Original Research

Predicting the Quality of Sleep Based on Job Burnout and the Anxiety of Being Infected by the Coronavirus among the Treatment Staff Taking Care of Patients with COVID-19

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Abstract

Background and Objective: Psychological problems including sleeping problems, anxiety, and job burnout are more prevalent among the treatment staff of the patients who suffer from coronavirus disease 2019 (COVID-19) rather than other treatment staff. Therefore, the current study aimed to predict the quality of sleep based on job burnout and the anxiety of being infected by the disease among this staff.

Materials and Methods: The current study was a cross-sectional research in which 215 participants from the treatment staff filled out the relevant questionnaires online. The sampling was performed by available method and the instruments included Pittsburgh Sleep Quality Index (PSQI), Corona Disease Anxiety Scale (CDAS), and Maslach Burnout Inventory (MBI). Finally, the data were analyzed in two sections of descriptive and inferential statistics using SPSS software.

Results: A correlation among all variables was observed. Moreover, the total model was significant (adjusted $r^2 = 0.37$, $P = 0.01$) and COVID-19 anxiety (standardized beta = 0.33, $P = 0.01$) and emotional exhaustion (standardized beta = 0.40, $P = 0.01$) predicted the sleep quality more than variables of depersonalization (standardized beta = -0.22, $P = 0.01$) and feeling of success (standardized beta = -0.12, $P = 0.06$).

Conclusion: COVID-19 anxiety and job burnout are good predictors for sleep problems in the treatment staff of the patients who suffer from COVID-19.

Keywords: Coronavirus; Sleep quality; Burnout; Psychological; Anxiety

Introduction

A new viral disease called coronavirus disease 2019 (COVID-19) was identified in the province of Hubei in China on December 8, 2019, and rapidly spread to other countries in the world (1). Except for the harmful and deadly consequences for the physical aspect of the human, this virus has some adverse psychological effects (2). The findings of a study by Kang et al. showed that the treatment staff who were exposed to the coronavirus as the result of taking care of the patients who suffered from this disease experience more burnout and overloaded feeling (3)

Job burnout is a significant phenomenon among the treatment staff and it is a syndrome of occupational exhaustion, depersonalization, and personal accomplishment assessment that leads to the decrease in individual efficiency (4). The treatment staff are less mentally healthy; besides, they are more exposed to exhaustion and depression rather than other treatment staff (5, 6). The rate of job burnout among this population is so

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high. Different findings state that 7.8% to 11% of graduate students in medical fields report thinking about suicide (7, 8), and 2% of women and 1% of men have reported suicide attempt (7). The people who report more burnout are probably more involved in non-professional activities and are less involved in altruistic activities that influence their quality of taking care of the patients (8).

Further, the other studies showed that the healthcare providers for patients with COVID-19 reported moderate to severe level of anxiety, so that anxiety was the most common psychological problem among these people (9). The findings of Bingham study showed that about 44% of treatment staff caring for the mentioned patients reported the symptoms of anxiety. Moreover, the other problem that this group is dealing with is the problem of sleeping (10). In the same vein, another study emphasized that about 34% of the treatment staff complained about their sleeping problem (9). Results have shown that after the pandemic of COVID-19, the treatment staff associated with this disease usually experience more anxiety, burnout, and psychological problems than other treatment staff (9). The problems of anxiety and sleeping among this treatment staff cause job inefficiency, poor interpersonal relationships with colleagues, and faulty service to the patients (11). According to a previous research, anxiety has an important effect on sleep quality (12). Thus, in this study, anxiety was chosen as a predictor of sleep quality.

Despite numerous researches that have been conducted during the prevalence of COVID-19 in terms of the issues related to anxiety and sleeping, most of these studies focused on the patients who suffered from the COVID-19 rather than the relevant treatment staff. Moreover, regarding the mentioned studies, the most common problems related to the treatment staff, especially those who take care of the patients who suffer from COVID-19 are anxiety and low quality of sleep. However, no study has predicted the quality of sleep based on the anxiety and job burnout among the treatment staff who take care of COVID-19 cases. Therefore, the current research has focused on this lacuna.

