

Effects of Character Strengths on Depression in Military College Students: The Chain Mediating Role of Positive Emotions and Life Satisfaction in a Cross-Sectional Study

Yan Zhang¹, Zhe Yang², Shengjun Wu¹

¹Department of Military Medical Psychology, The Fourth Military Medical University, Xi'an, 710032, People's Republic of China; ²Department of Health Statistics, School of Public Health, The Fourth Military Medical University, Xi'an, 710032, People's Republic of China

Correspondence: Shengjun Wu, Department of Military Medical Psychology, The Fourth Military Medical University, Changle West Road No. 169, Xi'an, 710032, People's Republic of China, Email wushj@fmmu.edu.cn; Zhe Yang, Department of Health Statistics, School of Public Health, The Fourth Military Medical University, Changle West Road No. 169, Xi'an, 710032, People's Republic of China, Email doudou05@fmmu.edu.cn

Purpose: Depression is one of the significant factors affecting the mental health of military college students. This study aims to explore the influencing mechanisms of depression in military college students.

Methods: This study employed a convenience sampling method to recruit 813 participants and collected data through online questionnaires administered via Wenjuanwang. The questionnaires comprised sections on demographic information, character strengths, positive affect, satisfaction with life, and depression scales. For data analysis, *t*-tests were conducted for intergroup comparisons, and Pearson's correlation analysis was utilized to evaluate the relationships between variables, and regression analysis combined with structural equation modeling was applied to investigate the chain mediating effects.

Results: Character strengths negatively predict depression among military academy students, with a mediating effect of -0.169 (95% CI: -0.323 to -0.050). Life satisfaction partially mediates this relationship (mediating effect: -0.074 , 95% CI: -0.323 to -0.050). Positive emotions do not significantly mediate this relationship ($\beta = -0.045$, 95% CI: -0.154 to 0.057). Character strengths also indirectly influence depression via the sequential mediation of positive emotions and life satisfaction (mediating effect: -0.163 , 95% CI: -0.398 to -0.199 , $p < 0.05$).

Conclusion: Educators in military college may consider designing comprehensive intervention programs to cultivate character strengths, which could potentially enhance positive emotions and life satisfaction, and possibly prevent depression or reduce its level.

Keywords: character strengths, positive emotions, depression, life satisfaction, military college students

Introduction

Depression is a common affective disorder that has become one of the most important factors threatening human health. Darío Moreno-Agostino et al¹ found that the prevalence of depression is on the rise worldwide. Under the stress of study and pressures of life, college students are especially prone to mental health problems, particularly depression, and this issue has increasingly raised wide social concern. Researches on the mental health of college students have found that the prevalence of depression among Chinese college students in recent years has been as high as 20–60%.^{2,3} A large-scale study on Chinese college freshmen found that about 65.55% of them have experienced depression.⁴ In contrast to general college students, military college students, as the incoming, high-quality military talents for the future army, are an important power for medical support and the maintenance of the army's fighting force. As military college students, they are in a critical period for their developing personalities and growing talents, when they initially face the pressure of military life pressures, such as the environment of the military camps, the mode of management, interpersonal relationships, studies, and military training and tasks, are more likely to make them prone to emotional problems like depression.



In recent years, the prevention and timely treatment of psychological problems among military personnel have become a significant issue in the military medicine field in many countries.

Depressed mood is affected by a variety of factors. With the rise of positive psychology, more and more attention has been paid to the impact of positive psychological resources on depression, of which character strengths and positive emotions are important examples. Positive psychology posits that individuals have the inherent capacity for growth, self-fulfillment, and happiness. If a person lacks these abilities, he or she may develop depression. Prior studies have shown that character strengths are strongly associated with depression, mental health, and life satisfaction.⁵

Character strengths can be defined as positive traits reflected in thoughts, feelings, and behaviors. They exist in degrees and can be measured as individual differences.⁶ Moreover, these strengths change dynamically over time, and thus they can be enhanced through cultivation and training. The Resource-Conservation-Theory posits that when an individual interacts with their environment, resources like character strengths can enable the individual to better cope with external pressures and challenges and minimize negative emotional experiences, thus enabling him or her to obtain more resources.⁷ As character strengths are an important component of an individual's positive psychological resources, their relationship with depressed mood has received increasing attention. On the emotional level, character strengths can lead to more positive experiences;⁸ on the level of physical and mental health, character strengths are defensive factors that play a protective role in the face of mental health problems (eg, depression), stress, and adversity.⁹ Character strengths are positively associated with positive emotional experiences, hope, and happiness, but negatively correlated with anxiety and depression.¹⁰ A study on nurses found that character strengths are directly and negatively correlated with depressive symptoms and positively correlated with mental health.⁵ Character strengths interventions can increase the levels of individual satisfaction, positive emotions, etc., and reduce problems such as depression and anxiety.^{11–13} Studies of character strengths-based curricular interventions have demonstrated significant increases in students' positive experiences of well-being, life satisfaction, and positive emotions after the interventions.¹⁴

Positive emotion, defined as a pleasurable subjective experience, typically emerges when an individual's needs are fulfilled. Positive emotions can facilitate individuals' proactive behavioral tendencies. Fredrickson's Broaden-and-Build Theory of positive emotions posits that positive emotions can broaden an individual's thoughts and actions, build lasting physiological and psychosocial resources, and bring about more positive feedback, thereby alleviating negative emotions and depressive symptoms.¹⁵ A core feature of depression is mood dysregulation, ie, an increase in negative emotions and a decrease in positive emotions. The absence of positive emotions is an important manifestation of depression. Empirical research has shown that depression is associated with difficulties in up-regulating positive emotions and that depressed individuals are less likely to use rational positive emotion regulation strategies. Positive emotions can lead to positive outcomes such as higher levels of physical and mental health, healthier behaviors, and better interpersonal relationships.¹⁶ Positive emotions can increase psychological resources, improve the cognition of setbacks and failures, enhance psychological resilience, and boost the ability to resist stress and adversity as well as the capacity to recover from negative states.¹⁷ Therefore, we may as well try to leverage positive emotions to improve an individual's depressive state and enhance their mental health.

Life satisfaction is an individual's subjective experience of his or her evaluation of his or her own life quality according to his or her own standards, and such life satisfaction is the basic condition of his or her mental health.¹⁸ Scholars believe that life satisfaction can negatively predict the level of depression, suggesting that enhancing an individual's life satisfaction may improve depressive conditions.^{19–24} Scholarly research has indicated that depression is significantly negatively correlated with life satisfaction.^{25,26} Additionally, studies have shown that life satisfaction is negatively correlated with anxiety and depression while being positively correlated with psychological resilience.²¹ In Turkey, with a measure of depression, a positive correlation was found in pregnant women concerning the number of children they had and a negative correlation with life satisfaction.²² In a cross-sectional study, life satisfaction was found to be negatively associated with depressive symptoms, and depressive symptoms were comorbid with loneliness, anxiety, and dependency.²⁷ These findings suggest that life satisfaction could serve as a potential psychological target for intervening in depression, but its mechanism of action needs to be further explored by incorporating group characteristics.

