



The Influence of Physical Education on The Psychological Quality of College Students in The New Era

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ABSTRACT

Academic pressure, employment pressure and emotional pressure together lead to serious mental health problems of college students, and their psychological quality is also questioned by the public. At this time, it has become a new attempt to solve the mental health problem to pay attention to the construction of psychological quality in the development of college students' psychological quality. Research shows that exercise is a strong predictor of mental health. The purpose of this study is to explore the development process of physical exercise-induced individual psychological changes, and use PARS-3 to study. Using MTIS and CSMHDO as research tools, 777 college students were investigated to explore the mediating effect of mental toughness on the relationship between exercise and mental health quality of college students.

Keywords: College Students, Physical Exercise, Mental Health Quality, Mental Toughness.

I. INTRODUCTION

Facing the pressure of study, employment and emotion, college students not only suffer from mental health problems, but also their psychological quality is questioned by all walks of life. At this time, the development of college students' psychological quality and the construction of college students' mental health quality become a new research direction to solve the problem of mental health.

Therefore, this study based on the investigation of sport cause the development of college students' psychological change process, using sports rating scale, mental toughness questionnaire and quality of college students' mental health questionnaire, through the mental toughness of 777 college students, in sports and to study the effect between the quality of college students' mental health.

II. RESEARCH METHODS

2.1 Literature method

Mainly through library borrowing books and materials, with the help of CNKI, China Journal Network database, China excellent Master's and Doctoral dissertation database, network resource search engine and Sports literature database in Chinese and foreign languages, etc. With "sports", "exercise", "tenacity", "psychological toughness", "psychological quality", "mental health, mental health quality" as the key words, refer to relevant literature to understand the current status and problems of relevant research, and sort out the relationship between integration variables.

2.2 Questionnaire survey

The research objects are selected based on the regional economic development level of Henan Province, the level and type of colleges and universities, and convenient sampling is adopted to select the undergraduate students from 8 colleges and universities affiliated to the Ministry of Education in Henan Province. A total of 800 questionnaires were sent out in this survey, and 777 were effectively received with effective recovery rate of 97.1%.

Table 1: Basic situation of research cardinality (N=777)

		N	%			N	%
gender	men	395	50.8	Years of exercise	Less than 1 year	287	36.9
	women	382	49.2		1-3years	210	27.1
source	city	385	49.5		3-5years	161	20.7
					More than 5 years	119	15.3
				Freshman year	209	26.9	
	rural	392	50.5	Sophomore year	215	27.7	
				Junior year	191	24.6	
				Senior year	162	20.8	

2.3 Statistical processing methods

SPSS20.0 and AMOS20.0 were used for data analysis. T test and analysis of variance were used to analyze the demographic differences of each variable, and regression analysis and guidance analysis were used.

III. DISCUSSION

3.1 The status quo of sports, psychological fortitude and psychological and physical health quality of college students

3.1.1 The overall situation of sports, psychological fortitude and psychological and psychological health quality of college students

Table 2: Statistical results of college students' sports status, psychological toughness and mental health description (N=777)

	Min	Max	M	SD
Physical activity	0.00	100.00	27.51	21.53
Mental toughness	1.00	7.00	3.80	1.44
Mental health quality	2.15	4.49	3.38	0.32

Table 2 is the descriptive statistical results of college students in the amount of exercise, mental firmness and mental health quality. The results show that the amount of exercise of college students is at a medium low level, the psychological toughness is at a medium lower level, and the overall level of mental health quality is above the medium level.

3.1.2 The differences in demographic variables of sports, psychological toughness and mental health quality of college students

A: Differences in demographic variables of sports:

Table 3: Test of gender and origin of physical activity

Table 3: Test of gender and origin of physical activity						
			M	SD	t	P
Physical activity	gender	men	37.72	22.46	45.44	0.00
		women	16.96	14.25		
	source	city	28.68	22.22	1.496	0.06
		rural	26.37	20.81		

The independent sample T test was used to test the difference between gender and origin of students' exercise amount, and the results showed that gender had a significant main effect on exercise amount ($P < 0.01$), and male students' exercise amount was significantly higher than female students. In the test of origin and place, there was marginal significant difference in the amount of exercise ($P > 0.01$).

