

Assessment of the Working Environment of a Specialized Hospital for the Treatment of COVID-19

Bakhriddin Nurmatov¹, Bakhodir Rakhimov², Sardor Fayziboev³

¹Researcher, Assistant, Tashkent Medical Academy, Uzbekistan

²Dsc., Assistant Professor, Tashkent Medical Academy, Uzbekistan

³Master's Student, Tashkent Medical Academy, Uzbekistan

Abstract The aim of this study is to examine the working conditions of medical personnel responsible for treating and caring for COVID-19 patients and, subsequently, to propose measures to safeguard their health. The survey encompassed 75 hospital employees specializing in COVID-19 treatment, representing at least 15% of the total staff. Through this survey, the medical staff identified high-risk scenarios for contracting the disease and developed strategies to mitigate these risks and protect their health.

Keywords COVID-19, Labor process, Working conditions, Workers' health, Questionnaires

1. Introduction

According to the guide "Guidance on Preparing Workplaces for COVID-19" [1,2,5] developed by the United States Occupational Safety and Health Administration (OSHA), the classification of the effects of SARS-CoV-2 on workers was developed and divided into very high, high, medium, and low levels. The highest level of this classification includes doctors, nurses, dentists, paramedics, emergency medicine doctors, laboratory workers, and specialists in pathological anatomy. According to scientific and research works, medical workers who worked during the pandemic were in the 3rd class of harmful and dangerous factors of the working environment, with a rating of not less than 3.3 [4]. Another study described the negative impact of the COVID-19 pandemic on the mental well-being of medical workers, resulting in depression, anxiety, and stress. It concluded that the COVID-19 pandemic significantly contributed to depression, anxiety, and stress among medical workers [2,3].

2. Research Objective

The main aim of this research work is to study the working conditions of medical workers who treat and care for patients infected with COVID-19.

3. Object and Subject of the Research

The research work was carried out at Zangiota No. 2

hospital, a medical institution specializing in the treatment of patients infected with COVID-19 in the city of Tashkent. The study involved a sanitary-hygienic assessment of treatment conditions within the hospital, focusing on key areas such as reception, wards, intensive care units, and sorting areas.

4. The Main Section

Anonymous questionnaires were used to study and evaluate the health of employees during the investigation of indoor air and surface contamination in the hospital specializing in the treatment of COVID-19. These questionnaires also aimed to assess the hygienic factors of the hospital's indoor air. At least 15% of the total number of employees participated in the surveys, totaling 75 employees.

According to questionnaire, 34 (43.5%) men and 41 (54.7%) women participated in the survey. In terms of age groups, 14 (18.7%) were aged 18-24, 37 (49.3%) were aged 25-34, 22 (29.3%) were aged 35-44, and 2 (2.7%) were aged 45-54. Regarding marital status, 14 (18.7%) were unmarried, 60 (80%) were married, and 1 (1.3%) was divorced. It was found that 39 (52%) of the respondents have a higher education and 36 (48%) have secondary education. In terms of length of service, 51 (68%) have 1-10 years of experience, 22 (29.3%) have 11-20 years, and 2 (2.7%) have 21 or more years. Regarding job types of medical workers, 37 (49.3%) are treating doctors, 12 (16%) are nurses, 3 (4%) are receptionists (support staff), 9 (12%) are laboratory workers, and 2 are other staff (including roles in activities such as X-ray/radiology and sanitation). 75 staff members surveyed, 25 (33.3%) worked in the outpatient department, 31 (41.3%) in the intensive care unit, 11 (14.7%) in reception, and 1 (1.3%) as sanitation workers.

The next section of the questionnaire focused on assessing the impact of COVID-19 on the health of medical workers at Zangiota Hospital No. 2, specializing in the treatment of COVID-19 patients (Table 1). It was found that during the study period, 16 (21.3%) hospital employees contracted COVID-19, while 59 (78.7%) did not. Regarding exposure, 58 (77.3%) had direct contact (within 1 meter) with a COVID-19-infected patient, 6 (8%) did not have such contact, and 11 (14.7%) were unsure. Similarly, 58 (77.3%) reported direct contact with a surface contaminated with COVID-19, while 6 (8%) did not have contact within 1 meter, and 11 (14.7%) were unsure.