Research has shown that positive emotions have significant direct effects on life satisfaction and academic engagement.²⁸ Network analysis reveals that positive emotions are highly correlated with higher levels of life satisfaction. The Directed Acyclic Graphs revealed that positive emotions significantly influenced life satisfaction.²⁹ The findings underscore the importance of positive emotions in enhancing life satisfaction. Other studies have found that positive emotions were significantly associated with life satisfaction in the expected way.³⁰ Consistent with the broaden-and-build theory, positive emotions appear to predict life satisfaction.³¹ Cross-lagged analysis indicated that positive emotions predicted life satisfaction after controlling for auto regressor effects. Positive emotions were positively associated with life satisfaction across the different time points as well.³²

Although previous studies have investigated the relationships among character strengths, positive emotions, life satisfaction, and depression, the following limitations still exist: First, most prior studies have focused on single effect only, and whether character strengths influence depression through positive emotions and life satisfaction via a chain mediating effect has not been fully explored; Second, there is currently no research on how character strengths affect depressive symptoms among military college students.

Therefore, this study aims to fill this research gap by constructing a chain mediation model to analyze the intrinsic association between character strengths and depression in military college students. In this study, the following four hypotheses were proposed:

H1: The character strengths of military college students are significantly negatively predictive of depression.

H2: Positive emotions play a mediating role between character strengths and depression.

H3: Life satisfaction plays a mediating role between character strengths and depression.

H4: Character strengths affect the depression of military college students through the chain mediation of positive emotions and life satisfaction.

By examining the above hypotheses, this study aims to accurately identify the influencing factors and underlying mechanisms of depression in military college students from the unique perspective of positive psychology, so as to provide a solid theoretical basis and practical guidance for the development of scientific and effective depression intervention strategies, thereby improving the mental health of military college students and ensuring the smooth progress of their learning, training, and future military career development.

Materials and Methods

Study Design

This study was a descriptive cross-sectional survey of military college students and adhered to the STROBE statement.

Setting

On December 10th, 2024, we used a convenience sampling method to recruit 813 undergraduate students at a military college.

Study Size

According to the statistical method,³³ the sample size is typically 5 to 10 times the number of study variables. In this study, there were 135 variables (including demographic data and all scale variables). Considering potential invalid questionnaires, a 10% increase in the sample size was necessary. Therefore, a minimum sample size of 743 was calculated to meet the requirements of this study.

Participants

A total of 860 questionnaires were distributed, of which 813 valid questionnaires were collected, yielding a validity rate of 94.5%. Participants were eligible for inclusion if they (1) were healthy based on self-report; (2) with no self-reported history of neurological or psychiatric illnesses; (3) consented to participate in the study; and (4) non-psychology majors. Of the participants, 66.9% were male, 55.7% were from towns and cities, 94.6% were of Han nationality, and the average

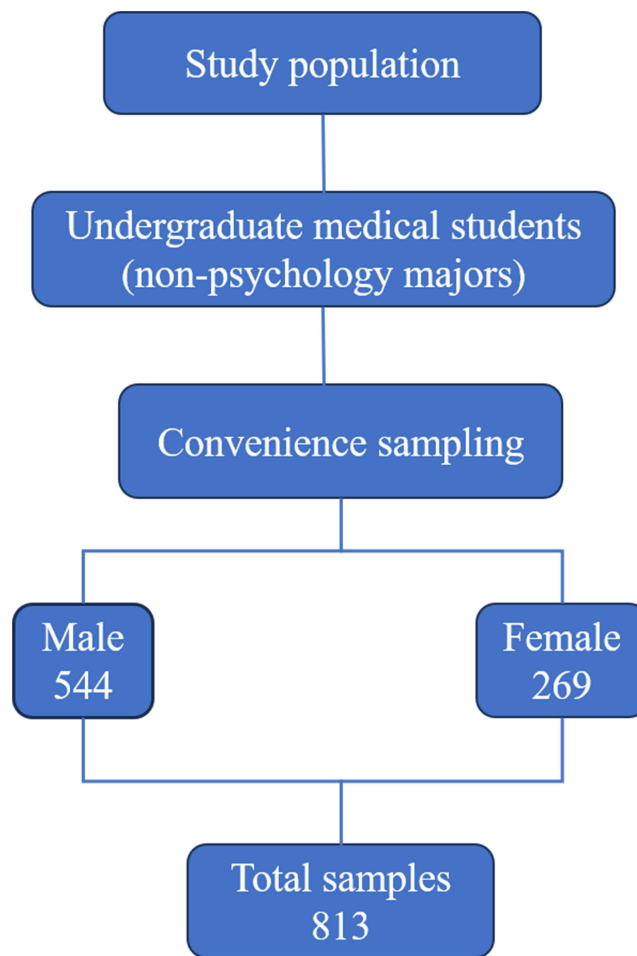


Figure 1 Participants recruit flow diagram.

age was 21.19 ± 4.26 years old (Figure 1). The exclusion criteria were: (1) students presenting with major physical disorders potentially interfering with assessment; (2) students without valid written informed consent.

Data Collection Procedure

This study utilized an online survey hosted on the Wenjuanwang platform. Specifically, the survey was administered by researchers who were trained to administer the questionnaires after class during students' free time, whereby all students in each class unit completed it by scanning a QR code in the classroom via WeChat. Prior to this process, students were explicitly informed that the survey was anonymous, intended solely for academic research, and required independent and truthful responses. Furthermore, the questionnaire's landing page displayed an Informed Consent Form outlining the research purpose; consequently, students were required to acknowledge it via a checkbox before proceeding. During the completion phase, researchers emphasized that items assessing positive emotions and depression specifically reflected participants' emotional states during the preceding week. This study complies with the ethical principles of medical research as set out in the Declaration of Helsinki, and approved by the Ethics Review Committee of The First Affiliated Hospital of the Fourth Military Medical University (KY20234188-1).

Measures

Demographic Characteristics

A self-made questionnaire was used to measure the demographic characteristics of participants. The contents of the questionnaire included: gender, age, place of origin and nationality.

Character Strengths Questionnaire

The Chinese Virtues Questionnaire as revised by Wenjie Duan et al was used to measure character strengths.³⁴ The scale measures 24 character strengths across three dimensions (Relationship, Vitality, Conscientiousness) through 96 items. All items are scored on a five-point Likert scale from 1 = *very unlike me* to 5 = *very much like me*. The average score for each subdimension is calculated. The higher the score, the higher the level of character strengths. The Cronbach's α coefficient of the total scale in this study was 0.987.

The Satisfaction with Life Scale (SWLS)

The SWLS was formulated by Diener³⁵ to evaluate overall life satisfaction. It is a unidimensional scale with 5 items; all scored on a seven-point Likert scale from 1 = *very much not satisfied* to 7 = *very much satisfied*. Higher total scores indicate greater life satisfaction. The Cronbach's α coefficient of the scale in this study was 0.894.

Positive Emotions

Positive emotions were measured using the section on positive emotions from the Positive and Negative Affect Scale (PANAS). This scale was formulated by Watson, Clark, and Tellegen and revised by Huang Li, Yang Tingzhong, and Ji Zhongmin.³⁶ It has been shown to have good reliability and validity. The scale comprises 10 items, designed to assess the emotional level experienced by respondents in the past week, all scored on a five-point Likert scale from 1 = *very slight or not at all* to 5 = *very strong*. The total score is calculated with higher scores indicating stronger positive emotions. The Cronbach's α coefficient of the positive emotion subscale in this study was 0.910.

