Sleep Quality in the Withdrawal of Medical Members from Wuhan Using the Pittsburgh Sleep Quality Index

Chen Li
   Tongji University Affilliated East Hospital: Shanghai East Hospital
Yang Liu
   Tongji University Affilliated East Hospital: Shanghai East Hospital
Wei Xu
   Tongji University Affilliated East Hospital: Shanghai East Hospital
Changjing Zhang
   Tongji University Affilliated East Hospital: Shanghai East Hospital
Yezhou Shen
   Tongji University Affilliated East Hospital: Shanghai East Hospital
Xingping Lv
   Tongji University Affilliated East Hospital: Shanghai East Hospital
Yunhe Zhang
   Tongji University Affilliated East Hospital: Shanghai East Hospital
Feifei Wang
   Tongji University Affilliated East Hospital: Shanghai East Hospital
Shaolin Ma (✉ mslin@sohu.com)
   Shanghai East Hospital, Tongji University

Research article

Abstract

Objective: The main purpose of this paper is to investigate sleep quality in the withdrawal of medical members dispatched to control the Corona Virus Disease 2019(COVID-19) outbreak in Wuhan, Hubei province, China.

Methods: Forty-seven medical members (including twenty medical members treating mild COVID-19, seventeen medical members treating severe COVID-19 and ten logistics team members) completed questionnaire using Pittsburgh Sleep Quality Index. Pittsburgh Sleep Quality Index (PSQI) was used to evaluate the sleep quality of the medical members.

Results: A total of forty-seven medical members participated in the sleep quality survey. The PSQI total scores are 5.6±4.3, 11.0±5.0 and 3.4±2.0 in treating mild COVID-19, treating severe COVID-19 and logistics team members, respectively. Medical members treating patients with severe COVID-19 had significantly higher PSQI total scores than those who facing up to the patients with mild COVID-19 and logistics team members. ($P<0.005$). The components of PSQI such as sleep duration and sleep medications were significantly higher in medical members treating patients with severe COVID-19 than those who facing up to the patients with mild COVID-19 and logistics team members ($P<0.005$). The components of PSQI such as sleep quality and daytime dysfunction were worse in medical members treating patients with severe COVID-19 than logistics team members ($P<0.005$).

Conclusions: Findings indicate that medical members treating patients with severe COVID-19 had worse sleep quality than who facing up to the patients with mild COVID-19 and logistics team members.

Introduction

The Corona Virus Disease 2019(COVID-19) was outbroke in China's Hubei province in January 2020[1]. Unprecedented pressures were built speedily on medical system. The National Health Commission of the People's Republic of China recruited some gymnasiums and stadiums to treat patients with COVID-19, which was formally known as mobile cabin hospital [2,3]. Many hospitals had been converted into designated hospitals for treatment of COVID-19. Over 40,000 medical members from across the nation have supported Hubei since February. When we focus on novel coronavirus pneumonia under the spotlight, we should also pay attention to the physical and mental health of the medical members.

For adults aged 18 years and older, 7-9 hours of sleep a day is advised as the appropriate time [4]. Sleep disorders are common in the general population, and between 15% and 20% of adults suffered chronic sleep problems [5]. Previous studies have shown that sleep dysfunction is not only bound up with hypertension, obesity, depression and cardiovascular diseases, but also impacts daily routines [6,7].

The Pittsburgh Sleep Quality Index (PSQI) which provided a reliable and standard measure to distinguish "good" from "bad" sleepers through a simple index was drew up in 1989. The sleep quality of the respondents in the previous month was evaluated, with a total score range of 0-21. The higher the score,

the worse the sleep quality. The total PSQI scores ≤5 indicates "good sleep quality", whereas the total PSQI scores ≥5 indicates "bed sleep quality". A cutoff score of 5 issued a diagnostic sensitivity of 89.6% and a specificity of 86.6 %[8]. The severity of COVID-19 is a great test for the physical and mental health of medical members. The cognitive of the disease, the frustration after the failure of the treatment of severe patients, and the helplessness after hearing the medical members infected with COVID-19 can seriously affect the sleep quality of medical members. Due to the outbreak of COVID-19, there is still a lack of research on the sleep quality in the withdrawal of medical members. Therefore, this study aimed to assess the sleep quality in the withdrawal of medical members.

