

The Relationship Between Adolescent (Between 16-19) Depression and Academic Pressure, and the Solving Strategies

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Abstract: In today's society, the probability of high school students aged 16 to 19 developing depression due to academic stress has significantly increased. A good psychological state is not only related to grades and future academic performance, but more importantly, it has a significant impact on physical health. Among all policies aimed at reducing academic pressure, there is a significant gap for teenagers aged 16 to 19. The research aims to raise awareness of the importance of policies for students aged 16 to 19 and to assist in the development of relevant policies. Through studying relevant literature, this paper found that the relationship between academic stress and depression is unusual, as it is the result of a series of factors that lead to a decrease in one's own ability to cope. In addition, there are two mediating variables, namely academic burnout and learned helplessness. Therefore, students' negative emotions surge, and the probability of depression increases. To solve this problem, this paper try to give relevant, effective solutions, which are divided into student individual level, parent communication level, and school auxiliary level. In conclusion, this paper found a more complex relationship between academic stress and depression, and proposed measures.

1 Introduction

Adolescent depression, especially among high school students aged 16-19, has become a global problem, posing a serious threat to the physical and mental development of adolescents. According to the data of the World Health Organization, the prevalence of depression among adolescents aged 10-19 is as high as 13.3%, while the probability of depression is 14.9% to 42.3% [1]. In China, although the government implemented the "double reduction" policy in 2022 to reduce the schoolwork burden of primary and secondary school students, high school students (mainly aged 16-19) were not included in the scope of the policy, and they still faced great academic pressure. Studies have shown that academic stress is one of the key factors affecting adolescents' mental health, especially depression. Therefore, it is essential to explore the relationship between academic stress and depression in Chinese adolescents and

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to develop effective strategies to help address this problem, from Okpete and Haewon (2024) [2].

Previous studies have shown that the relationship between adolescent depression and academic stress is very close and complex. A cross-sectional study of 1200 high school students in Shandong by Jiang and Li found that up to 58.7% of the students listed "unsatisfactory test results" as the main source of stress. The "fierce competition for admission to higher education" and "high family expectations for academic achievement" followed by 53.2% and 49.1% respectively [2]. In addition, Jiang and Zhou conducted a large sample analysis ($n=8311$) based on the data of the China Education tracking survey (CEPs) from 2013 to 2015 [3]. After controlling for gender, family socio-economic status and urban-rural differences, it was found that the probability of adolescents reporting moderate to severe depressive symptoms increased by about 37% for each standard deviation of academic performance, so academic performance was significantly negatively correlated with the level of depression. In addition, Jiang and Zhou also concluded that in schools or classes with more fierce competition, the relationship is closer. Moreover, adolescents at risk of depression have significantly lower learning diligence, intrinsic motivation, and learning efficacy, according to Jiang and Zhou.

There are also some key mediating factors, such as learned helplessness, that is, the belief that no matter how hard you try, you are doomed to fail, and school burnout, that is, feeling exhausted and cynical about your studies, are two key mediating variables. Suma's research further supports this view, pointing out that psychological stressors such as test anxiety and time management conflict can directly and negatively predict high school students' learning efficacy by weakening self-regulation resources ($\beta=-0.48$, $P<0.01$) [4]. The sense of inefficiency is the core precursor of learned helplessness; Shi's chain mediation model reveals how the use of social media worsens peer relationships and self-esteem by increasing academic pressure, and ultimately damages mental health. School burnout plays a potential regulatory role in many links.

This study aims to empirically analyze the correlation between academic stress and depression in Chinese adolescents. As an important psychosocial factor in the growth stage of teenagers, academic stress may have a profound impact on their mental health. To further understand this relationship, this study will use a multi-dimensional data analysis method to comprehensively examine the characteristics of stressors and their specific links with different psychological manifestations, such as depression, anxiety, and behavior degradation. At the same time, this study will also focus on identifying protective factors that can significantly reduce or alleviate the risk of adolescent depression, such as family atmosphere, school support, peer relationships, and personal coping ability. This study will put forward practical intervention measures based on the results, which can not only provide scientific guidance for the improvement of teenagers' mental health, but also provide a practical basis for the education department to design more humanized teaching strategies. At the family level, this study will provide parents with clear and effective parenting suggestions, such as balancing pressure and support in academic planning, improving the quality of parent-child communication, helping teenagers build psychological resilience, enhancing their ability to deal with stress, and preventing and reducing the occurrence of depression and its possible negative chain reaction. Through this research, this paper hope to establish a more solid scientific foundation for the field of education and mental health in China, so as to promote the physical and mental health and all-around development of teenagers, and cultivate a new generation of teenagers with strong psychological quality and social adaptability for society.

