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Impact of COVID-19 infection on sleep among medical staff in Tikrit city

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Abstract

Background: After the appearance of a novel coronavirus (2019-nCoV) during 2019, the virus has spread with alarming speed and a pandemic quickly developed. The complex consequences of the pandemic phenomenon, i.e., the consequences of the pandemic per se and the countermeasures adopted to control infections and deaths, were associated with a negative impact on sleep quality. Besides, sleep disorders have special attention in the field of public health, due to good sleep quality favors to better health and well-being. Moreover, it is a primordial biological process for mental and physical health, negative emotions contribute to affect the quality of sleep, leading to sleep disorders. This demonstrates the need to prevent and reduce these complications through psychological support.

Aim of the study: To assess sleep disturbance and healthy sleep in medical staff who recovered from covid-19 infection.

Subjects and Methods: A cross sectional study enrolled 100 medical staff participants recovered from covid-19, from 1st of December to the 1st of march 2023, including 20-40 years old participants of both sex by using Pittsburgh Sleep Quality Index (PSQI) The PSQI is a widely used 19-item self-report questionnaire for measuring sleep disturbances and healthy sleep, It includes seven clinically derived domains of sleep difficulties, including sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances was conducted in Tikrit city using interviewer administered questionnaire through direct interview and the collected data was represented by a suitable tables.

Results: The study shows that among 100 participants who have gained recovery from covid-19, 65% (65) were female in gender and 35% (35) were male between (20-40) years. Participants were infected before 3 months were 33 (33%), and also 33 participants (33%) were infected before 2 months, while 34 (34%) participants were infected before 1 month. The study found that, the mean age of participants was 25 years and the mean time of sleep latency was 44.52 minutes which is prolonged than the normal time for a fall to sleep during normal situation and also in our study we demonstrate that, there was statistically significant association between body mass index and global sleep score and p-value was less than 0.05

Conclusion: The results suggest that there was no persistent and significant sleep disturbance up to 3 months after recovery.

1. There was significant difference between groups with normal and abnormal sleep and body mass index.
2. Low scores of PSQI was noted in 65% of participants
3. There was no significant difference between groups with normal and abnormal sleep and gender.

Weak points: In our study we face some weak points which considered as limitations for evaluation of sleep quality and the most important one is an element of subjectivity because it depends one questionnaire

Recommendation: The study recommended that:

1. To do more population based longitudinal studies to investigate psychological and neurobiological mechanisms of sleep disturbance.
2. To include large sample size in the next studies
3. To concentrate on those with high body mass index
4. To use different type of index for sleep assessments.

Keywords: Sleep parameters, COVID-19, sleep disturbance

1. Introduction

The novel coronavirus disease (COVID-19) was first observed in the Chinese city of Wuhan in late December 2019 [1]. COVID-19 spread rapidly worldwide due to the highly contagious nature of the virus, and the World Health Organization officially declared COVID-19 as a pandemic on March 11, 2020 [1].

With the pandemic, the number of suspected and confirmed individuals increased, as well as the workload, work pressure, and risk of infection of front-line clinical staff to fight the epidemic [2].

In this context, COVID-19 has become an aggressive agent that triggers negative psychological effects that can raise levels of anxiety, depression, and stress in individuals [3]. These negative emotions contribute to affect the quality of sleep, leading to sleep disorders. This demonstrates the need to prevent and reduce these complications through psychological support, using attitudes of social capital [4].

Besides, sleep disorders have special attention in the field of public health, due to good sleep quality favors to better health and well-being. Moreover, it is a primordial biological process for mental and physical health [5]. Despite public awareness, there are levels of anxiety that affect sleep quality during epidemics, including periods of population quarantine or self-isolation and in specific occupations [6]. Some non-pharmacological interventions during the hospitalization [7], confinement [8], and post-COVID-19 infection have been suggested [9].

Sleep is considered as a period of rest for the body and mind, during which volition and consciousness are in partial or complete abeyance and the bodily functions partially suspended. Sleep has also been described as a behavioral state marked by characteristic immobile posture and diminished but readily reversible sensitivity to the external stimuli [10]. Good sleep quality can promote rapid recovery of body function, relieve work fatigue, and maintain sufficient energy, physical strength, and a healthy mental state. It is a relevant parameter in the assessment of overall health, and a relevant factor in determining the risk of cardiovascular diseases (CVD) [11].

During the COVID-19 pandemic, the prevalence of insomnia has increased significantly [12] Quantified with AIS, the prevalence of insomnia reached 38% in 2,427 participants from the general population in Greece [13]. In the United States, in 513 healthcare workers, it found a prevalence of 64% [14]. In Iraq, a prevalence of 68% was documented in 268 physicians from different hospitals [15]. In 1,215 participants from 15 countries, a prevalence of 77% was observed [16]. In Greece, 150 nurses reported that 49% had insomnia [17]. Finally, in Poland, among 336 nurses and midwives was found that 45% presented moderate or severe clinical insomnia [18].

