

Do the Life Events Have Significant Influences on Sleep Quality of College Students?

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Abstract

Objective To explore the characteristics of sleep quality, life events and coping style in college students, and analyze the relationship among the above 3 variables. **Methods** Pittsburgh Sleep Quality Index (PSQI), Trait Coping Style Questionnaire (TCSQ), Life Event Scale (LES) and a self-edited questionnaire on the general information were adopted for investigating 838 college students who were selected by stratified random sampling from 7 universities in Guangdong Province. **Results** (1) The total score of PSQI and LES were (6.09±2.69) and (17.25±20.57), respectively. (2) The score of negative coping and positive coping were (27.26±6.60) and (32.37±6.54), respectively. There is a pairwise correlation among the total score of PSQI, TCSQ and the score of negative coping ($r = .246, .122, .148, P < 0.01$). There is a pairwise correlation among the total score of PSQI, the score of negative life events and negative coping ($r = .281, .122, .163, P < 0.01$). There is a pairwise correlation among the total score of PSQI, the score of negative life events and positive coping ($r = .281, -.084, -.079, P < 0.05$). (3) The negative coping played a partial intermediary role between negative life events and the total score of PSQI, and the intermediary effect accounted for 7.08% of the total effect. **Conclusions** Negative life events not only have a direct role on the sleep quality in the undergraduates, but also indirectly influence it through negative coping.

Keyword: College Students; Sleep Quality; Life Events; Coping Style; Mediating Effect

1. Introduction

The incidence of sleep disorders among domestic college students is 12.92 to 44.38% [1-2]. Long-term poor sleep can easily lead to psychological problems such as depression and anxiety [3-5], and sub-health [6], increase the risk of cardiovascular diseases, endocrine diseases, and other serious physical diseases [7-9], and may also lead to behavioral problems such as alcohol and drug abuse [10-11], which will hinder academic performance [12] and pose a great threat to the quality of life as well as physical and mental health of college students.

Life events are an inevitable objective existence and an important source of social stress in life [13-14], which will cause certain changes in an individual's health and lifestyle. Coping is a mediating variable of stress and mental health, as well as mediating

variable of psychological quality, emotion and behavioral problems, which has a buffering effect. Good coping styles help solve problems, relieve mental tension, reduce physical and psychological stress reactions, and play an important role in protecting physical and mental health, but bad coping styles harm individual physical and mental health [15].

Previous research has found that life events and coping styles are significantly related to the sleep quality of college students [16-18]. On the other hand, sleep quality is manifested as a series of explicit behavioral and emotional responses, which is an outcome variable; life events are external stimuli (external cause), which is a remote variable; coping style is an individual's behavioral response to a life challenge, which is a near-end variable. Life events should be

mediated by coping styles. From this we can assume that coping style plays a mediating role between life events and sleep quality (see Fig. 1)

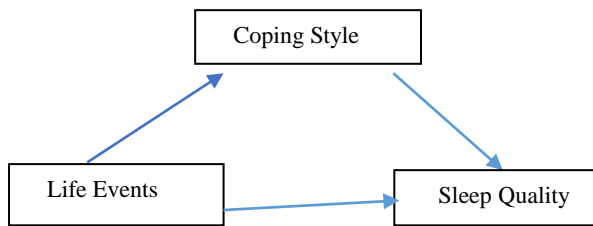


Figure 1. Pathway diagram of mediating effects of coping style between life events and sleep quality

2. Objects and Methods

2.1. Objects

Stratified random sampling was used to select undergraduates from 10 full-time colleges and universities in Guangdong Province (Guangdong Pharmaceutical University, Guangdong Medical University, Guangzhou Academy of Fine Arts, Xinghai Conservatory of Music, Jinan University, Guangdong University of Finance and Economics, Guangdong University of Foreign Studies, Dongguan University of Technology, Guangdong University of Technology, Shenzhen University) as research objects. 1,000 copies of questionnaires were distributed and 838 valid questionnaires were recovered. The effective rate was 83.8%. Among them, 398 were boys, 440 were girls; 822 were nationality, 16 were ethnic minorities; 270 were freshmen, 270 were sophomores, 210 were juniors, and 88 were seniors; 160 were in comprehensive universities, 198 in science and engineering universities, 48 in finance and economics universities, 43 in linguistic universities, 289 in medical universities, and 100 in art universities; 117 majored in engineering, 162 majored in science, 83 majored in economics, 61 majored in management, 90 majored in linguistics, 225 majored in medicine, 100 majored in art; 594 only children, 244 non-only children; 8 from rich families, 432 from well-off families; 350 from subsistence families, and 48 from poor families; 604 living in cities and towns for a long time, 234 living in rural areas for a long time; 30 with excellent academic performance, 420 with good academic performance, 328 with medium academic performance, 58 with middle and lower academic performance, and 2 with poor academic performance.