2. Relevant theoretical frameworks

2.1 Stress-Coping Theory

Stress-coping theory was proposed by Lazarus and Folkman, which regards stress as a cognitive evaluation of an individual's perception of environmental challenges or threats. Adolescents respond to academic stress through problem-focused coping or emotion-focused coping, which have different effects on mental health. Teenagers are in the whirlpool of academic pressure, and they will always choose between these two coping methods, and different choices also lay different foreshadowings for mental health. Effective time management, as a typical representative of problem-focused strategies, can quietly reverse the tide of academic anxiety [1].

2.2 Self-Determination Theory (SDT)

The SDT theory, developed by Deci and Ryan, suggests that adolescent mental health is largely driven by intrinsic motivation and initiative. Academic stress can lead to anxiety and depression if it disrupts their sense of autonomy, competence, and belonging [2]. Wang et al. [5], as collaborators of Ryan and Deci's team, designed a self-supported teaching intervention experiment based on SDT using 800 junior high school students from three middle schools in California, USA. When comparing the mental health indicators of traditional teaching classes and intervention classes, the data provide strong evidence: the academic autonomy and competence scores of students in the intervention class increased by 32%, and the detection rate of depression and anxiety was reduced by 25% compared with the control group.

2.3 Ecological Systems Theory

Ecosystem theory, developed by Bronfenbrenner, emphasizes that adolescent mental health is collectively influenced by multiple levels of the environment, including microsystems (home, school), mesosystems (communities, social networks), and macrosystems (culture, policy). For academic pressure, the support and coordination of the family environment and the optimization of the school education environment are particularly critical [4]. Li et al. (2023) conducted a cross-ecosystem tracking study on 1,200 junior high school students in North China, based on ecosystem theory, and analyzed the association between family parenting style, school support system, and community resource supply by quantifying the indicators of family parenting style, school support system, and community resource supply. The results of the study showed that those students in the ecological environment of "high family support + high school care + medium community resources" had a 41% lower degree of academic stress perception than the control group, and the incidence of depressive symptoms was only 1/3 of that of the control group. For students who lack home-school interaction and lack community academic support, even if a single family or school provides positive support, the negative impact of academic pressure is difficult to effectively buffer.

3 Research methods and technological evolution

3.1 Traditional Approach (2000-2010)

The questionnaire survey method collects data such as psychological state and family environment through structured questionnaires to explore stressors, stress feelings, and heart

Relationship between health indicators [6]. This method can quickly collect large-scale sample data, with low cost and convenient operation. The rationality of questionnaires will directly affect the quality of the data, making it difficult to collect deeper data.

The psychological assessment tool converts the psychological characteristics of individuals into quantitative scores through scoring rules and judges the individual's mind based on norm data.

The degree of abnormality of the state of affairs. Relatively mature questionnaires, such as SCL-90 and EPQ, have high credibility and can quickly screen out high-risk individuals with psychological problems, but require professional interpretation.

The case analysis method is to select typical adolescent mental health cases and analyze them through interviews, observations, data analysis, etc.

Analyze, restore the stress experience, psychological development trajectory, and influencing factors of the case, and summarize the personalized laws and conclusions. However, the method is not representative of the population and may overlook other specific characteristics.

3.2 Introduction of Scientific Research Methods (2010-2020)

The introduction of brain science technology involves using neuroimaging and electrophysiology technology to capture the brain activity characteristics of adolescents during emotional regulation. Functional magnetic resonance imaging (fMRI), electroencephalography (EEG), and other neural mechanisms used to study the neural mechanisms of adolescent emotion regulation are further studied, but the equipment is very expensive. The experimental environment of this technology is very demanding, and the final data analysis is also complicated.