Table 1. Assessment of the impact of COVID-19 on the health of medical staff working at Zangiota hospital No. 2, specializing in the treatment of patients infected with COVID-19 (N=75)

Status of impact of COVID-19 on the health of medical workers		Number	Percentage
Have you ever had COVID-19?	Yes	16	21,3
	No	59	78,7
	Unknown	0	0
Have you had direct (1 meter) contact with a patient with COVID-19?	Yes	58	77,3
	No	6	8,0
	Unknown	11	14,7
Have you had direct contact with a surface infected with COVID-19?	Yes	58	77,3
	No	6	8,0
	Unknown	11	14,7
Have you ever been involved in an aerosol-generating process?	Yes	32	42,6
	No	43	57,7
Have you had accidental contact with biological fluid/respiratory secretions?	Yes	12	16,0
	No	47	62,7
	Unknown	16	21,3

To analyze the risk of COVID-19 transmission among doctors during their work processes, we investigated their involvement in aerosol-generating procedures. Out of 75 employees surveyed, 32 (42.6%) answered "Yes," while 43 (57.3%) answered "No." Additionally, 12 (16%) employees indicated "Yes," and 47 (62.7%) answered "No." Moreover, 16 (21.3%) employees responded with "Unknown." According to research conducted by global scientists, the use of personal protective equipment (PPE) by medical staff at Zangiota Hospital No. 2, specializing in COVID-19 patient treatment, is crucial in mitigating COVID-19 transmission risks, as shown in Table 2.

Out of a total of 75 workers, 66 (88%) used personal protective equipment (PPE) during aerosol-generating procedures (AGP) while caring for patients with COVID-19, while the remaining 9 (12%) did not use PPE. Additionally, 73 (97.3%) staff used PPE when interacting with COVID-19 patients, with 2 (2.7%) not using PPE. Regarding mask replacement when wet, 73 (97.3%) employees answered "Yes," and 2 (2.7%) answered "No." For disposing of wet PPE in the waste bin, 74 (98.7%)

employees answered "Yes," and 1 (1.3%) answered "No." Furthermore, 74 (98.7%) employees practiced hand hygiene after removing PPE, while 1 (1.3%) did not. Regarding COVID-19 training, 47 (62.7%) of the 75 employees who tested positive for COVID-19 received training (in-service or online), while 27 (36.0%) did not, and 1 (1.3%) was uncertain.

Table 2. Assessment of the use of personal protective equipment by medical staff working at Zangiota Hospital No. 2, specializing in the treatment of patients infected with COVID-19 (N=75)

Indicators of personal protective equipment use		Number	Percentage
Did you use personal protective equipment (PPE) during aerosol-generating procedures while caring for a patient with COVID-19?	Yes	66	88,0
	No	9	12,0
Have you used PPE when interacting with a patient with COVID-19?	Yes	73	97,3
	No	2	2,7
If your mask gets wet, do you remove and change your mask?	Yes	73	97,3
	No	2	2,7
Do you dispose of wet PPE in the waste bin?	Yes	74	98,7
	No	1	1,3
Do you practice hand hygiene after removing PPE?	Yes	74	98,7
	No	1	1,3
Have you received any COVID-19 training (in-service, online)?	Yes	47	62,7
	No	27	36,0
	Unknown	1	1,3

According to Table 3, we aimed to assess the utilization of personal protective equipment components during interactions with patients at Zangiota Hospital No. 2, specializing in COVID-19 treatment. Given the epidemiologically contagious nature of COVID-19, it was mandatory for all staff to consistently use PPE during the pandemic. Based on questionnaire results, the use of PPE components during interactions with COVID-19 patients varied: always (50%-95% of the time), sometimes (20%-50% of the time), rarely (less than 20% of the time), and occasionally "I do not know."

Thus, it can be concluded that employees were at risk of contracting COVID-19 infection during their work. According to Table 4, cases with a high risk of contracting the disease were identified through questionnaires administered to hospital staff specializing in the treatment of COVID-19 patients.

Using questionnaires, medical staff specializing in the treatment of COVID-19 patients identified high-risk conditions for contracting the disease, such as age groups of staff, educational background, department where medical staff work, adherence to PPE usage during procedures, COVID-19 training, and direct face-to-face contact with patients within 1 meter. These factors play a crucial role in protecting their health. Prioritizing employee health in terms of protection can reduce illness among staff and prevent disabilities.