2.2 Tools

2.2.1 Life Event Scale (LES) [19]

LES is a self-assessment scale compiled by Yang Desen et al. (1999) with 48 items, including aspects of family life, work, and study, social and other aspects. They are divided into positive life stimulation (score is positive life stimulation amount) and negative life stimulus (score is negative stimulation amount) subscale. The difference between positive life stimulation amount and negative life stimulation amount is the total scale score (total life event value). The higher the score, the greater the psychological pressure the individual bears. 95% of normal adults have a total LES score of no more than 20 in one year. In this study, the Cronbach's

coefficient of the total scale is 0.87, and the Cronbach's coefficients of the positive and negative life stimulation subscales are 0.84 and 0.82, respectively.

2.2.2. Trait Coping Style Questionnaire (TCSQ) [20]

TCSQ is a self-assessment scale compiled by Jiang Ganjin et al. (1996) with 20 items, which are divided into two dimensions of positive coping (PC) and negative coping (NC). Likert 5 grades scoring is used from 1 (definitely no) to 5 (definitely yes). The higher the score, the more obvious the subject's tendency in this dimension (item). The average score of the dimension (item) that is bigger than 4 is the high score. In this study, the Cronbach's coefficient of the total scale is 0.88, and the Cronbach's coefficients of the positive and negative coping dimensions are 0.84 and 0.82, respectively.

2.2.3. Pittsburgh Sleep Quality Index (PSQI) [21]

PSQI is prepared by Buysse et al. (1993) and revised by Liu Xianchen et al. (1996). It is used to evaluate the subjective feeling of sleep quality in the last month. It consists of 19 self-assessment items (the 19th self-assessment item does not participate in scoring) and 5 other assessments. The 18-scored self-assessment items are divided into 7 dimensions that are sleep quality, time to fall asleep, sleeping time, sleep efficiency, sleep disorder, hypnotic drugs, and daytime dysfunction, which are graded at level 4 from 0 to 3. The higher the score, the more obvious the subject's tendency in this dimension (item). Total score < 4 is good sleep, 4 ≤ PSQI total score ≤ 7 is normal sleep, total score > 8 is sleep disorder. In this study, the Cronbach's coefficient of the total scale is 0.89, and the Cronbach's coefficients of the seven dimensions is 0.81 to 0.86.

2.2.4. Self-compiled personal general questionnaire

It includes 9 items, including gender, ethnicity, grade, school type, specialty category, academic performance, family economic status, birthplace, and whether they are only children.

2.3. Data processing

SPSS20.0 is used to process valid data. Descriptive statistics are used to describe the number of people in each score segment of PSQI, as well as the average score and standard deviation of each scale; Pearson product correlation is used to explore the correlation of variables; linear regression is used to analyze the mediating effect.

3. Results

3.1. Descriptive statistics

In this group, 122 people have good sleep (total PSQI < 4), accounting for 14.56%; 501 people have normal sleep (4 ≤ PSQI ≤ 7), accounting for 59.78%; 215 people have poor sleep disturbance (PSQI ≥ 8), accounting for 25.66%.

As can be seen from Table 1, the overall sleep quality of college students in this group is average (PSQI total score = 6.09 ± 2.69), and the negative and positive responses are at a medium level (the average scores of the two dimensions are 2.72 ± 0.65 and 3.24 ± 0.65, respectively). Life stress is normal for adults (LES total score is 17.25 ± 20.57).

Table1. Descriptive statistics of total scores and factor score of each scale

Dimension	Min	Max	M	SD	Number of items	Average scores	Standard devizLH r eachqiKSM-
Positive life stimulation	0	74	5.47	8.74			
Negative life stimulation	0	112	11.78	16.23			
Total value of life events	0	121	17.25	20.57	50	.35	.41
Negative response	10	45	27.26	6.60	10	2.72	.65
Positive response	16	50	32.37	6.54	10	3.24	.65
Sleep quality	0	3	1.24	.71	1	1.24	.71
Time to fall asleep	0	3	1.09	.84	2	.55	.41
Sleeping time	0	3	1.14	.83	1	1.14	.83
Sleep efficiency	0	3	.18	.56	1	.18	.56
Sleep disorder	0	2	.88	.49	1	.88	.49
Hypnotic drugs	0	3	.05	.33	1	.05	.33
Daytime dysfunction	0	3	1.50	.81	1	1.50	.81
PSQI total score	0	15	6.09	2.69	18	.34	.15

