

A Study on the Impact of Subjective Exercise Experience on the Psychological Capital of College Students

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Abstract: College students face multiple pressures such as academic challenges, career development, and interpersonal relationships. Understanding and promoting the psychological capital of college students is of great significance in improving their mental health level, enhancing their sense of happiness, helping them achieve career success, and enhancing their socio-economic value. This study focuses on college students and analyzes the impact of subjective exercise experience on capital. There is no significant difference in the level of psychological capital among college students of different genders. Positive well-being has a positive impact on psychological capital and its four core psychological abilities (efficacy, hope, resilience, and optimism); Negative psychological distress has no significant impact on psychological capital and its four core competencies; Fatigue is negatively correlated with psychological capital and its two core abilities of hope and optimism.

1. Introduction

The definition of psychological capital refers to a positive psychological state that an individual exhibits in the process of growth and development, specifically manifested as: (1) having confidence (Efficacy) and being able to make necessary efforts to achieve success when facing challenging work; (2) Positive attribution (Optimism) towards current and future success; (3) Persist in achieving goals and adjust the path to achieving them when necessary to achieve success (Hope); (4) When facing adversity and being troubled by problems, the psychological ability to persevere, quickly recover, and surpass (Resilience) to achieve success (Luthans, Youssef, & Avolio, 2008, Li, Trans)[1].

College students are a critical period in life, facing multiple pressures such as academic challenges, career development, and interpersonal relationships. Understanding and promoting the psychological capital of college students is crucial for their personal growth and social development. Studying the psychological capital of college students is of great significance in promoting their mental health level, enhancing their sense of happiness, helping them achieve career success, and enhancing their socio-economic value.

Research has found that positive emotions lead to positive cognition, positive behavior, and enhanced cognitive abilities, which in turn contribute to positive emotions (Fredrickson & Joiner, 2002)[2]. This will form a virtuous cycle, thereby improving the level of psychological capital.

The physiological effects of exercise on the body, such as the release of endorphins and

endogenous cannabinoids, can regulate emotions and happiness. A positive exercise experience is associated with higher levels of happiness, satisfaction, and self-worth. These positive experiences can enhance the components of psychological capital, such as self-esteem and confidence. Therefore, exercising subjective experiences may enhance psychological capital.

2. Method

2.1. Object

Taking undergraduate students from Guilin Institute of Aerospace Technology as the research object, a total of 784 valid questionnaire scores were obtained through online questionnaire survey, including 478 males and 306 females.

2.2. Tools

(1) The subjective exercise experience measurement tool uses the Subjective Exercise Experience Scale (SEES) (McAuley & Courneya, 1994)[3], which is divided into three subscales: Positive well-being, Psychological distress, and Fatigue. The Likert's 7-level scoring method is used. The higher the sum of the scores of each item in Positive well-being subscale, the stronger the positive well-being experience; The higher the sum of the scores of each item in Psychological distress subscale, the more severe the level of psychological distress; The higher the sum of the scores of each item on Fatigue subscales, the more severe the fatigue level. In this study, the Cronbach coefficients of the subscales of positive happiness, psychological distress, and fatigue were 0.830, 0.856, and 0.845, respectively.

(2) The psychological capital measurement tool for college students adopts the College Student Psychological Capital Questionnaire (PCQ-16) (Song & Mao, 2012)[4]. This questionnaire is revised based on the Chinese version of the Psychological Capital Questionnaire (PCQ-24) (Luthans et al., 2008, Li, Trans)[1]. The questionnaire is divided into four dimensions: efficacy, hope, resilience, and optimism, using Likert's 5-level scoring method. The higher the sum of all item scores, the higher the level of psychological capital. In this study, the Cronbach coefficient, a tool for measuring college students' psychological capital, was used $\alpha = 0.894$, the Cronbach coefficients for efficacy, hope, resilience, and optimism are 0.802, 0.800, 0.780, and 0.820, respectively.

3. Results

3.1. Gender Differences in Psychological Capital

T-test for differences in psychological capital levels between different gender groups. The average level of male psychological capital is 54.65, with a standard deviation of 9.06; The average psychological capital level of female students is 55.43, with a standard deviation of 8.74. The Levene homogeneity test of variance was not significant ($p > 0.05$), indicating that there was no significant difference in the discrete trend of the distribution of psychological capital levels between males and females.

Table 1: T-test of the Differences in Psychological Capital between Male and Female

Factor	Gender	N	M	SD	t	p
Psychological Capital Level	Male	478	54.65	9.06	-1.199	.231
	Female	306	55.43	8.74		

$t = -1.199$ ($p > 0.05$), indicating that there is no significant difference in psychological capital levels

between males and females. As shown in Table 1.

