

Original Article

Awareness and Knowledge of COVID-19 Among Health Care Workers in Early Phase of COVID-19 Pandemic

Serap Argun Barış¹, Emine Ünal Evren², Hakan Evren², Ece Şahinoğlu¹, Gözde Selvi¹, Haşim Boyacı¹, İlknur Başyigit¹, Füsün Yıldız³

¹Department of Pulmonary Disease, Kocaeli University Faculty of Medicine, Kocaeli, Turkey

²Department of Infectious Diseases and Clinical Microbiology, University of Kyrenia, Dr. Suat Günsel Hospital, Kyrenia, Turkish Republic of Northern Cyprus

³Department of Pulmonary Disease, University of Kyrenia, Dr. Suat Günsel Hospital, Kyrenia, Turkish Republic of Northern Cyprus

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Abstract

OBJECTIVE: The study aims to evaluate the awareness and knowledge of COVID-19 among healthcare workers.

MATERIAL AND METHODS: A questionnaire was applied to healthcare workers working at Kocaeli University Faculty of Medicine and University of Kyrenia, Dr. Suat Günsel Hospital, to evaluate the coronavirus disease 2019 awareness and level of knowledge.

RESULTS: A total of 598 healthcare workers participated in the study. Two-thirds of the respondents were from Turkey, while one-third were from the Turkish Republic of Northern Cyprus. The general symptoms of coronavirus disease 2019 were well known in the general population. Awareness of most symptoms was significantly lower in the Turkish Republic of Northern Cyprus group. It was well known that coronavirus disease 2019 can be asymptomatic in some patients and it can be contagious. The necessity of wearing surgical masks on sick individuals was less known in the Turkish Republic of Northern Cyprus group (96.6% vs 61.6%; $P = .000$). While handwashing was found similar in both groups for protection from coronavirus disease 2019 transmission, social distance and mask recommendations were lower in the Turkish Republic of Northern Cyprus group ($P < .05$). The concern about transmitting the virus to themselves and their relatives was more significant in the Turkish Republic of Northern Cyprus group than the Turkey group (84.4% vs 96.5%; $P = .000$). And 92.2% of the healthcare workers thought they should stay in an alternative place instead of their homes.

CONCLUSION: The awareness and knowledge level of coronavirus disease 2019 is higher in Turkey than in Turkish Republic of Northern Cyprus related to the increased number of coronavirus disease 2019 cases in Turkey. Continuous education programs can contribute to improving the level of knowledge and reducing anxiety.

KEYWORDS: Awareness, COVID-19, healthcare workers, knowledge

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INTRODUCTION

The coronavirus disease 2019 (COVID-19) was first described in Wuhan, China, at the end of December in 2019 and was found responsible for the worldwide outbreak.¹ Frequently detected symptoms are fever, cough, fatigue, myalgia, and shortness of breath. Patients with severe disease may develop acute respiratory distress syndrome, septic shock, and coagulopathy.^{2,3} The absence of approved treatment modalities or vaccination against COVID-19 necessitates taking strict precautions to prevent the virus from spreading.⁴ Healthcare workers (HCWs) are closely in contact with the patients. In addition to having an increased risk of developing COVID-19, HCWs are also an essential resource for spreading the virus. World Health Organization (WHO) and Centers for Disease Control and Prevention had broadcasted some recommendations to prevent HCWs from COVID-19 infection.^{5,6} Lack of knowledge, awareness, and attitude in HCWs may cause under-diagnosis delayed treatment and rapid spreading of the virus. Our study aims to evaluate the level of knowledge and understanding of HCWs about COVID-19 infection and discover information sources during the pandemic era.

MATERIAL AND METHODS

This study was conducted in both Dr. Suat Günsel Kyrenia University and Kocaeli University Faculty of Medicine in the early phase (March 2020 to June 2020) of the COVID-19 pandemic. Volunteer HCWs, including doctors, nurses, hospital personnel, technicians, and managers, were recruited to study. Participants who were informed about the study and gave written consent were asked to fill out a questionnaire. This questionnaire consisted of questions assessing knowledge (symptoms, transmission routes, clinical effects, and prevention) and awareness about COVID-19 infection. It was a non-validated questionnaire, but the physicians of both institutions prepared it according to COVID-19 Guidelines of the WHO and Turkish Ministry of Health.⁵⁻⁷ Verbal/written informed consent was obtained from the participants who agreed to take part in the study. The current study was conducted following the Declaration of Helsinki, and it was approved by Kocaeli University Non-Interventional Research Ethics Committee (No: 2020/180).