Materials And Methods

Participants

Forty-seven medical members completed questionnaire using Pittsburgh Sleep Quality Index. The participants' age range was between the ages of 24 and 56. 20 medical members treated mild novel coronavirus pneumonia, 17 medical members treated severe novel coronavirus pneumonia and 10 were logistics team members. All participants were the withdrawal of medical members from Wuhan and were given PSQI by the same researcher under the same conditions.

Measures

Pittsburgh Sleep Quality Index (PSQI), designed by Buysse et al., is the questionnaire for measuring quality of sleep during the previous month.There are 7 components in 18 items, and each component is scored according to 0-3 grade (eg, 0= not during the past month, 1= less than once a week, 2= once or twice a week, 3= three or more times a week). The cumulative score of each component is the total PSQI score, which ranges from 0 to 21. The higher the score, the worse the sleep quality.[8] (Appendix1)

Statistical Analyses

The data was analyzed by SPSS 25.0 software. The data are presented as mean ± SD or median and interquartile range (25%−75%, IQR). The distribution of variables used the Shapiro-Wilk test. According to the normality of the data, The Student's t-test was used for comparison. The Wilcoxon statistical test was used for Inter-group comparison. P<0.05 was considered statistically significant.

Result

Demographic data

In total, 47 medical members completed our questionnaire. Participants characteristics are shown in Table 1. There were approximately 55% of medical members patients experienced the poor sleep quality

during the past one month, especially in the doctors and nurses. The participants who treated patients with mild COVID-19 were 20, 17 participants who treated patients with severe COVID-19 patients, and 10 participants were logistics team members. The age and BMI didn't statistical difference among the three groups.

Table 1
Baseline characteristics of the participants

	Number (n)	Profession Doctor/Nurse(n)	Age (y, mean ± SD)	Gender Male/Female (n)	BMI (mean ± SD)
Treating mild COVID-19	20	7/13	34.8±4.4	7/13	22.9±1.5
Treating severe COVID-19	17	4/13	35.4±7.2	6/11	20.7±2.1
Logistics team members	10	0	40.5±9.3	10/0	23.5±2.4
Note: Treating mild COVID-19 represented the medical members who treat the mild patients. Treating severe COVID-19 represented the medical members who treat the severe patients. Data were presented as mean ± SD or median (interquartile range). BMI,Body Mass Index.					

Pittsburgh Sleep Quality Index (PSQI) scores

Pittsburgh Sleep Quality Index (PSQI) scores among the three groups are shown in Table 2. Medical members treating patients with severe COVID-19 had significantly higher PSQI total scores than those who facing up to the patients with mild COVID-19 and logistics team members ($P < 0.005$). The total PSQI scores are 5.6 ± 4.3, 11.0 ± 5.0 and 3.4 ± 2.0 in treating mild COVID-19, treating severe COVID-19 and logistics team members, respectively. The component such as sleep duration and sleep medications were significantly higher in medical members treating patients with severe COVID-19 than those who facing up to the patients with mild COVID-19 and logistics team members ($P < 0.005$). Sleep duration scores are 1 (0−1), 2 (1-2.5) and 1 (0−1) in treating mild COVID-19, treating severe COVID-19 and logistics team members, respectively. Sleep medications scores are 0(0−0), 0 (0−2) and 0 (0−0) in treating mild COVID-19, treating severe COVID-19 and logistics team members, respectively. The component such as sleep quality and daytime dysfunction were worse in medical members treating patients with severe COVID-19 than logistics team members ($P < 0.005$). Sleep quality scores are 2 (1−2) and 1 (0−1) in treating severe COVID-19 and logistics team members. Daytime dysfunction scores are 2(1−2) and 0 (0-0.25) in treating severe COVID-19 and logistics team members.