Center for Epidemiologic Studies Depression Scales (CES-D)

The Chinese version of the CES-D developed by Radloff, as revised by Wang Xiangdong et al³⁷ was used here. It consists of 20 items designed to identify depression in the general population in the past week. Higher total scores indicate greater frequency of depression. The total score ranges from 0 to 60 points, with a cut-off of 16 points for depressive symptoms. The Cronbach's α coefficient of the CES-D in this study was 0.969.

Statistical Methods

SPSS 26.0 software was used to calculate descriptive statistics, common method bias, Pearson's correlation analysis, and a *t*-test. AMOS 24.0 and Structural Equation Modeling (SEM) were used to test the mediating effects of positive emotion and life satisfaction and evaluate the model, with character strengths as the predictive variable and depression as the dependent variable.

Common method bias was tested using Harman's single factor test and Confirmatory Factor Analysis. For normally distributed quantitative data, the description was based on means and standard deviations. An independent samples *t*-test was used for comparison between two groups. The correlations between variables were analyzed using Pearson correlation analysis. The mediation effects of the variables were analyzed using hierarchical regression analysis and structural equation modeling techniques. The standard errors (SE) and 95% confidence intervals (CI) of the parameter estimates were obtained by taking 5,000 Bootstrap samples. If the 95% CI did not include zero, the effect was considered significant.³⁸

Results

Test for Common Method Bias

In order to control for common method bias, all responses in this study were anonymous, so as to minimize participants' privacy concerns and ensure the reliability and validity of the scale. However, due to the limitations of the measurement population, it was not possible to eliminate common method bias in the procedural control. Therefore, Harman's single factor test was used to perform an exploratory factor analysis on all scale items.³⁹ The results showed that there were 19 factors with eigenvalues greater than 1. The factor with the highest explanatory power accounted for 21.89% of the total variance, a proportion that is below the critical threshold of 40%.⁴⁰ Therefore, there are no serious common method biases in this study.

Table 1 Comparison of Multi-Factor and Single-Factor Models

Model	χ^2	df	χ^2/df	$\Delta\chi^2$	Δdf	p
Single-factor model	97633.979	8515	11.466	66,877.195	137	0.000
Multi-factor model	30756.784	8378	3.671			

Table 1 shows the results of comparing the CFA fit between the multi-factor model and the single-factor model. The chi-square value of the multi-factor model ($\chi^2= 30,756.784$) was considerably lower than that of the single-factor model ($\chi^2= 97,633.979$), indicating the multi-factor model fitted significantly better than the single-factor model ($\Delta\chi^2= 66,877.195$, $\Delta df= 137$, $p < 0.001$) and no serious common method bias existed in the study.⁴¹

Comparison of Total Scale Scores and Demographic Differences of the Variables

The top five core character strengths of the female participants were integrity, fairness, love, teamwork, and tolerance, while the top five core character strengths among males were integrity, fairness, love, teamwork, and gratitude.

The results of comparison of the groups demonstrated that, gender differences were observed in the scores for vitality and conscientiousness ($t=4.91$, $p<0.001$). There were also gender differences in the total scores for character strengths ($t=3.602$, $p<0.001$), life satisfaction ($t=2.65$, $p=0.008$), and positive emotions ($t=3.31$, $p=0.001$), with relatively higher scores for males. Depression levels differed by place of origin ($t=-2.09$, $p = 0.04$), with urban college students scoring lower than their rural counterparts. Detailed comparisons of the total scores of the scales are shown in Tables 2 and 3.

Correlation Analysis of Character Strengths, Positive Emotions, Life Satisfaction, and Depression

A Pearson's correlation analysis was conducted for all continuous variables. Relationship, vitality, conscientiousness, positive emotions, life satisfaction, and character strengths were all highly positively correlated, with correlation coefficients all exceeding 0.5. The total score of character strengths, as well as the sub-scales, was significantly and negatively correlated with depression, as were positive emotions and life satisfaction. The correlation coefficients of each variable are shown in Table 4.

Table 2 Comparative Analysis of Differences in Gender (M±SD)

Variable	Male (N=544)	Female (N=269)	t-value	p-value
Relationship	4.26±0.57	4.28±0.57	-0.43	0.665
Vitality	4.07±0.63	3.83±0.68	4.91	<0.001
Conscientiousness	3.98±0.62	3.73±0.64	5.35	<0.001
Life satisfaction	25.52±6.26	24.25±6.67	2.65	0.008
Positive emotions	38.06±6.97	36.26±7.94	3.31	0.001
Depression	11.98±2.77	12.32±3.55	-0.35	0.730
Character strengths	4.12±0.58	3.95±0.59	3.602	<0.001

Table 3 Comparative Analysis of Differences in Place of Origin (M±SD)

Variable	Urban (N=453)	Rural (N=360)	t	p
Relationship	4.28±0.56	4.26±0.58	0.63	0.530
Vitality	4.03±0.65	3.95±0.67	1.81	0.070
Conscientiousness	3.92±0.63	3.88±0.63	0.79	0.430
Life satisfaction	25.24±6.64	24.93±6.14	0.68	0.493
Positive emotions	37.42±7.44	37.51±7.25	-0.17	0.863
Depression	11.24±2.31	13.16±3.82	-2.09	0.040
Character strengths	4.08±0.59	4.03±0.59	1.239	0.216

Table 4 Correlation Analysis of Variables

	1	2	3	4	5	6	7
1 Relationship	1						
2 Vitality	0.835***	1					
3 Conscientiousness	0.807***	0.906***	1				
4 Character strengths	0.921***	0.973***	0.949***	1			
5 Depression	-0.306***	-0.332***	-0.273***	-0.324***	1		
6 Positive emotions	0.620***	0.703***	0.651***	0.698***	-0.298***	1	
7 Life satisfaction	0.523***	0.616***	0.588***	0.611***	-0.332***	0.612***	1

Note: *** $p < 0.001$.

Regression Analysis of Character Strengths, Positive Emotions, Life Satisfaction, and Depression

Using the suggestions of Wen Zhonglin for the mediating effects test,⁴² the chain mediation effect was detected. Positive emotions and life satisfaction were set as mediator variables, character strengths as the independent variable, depression as the dependent variable, and the stepwise regression method was used to test the mediation effect. The results are shown in Table 5.

After adjusting for gender and place of origin, character strengths significantly and negatively predicted the depression level of military college students ($\beta = -0.326$, $p < 0.01$). This indicates that the direct effect of character strengths on depression was significant. Therefore, Hypothesis 1 is supported. After including positive emotions in the regression equation, character strengths significantly and positively predicted positive emotions ($\beta = 0.696$, $p < 0.01$), but the prediction of depression by positive emotions was not significant ($\beta = -0.077$, $p = 0.11$). Therefore, positive emotions did not play a partial mediating role in the relationship between character strengths and depression; Hypothesis 2 was not supported. After including life satisfaction in the regression equation, character strengths significantly and positively predicted life satisfaction ($\beta = 0.356$, $p < 0.01$), and life satisfaction significantly and negatively predicted depression ($\beta = -0.192$, $p < 0.01$). Therefore, life satisfaction partially mediated the relationship between character strengths and depression; Hypothesis 3 is supported. After including positive emotions and life satisfaction in the regression equation, positive emotions significantly and positively predicted life satisfaction ($\beta = 0.363$, $p < 0.01$), indicating the existence of chain mediation between positive emotions and life satisfaction; Hypothesis 4 is supported. In summary, it can be concluded that positive emotions and life satisfaction play a chain mediating role between character strengths and depression in military college students.

