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The Impact of Academic Stress on Mental Health Issues: The Role of Uncertainty of Tolerance and Future Time Perspective

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Abstract: At present, college students' mental health issues have caught the social attention. A large number of studies found that mental health issues among college students are related to academic pressure. Thus, this study aims to understand how uncertainty of tolerance and future time perspective affect academic pressure..This study has 309 participants from China. They need to fill in four questionnaires, including the future time perspective questionnaire, academic stress questionnaire, uncertainty of tolerance questionnaire, and mental health questionnaire. Using structural equation modelling (SEM), the result showed that the association between academic stress and mental health was mediated by uncertainty of tolerance and future time perspective separately. The relationship between academic stress and mental health may then be impacted by uncertainty of tolerance, which could as chain mediation to forecast future time perspectives. This study focuses on the effects of uncertainty tolerance and future time perspective between college students' academic stress and mental health. Mental health is directly affected by academic stress, but uncertainty of tolerance and future time perspective play a mediating role, predisposing to anxiety to some extent.

Keywords: academic stress, mental health, uncertainty of tolerance, future time perspective

1. Introduction

Mental health issues, such as anxiety, depression, are a growing public health problem, especially among college students. A report by the 2022 World Health Organization highlights that globally nearly one in five young adults aged 18-24 experience mental health problems. In China, the 2022 National Mental Health Development Report showed that the detection rate of depression risk in the 18-24 age group was as high as 24.1%. The reason is that this age of students are more likely to have academic stress and feel uncertain in their future. Comparing secondary school students, university students often need to involves balancing multiple tasks and making complex decisions about priorities, time management, and curriculum. Therefore, university students may have to spend more energy to cope with these uncertainties, which can cause pressure and some mental health issues.

Previous studies showed that academic stress is one of major factors influencing college students' mental health, such as elevated levels of anxiety, sadness, and burnout [1]. The reason for some students having high level of academic stress is because they usually have excessive academic requirements, and live in a highly competitive environment [2]. However, when an individual has

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much academic demands, their academic stress, acting as an internal pressure, would be arised, because people need to spend more energy to deal with this pressure in order to achieve their goals [3]. In the long term, it will easily lead to mental tension or anxiety and affects mental health.

In addition, when students are in a high-pressure academic environment, they are more likely to have an increasing requirements for their future personal development. Thus, when these requirements for future personal development are uncertain or unclear, students may struggle to cope with these unknowns, especially students with high level of intolerance for uncertainty [4]. Uncertainty of tolerance refers to a tendency to react negatively to uncertain situations or events [5]. When students need the sense of certainty and control, the unpredictability of these variables can exacerbate stress, they tend to have a low level of tolerance in uncertain situations, which leading to increased anxiety, depression and other emotional issues [6].

Individuals with intolerance of uncertainty (IU) are prone to cognitive biases, which are manifested in repeated thoughts about future uncertainty (i.e., mental rehearsal) in an attempt to reduce anxiety [7]. However, this kind of repetitive thinking not only fails to relieve anxiety, but also leads to mental fatigue, further weakening the individual's ability to cope with uncertainty [8]. Being in this state for a long period of time, individuals will feel extremely uncomfortable with the unpredictability of the future, thus triggering persistent anxiety [7]. Therefore, for the college student population, this low tolerance for uncertainty may manifest itself in persistent worries about grades, academic performance, or future career prospects [9]. This persistent state of anxiety may lead to chronic stress or even the development of generalized anxiety disorder, which can affect an individual’s mental health [10].

In addition to uncertainty, the way in which students perceive time especially future time (referred to as ‘future time perspective’) may also have an impact on their mental health outcomes. Future Time Perspective (FTP) refers to how individuals perceive, evaluate, and plan for their future [11]. The positive future time perspective to view the future as full of opportunities and possibilities and to actively plan and pursue long-term goals. Negative future time perspective, on the other hand, tend to see the future as full of threats and uncertainties and may avoid long-term planning and goal setting [12]. It involves how individuals view time, future goals, and the ability to foresee and cope with future events [13]. Future time perspective is closely related to an individual’s tolerance for uncertainty. Individuals with low uncertainty tolerance are more likely to hold a negative future time perspective and tend to avoid or repeatedly think about uncertain situations [14]. This cognitive pattern not only exacerbates anxiety, but may also further diminish an individual’s mental health and motivation levels [11].

