Original Research

Comparison Of Anxiety And Sleep Quality Of Operating Room Personnel Before And After Vaccination Of Covid-19

Bahareh Mahdood[1], Behzad Imani[2]*, Salman Khazaei[3]

1. M.Sc. Student, Department of Operating Room, Student Research Committee, Hamadan University of Medical Sciences, Hamadan, Iran. 0000-0002-7774-2294
2. Assistant professor, Department of Operating Room, School of Paramedicine, Hamadan University of Medical Sciences, Hamadan, Iran. 0000-0002-1544-8196
3. Assistant professor, PhD of Epidemiology, Research Center for Health Sciences Hamadan University of Medical Sciences, Hamadan, Iran. 0000-0001-5918-2310

***Corresponding Author: Behzad Imani,** Assistant professor, Department of Operating Room, School of Paramedicine, Hamadan University of Medical Sciences, Hamadan, Iran. E-mail: behzadiman@yahoo.com. Orcid: 0000-0002-1544-8196

Abstract:

Background:

Introduction: Coronavirus (COVID-19) is an infectious disease caused by SARS-CoV-2 (acute coronavirus-2 respiratory syndrome). In the Covid -19 pandemic, health care personnel have suffered from anxiety and poor sleep quality, but vaccinations can also have psychological effects.

Materials and Methods:

The present study is a descriptive-analytical study in which the sample size included 143 members of the surgical and anesthesia team who were working during the Covid -19 epidemic in referral centers for Covid-19 patients in Hamedan. The Spielberger Obvious Anxiety Questionnaire and the Petersburg Questionnaire were used to assess anxiety and staff sleep quality, respectively. Data were collected before vaccination and after the second dose Covid-19 vaccination. Then the information was evaluated in SPSS26 software.

Results:

In this study, 93 members of the surgical team and 53 members of the anesthesia team were recruited. In total, 27.1% of the personnel were vaccinated with sputnik vaccine, 32.7% with Astrazenca, 23.6% with Sinopharm, and 16.6% of the personnel were vaccinated with Covaxin. The results of paired t-test to assess the level of anxiety of the surgical and anesthesia staff showed a significant difference ($P<0.001$). Also, the results of paired t-test in the quality of personnel sleep quality were also significantly different ($P<0.001$). Overall, the level of anxiety and sleep quality of the surgical and anesthesia staff improved after covid-19 vaccination.

Conclusion:

The level of anxiety and sleep quality of the surgical and anesthesia staff improves after vaccination of covid-19. Also, vaccination can have psychological effects on anxiety and sleep quality.

Keywords: Anxiety , Sleep Quality , Operating room , Vaccination , Covid-19

Submitted: 17 September 2022, Revised: 28 October 2022 , Accepted: 20 November 2022

[Downloaded from mail.intjmi.com on 2026-11-19]

Introduction

Coronavirus (COVID-19) is an infectious disease caused by SARS-CoV-2 (Acute Coronavirus 2 Respiratory Syndrome)(1). Crises such as the worldwide epidemic of coronavirus cause a wide range of responses in individuals that affect their mental health and physical(2). Health care workers are in a vulnerable situation during the present pandemic(3). Also, operating room personnel who are in direct contact with patients infected with Covid-19, are at a greater risk for becoming infected(4). On the other hand, the risk of adverse psychological complications is particularly high among health care workers (3) and these workers face difficult conditions and receive limited personal protective equipment (PPE) against COVID-19 patients, which puts them at a greater risk for psychological problems including depression, anxiety, and insomnia (5). Fortunately, safe and effective vaccines are available today(6), which in addition to immunological efficacy can also result in psychological improvements on its recipients. On average, health care workers spend 16 hours each day caring for COVID-19 patients (7). Mental health problems affecting health care workers can vary by person and this highlights the impact of COVID-19 on health care workers. This epidemic is a challenging situation for health care workers (8) and it has led to mental health problems such as anxiety and insomnia (9). Also, due to the fact that surgical technologists, in addition to the challenging conditions caused by the Covid-19 pandemic, also suffer from stress and anxiety since they have to cope with stressful situations. On the other hand, personnel have been forced to take shorter but more frequent shifts during the outbreak of COVID-19 to reduce their high exposure in high-risk areas. However, increasing the number of shifts is associated with a decrease in sleep quality (10, 11). Since sleeping is vital to maintaining energy, sleep deprivation can have significant adverse effects on health care workers such as memory loss, sluggishness, low mood, irritability, and suicidal ideation (12). In addition, poor sleep quality negatively affects the quality and efficiency of care provided by health care workers (13, 14). Lim et al. showed that nurses with sleep disorders are likely to experience high levels of stress (15). Therefore, we decided to conduct a descriptive-analytical study to investigate the psychological effect of Covid-19 vaccination on anxiety and sleep quality of members of the surgical team and anesthesia team.

