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Research Between Sleep Quality and Interpersonal Sensitivity of Chinese College Students

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Abstract

Background

To investigate and to explore the relationship between sleep quality and interpersonal sensitivity of Chinese college students.

Method

During the period from April 2019 to May 2019, the university students from five universities in Shanxi Province of China were selected by occasional sampling method. The research has received permission from Research Ethics Committee of ShanXi Medical University(2016010). A cross-sectional survey was conducted with the Chinese version of Pittsburgh Sleep Quality Index (PSQI), Symptom Checklist 90 (SCL-90) and the self-designed questionnaire. SPSS 25.0 was used for statistical analysis.

Results

A total of 901 college students were investigated. The average score of interpersonal sensitivity was 17.72±6.46, and 9.0% of college students were in the state of interpersonal sensitivity. Grade and specialty are the influencing factors of interpersonal sensitivity ($p<0.05$). The total PSQI score was 4.43±2.56. 28.0% of college students had poor sleep quality. Major was the influencing factor of sleep quality ($p<0.001$). In the multiple linear regression models, we found that daytime dysfunction, sleep disorder, subjective sleep quality, sleep latency and sleep time were the main factors affecting interpersonal sensitivity.

Conclusions

The higher the PSQI score, the higher the interpersonal sensitivity score. Among the dimensions of sleep quality, daytime dysfunction, sleep disorder, subjective sleep quality, sleep latency and sleep time can affect interpersonal sensitivity.

Background

Interpersonal relationship refers to the psychological relationship formed in the process of interaction between people. Common interpersonal relationships include kinship, friendship, classmate relationship, teacher-student relationship and so on. University is a special moment of life, which links the preceding and the following. It not only needs to face family relations, but also the relationship between college students. Compared with the learning and life style of middle school, college students need to face the change of adapting to the new learning and living environment, so the interpersonal relationship they need to face is more complex.

A prominent aspect of interpersonal communication is the sensitivity of interpersonal relationships, which are described as over-recognition of the behaviors and emotions of others[1]. It has also been found that high interpersonal sensitivity is associated with many factors. For example, lack of safety and security[1], internet addiction[2], mobile addiction[3], juvenile injury[4], anxiety[5], depression[6], unhealthy lifestyle[7] and so on.

College students with sensitive interpersonal relationships are prone to loneliness in communication[8], which results in psychological pressure. Serious interpersonal sensitive individuals are extremely cautious in interpersonal communication, alert to other people's evaluation, and sensitive to other people's evaluation. They have self-deficiencies in perceiving others, and are accustomed to acting in the way of minimal negative interpersonal evaluation, which will also increase interpersonal sensitivity. Sensitivity to interpersonal relationships can also trigger or aggravate certain psychiatric symptom s [9] [10] .In addition, there are also documents that show that[11]under the condition of equal sleep time, a person with good social support seems to be more resilient than a lonely person. Therefore, it can be inferred that interpersonal relationship may be related to sleep quality.

Whether in the family environment or in the university environment, with the increasing competitive pressure of college students’ work and study and the accelerated pace of life, sleep problems have become a common problem affecting physical and mental health. College students are in a critical period of physical and mental development, learning knowledge and skills, and their sleep quality directly affects their physical and mental health and learning efficiency. A poor sleep quality will inevitably lead to changes in mental health, thus affecting interpersonal relationships, resulting in interpersonal sensitivity. It is the inferiority complex, chagrin, uncomfortable emotions of college students when they get along with others, and they have a strong sense of alert and suspicion. There are also reports that sleep disorders can lead to deterioration of interpersonal problem-solving ability[12]. Therefore, interpersonal sensitivity is not only a hot issue of contemporary society, but also an important public health issue affecting people's physical and mental health.

So far, there are no psychosocial interventions for interpersonal factors in terms of sleep quality. Although there are some literatures which can reflect students’ interpersonal sensitivity, there are still few studies and discoveries about the sensitivity of sleep quality to interpersonal

sensitivity. Therefore, we investigate and analyze the influence of sleep quality on interpersonal sensitivity of college students, in order to provide a theoretical basis for improving interpersonal sensitivity of college students, and have a very important practical significance for the healthy growth of college students.