Corresponding author: Hakan Evren, e-mail: hakan.evren@med.kyrenia.edu.tr

Table 1. Demographic Characteristics of the Participants

	TR, n = 400		TRNC, n = 198		P
	n	%	n	%	
Gender					
Women	139	34.8	61	30.8	.3
Men	261	65.2	137	69.2	
Age					
18-25	39	9.9	24	12.1	
26-35	245	62.5	108	54.5	.004
36-45	75	19.1	32	16.2	
46-55	33	8.4	29	14.6	
56-65	0	0	4	2	
>65	0	0	1	0.5	
Residence					
Rural	12	3.1	21	10.6	.000
Urban	372	96.9	177	89.4	
Marital status					
Married	208	53.3	98	49.5	.5
Single	175	44.9	94	47.5	
Divorced	7	1.8	6	3	
Education					
Primary school	8	2.1	11	5.5	.000
Middle school	12	3	9	4.5	
High school	31	7.8	40	20.2	
University	237	59.7	101	51	
Master/doctorate	109	27.5	37	18.7	
Have you had a COVID-19 infection?					
Yes	21	5.3	0	0	.001
Has anyone of your relatives had COVID-19?					
Yes	81	20.5	2	1	.000

A *P* value of <0.05 was considered statistically significant.
TR, Turkey; TRNC, Turkish Republic of Northern Cyprus.

Statistical Analysis

The Statistical Package for Social Sciences version 20.0 software (IBM Corp.; Armonk, NY, USA). Categorical variables were expressed as counts (percentage). Continuous variables were expressed as median or mean \pm standard

deviation (SD). Mann–Whitney *U* test was used for comparison of continuous variables. Comparisons of categorical variables between the groups were performed using the chi-square test. A two-sided *P*-value <.05 was considered statistically significant.

MAIN POINTS

- The knowledge and awareness of the coronavirus disease 2019 (COVID-19) can be different among different countries.
- There is a gap of knowledge and awareness about symptoms and transmission routes of COVID-19 in healthcare workers.
- There is a deep concern about transmitting the virus to themselves and their relatives in healthcare workers.
- Training seminars and experience sharing can contribute to increasing the level of knowledge and reducing anxiety.

RESULTS

This study included 598 healthcare workers, 200 men (33.4%), and 398 women (66.6%). The average working time in the institution was 5.3 ± 5.5 years. Two-thirds of the HCWs were from Turkey, while one-third of them from Turkish Republic of Northern Cyprus (TRNC). The demographic characteristics of the groups were shown in Table 1. Twenty-one of the HCWs (3.5%) had a history of COVID-19 in themselves and 83 (14%) in their relatives. None of the HCWs in TRNC had a history of COVID-19 (*P* = .001), and the history of having COVID-19 in their relatives was significantly lower than the Turkey (TR) group (*P* = .000).