These results indicate that correlation analysis established significant relationships among the four variables. The regression analysis confirmed the significance of the paths from the independent variable to the mediator and from the mediator to the dependent variable, indicating that the key prerequisites for mediation have been validated. This allowed for further testing of the potential chain mediation effect and the examination of indirect effects within each model.

Table 5 Regression Analysis Between Variables

Predictor Variable	Model 1 Depression			Model 2 Positive Emotions			Model 3 Life Satisfaction			Model 4 Depression		
	β	t	p	β	t	p	β	t	p	β	t	p
Gender	-0.035	-1.041	0.298	-0.032	-1.256	0.210	-0.005	-0.196	0.845	-0.041	-1.230	0.219
Place of origin	0.063	1.877	0.061	0.039	1.564	0.118	-0.010	-0.380	0.704	0.066	2.023	0.043
Character strengths	-0.326	-9.742	<0.001	0.696	27.495	<0.001	0.356	9.644	<0.001	-0.155	-3.209	0.001
Positive emotions							0.363	9.845	<0.001	-0.077	-1.600	0.110
Life satisfaction										-0.192	-4.411	<0.001
R ²	0.110			0.490			0.440			0.142		
F	33.270***			259.185***			158.857***			26.615***		

Notes: All variables in the model have been standardized. Gender and place of origin are the control variables. *** $p < 0.001$.

Analysis of the Chain Mediation Effect of Positive Emotions and Life Satisfaction

The results for the parallel mediation effect and the chain mediation effect of character strengths and depression are shown in Figures 2 and 3 respectively. The fit indices of two models based on 5000 bootstrapped samples are shown in Table 6.

This study adopted the chain mediation model due to its superior model fit indices: $\chi^2/df=3.484 (<5)$, RMSEA=0.055 (<0.08), with all indicators (GFI=0.992, AGFI=0.971, CFI=0.996) outperforming the parallel mediation model. Furthermore, this model better aligns with the theoretical pathway of “character strengths → positive emotions → life satisfaction → depression”.

The deviation corrected percentile bootstrap method (5000 repetitions) was used to verify the indirect effect (see Table 7). The results show that the total standardized mediation effect of positive emotions and life satisfaction in the link between character strengths and depression was -0.163 , with 95% confidence intervals of $[-0.256, -0.030]$. This indicates a very clear direct correlation between character strengths and depression.

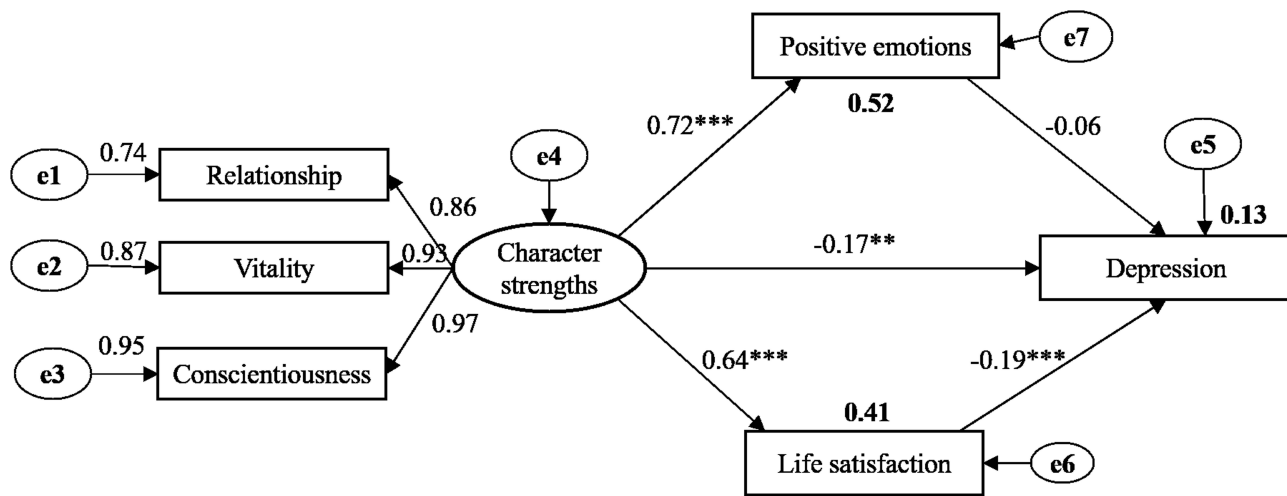


Figure 2 Results of the parallel mediation analysis.

Notes: The values shown are the standardized coefficients. The bold values represent R². ***p<0.001; **p<0.01.

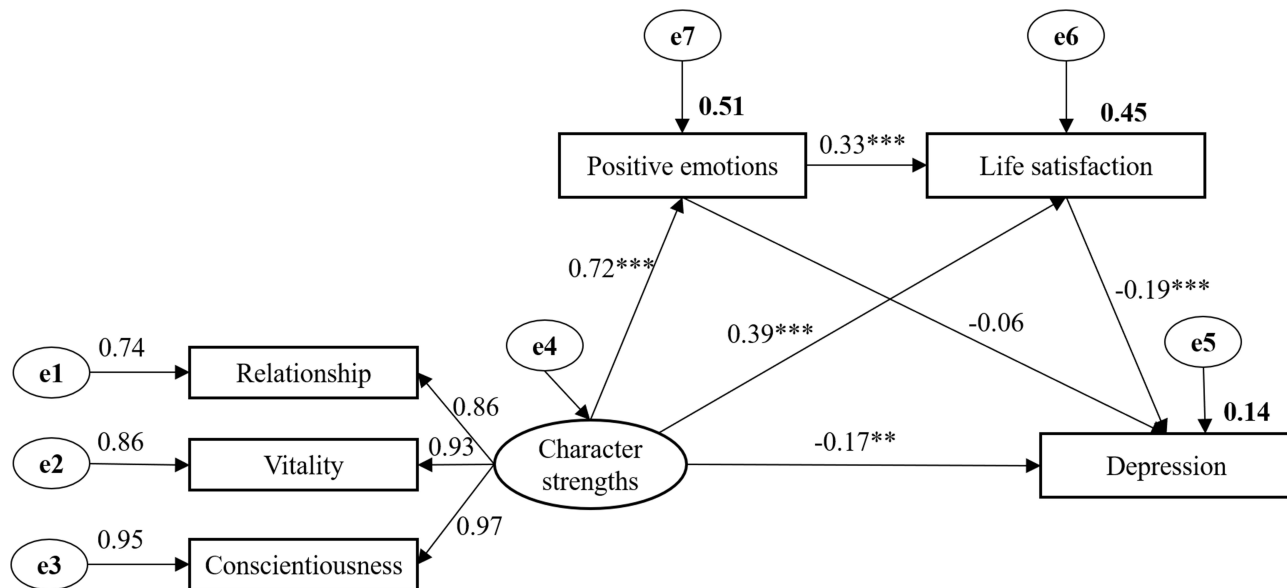


Figure 3 Results of the chain mediation analysis.