1 Methods

1.1 Study participants

A cross-sectional survey was conducted in April 2019 to investigate the sleep quality and interpersonal sensitivity of college students in Shanxi Province, China. In Shanxi Medical University, Shanxi University, Shanxi Agricultural University, Shanxi University of Finance and Economics, Taiyuan University of Technology, five universities were carried out, and their college students were selected as the research object. In each participating university, participants are required to conduct self-completed questionnaires in the classroom. 901 questionnaires were distributed and collected. There are 439 people in Shanxi Medical University, 77 in Shanxi University of Finance and Economics, 108 in Taiyuan University of Technology, 140 in Shanxi Agricultural University and 137 in Shanxi University. There were 348 boys and 553 girls, with an average age of 20.73 ±1.45. All participants gave their informed consent before participating in the study. The study was approved by the ethics committee of Shanxi Medical University.

1.2 Questionnaires

The Pittsburgh Sleep Quality Index (PSQI) is a self-rating scale compiled by Dr. Buysee [13] to assess the quality of sleep in a subject over the past month. The scale includes 18 items including subjective sleep quality, sleep latency, sleep time, sleep efficiency, sleep disorders, sleep medication use, and daytime dysfunction. Subjective sleep quality refers to the perceived overall quality of sleep. The sleep latency measures the time it takes to fall asleep. Sleep time refers to the actual sleep time. Sleep efficiency is calculated by sleep time and time spent in bed. Sleep disorders are behaviors that have a negative impact on sleep, such as waking up late at night or waking up in the morning, getting up at night to go to the bathroom, breathing uncomfortable, coughing or snoring loudly, feeling too hot or too cold to have nightmares and pain. Each component was scored by 0-3 points with 4 grades, and the cumulative score of each component was the total score of PSQI. The higher the score, the worse the quality of sleep. The total score ranges from 0 to 21, with 5 being the cut-off point. A total score of less than or equal to 5 is considered to be good sleep, while a score greater than 5 means lack of sleep, and it can be judged that there is a problem of sleep quality[14]. The Cronbach alpha coefficient of the scale was 0.794. It has good reliability and validity[15]

The interpersonal sensitivity assessment uses the interpersonal relationship sensitive scale in the Symptom Checklist 90 (SCL-90), which contains a total of 9 items. A five-level score was used to measure the degree of symptoms they had experienced in the past seven days, with "no" score 1, "very light" score 2, "medium" score 3, "partial" score 4, and "serious" score 5. The cumulative score of interpersonal sensitivity was 9-45, < 18, no interpersonal sensitivity, 18-27, mild interpersonal sensitivity and > 27, respectively. The higher the score, the higher the level of interpersonal sensitivity. In this study, a score of > 27 was used to detect interpersonal sensitivity. The Cronbach alpha coefficient of the scale was 0.876. There is a good validity and reliability among Chinese college students.

Self-designed questionnaire: mainly including basic information, such as gender, age, profession, grade, family residence and whether or not they are only children.

1.3 Quality Control

Before the investigation, the investigators were trained to grasp the contents of the questionnaire, fill in the specifications and precautions. During the investigation, the students surveyed are required to complete in the classroom, and the participants are required to complete the volunteers independently. If there is any doubt, they can consult the investigators.

1.4 Statistical analysis

Data was built using EpiData3.1 software; SPSS25.0 software was used for data analysis; t-test, analysis of variance and multiple linear regression analysis were used for statistical description and inference of relevant indicators. $P<0.05$ was considered statistically significant.

2 Results

2.1 Social demographic characteristics

A total of 901 students were investigated, with an average age of 20.73±1.45 years and a sensitivity score of 17.72±6.46. They included 439 medical students (48.7%) and 462 non-medical students (51.3%). 348 boys (38.6%) and 553 girls (61.4%).

Tables 1 and 2 showed participants' interpersonal sensitivity. The interpersonal sensitivity score of medical students was lower than that of non-medical students, and the difference was statistically significant (P < 0.05). In terms of grade, it is found that the interpersonal sensitivity scores of college students in different grades are different, and there are significant differences in the scores between Grade 4 and Grade 1, Grade 2 and Grade 3 (P < 0.01). There is a significant difference in scores between Grade 3 and Grade 5 (P < 0.05).

Tables 3 and 4 showed participants' sleep quality. The sleep quality of medical students is better than that of non-medical students, and the difference is statistically significant (P < 0.01).

Table 1
sociodemographic characteristics and interpersonal sensitivity scores

Variables		Total	Interpersonal sensitivity score	t value	p
discipline	Non-medical student	462	18.24±6.47	2.483	0.013*
	Medical Students	439	17.18±6.40		
gender	male	348	17.74±6.43	0.063	0.950
	Female	553	17.71±6.48		
Family residence	Urban	457	17.70±6.55	-0.110	0.912
	rural	444	17.75±6.36		
Only child	no	661	17.72±6.47	0.022	0.983
	yes	240	17.73±6.43		
* Significant p value (< 0.05).					

