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Research on Factors Influencing Mental Health and Intervention Strategies Based on Multi-method Fusion

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Abstract. In today's fast-paced and competitive world, mental health problems such as anxiety disorders and depression occur frequently, affecting the stability of individuals, families and society. This paper explores mental health by integrating literature review, data analysis and theoretical research. Findings show that genetic factors affect neurotransmitter systems through gene mutations and interact with the environment, which has an impact on mental health. Family dynamics, social environment, individual personality traits and cognitive styles, also significantly influence mental health conditions. While traditional assessments like questionnaires and clinical interviews remained widely used, big data and neuroimaging techniques offer new but limited potential. Effective intervention requires combining psychotherapy, medication, lifestyle adjustments and social support into and personalized treatment plans. This study provides theoretical and practical insights into improving public mental health and suggests future research should focus on larger sample size, interaction mechanisms, and enhanced evaluation methods.

Keywords: Mental health, Influencing factors, Intervention strategies, Treatment methods

1. Introduction

In the era of accelerating globalization and social transformation, fast-paced life and intense competition have made mental health a global concern. The World Health Organization defines mental health as encompassing self-awareness, stress coping, work efficiency, and social contribution—not merely the absence of mental illness [1]. In recent years, mental health problems have increasingly become prevalent and varied. Among anxiety disorders, generalized anxiety involves chronic unwarranted worry, panic disorder manifests as sudden attacks of fear and discomfort, and social anxiety hinders interpersonal interactions [2]. Mood disorders, particularly depression, are marked by low mood and loss of interest, and may lead to suicidal tendencies in several cases [3]. Bipolar disorder features drastic mood swings between depressive and manic states [4,5]. Personality disorders also cannot be underestimated. Patients with borderline personality disorder have unstable emotions and relationships, while those with antisocial personality disorder lack a sense of moral responsibility [6,7]. Mental health significantly affects individuals' physical health and work efficiency, influences family dynamics, and increases societal burdens, including healthcare costs and public safety concerns. Therefore, maintaining mental health is crucial for the development of both individuals and society [8].

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Despite growing research efforts, gaps remain in the analysis of influencing factors and the exploration of intervention strategies. This paper comprehensively applies literature research, data analysis, and theoretical derivation to analyze the key influencing factors, evaluate the intervention strategies, and put forward precise and comprehensive solutions, providing theoretical and practical support for the improvement of mental health.

2. Analysis of influencing factors of mental health

2.1. Genetic factors

Genetic factors significantly contribute to the development of mental illnesses such as depression and schizophrenia. Studies have identified polymorphisms in genes like the serotonin transporter gene (SLC6A4), which influence serotonin reuptake and emotional regulation, increasing susceptibility to depression under life stress. Similarly, variations in dopamine receptor genes are associated with schizophrenia, as they affect neurotransmitter systems, leading to cognitive and emotional disturbances [9].

However, genetics do not operate in isolation. According to gene-environment interaction theory, genetic predispositions may heighten sensitivity to stressors. Individuals with risk genotypes are more likely to develop mental illnesses when exposed to chronic stress or dysfunctional family environments. Conversely, positive environments can buffer genetic vulnerabilities. For instance, Li Qiming and Li Qi's longitudinal study shows that children raised in supportive families are less likely to develop mental disorders even if they carry susceptible genes [10,11].

2.2. Environmental factors

The family environment plays a vital role in shaping mental health. Research indicates that over 80% of adolescents from families with poor parent-child relationships exhibit signs of anxiety, depression, or hostility [12]. Parenting styles also matter: authoritarian parenting may foster low self-esteem and internalized distress, while overindulgence can hinder emotional resilience, increasing vulnerability to emotional issues [13].

Beyond the family, broader social environments also influence mental health. Individuals with low socioeconomic status often face stressors like unemployment and poverty, which are risk factors for mental disorders. The presence or absence of social support is critical—those with limited support are more prone to psychological distress, especially during crises. In contrast, strong social support systems can promote faster recovery and lower incidence of mental health problems following traumatic events [14].

2.3. Individual factors

Personality traits and cognitive styles are crucial in determining mental health outcomes. People high in neuroticism are more sensitive to stress and prone to negative emotions, making them more susceptible to anxiety and depression. In contrast, traits like extraversion, openness, and conscientiousness contribute to emotional resilience, social connection, and effective stress management.

Cognitive styles influence how individuals interpret experiences. A negative cognitive style often leads to pessimistic thinking and emotional distress when facing setbacks. For example, a person with such a style might see failure as personal incompetence, increasing the risk of depression.