Big data and longitudinal research are used to establish a regional database of adolescent mental health and conduct longitudinal research through big data. Ecological instantaneous assessment is to collect daily emotional data of adolescents in real time through mobile terminals, and finally summarize and analyze them. It can restore the most real psychological state in daily life. However, this technology is susceptible to external interference during measurement and has high technical requirements.

3.3 Digital Intelligence and Interdisciplinary Integration (2020-present)

AI early warning uses machine learning algorithms to analyze social media data, behavior trajectory, and other psychologically related issues, build risk prediction models, and predict behavior. The rapid rise of research based on big data and artificial intelligence predicts mental health risks through machine learning models and optimizes coping strategies [7].

Multimodal data fusion combines physiological indicators, behavioral data, and psychological assessment to achieve a more accurate psychological state assessment. Physiological sensors and other equipment are expensive, and the threshold for implementation is high. Digital intervention technology is used to monitor the subject's mood during chat in real time through AI, which is used for early intervention of anxiety, depression, and other problems. However, AI is not as rich in emotions as humans, and its intervention in some complex emotions is very limited.

4 Case study

4.1 Analysis of the Mediating Mechanism of Academic Stress on Adolescent Depression

A systematic review by Steare et al. (2023) [8] integrated data from 32 empirical studies and included a core cross-sectional survey study involving 490 middle and high school students to measure academic stress, school connection, learning burnout, and depressive mood levels using standardized scales, focusing on the chain mediating mechanism of academic stress affecting adolescent depression. The results showed that academic stress was significantly positively correlated with adolescent depression symptoms ($r=0.634$). School connection and learning burnout exerted a separate mediating effect of 9.00% and 11.92%, respectively, and the chain mediating path of "academic stress-school connection-learning burnout-depression" formed by the two accounted for 3.57%. In conclusion, academic stress can not only directly induce depression but also affect adolescents' mental health by weakening school ties and exacerbating learning burnout.

4.2 The Buffering Role of Family Support in Coping with Academic Stress

Zimmer-Gembeck et al. [9] used a longitudinal study to track 839 Australian students, exploring the relationship between family support and negative circumstances and students' coping strategies for academic stress at multiple time points. In the questionnaire, students answered questions about their sources of academic stress, such as workload, external pressure, and internal pressure. They also filled out information about their relationships with their families and four coping strategies. This includes two positive and two negative coping strategies, and the study also uses a path model to test the relationships between the hypotheses. The results of this case study show that, given similar ages and academic performance, despite consistently high academic pressure, Students with higher levels of parental support are projected to use more positive strategies and fewer negative strategies a year later. When there are more negative situations, the use of negative coping strategies increases significantly ($p < 0.05$). This study indicates that emotional support from families plays a stable buffering role between academic stress and depression, providing quantitative data support for family intervention. Family emotional support and students' coping strategies are closely related; a high level of support can have a protective effect.

4.3 The Combined Impact of Academic Pressure and Family Environment on Adolescents' Mental Health

Shilpa, Sulochanadevi, & Shashirekha describe the impact of academic stress and family environment on adolescent mental health. Like Steare, a cross-sectional survey study was used to collect data on pre-university students aged 17 to 19 in the Udupi region of India using a multi-stage sampling method. Studies have found that high-intensity academic pressure and poor family environment have a high impact on the occurrence of psychological problems such as anxiety and depression in adolescents. And the negative impact of academic stress on mental health is more pronounced when family communication is poor, parental over-intervention, or emotional support is lacking. The journal does not label obvious impact factors, but it is significant that it focuses on adolescents in developing countries. Research shows that schools and families need to play a role together, such as improving emotional responsiveness through family education and introducing psychological courses in schools to mitigate the impact of external stressors on mental health. This article reveals the role of social environment in adolescent mental health and provides a basis for developing intervention strategies.