Table 4: Difference test of exercise amount in different grades

	Freshman year	Sophomore year	Junior year	Senior year	F	P
Physical activity	27.19±19.8	30.48±22.1	29.03±20.5	22.20±23.1	5.06	0.00

Table 5: Comparison of college students in different grades

	一、二	一、三	一、四	二、三	二、四	三、四
	t	t	t	t	t	t
Physical activity	-3.29	-1.84	4.99*	1.45	8.28*	6.83**

Table 4 shows the test results of different grades of college students' exercise amount. It can be seen from the table that grade has significant main effect on exercise amount ($F = 5.06$, $P < 0.01$). Then pairwise multiple comparisons were made, as shown in Table 5. The results showed that there were significant differences between the senior and the other three grades ($PC < 0.01$).

B: Differences in psychological fortitude in demographic changes:

Table 6: Demographic variation of psychological fortitude

Table 6: Demographic variation of psychological fortitude						
			M	SD	t	P
Mental toughness	gender	men	4.08	1.58	5.64	0.00
		women	3.51	1.23		
	source	city	3.74	1.41	-1.147	0.05
		rural	3.86	1.47		

The independent sample t test was used to test the difference between gender and origin of college students. The results showed that the main effect of gender on psychological toughness was significant ($P < 0.01$). The psychological toughness of male students was significantly higher than that of female students. The mental firmness of urban and rural college students has a significant margin ($P < 0.1$), and the mean value of mental firmness of rural college students is higher than that of urban college students.

Table 7: The difference test of psychological fortitude in different grades

	grade	M	SD	F	P
Mental toughness	Freshman year	3.52	1.31	4.15	0.01
	Sophomore year	3.83	1.52		
	Junior year	3.99	1.49		
	Senior year	3.91	1.41		

Table 8: Comparison of college students in different grades

	一、二	一、三	一、四	二、三	二、四	三、四
	t	t	t	t	t	t
Mental toughness	-0.31*	-0.47**	-0.39*	-0.16	-0.08	-0.09

Table 7 shows the difference test results of mental firmness among college students of different grades. It can be seen from the table that the main effect of grade on mental fortitude is significant ($F = 4.15$, $P < 0.01$). In Table 8, the comparison of grades shows that there are significant differences between the first year and the other three grades.

Table 9: Difference test of mental toughness in sports years

Mental toughness	Less than 1-year (①) (M±SD)	1-3years(②) (M±SD)	3-5years(③) (M±SD)	More than 5 years(④) (M±SD)	F	P
	3.46±1.13	3.83±1.54	4.06±1.57	4.28±1.63	12.03	0.00

Table 10: Comparison

Mental toughness	①、②	①、③	①、④	②、③	②、④	③、④
	t	t	t	t	t	t
	-0.37*	-0.60**	-0.82**	-0.23	-0.45*	-0.22

Table 9 is the difference test results of college students in different years of exercise. It can be seen from the table that the main effect of exercise years on mental toughness is significant ($F = 12.03$, $P < 0.001$), and there is a significant difference in mental toughness of college students in different grades. Then multiple inspection, found that for duration of less than 1 year of college students, and their mental toughness were significantly lower than other years period group ($p < 0.01$), fixed number of year of the movement for 5 years or above level of college students' mental toughness is significantly higher than for 1 year and 1 to 2 years of college students under the, which lasted 1 to 3 years and 3-5 years of college students, There was no significant difference in psychological toughness between the students who had been exercising for 3-5 years and those who had been exercising for more than 5 years ($P > 0.05$).

C: The difference of college students' mental health quality in demographic change:

Table 11: The difference test of college students' mental health quality in sports years

	Less than 1 year (M±SD)	1-3years (M±SD)	3-5years (M±SD)	More than 5 years (M±SD)	F	P
cognitive	3.00±0.32	3.17±0.32	3.27±0.37	3.29±0.29	28.12	0.00
mood	3.35±0.33	3.53±0.38	3.52±0.36	3.59±0.37	18.21	0.00
personality	3.29±0.36	3.46±0.38	3.41±0.39	3.60±0.35	22.83	0.00
adapt	3.44±0.35	3.59±0.34	3.58±0.37	3.68±0.34	16.02	0.00
MHD	3.27±0.29	3.43±0.30	3.43±0.33	3.54±0.29	27.31	0.00

Table 11 is the test results of college students' mental health quality and the differences of the four dimensions in exercise duration. It can be seen from the table that the exercise duration years have significant differences in mental health quality and all dimensions ($F = 27.31$, $P < 0.001$). The results showed that the mental health quality and the level of the four dimensions of college students who exercised for more than 5 years were significantly higher than those of the other three years, while the mental health quality and the dimensions of college students who exercised for 1-3 years and 3-5 years had no significant difference ($P > 0.05$).