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Conversely, those with a positive cognitive style are more optimistic, view challenges as growth opportunities, and are more likely to maintain psychological well-being [15].

3. Research on mental health assessment methods

3.1. Review of traditional mental health assessment methods

Both the questionnaire assessment method and the clinical interview assessment method are commonly used approaches in mental health assessment, each having its own advantages and disadvantages. The questionnaire assessment method, such as the Symptom Checklist 90 (SCL-90), is easy to operate, suitable for large-scale testing, and capable of quickly collecting a large amount of data. However, it is easily interfered with by individual subjective factors, and the accuracy of the responses is questionable. Additionally, there are limitations in the questionnaire design. The clinical interview assessment method can gain an in-depth understanding of the subjects through face-to-face communication, flexibly explore unique information about individuals, and uncover potential problems. Nevertheless, it has high requirements for the professional qualities of the assessors, takes a long time, lacks a standardized process, and has poor comparability of the results among different assessors [16].

3.2. New-technology-based mental health assessment means: big data analysis and neuroimaging technology

With the development of information technology, big data analysis is widely used in the field of mental health assessment. In order to deeply explore its application effects, this article conducts a detailed analysis of a dataset from Kaggle, containing 1,967 records and 350 fields [17]. This dataset covers multi-source information collected from platforms such as social media, including the sub - forums to which posts belong, authors, dates, contents, as well as various readability indicators, emotional indicators, life stress indicators, and word usage frequencies, providing a rich data foundation for the research. In the actual analysis process, we use a variety of data analysis methods to mine the data. Taking the analysis of language patterns as an example, through natural language processing technology, we conduct word frequency statistics and sentiment analysis on the content of the posts in the dataset. We found that among many posts, words related to anxiety and worry, such as "anxiety", "fear", and "worry", appear frequently. In some posts related to the theme of health anxiety, the frequency of these words reaches 11 times per 100 words, which to a certain extent reflects that these users may have relatively obvious anxiety. Further, by using a sentiment analysis algorithm, the posts are classified into three categories: positive, neutral, and negative. The results show that about 48% of the posts show a negative sentiment tendency, which corroborates the results obtained from the word frequency analysis and indicates that a considerable number of users are in a negative emotional state and have potential mental health problems.

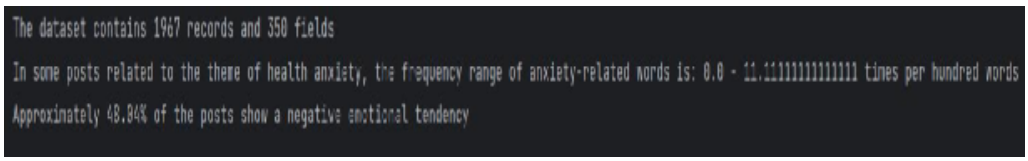


Figure 1: Running results

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Big data analysis has obvious advantages. The large sample size and multi-dimensional data are conducive to grasping individual psychology and dynamically tracking changes [18]. However, it also faces challenges. There are risks in data privacy protection, and the subjective factors of users affect the accuracy of data. Screening and processing massive data require the consumption of large amounts of resources. In conclusion, big data analysis brings new opportunities for mental health assessment. Only by solving the existing problems can its value be fully realized.

Neuroimaging technology, such as functional magnetic resonance imaging (fMRI), can directly observe the structural and functional changes of the brain, providing an objective basis for mental health assessment. Research has found that patients with depression have structural and functional abnormalities in certain brain regions, such as the prefrontal cortex and hippocampus. Neuroimaging technology can help researchers deeply understand the neural mechanisms of mental diseases and provide more accurate information for diagnosis and treatment [19]. However, neuroimaging technology is expensive, complex to operate, and the relationship between brain images and mental diseases has not been fully clarified yet, limiting its wide - scale clinical application. In addition, neuroimaging technology can only reflect the physiological state of the brain and cannot completely replace traditional mental health assessment methods. It needs to be used in combination with other methods.

4. Research on mental health intervention strategies

Psychological therapies play a crucial role in addressing mental health issues. Cognitive-behavioral therapy (CBT) targets negative thought patterns and maladaptive behaviors. For example, in treating anxiety disorders, CBT helps patients recognize distorted thoughts, such as catastrophizing, and introduces behavioral strategies like relaxation and exposure therapy to alleviate symptoms [20]. Psychoanalytic therapy explores unconscious conflicts rooted in childhood experiences. By using techniques (eg. free association and dream analysis), this therapy helps patients understand the deep-seated causes of their distress and promotes long-term healing. Humanistic therapy emphasizes individual potential and self-growth and creates an accepting environment where patients feel valued and supported, encouraging self-exploration [21].

