

Stress Perception Mediates the Relationship between Stress and Quality of Life among Chinese Police Officers

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Research

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Abstract

Background Police officers are known for working under high-stress environment, and it is widely reported that police officers suffer from stress-related ailments which could subsequently impact their life quality. However, there is little direct research that describes the relationship between police officers' quality of life and stress. Current study aims to investigate police officers' quality of life and explore the effect of stress on life quality of police officers. Our study also explores the effect of stress perception on the relationship between the stress and quality of life to see whether changing police officers' stress perception can improve their quality of life.

Methods We conduct literature search on police officers' life quality in China, and compare the result against the general population. We also investigate 914 Chinese police officers, measured their life quality, stress level and stress perception, and analyze the stress' influence on quality of life.

Results The result shows that the life quality of police officers is generally lower than the general population, and many factors, such as age, education level and gender, will influence the quality of life. Police officer's life quality is negatively correlated with their stress level, and stress perception appears to mediate the relationship between the stress and quality of life.

Conclusion Police officers' quality of life is low, and stress has negative effect on it. And stress would affect the stress perception and then influence mental and physical health of police officers.

Introduction

Quality of life is defined by WHO as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. Previous studies reported that depression, economic condition, health condition, cognitive function and marriage condition would influence the elderly's quality of life (Xu, 1994; Dai, Liu, & Ma, 2003), and the quality of life of people with breast cancer correlated with social support (Sammarco, & Angela, 2001).

Besides, stress is also an influential factor of life quality. Some studies on cancer patients indicated that quality of life was affected negatively by stress (Kreitler, Peleg, & Ehrenfeld, 2010). An online study in 2014 examined the relationship between generally perceived levels of stress and the quality of life on Facebook and found that people who spent the more time on Facebook had the higher stress and lower quality of life (Bevan, Gomez, & Sparks, 2014). Since police work is known for its high-stress nature (He, Zhao, & Archbold, 2002; Sarason, et al., 1980), police officer's quality of life may be in the lower end of the spectrum. Police officers are often exposed to some stressful events, such as confrontation, violence, traumatic incidents, and human misery (Chen, et al., 2006). Besides the stress from work, police officers also suffer the stress from family and relationship, since they tend to have little time to deal with family issues.

Lipp and Marilda (2009) investigated the levels of occupational stress and quality of life of Brazilian police officer and found that the police officers considered their job to be very stressful and their standard of quality of life was found to be poor. Santanu and his colleagues (2016) studied the relationship between job stress and quality of life among police personnel in India, and found that officers were more stressed than constables, while the score of quality of life was higher in constables than officers, which implied that policemen who had higher work stress had lower quality of life. Few studies have investigated the relationship between the stress and quality of life of Chinese police officers, thus our study aims to investigate current situation of quality of life of police officers in China, to compare it against the general population, and to explore the effect of stress on quality of life of Chinese police officers. We assume that life quality of police officers would be lower than the general population(hypothesis1), and stress would have negative effect on life quality of police officers (hypothesis 2).

Due to the impracticality of enhancing police officers' life quality by cutting their workloads and work-derived raw stress, we investigate the relationship between stress and quality of life and try to discover another possible route. Previous study on U.S.A. adult found that high amounts of stress and the perception that stress impacts health were each associated with poor physical and mental health (Keller, Peleg, & Ehrenfeld, 2012). And according to Ellis's ABC Theory of Emotion, activating event will influence the people's belief and then affect consequence (Ellis, 1985). Therefore, we want to explore the effect of stress perception on the relationship between the stress and quality of life. We assume that stress perception would mediate the relationship between the stress and quality of life (hypothesis 3), and we can change the stress perception of police officers to improve their quality of life.

Method

Study 1: current situation of quality of life

Data base and key words

We take 'quality of life' and 'police officer' as key words and used China Academic Journals Electronic Publishing House as database in our literature search.

Inclusion criteria

Our inclusion criteria are: (1) written in Chinese; (2) literature is research study; (3) quality of life is measured by the questionnaires which have norm in China, such as SF-36, WHOQOL-BREF; (4) the sample can represent the normal police population.

Data analysis

According to our standards, we include 4 papers in our study. We list the data of quality of life in the tables and compare them against the norm of general population.