Table 2
Grade and interpersonal sensitivity scores

Variables		Total	Interpersonal sensitivity score	F value	p
grade	Grade 1	150	17.71±6.94	5.790	<0.001**
	Grade 2	213	17.69±6.05		
	Grade 3	368	18.63±6.70		
	Grade 4	131	15.71±5.25		
	Grade 5	39	16.05±6.41		
**Significant p value (< 0.01).					

Table 3
Social demographic characteristics and PSQI scores

Variables		Total	PSQI scores	t value	p
discipline	Non-medical student	462	4.67±2.65	2.877	0.004**
	Medical Students	439	4.18±2.44		
gender	male	348	4.51±2.71	0.699	0.485
	Female	553	4.38±2.46		
Family residence	Urban	457	4.33±2.61	-1.140	0.254
	rural	444	4.53±2.50		
Only child	no	661	4.40±2.49	-0.637	0.524
	yes	240	4.52±2.75		
**Significant p value (< 0.01).					

Table 4
Grade and PSQI score

Variables		Total	PSQI score	F value	p
grade	Grade 1	150	4.15±2.22	1.879	0.112
	Grade 2	213	4.37±2.74		
	Grade 3	368	4.69±2.69		
	Grade 4	131	4.24±2.29		
	Grade 5	39	4.03±2.22		

2.2 Correlation Analysis of College Students' PSQI Total Scores and Their Dimensional Scores and Interpersonal Relationship Sensitive Scores

There was a positive correlation between the sensitivity scores of college students' interpersonal relationship and the total score of PSQI and each dimension in Shanxi Province (P < 0.01). (Table 5)

Table 5
Correlation coefficient between college students' PSQI scores and scores of each dimension and interpersonal sensitivity scores

	interpersonal relationship sensitivity	sleep efficiency	sleep time	subjective sleep quality	sleep latency	sleep disorders	sleep medication use	daytime dysfunction	PSQI
scores	17.72±6.46	0.17±0.46	0.37±0.58	1.15±0.66	0.65±0.76	0.87±0.52	0.05±0.32	0.90±0.95	4.43±2.56
Pearson correlation coefficient	1.000	0.101	0.139	0.258	0.149	0.310	0.103	0.369	0.405
p		0.003**	<0.001**	<0.001**	<0.001**	<0.001**	0.002**	<0.001**	<0.001**
**Significant p value (< 0.01).									

2.3 Interpersonal sensitivity and sleep quality

We compared the interpersonal sensitivity scores of college students with poor sleep quality and those with good sleep quality, and found that there was a significant difference between the two, indicating that sleep quality had an impact on interpersonal sensitivity. (Table 6)

Table 6
Comparison of interpersonal sensitivity scores of different sleep qualities

PSQI	total	interpersonal sensitivity scores	T value	p
PSQI≤5	649	16.45±5.86	-9.409	<0.001**
PSQI>5	252	21.00±6.77		
**Significant p value (< 0.01).				

2.4 Regression Analysis of College Students' PSQI Total Score and Interpersonal Relationship Sensitivity Score

The PSQI was divided into independent variables and the interpersonal sensitivity score was taken as dependent variables for multiple linear regression analysis. The results showed that there was a positive correlation between PSQI total score and interpersonal sensitivity score, which could explain the variation rate of 16.3%.Multilevel linear regression analysis was conducted with sleep quality dimensions as independent variables and interpersonal sensitivity scores as dependent variables. The results showed that the explanatory rate of each dimension of sleep quality on interpersonal sensitivity score was 18.4%. (Table 7)

Table 7
Multiple linear regression with interpersonal sensitivity score as the dependent variable

Dependent variable	Independent variable	β	S_E	β'	t	P	R^2	R^2_{adj}
interpersonal sensitivity							0.164	0.163
	PSQI scores	1.021	0.077	0.405	13.283	<0.001**		
interpersonal sensitivity							0.188	0.184
	daytime dysfunction	1.679	0.223	0.247	7.219	<0.001**		
	sleep disorders	2.017	0.421	0.162	4.792	<0.001**		
	subjective sleep quality	0.748	0.346	0.076	2.162	0.031*		
	sleep latency	0.601	0.267	0.077	2.251	0.025*		
	sleep time	0.702	0.345	0.063	2.031	0.043*		
**Significant p value (< 0.01).								
* Significant p value (< 0.05).								

