An Early Warning Study of College Students' Mental Health Risk Based on Dual-Factor Modeling

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Abstract. This study analyzes how to carry out early warning of mental health risks of college students based on the dual-factor model. We understand the dual-factor theoretical model of mental health. The influencing factors of mental health are analyzed in terms of both protective factors and risk factors. This leads to how to carry out mental health risk early warning and construct a mental health risk early warning model for college students. The field of mental health risk early warning for college students has become a new trend in mental health research.

Keywords: College Student, Mental health, Dual-Factor Model ·Risk Early Warning

1 Introduction

"Strengthening the construction of a social psychological service system and fostering a self-respecting, self-confident, rational, calm and positive social mindset" is a clear request made by the Party for psychological work. As an important part of the social group, the level of psychological health of college students is directly related to the realization of the goal of "socialist modernization and power in the new era". Under the background of the national big data strategy, the strategy of developing the country through science and education, and the strategy of strengthening the country through talents, it has become a new trend in the field of mental health research to organically combine the big data technology with the study of college students' mental health, and to intensify the basic, holistic, and systematic research on the variables related to the risk and intervention of college students' mental health.

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2 Studies Related to Theoretical Models of College Student Mental Health

Through combing the development process of mental health model, it is found that the traditional mental health model is to use negative psychological symptom indicators, also known as psychopathology (Psychopathology, PTH), to classify the state of mental health into two categories of low PTH (mental health), and high PTH (mental ill-health). With the rise of positive psychology[1], researchers gradually broke through the tradition of using only negative indicators, such as symptoms, as the basis for diagnosis, and incorporated positive indicators, such as Subjective Well- Being (SWB), to form the dual-factor model of mental health (DFM)[2]. The DFM theory suggests that even if an individual is cured of a mental illness, it is not enough to ensure or maintain his or her mental health, and that positive indicators need to be added to the mental health assessment system to identify individuals or populations at high risk of deteriorating mental health. When mental health is monitored within a dual-factor framework, it is possible to gain a comprehensive understanding of mental health functioning, and to identify people at risk for mental health by characterizing them as "borderline".

The DFM advocates for both negative and positive indicators of mental health, and classifies people into four categories of mental health status based on both, namely, those who are complete mental health (Low PTH-High SWB), vulnerable (Low PTH-Low SWB), symptomatic but content(High PTH-High SWB), and troubled (High PTH-Low SWB)[3]. It was emphasized that the ultimate goal of psychotherapy and counselling is to reach a state of complete mental health, thus making diagnosis and treatment more comprehensive and accurate[4]. Since then, more researchers have used empirical methods to validate the dual-factor diagnostic model of mental health among college and high school students[5].The DFM has been developed in the West for more than a decade and has had a large academic impact, and the *Handbook of Positive Psychology* has a special chapter on it. However, domestic research on DFM is just emerging, and empirical research on the dual-factor model of mental health in the college student population needs to be strengthened, and the dual-factor model of college student mental health needs to be further constructed to validate the effectiveness of the theoretical model and expand the theoretical model of college student mental health risk monitoring.

3 A Study of Factors Influencing Mental Health Based on Dual-Factor Modeling

Drawing on Herzberg's dual-factor theory in the field of mental health, mental health and ill health are caused by different factors. Mental health depends on protective factors, which are the influences associated with positive psychology. Mental ill-health, on the other hand, depends on risk factors, which are influences associated with mental illness.

3.1 A Study of Protective Factors in Mental Health

Empirical studies on the determinants of subjective well-being are widely dispersed in psychology and public health research, studies have also found that the determinants/correlates of subjective well-being focus on, basic demographics, socioeconomic status, health and functioning, personality, and social support. The most investigated demographic information is on age and gender, in terms of gender for example, researchers have different findings, some researchers found that females are positively correlated with subjective well-being[6], while others found that females are negatively correlated with subjective well-being[7]. Socioeconomic status includes income, education, employment, and family structure, with income being the factor of greatest concern, and there is consensus that income has a positive effect on SWB[8]. Health and functioning include general health status, weight, physical activity, sleep, disability, and specific diseases. Researchers generally agree that general health status and self-reported health are positively and strongly associated with SWB[6]. Research on personality has been divided into two groups: one examining the Big Five personality traits (i.e., extraversion, easy-going, openness, conscientiousness, and neuroticism), and the other examining more nuanced personality traits (e.g., optimism, self-esteem, and self-efficacy). Social support is also an important influence, and studies have found that social support positively affects subjective well-being[8, 9]. The relatively consistent findings on how SWB is affected by income, general health, disability, physical activity, personality and social support are also questioned due to inconsistencies in the control variables. In addition, the ways in which these determinants/associated factors influence SWB remain understudied.