In the general population during confinement for COVID-19, to date, insomnia has been associated with older age, female gender, economic problems, low social status, social isolation, low education, low family income, married marital status, presence of co-morbidity, greater severity of infection, deteriorated health status, health work, and longer duration of infection [19, 20] In the same way, insomnia has been associated with stress-related COVID-19, anxiety, and depression [21].

In clinical care, identifying and treating insomnia in COVID-19 survivors is vital to promote quality of life, well-being, and functionality [22].

Because the disturbances in sleep during out-break of

infectious disease, this systematic review aims to evaluate the sleep equality of corona virus survivors by Pittsburg sleep quality index (PSQI).

1.1 Aim of study

To assess sleep quality in medical staff who recovered from covid-19 infection.

1.2 Objectives

1. Evaluate the impact of covid-19 on sleep.
2. Assess the relationship between demographic factors and global sleep score.
3. Identify the association between period of recovery and global sleep score.
4. Clarify the sleep latency and its relation to period of recovery.

2. Subjects and Method

2.1 Design of study

A cross sectional study enrolled 100 medical staff participants recovered from covid-19, from 1st of December to the 1st of March, including 20-40 years old participants of both sex by using Pittsburgh Sleep Quality Index (PSQI) The PSQI is a widely used 19-item self-report questionnaire for measuring sleep disturbances and healthy sleep, It presents a cutoff point where it considered good sleep quality if PSQI equal or less than 5 and poor sleep quality if PSQI higher than 5, the study was conducted in Tikrit city using interviewer administered questionnaire through direct interview and the collected data was represented by a suitable tables.

2.2 Sample and data collection

A random sample was collected by questionnaire. The questionnaire contained closed ended questions.

2.3 Ethical approval

Ethical approval for the study protocol, questions and consent was granted by Ethics Committee at the Tikrit University.

2.4 Pilot study

Approximately the same questionnaire had tested on small sample size. Therefore, we knew that the main study is feasible with close monitoring to neglecting weak response.

2.5 Data analysis

Done by manual statistical methods. All results will have represented by a suitable table, the descriptive analysis focused on frequencies and percentages, while chi-square was utilized to determine the differences between variable and ANOVA test for determine the significant between different groups. P-value of less than 0.5 was considered statistically significant.

2.6 Budget

Our study is very low cost due to its questionnaire-based type.

3. Results

Table 1: Mean and stander deviations of sleep latency in different groups of participants

Sleep latency					
Duration of recovery	Minimum	Maximum	Mean	Standard deviation	p-value
Before 1 month	20	120	40.08	27.22	0.6188
Before 2 months	20	130	47.27	36.64	
Before 3 months	20	130	46.23	33.01	

Table (1) demonstrate that the mean of sleep latency was increased in all groups 40.08 minutes in participants who recovered before one month, 47.27 minutes in those who recovered before two months and 46.23 minutes in those who recovered before three months, but; there was no significant association between sleep latency and period of recovery and p –value was (0.6188).

Table 2: Association between period of recovery and global PSQI score

Duration of recovery	PSQI		Total	Mean (SD)	F-ratio	P-value
	Less than 5	More than 5				
Before 1 month	24 (70.6%)	10 (29.4%)	34	40.08 (27.22)	0.4822	0.6188
Before 2 months	21 (63.7)	12 (36.3%)	33	47.27 (36.64)		
Before 3 months	20 (60.7%)	13 (39.3%)	33	46.23 (33.01)		
Total	65	35	100			

Table (2) show that there was non-significant association between global score of sleep and period of recovery in all groups ANOVA test was done and f-ratio was 0.4822, p-

value 0.6188 which mean that, there was no significant association between 3 groups as well as with in the each of the groups.

Table 3: Association between global score and gender

Gender	Global score			Total
		Normal sleep	Abnormal sleep	
Male	Number	22	13	35
	Percentage	22%	13%	35%
Female	Number	43	22	65
	Percentage	46%	19%	65%
Total	Number	65	35	100%
	Percentage	65%	35%	

Table 3 show that there was non-significant statistical association between the type of sleep and gender p-value, in both normal and abnormal sleep groups; majority of cases

were female 65 participants out of 100 (65%), while 35 participants only were male (35%) Chi square test was done and p- value was non-significant and p-value (0.741).

Table 4: Association between age and body mass index with PSQI score

Parameters	Types of sleep	Number of participants	Mean	S.D.	P-value	
Age	Normal	65	25.26	4.78	0.596	NS
	Abnormal	35	24.29	3.36		
BMI	Normal	65	22.34	2.78	Less than 0.0001	Significant
	Abnormal	35	33.4	3.22		

The data from table 4 demonstrate that there were no significant differences regarding age in both participants groups with normal and abnormal PSQI score, while there were significant differences regarding body mass index in both participants groups with normal and abnormal PSQI score and p-value was less than (0.0001).