3.1.3 The relationship between sports, mental toughness and mental health quality of college students

Table 12: Correlation matrix of sports, mental toughness and mental health quality of college students

variable	1	2	3	4	5	6	7	8	9	10
gender	※									
grade	0.13*	※								
Fixed number of year	0.29	0.06	※							
Physical activity	0.48**	0.04	0.43	※						
Mental toughness	0.33**	0.26**	0.23**	0.52**	※					
cognitive	0.37**	0.21**	0.19**	0.31**	0.29**	※				
mood	0.35**	0.18**	0.14**	0.26**	0.25**	0.70**	※			
personality	0.35**	0.27**	0.22**	0.27**	0.36**	0.68**	0.66**	※		
adapt	0.36**	0.26**	0.16**	0.26**	0.33**	0.71**	0.65**	0.71**	※	
MHD	0.41**	0.26**	0.20**	0.31**	0.35**	0.88**	0.86**	0.87**	0.88**	※
mean	0.51	0.25	0.15	27.51	3.80	3.28	3.31	3.41	3.54	3.38
Standard deviation	0.50	0.43	0.36	21.53	1.44	0.36	0.35	0.38	0.36	0.31

Table 12 shows the correlation analysis results of sports, psychological toughness and mental health quality of each dimension. It can be seen from the table that sports, psychological toughness and mental health quality of college students are significantly positively correlated with each dimension, that is, the higher the amount of exercise and the stronger the psychological toughness of college students, the higher their mental health quality. Due to the significant correlation between the tested variables, it is suitable to test the mediation effect hypothesis.

3.2 Test of mediating effect of mental toughness on sports and mental health quality of college students

Table 13: The effect of mental toughness in sports and college mental health quality

regression equation			overall index			Regression coefficient	significant
results variable	Control variables	Predictor variable	R	R ²	F	β	t
Mental toughness	gender		0.34	0.12	25.24**	0.04	1.07
	grade					0.06	1.69
	Years of exercise					0.01	0.35
		sports				0.31	7.65***
Mental health quality	gender		0.49	0.24	47.57**	0.29	8.07***
	grade					0.21	6.49***
	Years of exercise					0.04	1.18
		sports				0.12	2.95**
		Mental toughness				0.09	2.56**
Cognitive quality	gender		0.44	0.19	36.70**	0.26	6.92***
	grade					0.16	5.00***
	Years of exercise					0.03	0.86
		sports				0.14	3.50***
		Mental toughness				0.09	2.53**
Emotional quality	gender		0.39	0.15	28.03***	0.26	6.84***
	grade					0.13	3.93***
	Years of exercise					0.00	0.02
		sports				0.11	2.59**
		Mental toughness				0.08	2.01
personality	gender		0.45	0.20	38.32***	0.24	6.40***
	grade					0.22	6.68***
	Years of exercise					0.09	2.50**
		sports				0.09	2.61**
		Mental toughness				0.09	2.75**
	gender		0.43	0.11	25.14***	0.27	7.11***
	grade					0.21	7.37***
	Years of exercise					0.03	6.37***
		sports				0.08	2.02*
		Mental toughness				0.07	2.14*

Note : β is standardized regression coefficient, * denotes $P < 0.05$, ** represents $P < 0.01$, *** indicates $P < 0.001$

Gender, grade and years of exercise were used as control variables in regression analysis to test the mediating effect of mental toughness (male students, junior students and exercise lasting more than 5 years were used as reference groups respectively). Sports was the independent variable, psychological fortitude was the intermediary variable, and mental health quality and four dimensions were the dependent variables for regression analysis. The results showed as follows: firstly, physical activity positively predicted mental firmness ($P = 0.31$, $P < 0.001$); Secondly, when sports and mental toughness simultaneously predicted mental health quality, the positive prediction effects of sports and mental toughness were significant ($P = 0.12$, $P < 0.001$; $P = 0.09$, $P < 0.01$); Finally, sports and psychological fortitude can predict cognitive quality, youth quality, personality quality and adaptation quality respectively.

3.3 Analysis of current situation of sports, psychological fortitude and mental health quality of college students**3.3.1 The overall characteristics of sports, psychological toughness and mental health quality of college students**

This study results show that the sports level of college students is at a level below average, a serious shortage of exercise intensity and exercise frequency, physical conditions of groups of college students is still a worrying link, youth sports development report clearly pointed out the reasons of students' physique condition than primary school students is a serious lack of physical exercise. The main reasons for this phenomenon are the popularity of electronic products and the lack of pressure from physical examination. The study also found that the overall psychological strength of college students in the lower level.