3.2. The Impact of Subjective Exercise Experience on Psychological Capital

Use SPSS v.23.0 to establish a regression model. D-W=1.920, indicating that the data are independent of each other and meet the independence condition of linear regression.

ANOVA analysis showed that $F = 65.816$ ($p < 0.001$), subjective exercise experience had a significant impact on the psychological capital of college students, with adjusted $R^2 = 0.202$. As shown in Table 2.

Table 2: The Significance of Subjective Exercise Experience on Psychological Capital

ANOVAa					
Model	Sum of Squares	df	Mean Square	F	p
Regression	12630.545	3	4210.182	65.816	.000b
Residual	49895.981	780	63.969		
Total	62526.526	783			
a. Dependent Variable: Psychological_Capital					
b. Predictors: (Constant), Well_being, Distress, Fatigue					

The results of the impact of positive well-being, psychological distress, and fatigue on psychological capital are shown in Table 3:

(1) The impact of positive well-being: $t = 16.535$ ($p < 0.001$), and positive well-being has a significant positive impact on the psychological capital of college students, and the standardized regression coefficient $\beta = 0.389$.

(2) The impact of psychological distress: $t = 16.535$ ($p > 0.05$), and the impact of psychological distress on the psychological capital of college students is not significant.

(3) The impact of fatigue: $t = -2.440$ ($p < 0.05$), and fatigue has a significant negative impact on the psychological capital of college students, and the standardized regression coefficient $\beta = -0.097$.

Table 3: Regression coefficient of subjective exercise experience affecting psychological capital

Coefficientsa							
Model	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	39.868	2.411		16.535	.000		
Well_being	.934	.088	.389	10.580	.000	.758	1.319
Distress	-.091	.096	-.042	-.944	.345	.524	1.907
Fatigue	-.188	.077	-.097	-2.440	.015	.646	1.549
a. Dependent Variable: Psychological_Capital							

3.3. The impact of subjective exercise experience on efficacy

ANOVA analysis showed that $F = 36.322$ ($p < 0.001$), subjective exercise experience had a significant impact on efficacy of college students, with adjusted $R^2 = 0.119$. As shown in Table 4.

The results of the impact of positive well-being, psychological distress, and fatigue on efficacy are shown in Table 5.

(1) The impact of positive well-being: $t = 8.293$ ($p < 0.001$), and positive well-being has a

significant positive impact on efficacy of college students, and the standardized regression coefficient $\beta=0.319$.

(2) The impact of psychological distress: $t = -0.267$ ($p>0.05$), and the impact of psychological distress on efficacy of college students is not significant.

(3) The impact of fatigue: $t=-1.622$ ($p>0.05$), and the impact of fatigue on efficacy of college students is not significant.

Table 4: The Significance of Subjective Exercise Experience on efficacy

ANOVAa					
Model	Sum of Squares	df	Mean Square	F	p
Regression	771.862	3	257.287	36.322	.000b
Residual	5525.208	780	7.084		
Total	6297.070	783			
a. Dependent Variable: Efficacy					
b. Predictors: (Constant), Well_being, Distress, Fatigue					

Table 5: Regression coefficient of subjective exercise experience affecting efficacy

Coefficientsa							
Model	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	9.944	.802		12.394	.000		
Well_being	.244	.029	.319	8.293	.000	.758	1.319
Distress	-.009	.032	-.012	-.267	.790	.524	1.907
Fatigue	-.042	.026	-.068	-1.622	.105	.646	1.549
a. Dependent Variable: Efficacy							

3.4. The impact of subjective exercise experience on hope

ANOVA analysis showed that $F = 38.458$ ($p<0.001$), subjective exercise experience had a significant impact on hope of college students, with adjusted $R^2=0.126$. As shown in Table 6.

Table 6: The Significance of Subjective Exercise Experience on hope

ANOVAa					
Model	Sum of Squares	df	Mean Square	F	p
Regression	830.438	3	276.813	38.458	.000b
Residual	5614.315	780	7.198		
Total	6444.754	783			
a. Dependent Variable: Hope					
b. Predictors: (Constant), Well_being, Distress, Fatigue					

The results of the impact of positive well-being, psychological distress, and fatigue on hope are shown in Table 7:

(1) The impact of positive well-being: $t = 7.885$ ($p<0.001$), and positive well-being has a significant positive impact on hope of college students, and the standardized regression coefficient $\beta=0.303$.

(2) The impact of psychological distress: $t = -0.408$ ($p > 0.05$), and the impact of psychological distress on hope of college students is not significant.

(3) The impact of fatigue: $t = -2.64$ ($p < 0.05$), and fatigue has a significant negative impact on hope of college students, and the standardized regression coefficient $\beta = -0.110$.