Materials and methods

Objective:

The aim of this study was to Comparison of anxiety and sleep quality of operating room personnel before and after vaccination of Covid-19.

Study design:

This study was conceived in March 2021 and ended in July 2021. In this cross-sectional study, the Spielberger questionnaire was used to assess the degree of overt anxiety and to assess the sleep quality of surgical and anesthesia staff. Also, the St. Petersburg Sleep Quality Questionnaire was used to assess the anxiety and sleep quality of surgical and anesthesia staff after Covid-19 vaccination. In this study, all personnel of the surgical and anesthesia team in Coivd-19 Central Hospitals were evaluated before vaccination and after the injection of the second dose of Covid-19 vaccine by two questionnaires of Spielberger and St. Petersburg

Sample and sampling method:

Our target population consisted of all surgical team personnel, including operating room staff and surgeons, and the anesthesia team, which included anesthesiologists and anesthesia technicians, who had been vaccinated with AstraZeneca, Sputnik V, Sinopharm, and Covaxin. Sampling was performed by available methods. The study population included 427

[Downloaded from mail.intjmi.com on 2026-11-19]

staff members of the surgery and anesthesia team, 143 of whom participated in this study. The sample size of our study included 93 members of the surgical team, including operating room staff and surgeons, and 53 members of the anesthesia team were included in the study, which included anesthesiologists and anesthesia technicians.

Data collection:

1) Spielberger Obvious Anxiety Assessment Questionnaire: The questionnaire includes 20 questions related to situational anxiety and 20 questions related to trait anxiety. The minimum score (20) means no anxiety and the maximum (80) means the highest level of anxiety. Scores 21-39 mean mild anxiety, scores 40-59 indicate moderate anxiety and scores 80-60 indicate severe anxiety. This questionnaire is standard and has universal validity and trust (16).

2) Petersburg Sleep Quality Assessment Questionnaire (PSQI): This questionnaire basically has 9 items. On the other hand, question 5 also includes 10 sub-items; the total number of questionnaire items includes 19 items. The questionnaire was scored in a 4-point Likert scale from 0 to 3 and has 7 subscales that include subjective sleep quality, sleep latency, sleep duration, and sleep efficiency. habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction (17).

Inclusion and exclusion criteria:

Staff with the following criteria were included in the study: No diagnosed mental illness, consent to participate in research and completion of informed written consent to participate in the study, no use of drugs and alcohol, and employment in general and specialized operating room wards. Exclusion criteria also included leaving the service for any reason during the study intervention, lack of motivation of the research unit to continue cooperation, use of drugs that affect anxiety or sleep, and incomplete completion of questionnaires.

Data analysis:

To analyze the questionnaire, descriptive statistics were used to examine quantitative information and chi-square test was used to analyze the relationship between anxiety and sleep quality of surgical and anesthesia staff with different types of Covid-19 vaccines in SPSS 26 software.

Ethical considerations:

This article is taken from the master's thesis approved by Hamadan University of Medical Sciences with design number: 140003252576 and ethics code: IR.UMSHA.REC.1400.194.

Results

In this study, 146 members of the surgery and anesthesia team were included in the study, of which 27.4% were men and 72.6% were women. 59.6% of these people were in the age range of 20 to 30 years and 27.4% and 13% of them were 31 to 40 years old and over 40 years old, respectively. Also, the highest work experience in these people is recorded in the category of less than five years with 52.1%. Among the vaccines injected into the study population were Sputnik (27.1%), AstraZeneca (32.7%), Sinopharm (23.6%) and Covaxin (16.6%). Paired t-test was used to evaluate the difference between the recorded scores of anxiety and sleep quality of surgical and anesthesia staff. The mean and standard deviation for anxiety before and after vaccination were 2.9 9. 9.7. Also, the result of paired t-test to evaluate anxiety before and after vaccination in the staff of the surgical team was calculated to be $P<0.001$, which showed a significant improvement in the study participants. The result of paired t-test showed a significant difference for the quality of sleep of personnel before and after vaccination ($P<0.001$); Also, the mean and standard deviation to evaluate the sleep quality of

[Downloaded from mail.intjmi.com on 2026-11-19]

surgical and anesthesia staff were calculated to be 8.6 ± 3.4.

