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RESEARCH ARTICLE

Psychological resilience and emotional self-regulation of higher vocational college students

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ABSTRACT

Vocational college students are facing the contradiction of coordinated physical and mental development, as well as the pressure of learning development and social expectations. Many high school students have poor emotions, and the difficulty in regulating emotions is closely related to their mental health. This article uses the Connor Davidson Resilience Scale (CD-RISC) to measure individuals' positive psychological qualities in adapting to adversity, in order to study the psychological resilience and emotional self-regulation strategies of vocational college students. This study investigated the psychological resilience (PR) and emotional self-regulation (ESR) styles of high school students using different scales. In addition, correlation and regression studies were conducted on stress perception, PR, positive emotions, and mental health. The results indicate that vocational college students have a moderate level of public relations, and they are more inclined to use cognitive reevaluation as ESR. The PR of HVC students is positively and negatively correlated with positive and negative emotions, respectively. The PR of HVC students is positively correlated with cognitive reappraisal and negatively correlated with expression inhibition. There is no significant relationship between stress and its factors and expression inhibition.

Keywords: higher vocational college students; psychological resilience; emotional self-regulation

1. Introduction

Even if people have experienced or are experiencing severe stress/adversity, their psychological development has not been impaired or even worsen, which is the phenomenon of psychological resilience (PR) development[1,2]. Higher vocational college (HVC) students face many academic competition and social adaptation challenges, and a good PR is a necessary condition for their academic success and healthy development. Research has shown that individuals with higher PR level have lower symptoms of depression and anxiety and have higher self-esteem and happiness[3–6]. Even though HVC students are inexperienced and lack the corresponding social skills and life experiences, they have to face all types of events in their lives independently. However, they cannot properly handle some stress events and manage their emotions effectively possibly because of their immaturity. Accordingly, the focus of this study is the relationship between their stress and psychology and emotional adjustment and the mechanism between them and emotions.

Most existing studies have used emotional factors, such as emotional adjustment, positive emotions, and self-efficacy, to predict PR. In recent years, more researchers have begun to focus on the inner emotional trait

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of emotional belief[7,8]. HVC students are faced with the contradiction of coordinated development of mind and body and the pressure of learning development and social expectations, so they are easily troubled by emotions. Many HVC students' emotions are in a bad state[9], and the difficulty of emotional regulation is closely related to their mental health[10]. The current study aims to explore HVC students' PR and their emotional self-regulation (ESR) mode.

2. Literature review

Studies have suggested that emotional belief, as a higher level existence, affects how individuals control emotions and the corresponding emotional reactions[11,12]. An empirical study has also found that cognitive reappraisal adjustment strategy can improve HVC students' PR, while the use of expression inhibition strategy will hinder the promotion of PR[13]. In addition, cognitive reappraisal plays an intermediary role between emotional beliefs and depression[14]. People with high PR experience are found to have more positive and negative emotions than those with low PR[15]. Graham et al.[16] indicates that PR is a dynamic process. To deeply understand the development and mechanism of PR, researchers should substantially explore the individual differences and internal processes of people's ability to cope with stress and adversity.

Emotion means people's attitude, experience, and corresponding behavioral response to objective ideas. Moreover, emotion is a special type of subjective experience, external expression, and physiological stimulation. In the past, people usually regarded emotion as an independent, autonomous construct similar to a fixed behavior, but it is currently regarded as a tendency and controllable idea. Peng et al.[17] conducts a study on college students and finds that they are more likely to adopt the ESR mode of cognitive reappraisal, which has a certain predictive effect on mental health. Syn et al.[18] investigates the relationship between ESR and depression. Results indicate that when patients with high emotion feel negative emotions, they will focus more on and vent themselves. By contrast, they will ignore and suppress themselves more when they feel positive emotions. Therefore, the aforementioned study believes that inappropriate self-emotional adjustment has generally led to a rise in depression. Kim and Koh[19] studies the relationship between students' psychological recovery and mental health. The results show an evident correlation between the sub-dimension scores of psychological recovery and mental health.

Academics have always been convinced of the certainty of the relationship between severe stress and psychological behavior problems, and believe that severe stress will inevitably lead to psychological problems. However, in recent years, PR has become a hot issue in the field of psychology, and the important concept of PR has made people re-examine the influence of stress and adversity on people's psychological behavior. PR is an individual's good adaptation to life adversity, trauma, tragedy, threats or other major pressures in life, which means "resilience" to life pressures and setbacks. Positive emotions can partially mediate the relationship between PR and depression, as well as the relationship between PR and overall happiness. Therefore, PR's predictive effect on mental health of college graduates is realized through the intermediary variable of positive emotion[20].