Table 7: Regression coefficient of subjective exercise experience affecting hope

Coefficients ^a							
Model	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	9.645	.809		11.925	.000		
Well_being	.233	.030	.303	7.885	.000	.758	1.319
Distress	-.013	.032	-.019	-.408	.684	.524	1.907
Fatigue	-.068	.026	-.110	-2.640	.008	.646	1.549

a. Dependent Variable: Hope

3.5. The impact of subjective exercise experience on resilience

ANOVA analysis showed that $F = 30.282$ ($p < 0.001$), subjective exercise experience had a significant impact on resilience of college students, with adjusted $R^2 = 0.101$. As shown in Table 8.

Table 8: The Significance of Subjective Exercise Experience on resilience

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	p
Regression	627.115	3	209.038	30.282	.000 ^b
Residual	5384.471	780	6.903		
Total	6011.587	783			

a. Dependent Variable: Resilience
b. Predictors: (Constant), Well_being, Distress, Fatigue

Table 9: Regression coefficient of subjective exercise experience affecting resilience

Coefficients ^a							
Model	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	10.789	.792		13.621	.000		
Well_being	.192	.029	.257	6.611	.000	.758	1.319
Distress	-.058	.032	-.086	-1.848	.065	.524	1.907
Fatigue	-.020	.025	-.033	-.788	.431	.646	1.549

a. Dependent Variable: Resilience

The results of the impact of positive well-being, psychological distress, and fatigue on efficacy are shown in Table 9:

(1) The impact of positive well-being: $t = 6.611$ ($p < 0.001$), and positive well-being has a significant positive impact on resilience of college students, and the standardized regression coefficient $\beta = 0.257$.

(2) The impact of psychological distress: $t = -1.848$ ($p > 0.05$), and the impact of psychological distress on resilience of college students is not significant.

(3) The impact of fatigue: $t = -0.788$ ($p > 0.05$), and the impact of fatigue on resilience of college students is not significant.

3.6. The impact of subjective exercise experience on optimism

ANOVA analysis showed that $F = 40.552$ ($p < 0.001$), subjective exercise experience had a significant impact on optimism of college students, with adjusted $R^2 = 0.132$. As shown in Table 10.

Table 10: The Significance of Subjective Exercise Experience on optimism

ANOVAa					
Model	Sum of Squares	df	Mean Square	F	p
Regression	968.515	3	322.838	40.552	.000b
Residual	6209.690	780	7.961		
Total	7178.204	783			
a. Dependent Variable: Optimism					
b. Predictors: (Constant), Well_being, Distress, Fatigue					

The results of the impact of positive well-being, psychological distress, and fatigue on optimism are shown in Table 11:

(1) The impact of positive well-being: $t = 8.514$ ($p < 0.001$), and positive well-being has a significant positive impact on optimism of college students, and the standardized regression coefficient $\beta = 0.326$.

(2) The impact of psychological distress: $t = -0.317$ ($p > 0.05$), and the impact of psychological distress on optimism of college students is not significant.

(3) The impact of fatigue: $t = -2.141$ ($p < 0.05$), and fatigue has a significant negative impact on optimism of college students, and the standardized regression coefficient $\beta = -0.089$.

Table 11: Regression coefficient of subjective exercise experience affecting optimism

Coefficientsa							
Model	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	9.490	.851		11.158	.000		
Well_being	.265	.031	.326	8.514	.000	.758	1.319
Distress	-.011	.034	-.015	-.317	.751	.524	1.907
Fatigue	-.058	.027	-.089	-2.141	.033	.646	1.549
a. Dependent Variable: Optimism							

4. Discussion

The current research results support the hypothesis that subjective exercise experiences may affect psychological capital, although the degree of impact is lower than expected. From the analysis results, it can be seen that the positive well-being of subjective exercise has a significant impact on psychological capital, which also confirms the view in previous studies that positive emotions are positively correlated with psychological capital.

It is reasonable that well-being affects psychological capital by influencing its four core competencies, but it is unexpected that negative psychological distress has no significant impact on all four core competencies. Further research is needed to determine the specific reasons.

This study did not consider factors such as exercise intensity, load, and stage of exercise of the objects, which inevitably leads to some limitations. These are likely important mediators or moderating variables that influence psychological capital through subjective exercise experiences.

5. Conclusion

There is no significant difference in the level of psychological capital among college students of different genders. Subjective exercise experience has a significant positive impact on psychological capital, and positive well-being of exercise has a significant positive impact on the four psychological abilities of psychological capital: efficacy, hope, resilience, and optimism; Negative psychological distress has no significant impact on psychological capital and its four core competencies; Fatigue has a negative correlation with the two core competencies of hope and optimism in psychological capital, thereby negatively affecting psychological capital.

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