5 Discussion

The relationship between adolescent mental health and academic pressure is an important topic in current psychology and education. The relationship between adolescent depression and academic pressure is not a simple cause-and-effect relationship; it involves a series of psychological processes within the student that indirectly contribute to the problem. The main sources of academic stress include workload, exam pressure, and external evaluations from parents, teachers, and even peers. Under such high-pressure conditions, students' mental resilience is clearly insufficient, and their self-efficacy and emotional regulation abilities will be affected. Steare et al. stated in a systematic review that persistent academic stress can indirectly increase the risk of depression by weakening self-efficacy [5]. Students may work hard while enduring long hours of academic pressure, but if they don't change the outcome, they may develop a resistance to learning and feel exhausted from studying, thus increasing their risk of depression [10].

Despite the variety of academic pressures, their impact varies from student to student; not everyone will produce the same results from the same pressure. A student's personal circumstances and environment greatly influence the symptoms of depression. At the individual level, research has shown that taking certain coping strategies can significantly regulate academic stress. Jeyasingh's research indicates that students adopt emotion-focused coping mechanisms (such as mindfulness meditation) and time-focused coping mechanisms (such as time management and study planning). Even when faced with high academic pressure, they showed a lower risk of depression [1]. Meanwhile, Uswatun et al.'s research showed that the mediating role of self-efficacy and the protective role of emotion regulation are crucial in the relationship between academic stress and depression. This makes stress a challenge rather than a threat to depression. Besides personal factors, its role is also influenced by family. The longitudinal study by Zimmer-Gembeck et al. [9] showed that parental emotional support can mitigate the negative effects of academic stress [8]. With long-term emotional support and positive communication, students can maintain a good level of mental health.

Conversely, Shilpa et al.'s study found that some unsupportive, high-expectation families increase the risk of depression in their children [3]. Family emotional support can reduce academic stress while also promoting self-efficacy and psychological adjustment abilities. The school environment is also a key factor influencing adolescent mental health. Schools are the living spaces of teenagers. Schools should provide teachers with support and care for students, implement comprehensive student evaluation systems, consider the accessibility of psychological resources, and enhance the overall school atmosphere to continuously influence the mental health of teenagers and reduce their academic pressure. Bustomi et al. found in their study that supportive teacher-student relationships, fair evaluation systems, and available mental health resources can effectively reduce the risk of depression caused by academic stress and allow students to experience positive emotions [4]. Besides personal and family factors, academic performance is also an important factor that cannot be ignored, and its protective role for teenagers needs to be emphasized.

Existing solutions have certain limitations; current research primarily relies on cross-sectional studies and retrospective questionnaire data. Such studies often struggle to uncover causal relationships and fail to detect the dynamic changes in students' stress and psychology. At the same time, students' answers may be subject to memory bias and social expectation bias, which may make it impossible to guarantee that all data is completely true and reliable. Existing research data samples are mostly from the same region, culture, and education system. The problem with this is that conclusions drawn from such samples cannot be directly applied to other regions. Its applicability needs further validation in other regions. In recent years, the development of artificial intelligence and big data analytics has been gradually applied to adolescent mental health research. However, privacy protection issues and data ethics controversies remain, which are areas where the technology can be upgraded and

improved. In the future, more longitudinal and longitudinal studies can be conducted to observe the dynamic changes in academic pressure and adolescent mental health, identify key turning points, and focus on the multi-level intervention effects at the individual, family, and school levels. This will provide more reliable data for developing more targeted and sustainable mental health intervention programs.

6 Conclusion

This study explored the relationship between mental health and academic stress in adolescents (16 to 19 years old). Multiple studies have confirmed that academic stress is a key factor in increasing the risk of depression, including exams, competition from classmates, and parental expectations. When these factors act simultaneously, students' risk of depression increases significantly, with indirect effects from learned helplessness and academic burnout also present. Under high-pressure environments, teenagers' interest and motivation in learning are weakened, and the accumulation of these negative emotions exacerbates the development of depressive symptoms.

This study also demonstrates the buffering effect of protective mechanisms against negative academic impacts. It also highlights the importance of cultivating individuals' emotional regulation and time management skills to enhance their psychological resilience. Families provide emotional support and communication; schools cultivate positive teacher-student relationships and establish more diverse evaluation systems.

Overall, this study provides theoretical and data support for understanding the complex relationship between adolescent mental health and academic stress, and also offers scientific evidence to aid in the development of mental health intervention programs.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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