Table 2
PSQI scores among Treating mild COVID-19, Treating severe COVID-19 and Logistics team members

PSQI	Treating mild COVID-19	Treating severe COVID-19	Logistics team members
Total score	5.6±4.3	11.0±5.0 *	3.4±2.0
Sleep quality	1(0−2)	2(1−2) *	1(0−1)
Sleep latency	1(0−3)	2(1−3)	1(0−1)
Sleep duration	1(0−1)	2(1-2.5) *#	1(0−1)
Sleep efficiency	0(0−1)	1(0-2.5)	0(0-0.25)
Sleep disturbances	1(1−1)	1(1−1)	1(0−1)
Sleeping medications	0(0−0)	0(0−2) *#	0(0−0)
Daytime dysfunction	1(0−2)	2(1−2) *	0(0-0.25)
Note: Data were presented as mean ± SD or median (interquartile range). PSQI, Pittsburgh Sleep Quality Index. *p<0.005,compared with Logistics team members. #p<0.005, compared with Treating mild COVID-19.			

Discussion

COVID-19 is a highly contagious infectious disease [9]. On January 30, 2020, World Health Organization (WHO) declared the COVID-19 as a Public Health Emergency of International Concern (PHEIC) [10]. In February 2020, The National Health Commission of the People's Republic of China not only created the mobile cabin hospital to treat millions of patients with mild COVID-19, but also transformed hospitals into designated hospitals for treating patients with severe pneumonia caused by the new coronavirus.

Numbers of medical members across the country were engaged in the campaign treating COVID-19. For the medical members, we should not only cure patients, but also keep ourselves healthy. The researchers have been devoted to the relationship between sleep disorder and mental illness for decades [11]. Workplace stress was associated with poor sleep quality [12]. Almost lots of studies have proved that PSQI could be used to evaluate sleep dysfunction in clinical and non-clinical [13], but lack of sleep quality research for the medical members.

The results of investigation showed that PSQI total scores are extraordinary worse in medical members treating patients with severe COVID-19. Both medical members treating patients with severe COVID-19 and medical members treating patients with mild COVID-19 were above the cutoff for poor sleep quality (>5). More than 80%(14/17) of the medical members treating patients with severe COVID-19, 50%(10/20)

of the medical members treating patients with mild COVID-19 and 20%(2/10) of the logistics team members showed a PSQI total scores >5.

In this study, we found about 55% of medical members suffering sleep dysfunction. High transmission of the disease, high mortality of severe patients and high intensity of work can seriously affect the sleep quality of medical members. Medical members were in a high intensity, high stress work environment. The research showed that rotating shifts can interfere with nurses' circadian rhythms and affect their sleep quality [14]. It has been suggested that circadian rhythm disorder may make the body in an overloaded status, thereby reducing the ability to cope with pressure [15]. For evaluating medical members' sleep quality and how to improve the sleep quality of medical members are very important. The number of medical members participating in this survey is relatively small, and more medical members can be recruited to participate for later research.

Conclusion

Our findings contribute to knowledge about the poor sleep quality of medical members. Medical members treating patients with severe COVID-19 had worse sleep quality.

Abbreviations

COVID: Corona Virus Disease; BMI: Body Mass Index; PSQI: Pittsburgh Sleep Quality Index; WHO: World Health Organization; PHEIC: Public Health Emergency of International Concern.

Declarations

Ethics approval and consent to participate

The Institutional review boards at Shanghai East Hospital (protocol 2020023) and have approved the data collection.

Authors' contributions

All authors contributed to the conception of the study, interpretation of findings, and writing of the manuscript. All authors read and approved the final manuscript.

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Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests.

Availability of supporting data

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

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Appendix

Appendix 1 not available with this version