4. Discussion

4.1 PSQI

In our study, we evaluate sleep parameters quantitative and qualitative by using PSQI and its components, present study conducted at Tikrit city for at least three months on 100 medical staff participants who recovered from covid-19 infection, all quantitative sleep parameters were negatively affected regarding sleep latency (the time of going to bed), in this study demonstrate that the mean of sleep latency was increased in all groups and was 44.52 minutes for all groups, while was 40.08 minutes in participants who recovered before one month, 47.27 minutes in those who recovered before two months and 46.23 minutes in those

who recovered before three months, but; there was no significant association between sleep latency and period of recovery and p-value was (0.6188) and this agree with the results of study conducted by (Mohammad A. Salehinejad., *et al.*, 2020) at neurology and psychiatry department, Leibniz research center for working environment and human factors, Dortmund, Germany. Although the delayed phase state reported in the participants during the covid-19 might be transient if the situation changes back to routine, which was not explored in this study because this point needs long term follow up.

Besides quantitative parameter of sleep like sleep latency also this parameter can reflect significantly qualitative assessment of sleep and considered as low perceived sleep quality parameter, longer time needed to fall asleep (Bower *et al.*, 2010).

In current study, we found that only (35%) of participants had abnormal sleep and this is confirmed by evaluation of global sleep score by using PSQI which was more than 5 and this mean the participants complaining of sleep

disturbance as score increased more than 5 regarding all three groups according to period of recovery from covid-19, in addition to that we reported (65%) with normal sleep as global sleep score was below 5 but; there was no significant statistical association between period of recovery an global sleep score which confirmed by using ANOVA test and f-ratio and this is maybe due to small sample size, and this is disagree with (Gellan K. Ahmed *et al.*, 2021) at neurology and psychiatry department, faculty of medicine, Assiut university, Egypt who mentioned that only 8.8% of participants had no sleep disturbance.

4.2 Demographic data

Regarding demographical data there was no statistically significant association between gender and sleep quality measured by PSQI and found that only 13(37%) male was complaining of abnormal sleep and PSQI was more than or equal to 5 while 22 (48%) female presented with sleep disturbance during evaluation of PSQI and score was more than or equal to 5, this difference between male and female and presence of more female affected by sleeping abnormality could be due to hormonal factors which needs further assessment in the future studies or due to sample size which includes more females, this is disagree with study designed by (Luiz Felipe Ferriera De Souza *et al.*, 2021) Which found that statistically significant association between PSQI score and gender.

The mean age of participants was 25 years which was statistically insignificant in relation to sleep quality, while in our study we found that high statistically significant association between sleep quality and body mass index and reported about 35 out of 100 (35%) had poor sleep quality and BMI was linked to sleep quality, with greater BMI among poor sleep quality participants, present study agree with study conducted by (Yokanantini Muniandy and Chin Yi Ying at school of nutrition and diabetics, faculty of science, university of Sulita Zainal Abidin, Gong Badak Campus, Kuala Nerus, Terengganu, Malysia 2023), previous studies hav also shown thw males age 19-29 with poor sleep quality can be obese (30).

4.3 Importance of the study

This study is a cross sectional study that is a strong type of observational study that analyze data from population, or representative subset, at specific point of time.

That deal with a critical and important subject and becomes increasingly common and adversely affect life of male and female in different age groups. Many factors are implicated to have a strong effect on the quality of sleep, some of these factors are taken as a point for study in aim to find a clear relationship and strong association and finally to correct these factors like high body mass index and though a clear recommendation to the participants to reach optimal goal to reduce sleep disturbance and improve sleep quality.

Furthermore, the study can be a guide for further studies for more detailed searching and analysis about the sleep quality post covid-19 infection and factors associated with its development since the subject still new and need more and more work to approve and virtually apply these results as a medical recommendation through universal health organization (WHO) and other local health institutions.

4.4 Weak points

In our study we face some weak points which considered as

limitations for evaluation of sleep quality and the most important one is an element of subjectivity because it depends one questionnaire

5. Conclusions and Recommendations

5.1 Conclusion

1. The results suggest that there was no persistent and significant sleep disturbance up to 3 months after recovery.
2. There was significant difference between groups with normal and abnormal sleep and body mass index.
3. Low scores of PSQI was noted in 65% of participants
4. There was no significant difference between groups with normal and abnormal sleep and gender.

5.2 Recommendations

The study recommended that:

1. To do more population based longitudinal studies to investigate psychological and neurobiological mechanisms of sleep disturbance.
2. To include large sample size in the next studies
3. To concentrate on those with high body mass index
4. To use different type of index for sleep assessments.
5. To provides healthcare professionals with opportunity to continue promoting health weight.

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