Notes: The values shown are the standardized coefficients. The bold values represent R². ***p<0.001; **p<0.01.

Table 6 Fit Indices of Parallel Mediation and Chain Mediation Models

	χ^2/df	RMSEA	GFI	NFI	AGFI	IFI	CFI
Parallel Mediation	13.154	0.122	0.965	0.974	0.894	0.976	0.976
Chain Mediation	3.484	0.055	0.992	0.994	0.971	0.996	0.996

Table 7 Chain Mediation Effect Test of the Mediating Role of Positive Emotions and Life Satisfaction in the Relationship Between Character Strengths and Depression

	Effect Value	BOOT SE	Boot LLCI	Boot ULCI	p	Relative Mediation Effect
Total effect	-0.332	0.043	-0.398	-0.199	0.026	100%
Direct effect	-0.169	0.070	-0.323	-0.050	0.033	50.90%
Total indirect effect	-0.163	-0.056	-0.256	-0.030	0.012	49.10%
Character Strengths→Positive emotions→Depression	-0.045 [#]	0.052	-0.154	0.057	0.468	
Character Strengths→Life satisfaction→Depression	-0.074	0.018	-0.108	-0.037	0.016	22.29%
Character Strengths→Positive emotions→Life satisfaction→Depression	-0.044	0.014	-0.075	-0.02	0.012	13.25%

Notes: [#]Mediation percentages are reported only for statistically significant indirect effects.

Specifically, the mediation effect included the following three pathways: (1) Character Strengths → Positive Emotions → Depression (indirect effect -0.045); (2) Character Strengths → Life Satisfaction → Depression (indirect effect -0.074), and (3) Character Strengths → Positive Emotions → Life Satisfaction → Depression (indirect effect -0.044). Collectively, the 95% confidence interval for Pathway 1 included zero ($\beta = -0.326$, $SE = 0.052$, $p=0.468$), indicating nonsignificant mediation. Pathways 2 and 3 showed significant indirect effects ($\beta = -0.074$ and $\beta = -0.044$, respectively; 95% CIs excluded zero). Pathways 2 and 3 accounted for 35.54% of the total effect, with individual contributions of 22.29% and 13.25%. Therefore, although positive emotions did not have a significant mediation effect between character strengths and depression, the chain mediation of positive emotions and life satisfaction between the two variables was significant. This suggests that character strengths may negatively affect depression through life satisfaction and may also indirectly predict depression through the chain mediation of positive emotions and life satisfaction.

Discussion

This study reveals the mechanisms through which character strengths influence depression in military college students. The findings demonstrate that character strengths not only directly and negatively predict depression levels but also indirectly reduce depression through two pathways: (1) a single mediation of life satisfaction and (2) a chain mediation involving both positive emotions and life satisfaction.

This study assessed the levels of the 24 strengths in the character of military college students, of which the top five strengths were sincerity, fairness, love and being loved, teamwork, and tolerance. Sincerity, fairness, and love and being loved are the core strengths, in agreement with findings based on the US general population.⁴³ In this study, male military college students were found to score higher than female students on the total character strengths scale and the variables of vitality, conscientiousness, life satisfaction, and positive emotions. There was no significant gender difference in the scores of the relationship variable. This is inconsistent with the findings of studies on students from general college students,⁴⁴ for whom females scored higher than males on the relationship variable. The reasons may lie in aspects such as military training and values. In military training, male military college students often undertake more rigorous physical fitness and endurance training tasks, and the high-intensity training model continuously hones their willpower. At the value level, societal and military cultures place more prominent expectations on males for the role of perseverance and determination, and male military college students are more inclined to demonstrate character strengths in training and

daily life. In terms of place of origin, college students from urban areas scored higher than those from rural areas in their appreciation of beauty and lower in depression, suggesting that military academies should pay more attention to rural college students and cultivate their awareness and value of the appreciation of beauty.

The results regarding the mechanism of the effect of character strengths on depression in military college students showed that character strengths and their sub-scales were significantly negatively correlated with depression, which means that individuals with higher levels of character strengths exhibited fewer depressive symptoms. This is consistent with the findings of previous studies.^{5,13,43,45,46} Character strengths can significantly negatively predict depression, and thus Hypothesis 1 is supported. Prior studies have shown that interventions based on character strengths can alleviate depression.^{47,48} Research in positive psychology has shown that character strengths can serve as a buffer against stress and depression, fulfilling a protective function to assist college students in developing cognitive flexibility and adaptability as well as accelerating their psychological recovery from stressful situations.

This study found that positive emotions were highly positively correlated with character strengths and variables and were significantly negatively correlated with depression. Character strengths significantly predicted positive emotions and negatively predicted depression, in agreement with the results of prior studies.⁴⁶ Specifically, military college students with higher levels of character strengths had more positive emotions and lower levels of depression. However, the non-significant path via positive emotions was retained in Table 5 for full disclosure but excluded from mediation interpretations. The positive emotions did not show a significant predictive effect on depression in this study, inconsistent with the findings of prior studies on general college students.⁴⁹ That is, positive emotions did not partially mediate the relationship between character strengths and depression, and thus Hypothesis 2 was not supported. It may be that, based on the Broaden-and-Build Theory, although positive emotions can broaden cognitive and behavioral patterns and build psychological resources, specific stressors in military environments—such as high-intensity training, strict disciplinary constraints, and task uncertainty—continuously deplete individuals' psychological energy, potentially offsetting the broadening effect of positive emotions on cognition and their constructive role in psychological resilience. In this context, positive emotions fail to fully exert their buffering and regulatory functions, leading to their nonsignificant predictive role in depression among military college students.

Our study also shows that life satisfaction was highly positively correlated with character strengths and significantly negatively correlated with depression, a view that has reached general consensus among scholars in China and abroad.^{50–52} The results of the regression analysis show that character strengths had a significantly positive predictive effect on life satisfaction, while life satisfaction had a significantly negative predictive effect on depression. That is to say, individuals with higher levels of character strengths tended to have higher life satisfaction, and the higher the life satisfaction was, the less depressed the individual was. This is consistent with the results of prior studies.^{53–55} Further analysis showed that life satisfaction partially mediated the relationship between character strengths and depression in military college students; Hypothesis 3 was thus supported. Character strengths influence the level of depression by increasing individuals' life satisfaction. For example, individuals with character strengths such as hope, curiosity, and love have higher life satisfaction and lower levels of depression. It may be worth attempting to influence life satisfaction through interventions targeting character strengths, thereby directly or indirectly alleviating depression. According to the two-factor model of mental health, life satisfaction and depression are positive and negative indicators of individual mental health, respectively. In the general population, the character strengths most significantly associated with life satisfaction are hope, enthusiasm, love, gratitude, and curiosity. In a study of recovery from illness, physical illness was found to be less likely to lead to a decrease in life satisfaction in people who were brave, kind, and humorous. Millis found that the character strengths of hope, enthusiasm, humor, gratitude, and perseverance were the strongest predictors of life satisfaction in patients.^{56,57} The development of character strengths may serve as a pathway to improve the subjective experience of quality of life. Higher levels of life satisfaction can help individuals better cope with difficulties and stress in life, reducing the occurrence of depressive symptoms.