Discussion

The results of this study shows that the level of anxiety as well as the quality of sleep of the surgical and anesthesia team personnel in the Covid-19 pandemic after the vaccination have improved and has had positive psychological effects. To date, studies have not clearly investigated the psychological effects of Covid-19 vaccination on health care personnel. Today, the Covid-19 pandemic, with its many impacts on the psychological and social activities of medical staff, has been able to affect their sleep quality and anxiety; On the other hand, vaccinations against Covid-19 have had positive psychological effects on personnel. Nurses who cared for COVID-19 patients for more than 1 month were quarantined for 2 weeks (18), which in turn affected staff anxiety and sleep quality. Zang et al. (2021) stated that psychosocial factors associated with COVID-19 related personnel mental health and poor relationship quality with family, including unknown origin, fear of infection, poor social support, poor quality couple relationship with parents and children are in touch. These nurses are more likely to be concerned about their personal and family health(18), which in turn affects their anxiety and sleep quality. It is also important to be acknowledged that these factors also existed before the current pandemic. Notably, our results demonstrated that vaccination against Covid-19 have had a positive impact of the mentioned factors. Burton et al. (2020) also stated that psychological factors affecting nurses' health can affect the quality of their clinical care (19). Therefore, it can be emphasized that vaccinations have hidden effects on the quality of clinical care. The fact that patients with SARS-CoV-2 are asymptomatic may be overlooked (20) and that nurses in hospitals or public places may be at risk for the infection (21). This issue has had a significant effect on increasing their anxiety and vaccination has been able to reduce their anxiety. Kane Ann-Wook et al. (2021) stated that despite less job stress among medical staff in the post-epidemic period, the likelihood of using the COVID-19 vaccine is reduced (22); However, contrary to this study, the results of our study show that the acceptance of the vaccine as a way to prevent this infection in all staff of the surgical and anesthesia team of the Covid-19 hospitals and also had positive psychological effects. Also, when implementing the vaccination program, more emphasis should be placed on the psychological components (22) because this leads to more acceptance of vaccination and it can highlight the psychological aspects of this issue and ultimately affect the quality of medical care. On the other hand, Madison et al. (2021) discussed the relationship between stress and vaccination and emphasized that stress, depression, loneliness, and poor health behaviors can disrupt the immune system response to vaccines (23); Therefore, it should be noted that the staff of the surgical and anesthesia team may be exposed to stressful conditions including surgical stress and other situations caused by the Covid-19 pandemic, even after vaccination, which can reduce the effectiveness of the vaccine and consequently it leads to stress. In addition, Miller et al. (2004) suggested that stress-induced sleep quality decline may also occur (24). Therefore, it can be concluded that these factors can interact with each other.

Limitations

Since there have been no studies to examine and discuss the relationship between sleep quality and staff anxiety before and after the Covid-19 vaccination in detail, the authors have attempted to discuss various aspects of this relationship with other subjects.

Conclusion

Our findings show that the level of anxiety and sleep quality of the surgical and anesthesia

[Downloaded from mail.intjmi.com on 2026-11-19]

team personnel before and after vaccination of Covid-19 were significantly improved and after vaccination their anxiety level decreased. Also, they experienced higher sleep quality. It is noteworthy that the level of anxiety, stress and sleep quality of personnel had a direct effect on the performance of Covid-19 vaccination and on the other hand, Covid-19 vaccination also had a psychological effect on the level of anxiety and sleep quality of surgical and anesthesia team members.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgment:

This study has been adapted from an MSc thesis at Hamadan University of Medical Sciences. The authors would like to thank the Research Committee of Hamadan University of Medical Sciences for approving and supporting this article.

References

1. Soleimani M, Merajikhah A. The risk of transmitting the coronavirus to the perioperative team through aerosols produced in the operating room bathrooms. Perioperative Care and Operating Room Management. 2021.
2. Bastami M, Monibi H, Shahamati E, Yazdanpanah A. The Impact of COVID-19 Pandemic on Quality of Life and Psychological Outcomes Associated Home Quarantine: A Narrative Study. Clinical Schizophrenia & Related Psychoses. 2022.
3. Rajkumar RP. COVID-19 and mental health: A review of the existing literature. Asian journal of psychiatry. 2020;52:102066.
4. Khah AMM, Khoozani AB. How to protect operating room staff from COVID-19? Perioperative care and operating room management. 2020;20:100114.
5. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA network open. 2020;3(3):e203976-e.
6. Voysey M, Clemens SAC, Madhi SA, Weckx LY, Folegatti PM, Aley PK, et al. Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK. The Lancet. 2021;397(10269):99-111.
7. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. Psychiatry research. 2020;288:112954.
8. Xiang Y-T, Yang Y, Li W, Zhang L, Zhang Q, Cheung T, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. The lancet psychiatry. 2020;7(3):228-9.
9. Johnson SU, Ebrahimi OV, Hoffart A. PTSD symptoms among health workers and public service providers during the COVID-19 outbreak. PloS one. 2020;15(10):e0241032.
10. Haile KK, Asnakew S, Waja T, Kerbih HB. Shift work sleep disorders and associated factors among nurses at federal government hospitals in Ethiopia: a cross-sectional study. BMJ open. 2019;9(8):e029802.
11. Behzad I, Maryam B. Musculoskeletal Disorders in Operating Room: A Phenomenological Study. Journal of Musculoskeletal Research. 2022;25(01):2150024.
12. Nena E, Katsaouni M, Steiropoulos P, Theodorou E, Constantinidis TC, Tripsianis G. Effect of shift work on sleep, health, and quality of life of health-care workers. Indian journal of occupational and environmental medicine. 2018;22(1):29.
13. Giorgi F, Mattei A, Notarnicola I, Petrucci C, Lancia L. Can sleep quality and burnout affect the job performance of shift-work nurses? A hospital cross-sectional