Study2: the relationship between stress and quality of life

Participants

Yiwu is a county-level city in Zhejiang province and is the largest county-level city in China, with about 1200 policemen. Questionnaires were sent out during the annual health examination of policemen, and 914 police officers aged from 22 to 60 participated in the study voluntarily, and 900 (mean age = 38.3, SD = 9.8) completed the questionnaire thoroughly. 6 police officers returned incomplete data and 8 refused to offer demographic data. The effective response rate of the questionnaire is 98.5%, and the response rate of entire sample is 75%.

Measure

Police stress scale

Our study used the Police stress scale (Chen, & Xu, 2012) to measure the stress of police officers. This scale has 46 items and 6 dimensions, including task-related stressor, social life stressor, power motive stressor, self-related stressor, negative emotion stressor and organization management stressor.

Participants were required to judge whether the event described in item occurred to themselves. If it did not occur, it is recorded as 0. If the event occurred, the participants were asked to evaluate the impact of the event by 5-point Likert format (not affected, mild, moderate, severe, or extremely severe), and high score indicates high levels of stress. The scale has been found to have highly acceptable psychometric property (Chen, & Xu, 2012) in the sample of Chinese policemen.

Chinese version of perceived stress scale

The Chinese version of perceived stress scale (CPSS-14) (Yang & Huang, 2003) was used to measure the stress perception, which consists of 14 items under two dimensions. The positive dimension (7 items) estimates the degree of ability to cope with existing stressors, while the negative dimension (7 items) evaluates the sense of losing control and negative affective reactions. It measures stress that one perceived in preceding month. The items are rated on a 5-point Likert-type scale ranging from 0(never) to 4(very often).

Short form health survey

The Short form health survey (SF-12) (Huo, et al.,2018) is one of the most used HRQoL questionnaires. This scale incorporates two dimensions: physical component summary (PCS) and mental component summary (MCS), for estimating health-related functions along eight subscales: physiological function (PF), Role limitations due to physical problems (RP), body pain (BP), general health (GH), vitality (VT), social function (SF), Role limitations due to emotion problems (RE), mental health (MH). Each dimension is scored by Likert's cumulative method, and scores are transformed onto a 0 to 100 scale.

Data analysis

For statistical analysis, Mean and Standard Deviation (SD) are computed. Analysis of variance is used to examine the differences of stress, stress perception, and quality of life for age, education, years of service, and t-testing was used to analyze the gender difference. Analysis of variance is also used to test

the effect of stress on quality of life. Mediation analysis is used to explore the relationship among stress, stress perception and quality of life. All data are analyzed with the SPSS 22.0 statistical analysis software package and Process 3.4 software package.

Result

Current situation of police officers' quality of life

According to the data provided by the WHO quality of life research group, the score of WHOQOL-BREF tested in Chinese people from 2000 to 2002 shows: physiological score is 61.3 ± 16.3 , psychological score is 61.6 ± 13.7 , social relations score is 64.6 ± 14.2 , environment score is 52.9 ± 13.5 . After comparison (Table 1), the result of first article shows that the life quality of recruits of China armed police is higher than the general population. The result is well within our expectation, since the sample is consisted by new recruits who barely experienced much stress. The second article indicates that the scores of four fields of quality of life are lower in police officer than normal people, which is in accordance with our hypothesis.

Table 1
result of WHOQOL-BREF questionnaire in previous research

article	questionnaire	N	subscale	M	SD
Quality of life and its Associated Factors among recruits of south China armed police before and after their Basic Military Training	WHOQOL-BREF	820	physiological score	67.90	13.31
			psychological score	65.16	14.26
			social relation score	66.16	16.71
			environmental score	59.98	14.23
The Life Quality of Policemen in Kunming and Its Influencing Factors	WHOQOL-BREF	70	physiological score	58.06	14.88
			psychological score	54.35	14.40
			social relation score	60.00	20.29
			environmental score	47.41	19.61
			total score	57.59	10.52