This study found that military college students' positive emotions and life satisfaction played a chain mediating role in the relationship linking character strengths to depression, consistent with our Hypothesis 4. This implies that, in addition to developing character strengths, it is crucial to emphasize the cultivation of positive emotions and the enhancement of satisfaction as effective means to mitigate depression. This chain mediating process indicates that

positive emotions and life satisfaction form a continuously influencing pathway between character strengths and depression. Individual-environment interaction theory suggests that an individual's development is influenced by both their external social environment and the individual's intrinsic traits. As an internal characteristic of individuals, when confronting external adversity, resources like character strengths and positive emotions may assist individuals in adapting to adverse environments. This adaptation has the potential to enhance life satisfaction, which could, in turn, contribute to a reduction in depression. Military colleges may as well emphasize the cultivation of character strengths in education and management, and strive to reduce the occurrence of depression by promoting life satisfaction and positive emotions, thereby enhancing the students' mental health.

In research on the influencing factors of depression, genetic, environmental, psychological, social, and biological factors are all associated with it. Current studies suggest that depression is a heterogeneous disease driven by multiple factors. The genetic and neurobiological research indicates that depression shares biological foundations with other affective disorders, collectively forming part of a continuum or affective disorder spectrum rather than independent disease categories.⁵⁸ Meng et al's studies have shown a significant positive correlation between perceived stress and anxiety and depression.⁵⁹ Based on scholarly perspectives, depression is associated with stress.^{60–62} Previous research has noted that individuals with high neuroticism are more prone to maladaptive responses to stressful events and are at a higher risk of mental health problems, such as depressive symptoms.⁶³ Although this study did not include military-specific moderators, its key findings demonstrate that the core mediating pathway via positive emotions and life satisfaction remains robust even without controlling for military environmental stressors. This provides a new perspective for understanding the mechanisms influencing depression and developing intervention strategies.

Practical Implications

This study preliminarily validates the chain mediating the role of positive emotions and life satisfaction in the relationship between character strengths and depression among military college students, highlighting the importance of proactive mental health interventions. Several possible avenues for future intervention design could be considered:

First, to develop a mental health framework from a strengths-based approach.⁶⁴ The focus of mental health for military college students is the exploration and cultivation of character strengths, and the application of these strengths, with an emphasis on prevention rather than addressing issues after they arise. On the one hand, to conduct courses for strengths identification and enhancement, using psychological assessment tools to help students understand their own strengths and designing targeted training modules to reinforce them. On the other hand, to set up practical projects for strengths application, encouraging students to proactively use their character strengths to solve problems in military training and daily tasks, such as students with leadership strengths to organize squad training and those with creativity strengths to participate in tactical innovation.

Second, while exploring and cultivating character strengths, we focus on positive psychological collaborative interventions based on the PERMA theory to enhance positive emotions and life satisfaction. PERMA theory is a theory of happiness in positive psychology that encompasses five elements: positive emotions, relationships, engagement, meaning, and accomplishment.⁶⁵ Here are some possible suggestions: a) In daily military life, positive emotions can be discovered through the "Three Good Things" exercise, created through gratitude visits or writing gratitude letters, and enjoyed through storing mementos and other practices, thereby enhancing feelings of happiness and life satisfaction.⁶⁶ b) In military training and missions, emotional regulation abilities can be improved through mindfulness training, imagery training, etc., to enhance emotional stability.⁶⁷ c) In team collaboration tasks, train positive communication, cultivate proactive constructive communication and empathy, establish strong interpersonal relationships, and provide emotional support.^{67,68}

This approach enables military college students to better adapt to their life in military academy and cope with challenges there, ultimately promoting growth and positive adaptation to future military tasks.

Limitations and Future Directions

The results of this study have enriched the theoretical results on the influence mechanism of depression and can play a guiding role in the development of mental health intervention schemes for military college students. However, it still has some shortcomings worth noting.

First, this study employed cross-sectional data, which precludes the determination of temporal sequences or causal relationships. Future research should utilize longitudinal data to elucidate the causal relationships between character strengths, positive emotions, and life satisfaction. Second, the study was conducted only with military college students from a specific military academy, and the gender ratio was not balanced. Future research with military college students should be conducted on a larger scale and with a more balanced gender ratio. Third, this study primarily focused on the chain mediating the role of positive emotions and life satisfaction in the link between character strengths and depression. However, there may be other additional variables, particularly military-specific stressors, that play mediating or moderating roles. Therefore, follow-up studies should take these other variables into consideration. Fourth, the data are derived primarily from self-reports by trainees, which may be susceptible to the social desirability bias and other confounding factors. In the future researches, researchers should consider integrating multiple measurement methods and research designs with high ecological validity, such as third-party assessments and experience-sampling methods.

Conclusion

The findings of this study reveal significant relationships among character strengths, positive emotions, life satisfaction, and depression within a population of military college students. Notably, character strengths demonstrate a significant direct effect on depression. Furthermore, they exert an indirect effect on depression via the chain-mediating roles of positive emotions and life satisfaction. However, the cross-sectional design warrants a cautious interpretation of these findings. These findings suggest that mental health educators at military colleges can design comprehensive intervention programs to enhance students' character strengths. This enhancement can thereby increase their positive emotions, which in turn can improve life satisfaction, ultimately reducing depression levels. Adopting such a comprehensive intervention approach is likely to be proven more effective.

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics Approval and Informed Consent

This study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Review Committee of The First Affiliated Hospital of the Fourth Military Medical University (KY20234188-1). All subjects gave informed consent.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

This research was funded by the National Natural Science Foundation of China (72374208) and the Interdisciplinary Integration Special Project (2024JC046).

Disclosure

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

1. Moreno-Agostino D, Wu YT, Daskalopoulou C, Hasan MT, Huisman M, Prina M. Global trends in the prevalence and incidence of depression: a systematic review and meta-analysis. *J Affect Disord.* 2021;281:235–243. doi:10.1016/j.jad.2020.12.035