Shen and Wang[21] holds that PR mainly exists in the following three situations: children who have experienced adverse environment can overcome difficulties, adapt to adversity and have positive development results; Still in adversity or unfavorable environment, the individual's psychological behavior is normal and has not been hurt; Children who have experienced great disasters or major negative events, such as earthquakes and wars, can all recover their psychological normal level in the process of growing up. Liu[22] holds that PR is the result that individuals can still adapt well to adverse environment after experiencing serious adverse environment and develop smoothly into positive results. Chen and Wang[23] holds that PR is an individual's

ability to adapt to negative environment. PR refers to the different abilities or characteristics that individuals have when coping with negative events such as setbacks, adversity, stress and trauma.

PR, as a complex and dynamic psychological process, is bound to have an impact on students' academic mood. At present, China has entered a transitional period of economic development. With the upgrading of industrial structure, enterprises need more excellent professional and technical personnel. Accordingly, studying HVC students' PR and academic emotion is of considerable theoretical and practical significance for the healthy development of their body and mind and in improving the quality of HVC education.

3. Research method and process

3.1. Research objects

In this study, 500 questionnaires were distributed in several colleges by random sampling; 452 were recovered, 415 were valid, and the effective recovery rate was 83%. Demographic variables involved are gender, whether they are an only child, place of origin, grade, and whether their parents are working.

In this study, females and males account for 40.9% and 59.1%, respectively. Only child and non-only child account for 55.7% and 44.3%, respectively. Urban and rural students account for 46.2% and and 53.8%, respectively. Lastly, 34.6% are freshmen and 65.1% are sophomores.

3.2. Research hypothesis

Based on the research at home and abroad, this study puts forward the following assumptions:

Hypothesis 1: HVC students' PR is generally at a medium level.

Hypothesis 2: There are differences in demographic variables such as gender, major, grade and parents' education level in each dimension of HVC students' PR.

Hypothesis 3: All dimensions of HVC students' PR have a significant predictive effect on academic emotions.

Hypothesis 4: Positive emotions play an intermediary role between PR and mental health.

3.3. Measuring tool

3.3.1. Connor–Davidson resilience scale

The Connor–Davidson resilience scale (CD-RISC) measures the positive psychological quality of individuals to adapt to adversity[21]. CD-RISC consists of 25 items, including the 3 dimensions of tenacity, self-improvement, and optimism. A 5-level score (1 = "very inconsistent" and 5 = "very consistent") is adopted; the higher the score, the higher the PR. The internal consistency coefficient of the Chinese version is 0.91, and the three-factor structure is reasonable, with good standard validity. In this study, the internal consistency coefficient of the total table is 0.87.

3.3.2. Positive and negative affect schedule

The positive emotional scale was formed by the revision of the Positive and Negative Affect Schedule (PANAS). The scale consists of nine items, has good discrimination, and is a reliable and effective measurement tool for emotional well-being.

3.3.3. Emotional regulation scale

Emotional regulation scale (ERS) is compiled according to Gross' emotional regulation process model. ERS has 14 items, including cognitive reappraisal and expression inhibition. Likert self-rating scale of 7 points

was used, and the scores from "completely disagree" to "completely agree" were 1–7, respectively. The scale has good reliability and validity.

3.3.4. Symptom checklist SCL-90

SCL-90 is widely used locally and overseas. The scale consists of 90 items, with a five-level score, and has high reliability and validity. The scale includes nine dimensions: somatization, obsessive-compulsive disorder, interpersonal sensitivity, depression, anxiety, hostility, terror, paranoia, and psychosis.

3.4. Data processing

In this study, SPSS26.0 was used for data and statistical analyses, including descriptive statistics, correlation analysis, t test, and regression analysis. This research analyzes and compares the daily emotional state and ESR of HVC students with different PR levels.

4. Result

4.1. General situation of HVC students' PR

This study uses a five-point scoring scale. According to the data in **Table 1**, HVC students' PR scored 3.5 points in family support, which is above the average level (i.e., average level is 3.0 points), and the average scores of other dimensions are between 3.1 and 3.6. This result indicates that HVC students' PR is in the average level.

Table 1. General situation of HVC students' PR.

Project	M	SD
Family support	3.103	0.834
Targeted	3.62	0.871
Psychological cognition	3.329	0.826
Social support	3.333	0.734
Emotional control	3.545	0.949

4.2. Overall situation of HVC students' positive situation

The higher the score of the positive emotional scale, the more positive emotions students experience. **Table 2** shows that the positive emotions of HVC students are generally good, and over half of them often experience positive emotions and feel happy.