Table 3. Assessment of the utilization of personal protective equipment components during interactions with patients at Zangiota Hospital No. 2, specializing in the treatment of patients infected with COVID-19 (N=75)

Elements of personal protective equipment	Always (uptime 95% and above)	Always (uptime 50%-95%)	Sometimes (working time 20%-50%)	Rarely (workflow 20% or less)	Unknown
Protective gloves	61 (81,3)	12 (16,0)	1 (1,3)	0 (0)	1 (1,3)
N95 protective mask	27 (36)	40 (53,3)	7 (9,3)	0 (0)	1 (1,3)
Face shield or safety glasses	24 (32)	43 (57,3)	7 (9,3)	1 (1,3)	0 (0)
Disposable gown (overall)	43 (57,3)	26 (34,7)	4 (5,3)	1 (1,3)	0 (0)
Waterproof apron	19 (25,3)	22 (29,3)	29 (38,7)	5 (6,7)	0 (0)
COVID-19 after contact with another patient	45 (60)	27 (36)	3 (4)	0 (0)	0 (0)
After cleaning or aseptic process	19 (25,3)	47 (62,7)	9 (12)	0 (0)	0 (0)
After exposure to the patient's body or biological fluid	24 (32)	37 (49,3)	10 (13,3)	1 (1,3)	3 (4)
After contact with the surfaces of the patient with COVID-19	17 (22,7)	42 (56)	12 (16)	3 (4)	1 (1,3)
Decontamination of high contact surfaces	25 (33,3)	37 (49,3)	11 (14,7)	1 (1,3)	1 (1,3)

Table 4

Variables	Crude odds ratio*	CI = 95%	P
Sex	1,269	,420 - 3,838	,673
Age groups	2,345	1,032 - 5,330	,042
Information	4,375	1,260 - 15,196	,020
Work experience	4,004	,868 - 18,481	,075
Department where a medical officer works	,717	,535 - ,961	,026
Did you use personal protective equipment during the aerosol generation process (AGP) when caring for a patient with COVID-19?	6,250	1,443 - 27,061	,014
Have you used PPE when interacting with a patient with COVID-19?	,564	,273 - 1,168	,123
Did you practice hand hygiene after removing the IUD?	,000	,000	,999
Have you received any COVID-19 training (in-service, online)?	,116	,032 - ,416	,001
Have you had face-to-face (within 1 meter) contact with a COVID-19 patient?	,362	,181 - ,723	,004

P<0.05 - there is a relationship between the variable and the influencing factor; P>0.05 - there is a relationship between the variable and the influencing factor; * Crude Odds Ratio represents the probability of an outcome given a certain effect; CI = 95% - confidence interval, P-Value - confidence level.

5. Conclusions

Through questionnaires, hospital staff specializing in the treatment of COVID-19 patients identified high-risk conditions for contracting the disease. These include age groups of staff, education level, department where medical staff work, proximity to patients, adherence to PPE usage during medical procedures, completion of COVID-19 training, and face-to-face contact with patients within 1 meter. Addressing these factors is crucial for protecting employee health, reducing illness among staff, and preventing disabilities.

REFERENCES

- [1] Grebenkov, V., Batov, V. E., Kuznetsov, S. M. (2021). Assessment of working conditions for medical workers of military medical organizations during the pandemic of a new coronavirus infection. Medico-biological and socio-psychological problems of safety in emergency situations, No. 3, 35-40.
- [2] Alhourri. A., Abu Shokor. M., Marwa. K., Sharabi. A., Mohammad Nazir Arrouk. D., Al Hourri. F. N., Al Hourri. H. COVID-19 and Its Impact on Healthcare Workers: Understanding Stigma, Stress, and Quality of Life. Cureus, (2023). 15(4), e37846. <https://doi.org/10.7759/cureus.37846>.
- [3] Bielicki. Julia. A et al. "Monitoring approaches for health-care

workers during the COVID-19 pandemic.” *The Lancet. Infectious diseases* vol. 20.10 (2020): e261-e267. doi:10.1016/S1473-3099(20)30458-8.

- [4] Ng.K., Poon.B., H., Kiat. Puar.H., Shan Quah. J. L., Loh. W. J., Wong, Y. J., Tan.T. Y., Raghuram. J. COVID-19 and the Risk to Health Care Workers: A Case Report. *Annals of internal*

medicine, (2020) 172 (11), 766–767.
<https://doi.org/10.7326/L20-0175>.

- [5] U.S. Department of Labor Occupational Safety and Health Administration OSHA 3990-03 2020 Guidance on Preparing Workplaces for COVID-19 ([osha.gov](https://www.osha.gov)).