People with low uncertainty tolerance tend to view future events as threats rather than opportunities [15], primarily because they are uncomfortable with the inherent uncertainty of the future. This reduces their ability to maintain a positive or flexible mindset about the future [16]. More specifically, the future is inherently unpredictable and ambiguous. They may focus on the present or short-term issues that they believe they can control or predict [15]. This lack of engagement in long-term goals (such as career development, education, or life planning) leads to a restricted future time perspective, making them perceive long-term rewards as seemingly out of reach or unattainable [17]. Moreover, these individuals tend to view future events as a source of anxiety or pessimism. This negativity bias manifests itself as a focus on the worst-case scenario, and may even cause them to avoid thinking about the future altogether [18]. As a result, as their tolerance for uncertainty declines, they begin to see the future as an overwhelming, uncontrollable presence [19]. This causes them to distance themselves from long-term goals and lose active planning and engagement with the future [20]. This lack of engagement with the future, combined with increasing anxiety and avoidance, leads to a decline in mental health, including depression, social withdrawal, and lack of motivation [21]. Over time, mental health is prone to problems

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1.1. The Present Study

This study is to investigate about the role of uncertainty tolerance and future time perspective effected the link between academic stress and mental health. As a result, this study investigated the following hypotheses:

H1: Uncertainty tolerance plays a role as a mediator predicting the link between academic stress and mental health.

H2: Uncertainty tolerance may affect future time perspective, and then uncertainty tolerance and future time perspective may chain mediated the link between academic stress and mental health.

2. Methods

2.1. Participants and Procedure

This study recruited 309 students from different province, China. According to the selecting criteria, five mental health related questionnaires were selected separately. The questionnaire had 92 questions in total. It took an average of two seconds to complete each question, so it took about at least 3 minutes to complete all the questionnaires, after screening based on the final data, thus, 303 students' questionnaires (Female=128, Male=175) were left. 52.8% of participants were aged between 18 and 22 and 47.2% of participants were aged between 23 and 25, 31.7% of students is going to get a associate's degree and 68.3% of students is going to get a bachelor's degree.

The questionnaire was distributed through the website of WJX.cn. After the students' informed consent, the participants were told that they would participate in a study on mental health. The students filled out the questionnaire online.

2.2. Measures

Mental health was measured by the General Health Questionnaire-12 [22]. The scale is used to assess the incidence of mental illness. It is a 12-item self-report scale. The range is from 1= "Much less than usual" to 4= "Better than usual". The higher the score, the more serious the health problem. In this study, the Cronbach's alpha of the questionnaire is 0.95.

Uncertainty of tolerance was measured by Dalbert [23]. The article contains a 27-item uncertainty intolerance scale (IUS), which is developed to measure intolerance of uncertainty and mainly assesses reactions to uncertainty, ambiguous situations, and the future. The study created a 12-item IUS-12 scale, which includes two factors: Prospective Anxiety and Inhibitory Anxiety. It has good internal consistency and is highly correlated with the original 27-item IUS, providing an effective tool for measuring uncertainty intolerance. In this study, the internal reliability of the questionnaire was good ($\alpha = 0.91$).

Academic stress was developed by Bedewy and Gabriel [24]. The scale contains 18 self-report scales, ranging from 1 (Totally disagree) to 5 (Totally agree). This study shows that college students feel that the sources of stress are diverse and emphasizes the importance of using a tool to measure college students' stress. The reliability of the academic stress perception scale in this study was 0.83.