Drug therapy is commonly used for managing symptoms of severe mental illnesses, particularly depression and anxiety. Antidepressants work by increasing levels of neurotransmitters like serotonin and dopamine, thus improving mood and reducing emotional distress [22]. However, side effects such as drowsiness, nausea, or weight gain are common, and long-term use may lead to dependence. Therefore, medications should be prescribed under medical supervision and often combined with psychotherapy to enhance treatment effectiveness and reduce side effects.

Lifestyle changes can significantly impact mental well-being. Maintaining regular routines, engaging in physical activity, and consuming a balanced diet support emotional and cognitive health. Exercise promotes the release of endorphins, improving mood and reducing anxiety and depression. Research suggests that 150 minutes of moderate aerobic exercise weekly can substantially boost mental health [23]. Diets rich in Omega-3 fatty acids—found in fish and nuts—support brain function and emotional balance. Additionally, engaging in hobbies and creative activities like painting or music helps individuals express emotions and reduce stress. Participation in social and volunteer activities also enhances social connections and resilience.

A robust social support system provides essential emotional and practical help. Family support offers companionship and encouragement, helping to relieve psychological stress. Friends contribute to emotional expression and coping through shared experiences. Social institutions, such as counseling centers and community services, offer professional assistance for those in need.

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Moreover, public education and awareness campaigns are vital to reducing stigma and promoting a supportive environment for mental health [24].

Lastly, due to the complexity of mental health disorders, a single treatment method is often insufficient. Each intervention has its strengths and limitations; thus, combining multiple approaches can create a synergistic effect for more effective and holistic treatment. For example integrating psychotherapy with medication can address both physiological symptoms and underlying psychological issues. Antidepressants and anti-anxiety medications help regulate brain neurotransmitters to relieve symptoms, but they rarely resolve deep-seated emotional or cognitive problems. Psychotherapy complements drug treatment by helping individuals identify and modify negative thought patterns and behaviors. Cognitive-behavioral therapy (CBT) targets distorted thinking, while psychoanalytic therapy explores unconscious conflicts and past experiences. These approaches enhance self-awareness and coping abilities, reducing relapse risk.

Additionally, lifestyle adjustments and social support are vital for long-term recovery. Regular routines, physical activity, and a balanced diet support brain function and emotional stability. Emotional and practical support from family, friends, and community services reduces psychological burdens and fosters a supportive environment for healing. Personalization is essential as mental health issues result from varied genetic, psychological, and environmental factors. Tailored treatment plans—incorporating therapy, medication, and life adjustments—are more effective. For instance, a person with a genetic predisposition and high stress may benefit from psychotherapy, medication, and environmental changes such as stress reduction at work. Moreover, ongoing feedback and flexible adjustments are critical. Individuals respond differently to interventions; therefore, treatment should be dynamically modified based on effectiveness. If a patient does not improve with one therapy or experiences side effects from medication, timely adjustments are necessary to ensure the intervention remains aligned with their needs.

In sum, integrated and personalized approaches offer the most promising path to improving mental health outcomes.

5. Conclusion

This study deeply analyzes the influencing factors of mental health through the comprehensive application of multiple methods, including genetic, environmental, and individual factors, and clarifies their important roles in mental health and the complex relationships among them. At the same time, it studies traditional and new mental health assessment methods and reveals the advantages and disadvantages of these methods. On this basis, it proposes multiple mental health intervention strategies and emphasizes the importance of comprehensive intervention and personalized intervention.

However, this study has certain limitations. On the one hand, the selection of some data samples may be limited, and the representativeness of the samples may not be wide enough, which may affect the universality of the research results. On the other hand, the research on the interaction of influencing factors is not in-depth enough, and the complex mechanisms have not been fully revealed.

Future research can be carried out from the following aspects: First, expand the sample scope to cover people from different regions, social strata, and age groups to improve the reliability and universality of the research results. Second, deeply explore the complex interaction mechanisms of multiple factors, and use more advanced research methods, such as the combination of omics technology and psychological research, to comprehensively reveal the internal mechanisms influencing mental health. Third, further improve the mental health assessment system, integrate

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multiple assessment methods, and improve the accuracy and effectiveness of the assessment. Fourth, develop more precise and effective intervention technologies. Based on in-depth research on influencing factors and assessment methods, provide more targeted intervention programs for different individuals, promote the development of the mental health field, and provide stronger support for improving public mental health.

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