Table 4
Analysis of variance of variables for years of service

years of service	stress		stress perception		PCS		MCS	
	M	SD	M	SD	M	SD	M	SD
1–5(N = 194)	88.37	39.33	25.50	8.55	45.15	9.03	46.54	6.43
6–10(N = 209)	89.48	40.29	24.56	9.00	45.67	8.93	47.61	6.15
11–15(N = 187)	92.01	38.09	25.80	8.00	43.23	9.91	48.06	6.06
16–20(N = 77)	94.47	41.50	26.39	7.10	41.14	9.51	48.15	6.21
21–25(N = 79)	84.67	33.49	25.19	7.29	41.77	8.95	48.93	5.87
26–30(N = 66)	79.67	30.48	24.94	6.99	42.50	9.63	48.86	6.52
31–35(N = 53)	81.28	35.01	26.09	7.36	41.53	7.53	47.56	5.73
36–40(N = 35)	67.86	39.41	24.03	7.59	42.56	10.52	47.80	6.11
F	2.81		0.78		4.07		1.91	
P	0.01		0.61		< 0.01		0.07	
Note. PCS = physical component summary; MCS = mental component summary								

According to the research of life quality of people in Sichuan province in 2001, the norm of SF-36 in Chinese people(Li, et al.,2001) is: score of physiological function is 90.80 ± 15.07 , score of role limitations due to physical problems is 79.51 ± 34.70 , score of body pain is 82.41 ± 21.25 , score of general health is 67.30 ± 21.97 , score of vitality is 71.44 ± 15.81 , score of social function is 85.29 ± 18.06 , score of role limitations due to emotion problems is 76.48 ± 38.47 , score of mental health is 73.52 ± 15.68 . The results of two articles (Table 2) both indicate that the scores of physiological function, social function and mental health of police officers are lower than the norm, which means the level of physiological function, social function and mental health of police officers are lower than normal people.

Table 2
result of SF-36 questionnaire in previous research

article	questionnaire	N	subscale	M	SD
Investigation on the Quality of Life of Traffic Policemen	SF-36	179	PF	86.71	10.84
			RP	82.85	21.23
			BP	86.29	18.42
			GH	76.75	12.54
			VT	71.28	14.27
			SF	80.33	18.99
			RE	74.96	36.71
			MH	59.57	14.10
Cross-sectional Survey of Mental Health Status and Life Quality of Police Population in Shanghai	SF-36	1611	PF	86.58	16.68
			RP	78.82	33.31
			BP	81.78	18.89
			GH	66.42	21.24
			VT	70.08	18.32
			SF	81.31	19.16
			RE	79.97	33.21
			MH	69.12	15.59

Notes: PF = physiological function, RP = Role limitations due to physical problems, BP = body pain, GH = general health, VT = vitality, SF = social function, RE = Role limitations due to emotion problems, MH = mental health

General level of life quality of police officers in Yiwu

In our research, we find that PCS of police officers in Yiwu is 43.72 ± 9.37 , and MCS police officers in Yiwu is 47.73 ± 6.20 . According to the previous research of life quality of people in Chengdu(Li, et al.,2010), the score of PCS is 51.2 ± 6.6 , and the score of MCS is 49.9 ± 7.7 . Thus, the scores of life quality of police officers in Yiwu is lower than the norm in terms of PCS and MCS, which means the general level of life quality of police officers in Yiwu is lower than normal people.

Analysis of influence factors

Table 3 shows the differences of stress, stress perception and quality of life among different ages. The police officers aged from 21–25 and 41–45 get highest scores in stress and stress perception, which means these police officers experience the most stressful events and perceive the largest amount of

stress. As for the quality of life, the policemen aged from 26–35 have higher PCS than policemen in other age intervals, while the policemen aged from 46–50 have the lowest level of PCS. And the policemen aged from 46–50 have the highest level of MCS, while 21–25 have the lowest level of MCS. Table 4 indicates that police officers who have worked around 15–20 years have highest level of stress and stress perception. And the police officers who have worked around 31–35 or 16–25 years have the lowest level of PCS, and the police officers who have worked around 1–5 years have the lowest level of MCS. As for education level (Table 5), our study finds that there are no significant differences in stress and stress perception among different educational status, but the policemen who have a better education would have a higher level of PCS. The analysis of gender difference shows significant gender difference in stress, quality of life. The female police officers have a lower level of stress and a higher level of MCS (Table 6). Thus, age, years of service and gender are the influence factors of stress and quality of life, and education only correlates with quality of life.