Materials and Methods

This research was functional and descriptive in terms of the purpose and methodology, respectively. The participants included 215 treatment staff taking care of the patients who were resting in intensive care unit (ICU) in Tehran hospitals, Iran, infected by the COVID-19. The available sampling was conducted and the participants filled out the questionnaires online. After collecting the data, 18 questionnaires were removed due to missing data, and the final analysis was conducted on 198 questionnaires. The subjects included 136 (0.68) nurses, 44 (0.22) operating rooms' technicians, and 35 (0.17) physicians. The inclusion criteria to take part in this study included the age of 18-60 years, being treatment staff of the COVID-19 cases, informed consent to fill out the questionnaire, and not having a history of severe psychological disorders. Due to the emergency restriction during the pandemic, the link of the questionnaire was shared with the participants via social media such as WhatsApp and Telegram applications. First, a brief explanation was reported about the purpose of the study and then the participants were guided to fill out the questionnaires.

Study instruments

Pittsburgh Sleep Quality Index (PSQI): This questionnaire assesses the quality of people's sleep during the last four weeks and it takes 5-10 minutes to be filled out. Moreover, this index includes seven subscales and one general score. The general score ranges from 0 to 21 and the scores under five reveal the natural quality for sleep and the scores higher than five show low quality for sleep (13). The reliability, validity, and sensitivity of this questionnaire towards examining the quality of sleep have been investigated through various studies (Cronbach's alpha = 0.84 and correlation coefficient = 0.88). A score above 5 denotes poor sleep quality and below 5 indicates good sleep quality (14).

Maslach Burnout Inventory (MBI): This questionnaire includes 22 questions and three subscales of occupational exhaustion, depersonalization, and personal accomplishment assessment. Cronbach's alpha for emotional exhaustion, depersonalization, and sense of individual success have been reported as 0.84, 0.75, and 0.74, respectively. The questionnaire is a six-point Likert scale ranging from 0 (never) to 6 (every day) (15). The reliability of this questionnaire in Iran was checked via Cronbach's alpha for emotional exhaustion (0.76), depersonalization (0.79), and sense of individual success (0.74) (16).

Corona Disease Anxiety Scale (CDAS): This scale was developed by Alipour et al. to investigate the Iranian citizens who suffered from

COVID-19 anxiety including 18 items ranging from 0 (*never*) to 3 (*always*). This scale has two subscales of mental symptoms and physical symptoms, and one general scale. The Cronbach's alpha coefficients for the mental symptom (0.87), physical symptom (0.86), and for the whole scale (0.91) have been reported as well (17).

The analysis of the findings was revealed in two sections of inferential statistics and descriptive statistics. The descriptive statistics included percent, frequency, mean, and standard deviation (SD) and inferential statistics were run using correlation and simultaneous regression analysis.

Results

The participants included 198 subjects. Table 1 presents the characteristics of the participants.

Table 1. The characteristics of the participants

Characteristic	n (%)	Sleep quality score (mean ± SD)	P-value
Gender			
Men	97 (49.74)	8.70 ± 3.45	0.58
Women	101 (51.79)	8.58 ± 3.88	
Age (year)			
25-35	89 (45.64)	6.74 ± 1.48	0.01
> 35	107 (54.87)	9.59 ± 4.19	

SD: Standard deviation

Subjects were divided into two groups of optimal and poor sleep quality. The frequency and percentage of other variables based on these two components are presented in table 2.

The table 2 shows a significant difference between two groups according to good sleep quality and poor sleep quality in the variables.

Independent samples t-test was performed to assess the significant difference between two groups in sleep quality. Table 3 shows independent samples t-test between two groups with poor sleep quality and optimal sleep quality. The results show a significant difference between two groups.

Simultaneous regression analysis was run to predict the quality of sleep as a dependent variable. This dependent variable and subscales of job burnout questionnaire including emotional exhaustion, depersonalization, sense of individual success, and COVID-19 anxiety entered the model as the predictor variables. The result pointed out that the total model had significant results (adjusted $r^2 = 0.37$, f = 33.04, P = 0.01) (Table 4).

The coefficient of determination for each of the model components showed that the variables of emotional exhaustion, depersonalization, and COVID-19 anxiety could predict sleep quality.

Discussion

This study aimed at predicting the quality of sleep among the treatment staff who cared for the patients suffering from COVID-19. This anticipation was performed according to COVID-19 anxiety and job burnout among the treatment staff. The results showed a significant relationship among job burnout components, the variable of COVID-19 anxiety, and the quality of sleep, meaning that the first two variables predicted the quality of sleep. These results are in line with other studies showing that anxiety and problems of sleep are the most common problems among the treatment staff (1, 9, 18, 19).