3.2. Correlation analysis of each scale score

It can be seen from Table 2 that the total PSQI score, the LES total score, and the negative coping score are correlated in pairs ($r = .246, .122, .148$, all $P < 0.01$); the total PSQI score, negative life stimulation and negative coping score are correlated in pairs ($r = .281, .122, .163$, all $P < 0.01$); total PSQI score, negative life stimulation, and positive coping score are correlated in pairs ($r = .281, -.084, -.079$, all $P < 0.05$).

Table 2. Correlation analysis of total score and factor score of each scale

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Positive life stimulation												
2. Negative life stimulation	.294**											
3. Total value of life	.657**	.914**										
4. Negative response	.046	.163**	.148**									
5. Active response	-.013	-.079 *	-.068	-.010								
6. Sleep quality	.020	.298**	-.244**	.142**	-.091**							
7. Time to fall asleep	-.042	.116**	.074*	-.004	-.083*	.483**						
8. Sleep time	.008	.147**	.120**	.096*	.014	.311**	.178**					
9. Sleep efficiency	-.014	-.005	-.010	.014	-.025	.196**	.275**	.343**				
10. Sleep disorder	.154**	.166**	.196**	-.020	-.040	.288**	.296**	-.017	.084*			
11. Hypnotic drugs	-.033	.046	.022	.062	-.029	.189**	.025	.068*	-.042	-.017		
12. Daytime dysfunction	.134**	.289**	.285**	.164**	-.073*	.450**	.240**	.283**	.140**	.237**	-	
13. PSQI total score	.056	.281**	.246**	.122**	-.084*	.761**	.680**	.606**	.503**	.188**	.652**	

Note: * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$ (same below)

3.3. Mediating effects of coping styles on life events and sleep quality of college students

According to the mediation effect test method proposed by Baron and Kenny (1986), the total score of LES and the scores of each subscale are used as independent variables, and the total score of PSQI is used as the dependent variable. The positive response and negative response scores are analyzed as the intermediate variables. The results are shown in Table 3.

Table 3. Tests of the mediating effect of coping styles on life events and sleep quality

	Independent variable	Dependent variable	R ²	F	Sig.	β	t	Sig.
Step 1.1	Life events (total value)	PSQI	0.060	53.793**	0.000	0.032	7.334**	0.000
Step 1.2	Life events (positive)	PSQI	0.080	36.297**	0.000	0.009	-0.842	0.400
	Life events (negative)					0.048	8.351**	0.000
Step 2.1	Life events (total value)	Positive response	0.005	3.839	0.050	-0.021	-1.959	0.050
Step 2.2	Life events (total value)	Negative response	0.022	18.638**	0.000	0.047	4.317**	0.000
Step 2.3	Life events (positive)	Positive response	0.006	2.660	0.071	0.009	0.316	0.752
	Life events (negative)					-0.033	-2.277*	0.023
Step 2.4	Life events (positive)	Negative response	0.026	11.327**	0.000	-0.002	-0.062	0.951
	Life events (negative)					0.066	4.567**	0.000
Step 3	Life events (negative)	PSQI	0.086	26.128**	0.000	0.055	4.052**	0.000
	Life events (total value)					-0.009	-0.839	0.402
	Negative response					0.032	2.325	0.020

The specific analysis is as follows: Step 1. The total PSQI score (dependent variable) is used to regress the total value of the life events (independent variable), the amount of positive life stimulation (independent variable), and the amount of negative life stimulation (independent variable); the regression coefficient of the independent variable to total life events is significant ($\beta = 0.032$), the regression coefficient of the independent variable to negative life stimulation is significant ($\beta = 0.048$), and the regression coefficient of the independent variable to positive life stimulation is not significant. Step 2, positive response (mediating variable) is used to regress the total value of life events (independent variable), the amount of positive life stimulation (independent variable), and the amount of negative life stimulation (independent variable), and the regression coefficients are not significant. Negative response (mediating variable) is used to regress the total value of life events (independent variables) and the amount of positive life stimulation (independent variables) or the amount of negative life stimulation (independent variables). The regression coefficient of the independent variable to the total value of life events is significant ($\beta = 0.047$). The regression coefficient of the independent variable to the negative life stimulation is significant ($\beta = 0.066$), and the regression coefficient of the independent variable to the positive life stimulation is not significant. Step 3, in the first two steps, the coefficients of total PSQI score (dependent variable) and positive response (mediating variable) to positive life stimulation (independent variable) is not significant, and at the same time, the regression coefficients of the positive response (mediating variable) to the total value of the life events (independent variable), the amount of positive life stimulation (independent variable) and the amount of negative life stimulation (independent variables) is not significant, therefore, this step does not do a regressicc analysis of the total score of PSQI (dependent variable) to the positive