Table 3
Analysis of variance of variables for age

age	stress		stress perception		PCS		MCS	
	M	SD	M	SD	M	SD	M	SD
21–25(N = 68)	95.04	41.83	27.99	8.75	44.06	7.58	45.38	7.00
26–30(N = 179)	88.39	38.46	24.40	8.14	45.26	9.43	47.07	6.22
31–35(N = 157)	85.41	38.60	24.28	8.89	46.40	8.85	48.14	6.07
36–40(N = 155)	91.85	37.46	25.80	7.57	43.79	9.18	48.17	5.84
41–45(N = 94)	96.02	41.71	25.76	8.81	42.03	10.53	46.70	5.69
46–50(N = 115)	85.56	34.23	26.30	7.31	40.70	9.52	49.33	6.20
51–55(N = 67)	80.13	38.49	24.78	7.70	42.13	8.29	48.61	6.39
56–60(N = 61)	72.23	33.62	24.69	6.52	41.92	9.29	47.81	6.03
F	3.24		2.22		5.48		3.65	
P	< 0.01		0.03		< 0.01		0.01	
Note. PCS = physical component summary; MCS = mental component summary								

Table 5
Analysis of variance of variables for education

education	stress		stress perception		PCS		MCS	
	M	SD	M	SD	M	SD	M	SD
junior high school(N = 5)	76.80	37.10	25.40	4.67	44.19	5.79	44.61	7.80
high school(N = 74)	80.41	36.18	26.24	6.32	41.88	9.51	47.06	6.59
university(N = 784)	88.40	38.55	25.25	8.24	43.72	9.43	47.80	6.16
master(N = 37)	89.59	41.01	25.19	8.98	47.35	7.06	47.97	6.19
F	1.14		0.34		2.83		0.76	
P	0.33		0.80		0.04		0.52	

Note. PCS = physical component summary; MCS = mental component summary

Table 6
Analysis of gender difference

gender	stress		stress perception		PCS		MCS	
	M	SD	M	SD	M	SD	M	SD
Male(N = 797)	90.17	38.36	25.41	7.97	43.54	9.38	47.57	6.21
Female(N = 103)	68.85	33.89	24.70	9.19	45.15	9.25	48.96	6.00
T	5.37		0.84		1.65		2.14	
P	< 0.01		0.40		1.00		0.03	

Note. PCS = physical component summary; MCS = mental component summary

Effect of stress on quality of life

We divide the police officers into three groups (low stress level, medium stress level, high stress level) according to the stress level. The result of analysis of variance (Fig. 1) indicates that stress level has significant impact on both PCS ($F = 89.76, p < 0.01$) and MCS ($F = 63.38, p < 0.01$). The police officers who have higher level of stress have the lower level of life quality.

Correlation analysis

The descriptive statistics and correlation matrix are presented in Table 7. Stress is positive correlated with stress perception, and negatively correlated with PCS and MCS. Stress perception is negatively correlated with PCS and MCS.

Table 7
The result of correlation analysis

	M	SD	1	2	3	4
1.stress	87.73	38.46	-			
2.stress perception	25.33	8.11	0.61**	-		
3.PCS	43.72	9.37	-0.45**	-0.44**	-	
4.MCS	47.73	6.20	-0.37**	-0.53**	0.02	-
Note. N = 1196. *p < 0.05. **p < 0.01.						

Testing for proposed model

The main results generated by SPSS macro PROCESS are presented in Table 8 and Table 9, which consist of two parts: mediator and dependent variable model of PCS and mediator and dependent variable model of MCS. The mediator variable model is to test the effect of stress, and the dependent variable model is to test the effects of stress, stress perception. The LLCI and ULCI of the sequence of indirect effect are used to estimate the 95% confidence interval. Shall the interval does not contain zero, mediator effect exists. As can be seen from the result showed in Table 8 and Table 9, the intervals of two models don't contain zero, which mean stress perception have mediator effect on the relationship between the stress and quality of life. As can be seen from the mediator variable model of PCS ($F = 115.18$, $R^2 = 0.39$, $p < 0.01$) and dependent variable model of PCS ($F = 58.28$, $R^2 = 0.28$, $p < 0.01$), stress positively predicts stress perception ($\beta = 0.13$, $p < 0.01$), stress perception negatively predicts PCS ($\beta = -0.29$, $p = 0.04$), stress negatively predicts PCS ($\beta = -0.08$, $p < 0.001$). These results indicate that stress perception partially mediates the relationship between stress and PCS (Fig. 2). And the mediator variable model of MCS ($F = 115.18$, $R^2 = 0.39$, $p < 0.01$) and dependent variable model of MCS ($F = 65.27$, $R^2 = 0.30$, $p < 0.01$) indicates that: stress positively predicts stress perception ($\beta = 0.13$, $p < 0.01$), stress perception negatively predicts MCS ($\beta = -0.38$, $p = 0.04$). These results indicate that stress perception totally mediates the relationship between stress and MCS (Fig. 3).