The time perspective on the future also affects college students' mental health. The Future Time Perspective (FTP) Questionnaire [25] contains 10 questions, ranging from 1 (very true) to 5 (very untrue). This questionnaire is used to assess an individual's perspective on the remaining time in life. It measures whether an individual believes that their future is open or limited. Compared with someone who believes that their future is limited, someone who believes that their future is open may have different goals and make different decisions. The scale contains six factors, namely future-negative, future-positive, future-confusion, future-perseverant, future-perspicuity and future-

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planning. This measurement can help researchers understand and predict an individual's behavior, choices, and happiness. The test-retest reliability of the total scale was 0.92

2.3. Data Analysis

The descriptive statistics, correlation analysis used in this study were all provided by SPSS 29.0. AMOS 29.0 was used to test the hypothesized model and mediation effects. Model fit was assessed based on the goodness-of-fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). According to the recommendations of Hu and Bentler, the model is generally considered to be adequately fit when SRMR and RMSEA < 0.08, CFI and TLI ≥ 0.90.

3. Results

There is a significant correlation between each major variables (Table 1). There are a number of factors that affect the relevance of each other. Thus, age, education, and gender were controlled in the SEM model.

Table 1: Correlations of demographic variables and predict variables.

	1	2	3	4	5	6	7
1.gender	1						
2.age	-.005	1					
3.education	.051	.161**	1				
4.FTP	.000	-.036	.025	1			
5.stress	-.015	-.022	-.044	.932**	1		
6.mental health	-.007	-.074	.001	.937**	0.926**	1	
7.IU	-.047	-.065	.020	.854**	0.860**	0.857**	1

Note: *p<0.05, **p<0.01, ***p<0.001; stress=academic stress, FTP=future time perspective, IU=intolerance of uncertainty

Then, the result showed that model has a good model fit (CFI = 0.997, TLI = 0.995, RMSEA = 0.037, SRMR = 0.0375). Figure 1 showed that academic stress could positively predict uncertainty tolerance (beta=0.86, p<0.001), future time perspectives (beta=0.76, p<0.001), and mental health (beta=0.35, p<0.001). Uncertainty tolerance (beta=0.13, p<0.001) and future time perspectives (beta=0.50, p<0.001) could also positively predict mental health. More specifically, uncertainty tolerance (effect size=0.11, p=0.004) and future time perspectives (effect size=0.38, p=0.003) individually mediated the relationship between academic stress and mental health. Then, uncertainty tolerance could predict future time perspectives being chain mediation which in turn affect the relationship between academic stress and mental health (effect size=0.09, p=0.005) (See Table 2).

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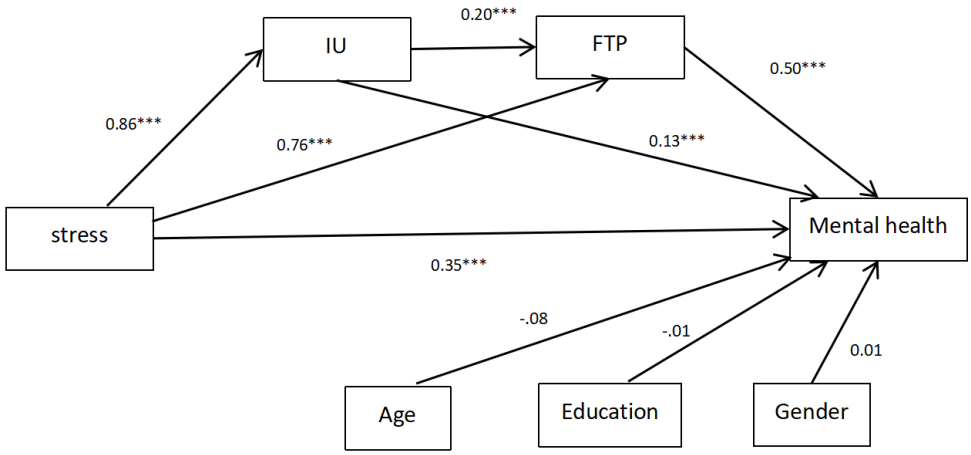