In the field of education, the awareness of developing students' psychological fortitude has not been paid enough attention. Therefore, the specific psychological effects of psychological fortitude on the physical and mental growth of college students need to be explored. At the same time, some studies show that psychological toughness is closely related to sports, and in the situation of lack of exercise, this is an important factor affecting the level of psychological toughness of college students.

3.3.2 Demographic difference analysis of psychological fortitude

Gender difference analysis: the results showed that gender had a significant difference in the effect of psychological adherence ($P < 0.001$), and the level of psychological adherence of male students was significantly higher than that of female students. This may be related to the personality characteristics of male and female students. Generally speaking, male students are willing to challenge and learn new content in sports games, while female students dare not make bold in sports. Some studies have found that boys' "risk taking" in sports is significantly higher than girls', but the perceived risk of injury is lower than girls'. As risk perception and risk taking are negatively correlated, boys will still ignore the injury and continue to focus on the current task even if there is a sports injury, while girls will easily give up continuing sports after the injury.

3.3.3 Demographic difference analysis of college students' mental health quality

Analysis of gender difference: The results show that gender has significant main effect on college students' mental health quality and all dimensions, and male students are significantly higher than female students, which may be due to physiological differences. Male brain hemisphere transformation degree is higher than female students, and their special intelligence is stronger than female students. Male students generally represent the image of firmness, while female students are weak and lack of sense of security. Therefore, the differences in physical and mental development characteristics and roles affect the development of mental health quality of male and female students.

3.4 Influence of sports and mental toughness on college students' mental health quality

3.4.1 The influence of sports on college students' mental health quality

In the analysis of the relationship between relevant variables, it is found that the amount of exercise is significantly positively correlated with the mental health quality of college students and the four dimensions. In other words, the better the physical activity, the higher the mental health quality of college students. College is an important stage for students to improve their mind and develop their personality. However, it is inevitable that they will encounter some obstacles and difficulties in their studies and interpersonal communication. For college students, sports can effectively relieve their stress and anxiety. The positive effect of sports on individual body and mind has been confirmed by many studies. The view of body and mind as a whole think that physical health and mental health are mutual influence and mutual gain. To a certain extent, physical health can be regarded as the foundation of mental health development, so the level of mental health will be improved when physical fitness is enhanced.

3.4.2 The influence of psychological toughness on college students' mental health quality

This study found that psychological toughness is significantly positively correlated with the mental health quality of college students, and it can significantly positively predict the mental health quality of college students, which means: the higher the level of psychological toughness, the higher the mental health quality of college students. The higher the psychological toughness, the more endogenous psychological protection factors students obtain, which can effectively buffer the adverse stress in sports on students. Therefore, the psychological toughness of college students can also be improved through some educational approaches. Thus, speculate that early psychological strong sex to the protection of quality of college students' mental health and gain effect is particularly important, high mental toughness of rendering to face the challenge of the study and life and setbacks, to actively respond to and to find effective measures to keep the firm faith, and can quickly adapt to adversity to grow, so that the quality of mental health to get stable development.

IV. CONCLUSION

4.1 Conclusion

1. The overall situation of college students' participation in sports is not optimistic. The level of psychological toughness is medium and low, and the level of mental health quality is medium and above.
2. There are significant differences of gender, discipline and grade in the amount of exercise of college students; There were significant differences in mental toughness and mental health quality in gender, grade and years of exercise, but no significant differences in discipline.
3. There is a significant positive correlation between sports status and mental health bremsstrahlung, college students' mental health quality and four dimensions (cognitive quality, emotional quality, personality quality and adaptive quality), indicating that with the increase of the amount of exercise.
4. Sports has a significant positive predictive effect on college students' mental health quality, and psychological fortitude plays a partial intermediary role between sports and college students' mental health quality.

4.2 Suggest

1. The cultivation of mental health quality is given priority to, supplemented by the infiltration of multi-dimensional education. Mental health quality is a kind of positive psychological quality inspired by the development of positive psychology trend. For the college students with frequent psychological problems, developing mental health quality can affect their physiological, psychological and social functions to a certain extent, and promote the college students to better adapt to the social development.
2. Physical education is given priority to, supplemented by extra-curricular activities. The results of this study show that sports can significantly affect the mental health quality of college students. Therefore, through appropriate sports measures, encouraging college students to actively participate in sports, forming regular sports habits, cultivating the concept of lifelong sports, can effectively promote the development of college students' mental

health quality. In this study, the sports situation of college students includes physical education and extracurricular exercise.

3. Psychological skills intervention is the main, supplemented by stress training. This study found that mental toughness can significantly affect the mental health quality of college students, which indicates that improving the level of mental toughness of college students can effectively develop their mental health quality.

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