2. Liu Y, Feng Q, Guo K. Physical activity and depression of Chinese college students: chain mediating role of rumination and anxiety. *Front Psychol.* 2023;14:1190836. doi:10.3389/fpsyg.2023.1190836
3. Cai H, Yan GY, Huang M. The intervention pathways of positive psychological qualities on college students' depressive emotions. *J Anhui Electron Inform Vocat Coll.* 2023;22(02):91–95.
4. Wang J, Duan Y, Yang Y, Liu M, Wu L. Identity fusion and aggressive behavior among Chinese freshmen: the chain mediating role of depressive mood and sleep quality. *J Interpers Violence.* 2024;39(5–6):1014–1034. doi:10.1177/08862605231201824
5. Xie J, Liu M, Zhong Z, et al. Relationships among character strengths, self-efficacy, social support, depression, and psychological well-being of hospital nurses. *Asian Nurs Res.* 2020;14(3):150–157. doi:10.1016/j.anr.2020.06.002
6. Robert C. Character strengths and virtues: a handbook and classification. *Am J Psychiatry.* 2005;162(4):419–421.
7. Hobfoll SE. Conservation of resources. A new attempt at conceptualizing stress. *Am Psychol.* 1989;44(3):513–524. doi:10.1037/0003-066X.44.3.513
8. Blanchard T, Kerbeykian T, Mcgrath RE, Fave AD. Why are signature strengths and well-being related? Tests of multiple hypotheses. *J Happiness Stud.* 2020;21(6):1–20. doi:10.1007/s10902-019-00170-2
9. Wallace N, Parente A, McGrath RE. Character strengths as moderators of the relationship between adverse childhood experiences and negative health outcomes. *Int J Appl Posit Psychol.* 2023;1–24. doi:10.1007/s41042-023-00097-3
10. Smith BW, Ford CG, Erickson K, Guzman A. The effects of a character strength focused positive psychology course on undergraduate happiness and well-being. *J Happiness Stud.* 2021;22(1):343–362. doi:10.1007/s10902-020-00233-9
11. Yu Y, Chotipanvithayakul R, Wichaidit W, Cai W. Effects of character strength-based intervention vs group counseling on post-traumatic growth, well-being, and depression among university students during the COVID-19 pandemic in Guangdong, China: a non-inferiority trial. *Psychol Res Behav Manag.* 2022;15:1517–1529. doi:10.2147/PRBM.S359073
12. Liu Q, Wang Z. Associations between parental emotional warmth, parental attachment, peer attachment, and adolescents' character strengths. *Child Youth Serv Rev.* 2021;120(1):1057–1065. doi:10.1016/j.childyouth.2020.105765
13. Liu Q, Wang N, Wang Z. Character strengths as a link between family psychosocial environment and depression symptoms among Chinese adolescents. *Child Soc.* 2022;36(6):1319–1335. doi:10.1111/chso.12578
14. Khanna P, Singh K, Proctor C. Exploring the impact of a character strengths intervention on well-being in Indian classrooms. *Sch Ment Health.* 2021;13(4):819–831. doi:10.1007/s12310-021-09450-w
15. Fredrickson BL. The broaden-and-build theory of positive emotions. *Philos Trans R Soc Lond B Biol Sci.* 2004;359(1449):1367–1378. doi:10.1098/rstb.2004.1512
16. Kurohara G, Ogawa K. Effect of positive emotions on perceptual processing of visual probes. *Neuroreport.* 2022;33(2):55–60. doi:10.1097/WNR.0000000000001758
17. Tian G, Yang Y, Zhang X, Zhao M, Tian Y. From defensive reasoning to innovation: how digital tools foster positive emotions in organizations. *BMC Psychol.* 2025;13(1):146. doi:10.1186/s40359-025-02486-6
18. Ma YG, Jia WZ. Explanatory style moderates the relationship of stressful life events and life satisfaction. *Chin J Health Psychol.* 2017;25(1):76–79.
19. Tan EJ, Cistullo L, Castle DJ, Rossell SL, Jenkins ZM, Phillipou A. Depression, perceived disability and unemployment are associated with reduced life satisfaction in anorexia nervosa. *Eat Disord.* 2022;30(3):323–330. doi:10.1080/10640266.2020.1836890
20. Ha JY, Park HJ. Effect of life satisfaction on depression among childless married couples: a cross-sectional study. *Int J Environ Res Public Health.* 2022;19(4):2055. doi:10.3390/ijerph19042055
21. Romaniuk A, Oniszczenko W. Resilience, anxiety, depression, and life satisfaction in women suffering from endometriosis: a mediation model. *Psychol Health Med.* 2023;28(9):2450–2461. doi:10.1080/13548506.2023.2197649
22. Kulak-Bejda A, Avci Aydın I, Çelik Eren D, et al. Impact of pregnancy on self-efficacy and personal competence in the context of risk of depression, mental health status, and satisfaction with life. *J Clin Med.* 2024;13(2):533. doi:10.3390/jcm13020533
23. Güler A, Gül S, Yildrm M. Social comparison, resilience, life satisfaction, depression, and anxiety among earthquake survivors in Turkey. *Int J Disast Risk Re.* 2024;105:104426.
24. Chen P, Sun HL, Zhang L, et al. Inter-relationships of depression and insomnia symptoms with life satisfaction in stroke and stroke-free older adults: findings from the health and retirement study based on network analysis and propensity score matching. *J Affect Disord.* 2024;356:568–576. doi:10.1016/j.jad.2024.04.036
25. Tian L, Zhang Q, Tsai C-L, Owusu G. Coping profiles among Chinese college students: associations with depression and life satisfaction. *Couns Psychol.* 2025;53(2):150–173. doi:10.1177/00110000241312982
26. Sabatini S. Self-perceptions of aging mediate the associations of change in depression with life satisfaction and disability. *Innov Aging.* 2024;8(Supplement_1):91. doi:10.1093/geroni/igae098.0284
27. Chen YL, Ding XW, Chen Y, Chen Y, Aierken A, Li Y. The association between life satisfaction, depressive symptoms, and common comorbid disorders during the COVID-19 pandemic. *Appl Psychol Health Well Being.* 2025;17(3):e70035. doi:10.1111/aphw.70035
28. Wang X, Wan Jaafar WM, Sulong RM. Building better learners: exploring positive emotions and life satisfaction as keys to academic engagement. *Front Educ.* 2025;10:1535996. doi:10.3389/feduc.2025.1535996
29. Kyriazos T, Poga M. Leveraging network insights into positive emotions and resilience for better life satisfaction. *Open Public Health J.* 2024;17:e18749445338146. doi:10.2174/0118749445338146241002101056
30. Extremera N, Rey L. Ability emotional intelligence and life satisfaction: positive and negative affect as mediators. *Pers Individ Differ.* 2016;102:98–101. doi:10.1016/j.paid.2016.06.051
31. Franke KB, Huebner ES, Hills KJ. Cross-sectional and prospective associations between positive emotions and general life satisfaction in adolescents. *J Happiness Stud.* 2017;18(4):1075–1093. doi:10.1007/s10902-016-9763-8
32. Datu JAD, King RB. Prioritizing positivity optimizes positive emotions and life satisfaction: a three-wave longitudinal study. *Pers Individ Differ.* 2016;96:111–114. doi:10.1016/j.paid.2016.02.069
33. Ni P, Chen J, Liu N. Sample size estimation for quantitative studies in nursing research. *Chin J Nurs.* 2010;45:378–380.
34. Duan W, SMY H, Yu B, et al. Factor structure of the Chinese virtues questionnaire. *Res Social Work Prac.* 2012;22(6):680–688. doi:10.1177/1049731512450074