response (mediating variable) and the amount of positive life stimulation (independent variable). The results show that when the negative life stimulation (independent variable) and the negative response (mediating variable) enter the regression equation of the total score of PSQI at the same time, the regression coefficient of the negative response (mediating variable) is significant ($\beta = 0.032$), and the regression coefficient of the negative life event (independent variable) is still significant ($\beta = 0.055$); when the total value of the life event (independent variable) and the negative response (mediating variable) enter the regression equation of the total score of PSQI at the same time, the regression coefficient of the total value of the life events (independent variable) is not significant.

The results show that negative response has a partial mediating effect between negative life events and sleep quality. The ratio of the mediating effect to the total effect is: effect $m = ab/c \times 100\% = 0.163 \times 0.122 / 0.281 \times 100\% = 7.08\%$.

4. Discussion

This study found that 25.66% of college students have obvious sleep disorders, which is lower than the results of the studies by Niu Jianmei [22] and Wang Haiqing [23], and higher than the results of the study by Bai Xue [24], and that may be related to different sampling methods and sampling regions. Several studies have pointed out that the sleep quality of college students is poor, and more than 18% of college students have sleep disorders [22-24], suggesting that sleep disorder is a common problem among college students in China. At the same time, this study also finds out that college students' active and negative responses are at a medium level, the coping style is intermediate, and life stress is at a normal value, which is consistent with previous research results [18, 25]. It suggests that the living environment of college students

is relatively stable, the living discipline is insufficient, and the coping style needs to be improved.

This study finds out that there are direct and indirect effects between the amount of negative life stimulation and the total score of PSQI.

On the one hand, there is a significant positive correlation between the amount of negative life stimulation and the total score of PSQI, which is a direct effect between the two and is consistent with the results of previous studies [17]. That is to say, the higher the amount of negative life stimulation, the higher the sleep quality index, and the lower the sleep quality. The reason is that individuals will produce a series of physiological and psychological stress reactions that consume physical and mental resources (including material and energy) when facing life events [14].

Conclusion

This study initially reveals the relationship between negative life events and sleeps quality of college students, and verifies the following hypothesis: there is a direct positive correlation between negative life events and sleep quality of college students, and it can also indirectly affect college students through negative responses. Based on this result, the following suggestions for home and school education are proposed: the psychological health education and psychological quality training of college students should be strengthened, which can help them improve their self-management ability and formulate reasonable learning and living plans, so as to reduce the occurrence of dependent negative life events (negative events affected by personal behavior, such as losing the opportunity participate in games due to delay); on the other hand, teaching methods should be reformed to create a good learning environment and improve the positive coping ability f college students, which enables them to better solve independent negative life events (events that re not affected by personal behaviors, such as theft or death of relatives). In the future, the data from longitudinal studies can be added to further verify the relationship between life events and sleep quality of college students.