[Downloaded from mail.intjmi.com on 2026-11-19]

study. Journal of advanced nursing. 2018;74(3):698-708.
14. Park E, Lee HY, Park CSY. Association between sleep quality and nurse productivity among Korean clinical nurses. Journal of nursing management. 2018;26(8):1051-8.
15. Lim S, Han K, Cho H, Baek H. Shift-work nurses' work environments and health-promoting behaviours in relation to sleep disturbance: A cross-sectional secondary data analysis. Journal of clinical nursing. 2019;28(9-10):1538-45.
16. Fazlollahpour-Rokni F, Shorofi SA, Mousavinasab N, Ghafari R, Esmaeili R. The effect of inhalation aromatherapy with rose essential oil on the anxiety of patients undergoing coronary artery bypass graft surgery. Complementary therapies in clinical practice. 2019;34:201-7.
17. Szigethy E, Bujoreanu SI, Youk AO, Weisz J, Benhayon D, Fairclough D, et al. Randomized efficacy trial of two psychotherapies for depression in youth with inflammatory bowel disease. Journal of the American Academy of Child & Adolescent Psychiatry. 2014;53(7):726-35.
18. Zheng R, Zhou Y, Fu Y, Xiang Q, Cheng F, Chen H, et al. Prevalence and associated factors of depression and anxiety among nurses during the outbreak of COVID-19 in China: A cross-sectional study. International journal of nursing studies. 2021;114:103809.
19. Burton C, Fink P, Henningsen P, Löwe B, Rief W. Functional somatic disorders: discussion paper for a new common classification for research and clinical use. BMC medicine. 2020;18(1):1-7.
20. Qiu D, Li Y, Li L, He J, Ouyang F, Xiao S. Policies to improve the mental health of people influenced by COVID-19 in China: a scoping review. Frontiers in psychiatry. 2020;11:1431.
21. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. The lancet. 2020;395(10223):470-3.
22. Kwok KO, Li K-K, Wei WI, Tang A, Wong SYS, Lee SS. Influenza vaccine uptake, COVID-19 vaccination intention and vaccine hesitancy among nurses: A survey. International journal of nursing studies. 2021;114:103854.
23. Madison AA, Shrout MR, Renna ME, Kiecolt-Glaser JK. Psychological and behavioral predictors of vaccine efficacy: Considerations for COVID-19. Perspectives on Psychological Science. 2021;16(2):191-203.
24. Miller GE, Cohen S, Pressman S, Barkin A, Rabin BS, Treanor JJ. Psychological stress and antibody response to influenza vaccination: when is the critical period for stress, and how does it get inside the body? Psychosomatic medicine. 2004;66(2):215-23.

[Downloaded from mail.intjmi.com on 2026-11-19]

Tables

Table 1. Examination of the frequency of demographic information in the staff of the surgery and anesthesia team

Variable	Number	

		Surgical team	Anesthesia team	Total Percent
Gender	Male Female	27 66	13 40	27.4% 72.6%
Marital status	Single Married	44 49	19 34	43.2% 56.8%
Age	20 to 30 years 31 to 40 years Over 40 years	55 25 13	32 15 6	59.6% 27.4% 13%
work experience	Less than 5 years 5 to 10 years 11 to 20 years 21 to 30 years	51 26 6 10	25 17 5 6	52.1% 29.5% 7.5% 11%

Table 2: Frequency of vaccination among surgical and anesthesia team personnel

OR personals Type of vaccination	Surgical team		Anesthesia team		Total Percent	
	No	Percent	No	Percent	No	Percent
Sputnik	24	25.8%	15	28.3%	39	27.1%
AstraZeneca	27	29%	19	35.8%	46	32.7%
Sinopharm	25	26.9%	11	20.8%	36	23.6%
Covaxin	17	18.3%	8	15.1%	25	16.6%

Table 3: Results of paired t-test, anxiety level and sleep quality before and after vaccination

Variable		Mean ± SD	P Value
Anxiety	Before vaccination	9.7 ± 2.9	< 0.001
	After vaccination		
Sleep quality	Before vaccination	8.6 ± 3.4	< 0.001
	After vaccination		

[Downloaded from mail.intjmi.com on 2026-11-19]