Table 8
The result of mediation model of PCS

Model of PCS	β	SE	t	p
Mediator variable model				
constant	14.78	2.98	4.97	0.00
stress	0.13	0.01	23.95	0.00
Dependent variable model				
constant	60.88	3.79	16.07	0.00
stress	-0.08	0.01	-8.53	0.00
stress perception	-0.29	0.04	-6.81	0.00
	β	Boot SE	LLCI	ULCI
Direct effect	-0.08	-0.01	-0.10	-0.06
	β	Boot SE	BootLLCI	BootULCI
Mediator	-0.04	0.01	-0.05	-0.03

Note. N = 900. Bootstrap sample size = 5000. LL = low limit, CI = confidence interval, UL = upper limit.

Table 9
The result of mediation model of MCS

Model of MCS	β	SE	t	p
Mediator variable model				
constant	14.78	2.98	4.97	0.00
stress	0.13	0.01	23.95	0.00
Dependent variable model				
constant	49.19	2.47	20.0	0.00
stress	-0.08	0.01	-1.26	0.21
stress perception	-0.38	0.03	-14.02	0.00
	β	Boot SE	LLCI	ULCI
Direct effect	-0.01	-0.01	0.21	-0.02
	β	Boot SE	BootLLCI	BootULCI
Mediator	-0.05	0.04	-0.06	-0.04

Note. N = 900. Bootstrap sample size = 5000. LL = low limit, CI = confidence interval, UL = upper limit.

Discussion

Both the results of our study and previous literature indicates that life quality of police officers are lower than normal people, which concur with our first hypothesis. The result of analysis of relationship between stress and life quality shows that stress would affect police officers' life quality, which is in accordance with our second hypothesis. Meanwhile, the result of mediation analysis shows that stress perception is the mediator of the relationship between stress and quality of life. It's concordant with our third hypothesis.

According to analysis of previous studies of SF-36, we find that police officers score lower in the dimensions of physiological function, social function and mental health, which is accordant with our expectation. In our field experience, police officers always have to work overtime when urgent event happens, which heavily shrinks their quality time with their families and friends. Police officers also tend to report stress from social relationship, which negatively impacts their social function. Besides, exposing to other occupational stressful events will also affect police officers' physiological function and mental health.

Our study find that many factors would influence police officers' stress and quality of life, including age, years of service and gender. The result indicates that police officers aged from 20 to 25 had the highest level of stress as well as low level of life quality, which could possibility be that new police officers have not yet adapted to their new job. We also find female police officers have a lower level of stress and a higher level of MCS, which is different from the finding of previous studies. Previous research abroad (Maran et al., 2016; He, Zhao, & Archbold, 2002) found that female police officers had worse mental health than male, in terms of depression and somatization. This difference may have two explanations: one is cultural difference, the other is that female sample in our research is much smaller than male sample. Thus, the gender difference of stress and life quality in police population still requires further research.

The analysis of mediation model indicates that stress perception can partially mediate relationship between stress and MCS, and totally mediate the relationship between stress and PCS. These results mean that stress can directly influence physical health and indirectly through the stress perception. While mental health can only be indirectly influenced by stress through the stress perception. Since mental health is more closely related to belief and cognition, these results are within our expectation.

Because of the nature of police occupation, it's unrealistic to alleviate police officers' psychological and physical difficulties by cutting their work burden and objective stress level. But the mediation model our study has found provides a possible way to decrease the negative effect of stress on life quality: intervention of stress perception. Previous studies found that mindfulness (Ivan & Kuijpers,2008), mind/body intervention (Deckro, et al.,2002) and eurythmy therapy (Berger, et al.,2015) had effects on

reducing the stress perception. Thus, future study can focus on the intervention of stress perception, to see whether the change of stress perception can lead to the improvement of life quality of police officers.

Conclusion

Our study find that life quality of police officer is low, and stress has negative effect on quality of life. Our results support the mediation effect of stress perception on the relationship between the stress and quality of life. Stress would affect the stress perception and then influence mental and physical health of police officers.

Declarations

Ethics approval and consent to participate: The research was approved by the institutional review boards of Zhejiang University.

