for ensuring data quality and the rigor of subsequent analysis. During this process, it is necessary to integrate multiple natural language data sources such as social media, questionnaire surveys, and images. Based on statistical methods and preset rules, using techniques such as correlation analysis and collinearity monitoring, key features are extracted and screened, missing values are filled in, redundant variables are removed, and data dimensionality is effectively reduced. At the same time, automatic cleaning of stop words, punctuation and other noise in social media, using stem extraction, grammar correction and other methods, achieves standardization, normalization conversion and classification merging of data formats. For time series data, sequence decomposition and smoothing are used, while for encoding category data, methods such as label encoding are used for preprocessing. Through this series of closely linked operations, high-quality data is extracted from multiple sources, laying a solid foundation for subsequent analysis and ensuring efficient and accurate data processing.

3.3. Conversion Mechanism -- The Natural Language Processing Capability of Artificial Intelligence Helps Effectively Implement Psychological Crisis Intervention in Contemporary Universities

Conduct in-depth analysis and classification of preprocessed data. Firstly, the bag of words model is applied, combined with the word frequency inverse document frequency method to extract features and digitize the text data; Then, through word embedding techniques, it is transformed into word vectors, filtered by weights, and representative vocabulary is extracted to reveal semantic relationships. Meanwhile, by utilizing pre trained language models such as GPT and BERT, context sensitive information in the text can be accurately annotated and represented, using LDA model for topic modeling and mining deep semantics. Subsequently,

classification models such as support vector machines, decision trees, and neural networks were used to classify the text. Based on existing sentiment dictionaries and new word libraries, classify computer language, identify students' psychological and physiological states, and predict emotions. Ultimately, multimodal fusion technology is adopted to integrate image, text, and sentiment analysis results, ensuring both accuracy and comprehensiveness of the analysis.

3.4. Feedback mechanism - the coordination ability of artificial intelligence enhances the effectiveness of the psychological crisis intervention system

When analyzing the integration of artificial intelligence into psychological crisis intervention for college students as a complete system, the feedback mechanism can be divided into three main stages: information input, information conversion, and information output. Feedback is not just the final result, but a dynamic link that runs through the entire process. The information input stage includes a set display mechanism and a selection mechanism, aimed at ensuring the accuracy and timeliness of feedback information. The information conversion stage covers the conversion mechanism, focusing on feedback on the effectiveness of information processing; The feedback mechanism in the information output stage reflects the timeliness of the warning. By identifying potential danger information, artificial intelligence can issue alert signals to users or relevant personnel and make dynamic adjustments and real-time feedback. The construction standards of feedback mechanism can refer to a series of important statements by General Secretary Xi Jinping, such as "cultivating a rational and peaceful healthy mentality, strengthening humanistic care and psychological counseling", and "strengthening the construction of social psychological service system, cultivating self-esteem, self-confidence, rational and peaceful, and positive social mentality" [6]. These statements emphasize problem orientation and point out the need to focus on the core goal of "cultivating virtue and nurturing people", promote the construction of feedback mechanisms in various fields, systems, and links, and comprehensively implement the work of "AI empowerment".

4. The Path of AI Empowering Psychological Crisis Intervention for College Students

In the digital age, the empowerment of artificial intelligence is both an opportunity and a challenge. We need to dialectically view the contradictions and dilemmas of artificial intelligence empowerment. We need to inherit the traditional approach of psychological crisis intervention, while also tapping into the infinite potential of intelligent transformation in psychological crisis intervention. It is necessary to adapt to the working state of artificial intelligence assisted intervention and prevent unauthorized behavior during the intelligent transformation [7]. Starting from the collaborative construction of warning forms, careful shaping of technological ecology, and emphasis on building subject literacy, fully activate the inherent potential of artificial intelligence, and promote the intelligent transformation of psychological crisis intervention towards stability and improvement.

4.1. Collaborative intelligent warning mode and traditional warning methods to assist college students in the transformation and balanced development of psychological crisis intervention

In the field of higher education, the deep integration of psychological crisis intervention for college students and artificial intelligence has great potential for improving intervention effectiveness. From a fundamental analysis, there is an inherent logical connection between traditional intervention and intelligent intervention in the psychological health intervention of college students, which involves inheritance and progression [8]. Therefore, promoting the organic integration of the two is imperative, and should focus on the three key links of intervention preparation, implementation, and evaluation.

In the preparation stage of intervention, it is advisable to use the intelligent characteristics of smart intervention as information collection and auxiliary means, while taking traditional human intelligence intervention as the main approach. On the one hand, utilizing artificial intelligence to collect the latest data and applying correlation analysis to gain insights into the behavior patterns of key individuals; On the other hand, relying on human intelligence to deeply integrate and analyze information, clear intervention paths and standardized processes are formulated under the mutual promotion of the two.

In the process of intervention implementation, it is necessary to break through the constraints of time and space by combining wisdom with traditional intervention, and follow the concept of human-machine collaboration for overall planning. Due to its group and real-time characteristics, classroom teaching should mainly rely on traditional interventions, and build real and close attention connections in specific temporal and spatial domains to ensure emotional and spiritual care is in place. In daily life scenarios, intelligent intervention is the main approach, utilizing smart devices to independently collect student information, answer questions, and implement intervention measures through human-computer interaction.

In the intervention evaluation stage, a preliminary evaluation of students' emotions, behaviors, and other aspects is first conducted based on smart intervention data. Then, the interventionist and the intervened individuals use their keen insights to re-examine the machine evaluation results, in order to construct a scientific evaluation system that combines dynamic and static, unifies subjectivity and objectivity, and coordinates qualitative and quantitative evaluation.