Table 2. Overall situation of positive emotions of HVC students.

Scale	Number of entry	M	SD	Theoretical interval	Theoretical median	<3
Positive emotion	9	3.05	0.79	1–5	3	45.1%

4.3. Descriptive statistics of HVC students' ESR style

Descriptive statistics of HVC students' ESR are shown in **Table 3**.

Table 3. Descriptive statistics of HVC students' ESR style.

Project		Cognitive reappraisal	Expression inhibition
Grade	Freshman	35.62 ± 8.054	33.521 ± 8.552
	Sophomore	34.39 ± 7.998	34.642 ± 7.814
Gender	Male students	33.882 ± 8.03	33.46 ± 7.958

	Female students	37.285 ± 8.752	34.953 ± 8.535
Only child or not	Only child	33.039 ± 8.421	37.186 ± 8.774
	Non-only child	34.375 ± 8.34	36.583 ± 7.865
Origin of students	Cities and towns	32.928 ± 8.944	33.679 ± 8.866
	Village	33.332 ± 7.361	35.71 ± 8.592

Paired sample *t* test was used to test the significance of the difference between the two modes of ESR. The results show a significant difference between the two ESR modes ($t = 14.068$, $p < 0.001$), indicating that HVC students are more inclined to adopt cognitive reappraisal as the mode of ESR.

4.4. Regression of stress perception to PR and mental health

To further establish the relationship among stress perception, PR, positive emotion, and mental health, this study performed a regression analysis with stress perception as independent variable and PR and mental health as dependent variables. Stress perception can explain 14.1% of the total variation of PR and is a negative prediction. **Tables 4** and **5** show that stress perception can explain 38.5% variance of mental health.

Table 4. Regression analysis of pressure perception on PR.

Dependent variable	Predictor variable	R^2	ΔR^2	Beta	T	P
PR	Stress perception	0.141	0.359	−0.384	−8.403***	0.000

Table 5. Regression analysis of stress perception on mental health.

Dependent variable	Predictor variable	R^2	ΔR^2	Beta	t	P
SCL—90	Stress perception	0.385	0.579	0.374	11.835***	0.000

Note: *** significant at the 0.001 level.

4.5. Correlation analysis of HVC students' stress, PR, and emotional adjustment

The relationships between PR and positive and negative emotions of HVC students are 0.477 and 0.477 and 0.394, respectively. A very significant positive relationship exists between HVC students' PR and their cognitive reappraisal, and the correlation coefficient is 00.238. The results show that the degree of expression inhibition is negatively correlated with its expression level, and the correlation was 0.119, reaching a very significant level of 0.001. Given the influence of numerous factors, such as stress, there is no significant relationship between stress and its factors and expression inhibition. See **Table 6** for details.

Table 6. Correlation matrix between PR and emotions and emotional regulation in HVC students.

Project	Target concentration	Emotional control	Positive cognition	Family support	Interpersonal assistance	PR
Positive emotion	0.215***	0.277***	0.403***	0.178***	0.165***	0.477***
Negative emotion	−0.333**	−0.361***	−0.234***	−0.322***	−0.439***	−0.394***
Cognitive reappraisal	0.172***	0.424***	0.168***	0.34***	0.195***	0.238***
Expression inhibition	0.029	−0.048*	0.030	−0.042*	−0.413***	−0.119***

Note: *significant at the 0.05 level, **significant at the 0.01 level, and ***significant at the 0.001 level.

4.6. Test of the mediating effect of emotional regulation

The mediating effect of expression inhibition between emotional belief and PR was analyzed. The results are shown in **Table 7**.

Table 7. Analysis of the mediating effect of emotional regulation between emotional belief and PR.

Project	Effect value	Boot standard error	Boot CI lower limit	Boot CI upper limit	Relative effect value
Total effect	−0.199	0.033	−0.153	−0.036	
Direct effect	−0.07	0.026	−0.14	−0.085	40.752%
Mediating effect of cognitive reappraisal	−0.126	0.033	−0.127	−0.103	58.755%
Total effect	−0.03	0.017	−0.15	−0.113	
Direct effect	−0.038	0.03	−0.175	−0.069	78.155%
Mediating effect of expression inhibition	0.03	0.016	0.01	0.011	27.889%

The indirect effect of expression inhibition in emotional belief and PR is 0.03, and the bootstrap 95% confidence interval is not 0. This result indicates that the mediation effect of expression inhibition between emotional belief and PR is significant, accounting for 27.889%.