35. Diener E, Emmons RA, Larsen RJ, Griffin S. The satisfaction with life scale. *J Pers Assess.* 1985;49(1):71–75. doi:10.1207/s15327752jpa4901_13
36. Huang L, Yang TZ, Ji ZM. Applicability of the positive and negative affect scale in Chinese. *Chinese Ment Health J.* 2003;17(1):54–56.
37. Radloff LS. The CES-D scale a self-report depression scale for research in the general population. *Appl Psych Meas.* 1977;1(3):385–401. doi:10.1177/014662167700100306
38. Holland SJ, Shore DB, Cortina JM. Review and recommendations for integrating mediation and moderation. *Organ Res Methods.* 2017;20(4):686–720. doi:10.1177/1094428116658958
39. Harman HH. *Modern Factor Analysis.* Chicago and London:University of Chicago Press; 1976.
40. Podsakoff PM, MacKenzie SB, Lee JY, Podsakoff NP. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J Appl Psychol.* 2003;88(5):879–903. doi:10.1037/0021-9010.88.5.879
41. Li J, Huang J, Hu Z, Zhao X. Parent-child relationships and academic performance of college students: chain-mediating roles of gratitude and psychological capital. *Front Psychol.* 2022;13:794201. doi:10.3389/fpsyg.2022.794201
42. Fang J, Wen Z, Zhang M, Sun P. The analyses of multiple mediation effects based on structural equation modeling. *J Psychol Sci.* 2014;37(3):735–741.
43. Smedema SM. An analysis of the relationship of character strengths and quality of life in persons with multiple sclerosis. *Qual Life Res.* 2020;29(5):1259–1270. doi:10.1007/s11136-019-02397-1
44. Li S. The research of college students' character strengths and the relationship between character strengths and mental healthy. *Huazhong Normal Univer.* 2015.
45. Thongpreem T, Deechaiya R, Chanachai S, et al. Moderating effect of variables associated with positive mental health in a mediation model on depression among college students: protocol for a longitudinal study. *Healthcare.* 2023;11(12):1709. doi:10.3390/healthcare11121709
46. Zhang Y, Wang JY, Yang Z, Dai H, Cao Y. Influence of character strengths and grit on life satisfaction and emotion of medical students in military academies. *Med Educ Res Pract.* 2023;31(1):42–47.
47. Gander F, Proyer RT, Ruch W, Wyss T. Strength-based positive interventions: further evidence for their potential in enhancing well-being and alleviating depression. *J Happiness Stud.* 2012;14(4):1241–1259. doi:10.1007/s10902-012-9380-0
48. Barzigar S, Homaei R. Effects of positivity training on character strengths, time perspective, and self-awareness in women with depression. *J Behav Ther Exp Psychiatry.* 2024;85:101974. doi:10.1016/j.jbtep.2024.101974
49. Chen WB, Zhang N. Stress mind set predict depressive symptoms among college students during COVID-19: mediating effects of positive and negative affect. *Chin J Health Psychol.* 2023;31(8):1239–1243.
50. Joelle LM, Gotlib IH. Depression: a cognitive perspective. *Clin Psychol Rev.* 2019;69(7):51–66. doi:10.1016/j.cpr.2018.06.008
51. Seo BK, Hwang IH, Sun Y, Chen J. Homeownership, depression, and life satisfaction in China: the gender and urban-rural disparities. *Int J Environ Res Public Health.* 2022;19(22):14833. doi:10.3390/ijerph192214833
52. Lok N, Aydin Z, Uzun G, Kayaaslan B, Selçuk Tosun A. Relationship of depression, hopelessness and life satisfaction with death anxiety in individuals who have had COVID-19. *Omega.* 2023;302228231174602. doi:10.1177/00302228231174602
53. Zuo C, Ahmad NS, Zeng L, et al. The relationship between character strengths and subjective well-being among Chinese impoverished college students: the chain mediating roles of perceived social support and positive emotions. *Psychol Res Behav Manag.* 2024;17:3227–3239. doi:10.2147/PRBM.S473189
54. Kagee A, Padmabhanunni A, Coetzee B, Booyens D, Kidd M. Sense of coherence, social support, satisfaction with life, and resilience as mediators between fear of COVID-19, perceived vulnerability to disease and depression. *S Afr J Psychol.* 2024;54(3):300–313. doi:10.1177/00812463241259123
55. Liu X, Yan P, Xu J. The mediating role of life satisfaction in the relationship between pregnancy stress and prenatal depression. *Chin J Health Stat.* 2023;40(05):718–720+725.
56. Hanks RA, Rapport LJ, Waldron-Perrine B, Millis SR. Role of character strengths in outcome after mild complicated to severe traumatic brain injury: a positive psychology study. *Arch Phys Med Rehabil.* 2014;95(11):2096–2102. doi:10.1016/j.apmr.2014.06.017
57. Weziak-Bialowolska D, Bialowolski P, VanderWeele TJ, McNeely E. Character strengths involving an orientation to promote good can help your health and well-being. evidence from two longitudinal studies. *Am J Health Promot.* 2021;35(3):388–398. doi:10.1177/0890117120964083
58. Ng QX, Lim DY, Chee KT. Reimagining the spectrum of affective disorders. *Bipolar Disord.* 2020;22(6):638–639. doi:10.1111/bdi.12960
59. Meng R, Luo X, Du S, et al. The mediating role of perceived stress in associations between self-compassion and anxiety and depression: further evidence from Chinese medical workers. *Risk Manag Healthc Policy.* 2020;13:2729–2741. doi:10.2147/RMHP.S261489
60. Hinkelmann K, Rose M. Stress and depression-a neurobiological perspective. *Hno.* 2025;73(3):175–181. doi:10.1007/s00106-024-01500-4
61. Preece DA, Mehta A, Petrova K, Sikka P, Pemberton E, Gross JJ. Alexithymia profiles and depression, anxiety, and stress. *J Affect Disord.* 2024;357:116–125. doi:10.1016/j.jad.2024.02.071
62. Corona A, Kenny PJ. Chronic stress drives depression by disrupting cellular housekeeping. *Nature.* 2025;641(8062):317–318. doi:10.1038/d41586-025-00910-w
63. Fernandes A, Ferreira S, Moreira P, et al. Stress, anxiety, and depression trajectories during the “first wave” of the COVID-19 pandemic: what drives resilient, adaptive and maladaptive responses in the Portuguese population? *Front Public Health.* 2024;12:1333997. doi:10.3389/fpubh.2024.1333997
64. Casey GW. Comprehensive soldier fitness: a vision for psychological resilience in the U.S. Army. *Am Psychol.* 2011;66(1):1–3. doi:10.1037/a0021930
65. Seligman M. PERMA and the building blocks of well-being. *J Positive Psychol.* 2018;13(4):333–335. doi:10.1080/17439760.2018.1437466
66. Krentzman AR, Mannella KA, Hassett AL, et al. Feasibility, acceptability, and impact of a web-based gratitude exercise among individuals in outpatient treatment for alcohol use disorder. *J Posit Psychol.* 2015;10(6):477–488. doi:10.1080/17439760.2015.1015158
67. Turliuc MN, Balcan AD. Psychological intervention programme for developing resilience in the military personnel. A randomized controlled trial. *Stress Health.* 2024;40(4):e3399. doi:10.1002/smi.3399
68. Seligman ME. Building resilience. *Harv Bus Rev.* 2011;89(4):100–106,138.

Psychology Research and Behavior Management

Dovepress
Taylor & Francis Group

Publish your work in this journal

Psychology Research and Behavior Management is an international, peer-reviewed, open access journal focusing on the science of psychology and its application in behavior management to develop improved outcomes in the clinical, educational, sports and business arenas. Specific topics covered in the journal include: Neuroscience, memory and decision making; Behavior modification and management; Clinical applications; Business and sports performance management; Social and developmental studies; Animal studies. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/psychology-research-and-behavior-management-journal>