3.2 Mental Health Risk Factors Study

In the study of factors influencing psychological symptoms, researchers have studied more for different symptoms such as depression and anxiety. Prior research suggests that a combination of genetic, biological, psychological, interpersonal, and environmental factors may contribute to depressive symptoms in college students through complex interactions[10]. With regard to demographic predictors including age, gender, and socioeconomic status, all of these factors have an impact on mental illness. On personality influences include overall self-esteem, self-concept, and individuality. Environmental factors include stressful events, relationships, and experiences at school[11], which are also important predictors of mental health. It can be noted that the factors influencing subjective well-being and those influencing psychological symptoms share some similarities in some respects, and further research is needed to differentiate them.

There is growing evidence that high levels of positive mental health protect individuals from mental illness, while low levels of positive mental health are risk factors for mental illness. Positive psychology may be an important resource for people with mental illness to recover and maintain their mental health[12]. Therefore, we can further investigate the influences of subjective well-being as protective factors and the influences of psychological symptoms as risk factors in terms of demographic

characteristics, socioeconomic status, health and functioning, personality, and social support within the framework of the dual-factor model of mental health.

4 Early Warning Study on Mental Health Risks

In the research on the characteristics of the four types of mental health status people distinguished by the DFM, national and international studies have shown that the four types of mental health status people distinguished by the DFM differ significantly in terms of academic functioning, physical functioning, psychological functioning, and social functioning, with fully mentally healthy people having the best indicators of each function and the fewest psycho-behavioral problems, and the fully pathological type being the opposite of the fully mentally healthy type, and that the quadratic division of the model series is empirically supported among Western students[13]. A study by Xinqiang Wang et al. found that students of the completely mentally healthy type had higher emotional experience, self-awareness, and life adaptation than the other three types of students[4]. Therefore, when mental health is identified within a dual-factor framework, it is possible to gain a comprehensive understanding of the mental health functioning of youth, and risk predictors of mental health can be identified through the characteristics of "risk-edge" populations. Interventions can then be identified or designed that are appropriate to meet needs related to well-being and psychopathology, thereby promoting the overall mental health of youth[2].

Predictive monitoring is a popular area of research that focuses on predicting potential problems before they occur during process implementation[14]. Mental health is also an important area for predictive monitoring[15].During their education at university, college students are exposed to stressful situations, new experiences, and changing expectations, making them susceptible to a variety of mental health problems[16]. Early intervention has important do applications for many mental illnesses and can prevent them from escalating. However, it is difficult to predict the progression of the illness and thus determine when to intervene. The rapid development of data collection technology and the great expansion of the scope of application provide psychology researchers with the possibility of large-scale user experiments, which allow researchers to obtain massive data for full-time tracking and recording, and to realize the flexibility of data granularity[17]. As a result, researchers have formed a set of effective measurement and prediction system for individual mental health by centralized mining of massive user psychological test data. Since then, researchers have tried to build psychological prediction models based on external performance or behavioral characteristics. For example: using machine learning methods to build a schizophrenia early warning model based on mental health datasets[18]; and using two algorithms, Support Vector Machines (SVMs) and Pace Regression, to build personality trait prediction models based on microblogging behaviors[19]. Well-designed programs can identify groups at risk for mental health or poor mental health and may improve the mental health outcomes of evidence-based interventions[20]. During the transition to mental illness, the effects of many risk factors cumulatively increase vulnerability to mental health disorders. This process may require tailored interventions to reduce risk or increase protective

factors and resilience, especially during sensitive developmental periods. With significant support from society and policymakers, future emphasis should be placed on promoting mental health and improving early detection and intervention in clinical settings, schools, and communities[21].

Therefore, the development of an early warning model for mental health risks among university students will help in the early identification of mental health risks and the allocation of resources for university mental health services, and will more effectively contribute to the management of mental health at the university.

5 Conclusions

In summary, although the existing results are of some significance, there are also some shortcomings:

(1) The DFM is able to screen out susceptible populations at the "edge of risk" and emphasizes the protective effects of positive mental health factors. Currently, there is no research on the feasibility of the dual-factor model of college students' mental health, the validity of the categorization, and the stability of the longitudinal tracking.

(2) Currently, in the research of mental health influencing factors, it mainly focuses on the research of one-dimensional indicators of mental illness or subjective well-being. There is a need to comprehensively examine the risky and protective factors of college students' mental health, as well as the predictive factors in the tracking process, based on the dual-factor theoretical model.

(3) Currently, research on prediction also focuses on the prediction of single factors. There is a need to establish a mental health risk prediction model for college students based on the dual-factor theoretical model and to propose a corresponding management program in conjunction with the actual work of the university.

In order to overcome the above-mentioned shortcomings and limitations in the research on college students' mental health, to enhance the foresight, comprehensiveness and pertinence of the research, and to promote the prevention and intervention of college students' comprehensive mental health, the research on the early warning of college students' mental health risk based on the dual-factor theory is imperative.

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