5. Discussion

HVC students' PR scored 3.5 points in family support, which is above the average level (i.e., average level is 3.0 points), and the average scores of other dimensions are between 3.1 and 3.6, indicating that HVC students' PR is in the average level. The development of HVC students' PR is shown to be relatively good, and the development quality comprises family cohesion, social resources, general PR, social skills, self-efficacy, and work plan style. After experiencing academic failure or other adversities, HVC students still face numerous psychological troubles and pressures different from ordinary HVC students when studying in HVC schools. Accordingly, improving HVC students' PR level, helping them complete their studies smoothly, and enabling them to acquire technical skills and also enhance the quality of their psychological health are issues that should be addressed in HVC education.

The positive emotions of HVC students are generally good, and over half of them will often experience positive emotions, such as happiness, enthusiasm, and pride. The overall situation of HVC students' emotions is that positive emotions are more than negative emotions. Therefore, HVC students experience more positive emotions. Paired sample *T* test was conducted to test the significance of the difference between the two ESR modes. The results show a significant difference between the two ESR modes ($t = 14.068$, $p < 0.001$), indicating that HVC students are more inclined to adopt cognitive reappraisal as ESR mode. Meanwhile, the scores of HVC students using cognitive reappraisal are not as high as those of freshmen. The possible reason are that they are faced with greater learning pressure in their sophomore year and that their age characteristics occasionally lead to difficulty in adopting the ESR method of cognitive reappraisal. No significant difference in cognitive reappraisal and expression inhibition exists between left-behind and non-left-behind HVC students.

Regression analysis of the data shows that stress perception can predict mental health and PR, PR can predict positive emotions and mental health, and positive emotions can predict mental health. To further establish the relationship among stress perception, PR, positive emotion, and mental health, this study performed a regression analysis with stress perception as independent variable and PR and mental health as dependent variables. Stress perception can explain 14.1% of the total variation of PR, and it is a negative prediction. Negative and low arousal academic emotions mainly include boredom, helplessness, depression, and upset-fatigue. After failure, they cannot correctly evaluate themselves, lack clear study and life goals, are not good at controlling their emotions, and cannot obtain the understanding and support of their parents. These outcomes will lead HVC students to experience negative emotions, such as boredom, helplessness, depression, and upset-fatigue, in their studies.

This study found that emotional belief can directly and negatively predict HVC students' PR and also predict PR through cognitive reappraisal. The indirect effect of expression inhibition on emotional belief and PR is 0.03, and the bootstrap 95% confidence interval is not 0. These results indicate that the mediation effect of expression inhibition between emotional belief and PR is significant, accounting for 27.889%. The more HVC students think that their emotions are uncontrollable, the more inclined they are to adopt expression inhibition, which can improve their PR level. When regulating negative emotions, individuals who think that emotions can be controlled evidently use cognitive reappraisal more[8]. The possible reason is that emotional belief, as the cognitive belief of individuals' inner emotions, controls how they make emotional adjustments in various situations. By testing the mediating effect of stress perception, PR and mental health, it is found that HVC students' PR plays a partial mediating role between stress perception and mental health. This is consistent with the research results in reference[10], but different from the research results in reference[17]. This result may be caused by the small sample size and weak representativeness of this study.

Due to the relationship between time, ability and experience, this study only makes a preliminary exploration of the status quo and relationship between PR and emotional self-regulation of HVC students, and there are still some shortcomings and deficiencies. Therefore, future research needs to expand the research on personal resources, and more research on personal resources between PR and emotional self-regulation is involved in future research.

6. Conclusion

This study found that HVC students' PR is in the middle level. The positive emotions of HVC students are generally good, and over half of them often experience positive emotions and are happy. HVC students are markedly inclined to take cognitive reappraisal as an ESR method. Stress perception can explain 14.1% of the total variation of PR, and it is a negative prediction. Stress perception can explain 38.5% variance of mental health. HVC students' PR is positively and negatively correlated with positive and negative emotions, respectively. A positive correlation exists between HVC students' PR and cognitive reappraisal and a negative correlation between HVC students and expression inhibition. No significant relationship exists between stress and its factors and expression inhibition. The indirect effect of expression inhibition in emotional belief and PR is 0.03, and the bootstrap 95% confidence interval is not 0. These results indicate that the mediation effect of expression inhibition between emotional belief and PR is significant, accounting for 27.889%.

Author contributions

Conceptualization, ZM and CL; methodology, ZM; software, ZM; validation, ZM and CL; formal analysis, ZM; investigation, ZM; resources, ZM; data curation, ZM; writing—original draft preparation, ZM; writing—review and editing, ZM; visualization, ZM; supervision, CL; project administration, ZM; funding acquisition, ZM. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

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