4.2. Improve the "content data system" technology ecosystem to support the transformation and stable development of psychological crisis intervention for college students

In the digital age, psychological crisis intervention for college students promotes the benign coupling of "content data system" through energy and information exchange with the technological ecosystem, obtains key empowering elements, accurately "monitors" students' psychological state, and reasonably "liberates" their psychological pressure [9]. The technology ecosystem covers content ecosystems such as positive technology intervention and integration empowerment, as well as external ecosystems such as data and systems.

In terms of technological content ecology, macroscopically, explore feasible paths to integrate psychological crisis intervention functions into artificial intelligence tools, so that artificial intelligence can effectively undertake tasks such as information integration, positive guidance, and intervention feedback. At the micro level, we will delve into the path of autonomous development and focus on developing artificial intelligence applications for psychological crisis intervention targeting college students. At the same time, we will promote the deep integration of artificial intelligence with other digital technologies, assist in innovation in fields such as digital twins, smart healthcare, and virtual technology, stimulate new business models, and provide impetus for high-quality development in various fields.

When building a data ecosystem, integrate a large number of psychological crisis intervention related resources into artificial intelligence systems to create new application spaces. This space should not only include basic knowledge of psychological crisis intervention, but also pay attention to the safety, reliability, and stability of the association library to ensure stable and positive output of intervention effectiveness.

From the perspective of institutional optimization, on the one hand, incorporate the prevention, diagnosis, and treatment of psychological crisis intervention assisted by artificial intelligence into the performance evaluation system. On the other hand, it is necessary to clearly define its application boundaries, draw red lines, accelerate the formulation of relevant laws and regulations, and use legal authority to prevent issues such as technological black boxes from the root.

4.3. Enhance the comprehensive literacy of intervention subjects and promote the transformation and healthy development of psychological crisis intervention for college students

The most important role of artificial intelligence in empowering is to awaken the self-awareness of intervention subjects, thereby promoting multidimensional improvement of self-awareness, prevention awareness, and thinking awareness [10].

From the perspective of the intervened individuals, the cultivation of digital literacy is particularly important. The core training objectives of college students' psychological education should be to cultivate awareness of psychological crisis, protection, and safety. Through the development and addition of classroom teaching, series courses, and relevant lectures, teaching and training activities should be used to strengthen their ability to self assess psychological issues, help them break free from the constraints of the information cocoon, and enable them to construct rational cognition and judgment of their current situation from a dialectical perspective.

For interveners, they should actively respond to the new challenges brought by technological empowerment and actively accept the new roles bestowed upon them. On the one hand, we should actively engage and deeply participate in the research and development of related software applications, using underlying thinking to explore how to empower with artificial intelligence. On the other hand, the interventionist needs to undergo a significant transformation in their role, gradually shifting from a passive interventionist who intervenes after a problem occurs to a healthy psychological builder, dialogue interventionist, and psychological problem solver who hide behind the machine and play a key role. At the same time, it is necessary to effectively protect the security of privacy data and actively use feedback mechanisms to integrate the effectiveness of college students' psychological crisis intervention and expert advice into artificial intelligence, generating college students' psychological crisis intervention content that combines information accuracy, security, logical rigor, and emotional sincerity.

5. Conclusion

In the current increasingly severe psychological crisis among college students, AI empowerment has brought new hope for psychological crisis intervention. Through mechanisms such as integrated display, selection, conversion, and feedback, as well as collaborative warning, improvement of technological ecology, and enhancement of subject literacy, artificial intelligence effectively compensates for the shortcomings of traditional interventions. In the future, we should continue to deepen the application and innovation of AI technology in this field, continuously optimize the intervention system, fully leverage its advantages, reduce the risk of psychological crisis among college students, and safeguard their mental health.

Biographies

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References

- [1] Tongtong, L., Tan, L., Xuning, G. Psychological Crisis Warning for College Students Based on Social Media Big Data [J]. Research on Modern Distance Education, 2021, 33(04): 92-103.
- [2] Jianqing, M., Meiyan, Z. Investigation and Analysis of Psychological Crisis and Intervention Status of College Students [J]. Party Building and Ideological Education in Schools, 2014, 23(08): 73-75.
- [3] Yonghui, L. Psychological crisis intervention dilemma and coping strategies for college students [J]. Chinese School Health, 2019,40(04): 486-489.
- [4] Improve systematic thinking ability and achieve overall planning and consideration [N]. People's Daily, 2023-9-13.
- [5] Ful, Longzong W, Lianfeng L. Research on college students' psychological crisis intervention based on web crawler technology [J]. Journal of Computational Methods in Sciences and Engineering, 2023, 23(3): 39-50.
- [6] Zihua, W., Hui, L. Guiding college students to establish a good social mentality [J]. People's Forum, 2018(07): 113-115.
- [7] Bingying, S., Jian, Z., Yan, L. Exploration of Establishing a "Trinity" Psychological Crisis Early Warning and Intervention Mechanism for College Students [J]. Party Building and Ideological Education in Schools, 2010(35): 39-40+53.
- [8] Siyuan, X., Xiaolan, H., Hai, S. The dilemma and optimization strategies of school psychological crisis intervention from multiple perspectives [J]. Chinese School Health, 2023, 44(09): 1377-1381.
- [9] Rengong, L., Juanhua, Pan. Exploration of Prevention and Intervention Mechanisms for College Students' Psychological Crisis [J]. Research on Higher Education in China, 2006(06): 52-53.
- [10] Zhiyong, C. Research on Prevention and Intervention Strategies for College Students' Psychological Crisis from the Perspective of Psychoanalysis [J]. Jiangsu Higher Education, 2022(12): 132-138.