Figure 1: SEM model

Note: *p<0.05, **p<0.01, ***p<0.001; stress=academic stress, FTP=future time perspective, IU=intolerance of uncertainty

Table 2: Indirect and direct effect in SEM model.

paths	Effect size	*p*	CI 95%	
			LOWER	UPPER
Indirect effect				
1 stress-> IU -> mental health	0.108	0.004	0.044	0.208
2 stress-> FTP-> mental health	0.383	0.003	0.291	0.477
3 stress->IU->mental health	0.087	0.005	0.045	0.167
Direct effect				
4 stress -> mental health	0.348	0.019	0.183	0.496

Note: stress=academic stress; IU=intolerance of uncertainty; FTP=future time perspective

4. Discussion

The present study investigated the mediating effects of uncertainty tolerance and future time perspective on college students' academic stress and mental health. In this study, mediator play an influential role. Whereas uncertainty tolerance as a mediator and with future time perspective as chain mediators indirectly influenced the path of academic stress and mental health.

In the first finding, uncertainty tolerance acts as a mediator in academic stress and mental health which is consistent with previous studies. Uncertainty about possible future threats can undermine our ability to avoid them or mitigate their negative effects, leading to anxiety [7]. Individuals with low uncertainty tolerance tend to interpret uncertain situations as threats, focus more on possible negative outcomes, and are prone to "catastrophising" thinking, overestimating the probability and

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severity of negative events [18]. Furthermore, students with low uncertainty tolerance may magnify the uncertainty in academic stress, perceive academic stress as unbearable, and even become anxious about test results, resulting in more negative emotions and psychological burdens [6]. For example, a student who have a high level of academic stress, such as very high academic demands, high sense of success in academic. If the school suddenly changes the way it assesses the student, the student will begin to have anxiety about it. The student will be anxious about whether he or she will be able to adapt to the test and whether he or she will still be able to do well. Especially if he / she needs to get a scholarship or keep his grad school. Over time, he or she will be prone to anxiety, insomnia and other negative emotions.

In the second finding, future time perspective also plays a mediating role in the process of academic stress and mental health. The future is inherently ambiguous and unpredictable, so people with low uncertainty tolerance are likely to view future events as a threat rather than an opportunity [15]. They may even focus on current or short-term problems that they believe they can control or predict to ensure that they feel secure enough. Moreover, the ability to anticipate, predict and plan for desired future outcomes is critical for health, motivation and behaviour [11]. If a person's view of the future is negative, then this negative view of the future may magnify the negative effects of academic stress on mental health in situations of high academic stress. A negative view of future time can make individuals more vulnerable and helpless in the face of stress, and they can easily fall into a mood of despair and anxiety from which they cannot extricate themselves. For example, some students, when facing academic difficulties and employment pressure, are confused and fearful of the future because they will feel that they have no future, that their certificates are not advanced enough, and that they do not know enough about society. Then it is easy to fail to find a job afterwards, not knowing what mistakes they will make in the interview, whether they will fail to answer the questions and so on. All these will magnify the academic pressure indefinitely, which will in turn lead to psychological problems, such as depression and insomnia, and may even result in failure to graduate.

4.1. Limitations

However, the study has some limitations. Firstly, the samples were selected mainly from China. This easily leads to the inability to generalize the data in this study to other cultural geographies, and there is a large cultural variability. Secondly, since the study was a cross-sectional study, it was not possible to determine the causal relationship between the variables. Therefore, further research using a longitudinal approach is needed. Third, the collection of data consisting of self-report questionnaires has well-known limitations.

4.2. Conclusion

This study examined the effects of uncertainty tolerance and future time perspective on college students' academic stress and mental health. Academic stress directly affects mental health, while uncertainty tolerance acts as a mediator, causing anxiety and overestimating the probability and severity of negative events. Future time perspective and uncertainty tolerance significantly influence academic stress and mental health in college students. Low uncertainty tolerance can lead to negative outlooks, causing psychological issues like depression and insomnia. Conversely, a positive future time perspective can mitigate these issues.

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