3 Discussions

Through this survey, it is found that the average sleep quality PSQI of college students in five universities in Shanxi Province is 4.43±2.56. We defined PSQI>5 as poor sleep quality, and the poor quality of sleep students accounted for 28.0% of the survey population. Compared with China, the results of our study are basically the same as those of Mongolia college students (27.8%[16], but significantly lower than those of Taiwan college students (54.7%)[17]. Compared with other countries, our results are significantly lower than those of Ethiopian students (55.8%)[18] and American Midwest college students (65.9%)[19]. The reason for this difference may be due to differences in the definition of sleep quality (using scales or scores), socioeconomic, geographic climate, eating habits, sleep habits, and differences in sociodemographic characteristics such as student age.

The sleep quality of medical students is better than that of non-medical students. This is inconsistent with the results of Shi[20] and Brick[21]. This may be that all the medical students we surveyed came from Shanxi Medical University. Because the school has the bedtime regulation of turning off the lights at a fixed time, it will directly interfere with the sleeping time of medical students. It may also be that after receiving medical knowledge education, college students have an impact on the cultivation of healthy sleep habits and put forward higher standards for their own health. Therefore, medical students pay more attention to maintaining physical and mental health and understanding how to maintain healthy living habits and ways. In addition, if they encounter sleep problems, medical students are more likely to self-intervention and improvement, rather than poor self-demand and poor sleep management, which results in the difference between medical students and non-medical students.

Through this survey, it is found that the total score of interpersonal sensitivity of college students in Shanxi Province is 17.72±6.45. In this study, a score of > 27 was used to detect interpersonal sensitivity.9.0% of the respondents are college students with interpersonal sensitivity. Our results are similar to those of Beijing University students in China[22]. The score is higher than that of Greek college students[23]. This may be due to the fact that Chinese college students are relatively dependent on their parents' family interpersonal relationship when they are young. When they enter university, they are faced with new environment and people, and they are likely to be unable to deal with this interpersonal communication problem.

In terms of specialty, we found that the interpersonal sensitivity score of medical students was lower than that of non-medical students. This may be due to the emphasis on cultivating doctor-patient relationship in medical colleges, which indirectly has a positive impact on interpersonal communication, leading to this difference.

In terms of grade, college students of different grades have different interpersonal sensitivity scores. Grade 3 scored the highest and Grade 4 scored the lowest. After comparisons, it was found that there were significant differences in scores between Grade 4 and Grade 1, Grade 2 and Grade 3, and there were significant differences in scores between Grade 3 and Grade 5.This may be due to the fact that our survey time is approaching the end of the semester and that Grade 3 students need to face such events as the final exam and the entrance examination for postgraduates, which results in greater pressure and tense interpersonal relationships, so their scores are also higher. As the graduation season is approaching, Grade 4 and Grade 5 students are facing less pressure and better interpersonal relationships. And with the progress of

college life, college students are more and more adapted to interpersonal communication, so senior college students have lower interpersonal sensitivity scores.

The main purpose of this study was to investigate the relationship between interpersonal sensitivity and sleep quality. The results of this study show that the participants' interpersonal sensitivity is indeed related to some dimensions of sleep quality, including daytime dysfunction, sleep disorders, subjective sleep quality, sleep latency and sleep time. Through correlation analysis, it is found that there is a positive correlation between PSQI score and interpersonal sensitivity score. The higher the PSQI score, the higher the interpersonal sensitivity score, indicating the more serious the interpersonal sensitivity. People with sensitive interpersonal relationships have worse sleep quality. This is consistent with Wang[16].

Although the influence of interpersonal relationship on people is ubiquitous nowadays, interpersonal relationship is still vulnerable to many factors. As the results of this study show, sleep quality has a significant impact on interpersonal relationships. Past studies[24] have shown that insomniacs are more likely to show more pain and discomfort in communicating with others, and are more likely to wake up during sleep, thus aggravating insomnia and sleep disorders. In the study of Aanes[25], it was found that interpersonal stress was significantly correlated with sleep problems at night and daytime sleepiness. This may be due to the negative effects of interpersonal sensitivity on sleep at night and daytime life. One possible explanation for this result is that negative feelings of interpersonal sensitivity or social discomfort can trigger reflection and arousal during sleep, causing brain alertness, thus interfering with the process of falling asleep, and the long duration of interpersonal sensitivity will lead to changes in sleep patterns and eventually lead to sleep quality problems.

There is also literature showing that sleep problems can predict interpersonal disorders. Mcglinchey found that sleep problems can predict more interpersonal stress and lead to impaired interpersonal function[26]. This suggests that a poor sleep quality can affect interpersonal relationships, increase interpersonal sensitivity and weaken self-regulation. Similar results were found in study of Christian[27]. Greater interpersonal conflict was also associated with sleep disorders[28].