Consent for publication: not applicable

Availability of data and materials: The datasets during and/or analyzed during the current study available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests

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Authors' contributions: YZ analyzed and interpreted the data and was a major contributor in writing the manuscript. CJ collected data from police officers and revised the manuscript. JW collected the questionnaires used in research, write and revised part of the manuscript. YJ revised the manuscript. SC directed research and revised the manuscript. All authors read and approved the final manuscript.

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Figures

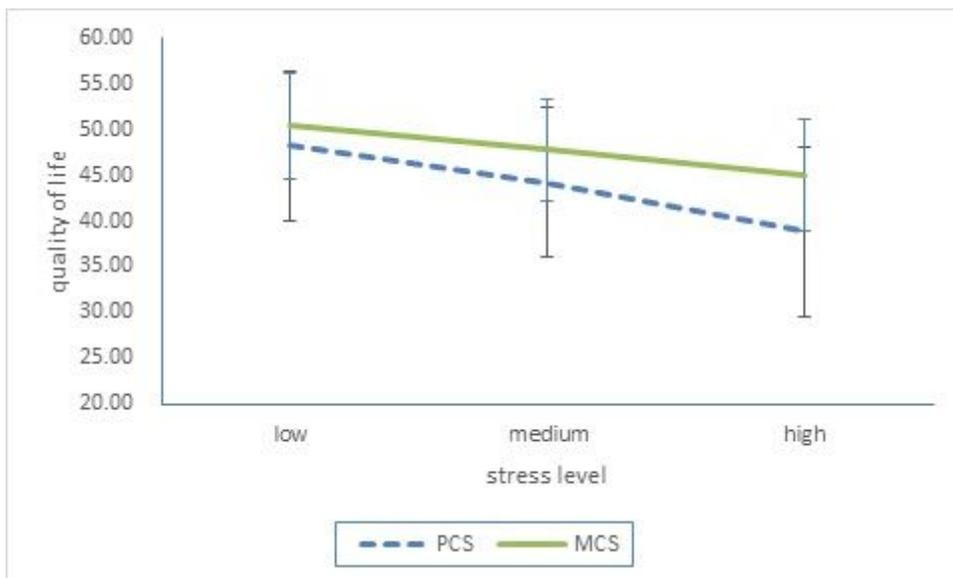


Figure 1

effect of stress on life quality

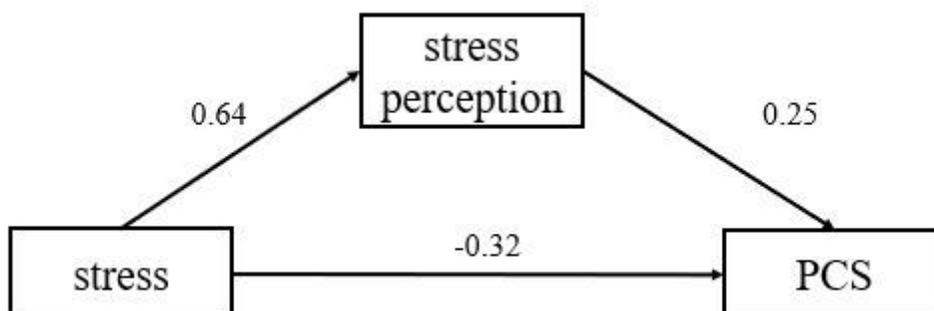


Figure 2

mediation model of PCS

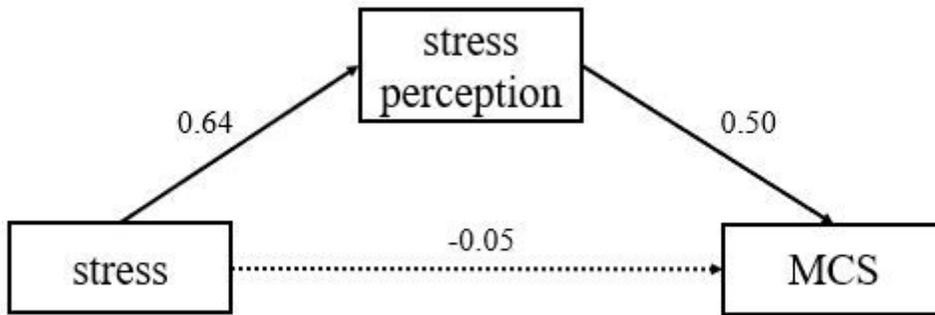


Figure 3

mediation model of MCS