Therefore, during such critical phenomena especially a new disease, the people who are more exposed to the phenomena suffer from more anxiety and stress rather than those who are not exposed to (2).

Table 2. Frequency and percentage of the variables in poor sleep quality and good sleep quality groups

Group	Variable	Total [n (%)]	PSQI > 5 (n = 105) [n (%)]	PSQI < 5 (n = 93) [n (%)]	P-value
Emotional exhaustion	Mild	103 (43.32)	38 (69.48)	65 (69.89)	
	Moderate	78 (39.39)	53 (26.76)	25 (26.88)	0.01
	Severe	15 (7.57)	12 (6.06)	3 (3.22)	
Depersonalization	Mild	107 (54.04)	43 (21.17)	64 (68.81)	
	Moderate	82 (21.21)	51 (25.75)	31 (33.33)	0.01
	Severe	14 (7.07)	9 (4.54)	5 (5.37)	
Poor sleep quality	Mild	113 (57.07)	54 (51.42)	57 (61.29)	
	Moderate	77 (38.88)	40 (38.09)	31 (36.55)	0.04
	Severe	12 (6.06)	7 (6.66)	5 (1.07)	
COVID-19 anxiety	Mild	103 (43.32)	34 (32.38)	69 (74.19)	
	Moderate	79 (39.89)	56 (53.33)	23 (24.73)	0.01
	Severe	16 (8.08)	14 (13.33)	2 (2.15)	

PSQI: Pittsburgh Sleep Quality Index; COVID-19: Coronavirus disease 2019

Table 3. Independent samples t-test

		Levene's test		t-test				
		f	P-value	t	df	P-value	Mean difference	SE
Sleep quality	Equal variances assumed	165.52	0.01	-13.85	196.00	0.01	-6.52	0.47
	Equal variances not assumed		0.01	-14.69	107.63	0.01	-6.52	0.44

SE: Standard error; df: Degree of freedom

Table 4. Predicting the sleep quality based on job burnout and coronavirus disease 2019 (COVID-19) anxiety

Model	Standardized beta	T	P-value
(Constant)		1.17	0.24
COVID-19 anxiety	0.33	3.34	0.01
Emotional exhaustion	0.40	3.98	0.01
Depersonalization	-0.22	-2.87	0.01
Sense of individual success	-0.12	-1.91	0.06

Moreover, anxiety is one of the main components that cause irregularity in sleeping (20) and thus, the sleeping of the treatment staff will face some challenges. Besides, fear of being infected by the virus or infecting others such as family members and friends leads to anxiety and then sleeping problems (1). Another component that predicted sleep quality in this study was job burnout. In this regard, other studies claim that severe pressure of working causes sleeping problems (19, 21). In explaining this finding, it can be said that in periods of crisis, the treatment staff deal with patients that are usually at risk of death and as a result, patients and their families have high expectations of them. Therefore, stress as a psychological consequence in such conditions causes more burnout and disruption of their normal sleep (1).

The treatment staff who take care of the patients infected by the COVID-19 suffer from more emotional problems because they experience less social support and attendance in the society due to their particular condition and feel much stress and worry about the disease. Thus, these issues lead to appearing more difficulties in sleeping (9). The ability to predict more emotional exhaustion among the components of burnout compared to other components is a confirmation of this explanation. However, the current study has a number of limitations that should be regarded in generalizing the results. This study was conducted on treatment staff who provide treatment for the patients infected by the COVID-19 and it cannot be generalized to other treatment staff irrelevant to COVID-19. Second, PSQI was used for investigating the quality of sleep and it might not be objective. Moreover, even though job burnout and COVID-19 anxiety have predicted the variance of

the quality of sleep (37%), other references for predicting are not clear. Third, the number of participants was limited and that would be better to increase this number. Finally, this study was conducted on the treatment staff taking care of the patients suffering from COVID-19 and it is suggested to include the participants other than treatment staff. Therefore, it is recommended to include other participants from general population using more precise instruments for the research.

Conclusion

Poor sleep quality leads to the low efficiency of medical staff in providing patient services. Therefore, paying attention to its improvement is essential.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

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