This may be due to lack of sleep, resulting in the decline of language organization ability and resulting in poor interpersonal communication, which indirectly leads to interpersonal barriers[29] .

Of course, we should also pay attention to interpersonal sensitivity, which can also affect sleep quality. Tafoya[30] reported that interpersonal sensitivity was found to be the best predictor of sleep differences. This suggests that there is an interaction between interpersonal sensitivity and sleep quality. If there is a problem on one hand, the other is also likely to be affected. If not handled in time or improperly, it is likely to form a vicious circle.

This study is different from many earlier studies on interpersonal relationships, which are usually limited to the study of factors that can negatively affect interpersonal relationships. In contrast, the study on the relationship between interpersonal relationships and sleep quality dimensions helps to clarify which dimensions of sleep quality can affect interpersonal sensitivity, so specific measures may be proposed to improve the impact of sleep quality on interpersonal sensitivity.

We explored the relationship between the factors of sleep quality and interpersonal sensitivity. We found that daytime dysfunction, sleep disorder, subjective sleep quality, sleep latency and sleep time entered regression equation. The explanatory rate of the five factors on interpersonal sensitivity score was 17.5%. Among them, daytime dysfunction has the greatest impact on interpersonal relationships. This may be due to a good sleep quality, which can effectively relieve stress and tension, thus affecting interpersonal relationships. If the quality of sleep is poor, college students are more likely to have negative emotions such as uncomfortable and inferiority complex when communicating with others, and affect their daily life. It produces more pressure, which has a negative effect on interpersonal communication. There is evidence that in adolescents with shorter sleep duration, the increase in daily interpersonal stress interacts with the decrease in sleep duration[31]

In addition, Holdaway[6] found that children's sleep was associated with the quality of teacher-student relationship. The worse the relationship, the more likely they were to have daytime sleepiness. This suggests that interpersonal relationships may affect our sleep quality from childhood.

In college life, college students pay more attention to interpersonal relationship. Because interpersonal relationship is a basic social need, college students gradually transfer interpersonal relationship from family to people outside family when they communicate with others in their study and life. In universities, the main interpersonal relationship is with roommates, classmates and teachers. If interpersonal relationship is not well handled, it can easily lead to physical and psychological problems. In addition, it also reflects a person's social ability. If a person does not have a good interpersonal relationship, it will easily lead to the difficulty of interpersonal negotiation in daily life. Bad interpersonal relationships can easily lead to depression, which will affect the quality of sleep. On the contrary, college students with poor sleep quality are more likely to face others with inadequate energy, sleepiness and other discomfort when communicating, which results in the

sensitivity of interpersonal relationship between them. And students with poor sleep need more time to fall asleep, which can easily cause stress and discomfort, and thus more sleep disorders, such as wake-up in dreams, nightmares, etc. If this state lasts too long, it is likely to transfer this sleep pressure to interpersonal interaction, thus causing interpersonal sensitivity.

4 Conclusions

There was a positive correlation between sleep quality score and interpersonal sensitivity score of Chinese College students. Among the dimensions of sleep quality, daytime dysfunction, sleep disorder, subjective sleep quality, sleep time and sleep time can affect interpersonal sensitivity. With the increasing demand for sleep quality and interpersonal relationship assessment, we have focused on the impact of sleep quality on interpersonal sensitivity, so our findings are of great significance. These results will help schools and society to understand college students' sleep quality and interpersonal sensitivity. Individual efforts can improve these factors, and provide adequate help and comprehensive education to improve their sleep quality and interpersonal sensitivity.

This study also has some limitations: Firstly, due to the cross-sectional design of this study, we cannot infer the causal relationship between sleep quality and interpersonal sensitivity. Secondly, although standardized questionnaires assess sleep quality and interpersonal sensitivity, these measures are different from clinical diagnosis, so more accurate diagnostic methods should be adopted in the future. Thirdly, this study is based on the results of self-designed questionnaires. Because students can manipulate the information and the results of questionnaires are influenced by the participants' emotions and personalities, reporting bias cannot be eliminated. Fourthly, this study uses non-probabilistic accidental sampling. We should be cautious in extrapolating the results of the study.

Declarations

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Availability of data and materials

The datasets used during the current study are available from the corresponding author on reasonable request.

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Ethics declarations

Ethics approval and consent to participate

This study was examined and approved by the Ethics Committee of Shanxi Medical University. participants were informed of the purpose and procedure of the study before the study began.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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