References

1. Xu Chunyan, Li Wei, Pan Chaolan, et al. Research on the relationship between sleep quality and diet of college students [J]. Preventive Medicine, 2017, 29(2): 142-145
2. Fan Shaoyi, Wen Junmao, Chen Zongjun, et al. Research on the correlation between sleep quality and physical type of college students [J]. Chongqing Medical Journal, 2016, 45(23): 3249-3251.
3. Wallace Deshira D, Boynton Marcella H, Lytle Leslie A. Multilevel analysis exploring the links between stress, depression, and sleep problems among two-year college students [J]. Journal of American College Health, 2017, 65(3): 187-196.
4. Rose D, Gelaye B, Sanchez S, et al. Morningness / eveningness chronotype, poor sleep and daytime sleepiness in relation to common mental disorders among Peruvian college students [J]. Psychol Health Med, 2015, 20(3): 345-352.
5. Mill JG, Hoogendijk WJ, Vogelzangs N, et al. Insomnia and sleep duration in a large cohort patients with major depressive disorders and anxiety disorders [J]. Clin Psychiatry, 2010, 71(3): 239-246.
6. Li Baikun, Zhan Yucan, Li Jing, et al. Correlation between sub-health status and sleep status of college students [J]. China Health Education, 2017, 33(7): 637-640.
7. Liu RQ, Qian Z, Trevathan E, et al. Poor sleep quality associated with high risk of hypertension and elevated blood pressure in China: Results from a large population-based study [J]. Hypertens Res, 2016, 39(1): 54-59.
8. Osonoi Y, Mita T, Osonoi T, et al. Poor sleep quality is associated with increased arterial stiffness in Japanese patients with type 2 diabetes mellitus [J]. BMC Endocr Disord, 2015, 15: 29.
9. Twig G, Shina A, Afek A, et al. Sleep quality and risk of diabetes and coronary artery disease among young men [J]. Acta Diabetol, 2016, 53(2): 261-270.
10. Lisa M. Fucito, Kelly S. DeMartini, Tess H. Hanrahan, et al. Using sleep interventions to engage and treat heavy-drinking college students: A randomized pilot study [J]. Alcoholism: Clinical and Experimental Research, 2017, 41(4): 798-809.
11. Roane BM, Taylor DJ. Adolescent insomnia as a risk factor for early adult depression and substance abuse [J]. Sleep, 2008, 31(10): 1351-1356.
12. Monica E. Hartmann, J. Roxanne Prichard. Calculating the contribution of sleep problems to undergraduates' academic success [J]. Sleep Health: Journal of the National Sleep Foundation, 2018, 4(5): 463-471.
13. Liu Yunhe, Yang Yisheng. Review of the research on psychological defense mechanism[J]. Journal of Inner Mongolia Normal University (Philosophy and Social Science Edition), 2008, (1): 88-92.
14. Jiang Ganjin. Multi-factor system of psychological stress (Review) - Exploring the theory and application of psychological stress in the Past 20 Years [A]. Psychosomatic Medicine Branch of Chinese Medical Association. Proceedings[C]. Psychosomatic Medicine Branch of Chinese Medical Association, 2006: 6.
15. Compas Connor-Smith Saltzman, Compas BE, Connor-Smith JK, et al. Coping with stress during children and adolescence: Problems, progress, and potential in theory and research [J]. Psychological Bulletin, 2001, 127: 87-127.
16. Friedrich Anja, Clacen Merle, Schlarb Angelika A. Sleep better, feel better? Effects of a CBT-I and HT-I sleep training on mental health, quality of life and stress coping in university students: A randomized

- pilot controlled trial *BMC Psychiatry*, 2018, 18(1): 60-68.
17. Liu Ling, Yan Youwei, Lin Rongmao, et al. The relationship between life events and sleep quality of college students [J]. *Chinese Journal of Mental Health*, 2011, 25(4): 308-309.
 18. Liu Shuangjin, Hu Yiqiu, Sun Huanliang. The impact of life events on depression in college students: Chain-mediating effect of nervousness and coping styles [J]. *Chinese Journal of Clinical Psychology*, 2018, 26(6): 1230-1234.
 19. Yang Desen, Zhang Yalin. Life Events Scale[J]. Manual of mental health rating scale (Chinese Journal of Mental Health, Supplement), 1999, 10: 101-105.
 20. [20] Jiang Ganjin. Trait Coping Style Scale[J]. Manual of Mental Health Rating Scale (Chinese Journal of Mental Health, Supplement). 1999, 10: 120-122.
 21. [21] Liu Xianchen, Tang Maoqin, Hu Lei, et al. Reliability and validity of Pittsburgh Sleep Quality Index[J]. *Chinese Journal of Psychiatry*, 1996, 29: 103-107.
 22. Niu Jianmei, Zhang Yanting, Qiang Jinping, et al. Correlation between depression and sleep quality in college students [J]. *Modern Preventive Medicine*. 2017, 44 (22): 4135-4138.
 23. Wang Haiqing, Rao Jiaming, Ye Yunfeng, et al. Association analysis of mobile phone use and sleep quality among college students in a certain university in Guangzhou[J]. *Practical Preventive Medicine*, 2016, 23 (4): 429-433.
 24. Bai Xue, Zhu Yaxin, Wang Ziqi, et al. Research on sleep quality of college students and its influencing factors [J]. *China Health Statistics*. 2017, 34(5): 739-741.
 25. Hou Yongmei, Hu Peicheng, Wang Yiyang. The Effect of resilience on medical students' learning burnout: The mediating effect of coping styles [J]. *Advances in Psychology*, 2017, 7(7): 845-851.