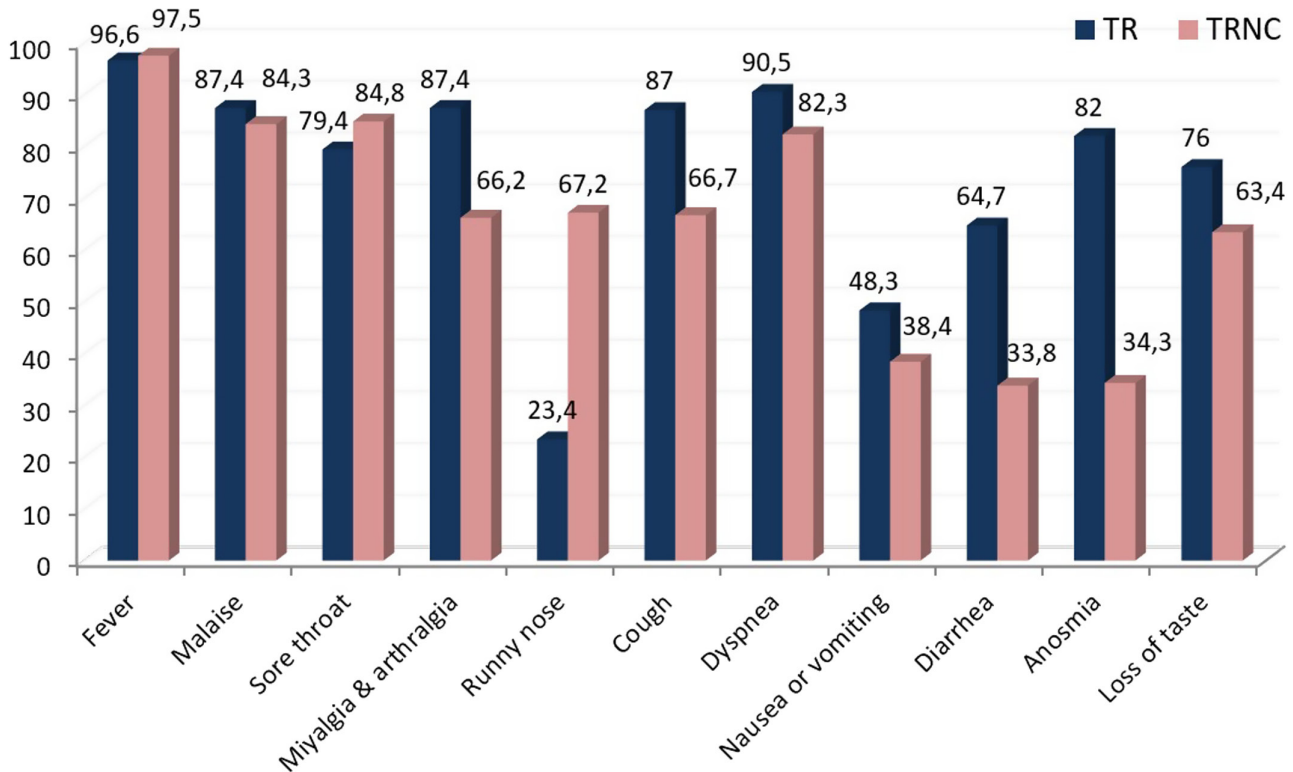


Figure 1. Symptoms of COVID-19. TR, Turkey; TRNC, Turkish Republic of Northern Cyprus.

The most frequently used sources of information on COVID-19 were television (80.4%), hospital training seminars (51.5%), and webinars (30.2%). Although the general symptoms of COVID-19, such as fever, malaise, myalgia and arthralgia, and respiratory symptoms, are well known in the general population, its gastrointestinal effects, effects on taste, and smell were not fully understood. Furthermore, awareness of most symptoms was significantly lower in the TRNC group (Figure 1).

Among the whole study population, it was well known that COVID-19 is transmitted by droplets (93.6%). However, 111 (21.1%) of all participants thought that COVID-19 could be transmitted sexually and 80 (15.4%) that it could be transmitted by blood. The thoughts about the transmission routes of the COVID-19 virus according to groups were shown in Figure 2.

It was well known that COVID-19 can be asymptomatic in some patients (94.4%); these patients can be contagious even they are asymptomatic (96.9%). Coronavirus disease 2019 can affect both lungs and other organs (92.9%). Old age and chronic diseases might be related to the more severe clinical course (96.8%). The comparison of knowledge about the general characteristics of the COVID-19 infection among the groups is shown in Table 2.

While handwashing was found similar in both groups for protection from COVID-19 transmission, social distance and mask recommendations were found to be lower in the TRNC group ($P < .05$) (Figure 3). The ideas of the HCWs about protective precautions and concerns are shown in Table 3. The necessity of wearing surgical masks on sick individuals was less known in the TRNC group (96.6% vs 61.6%; $P = .000$).

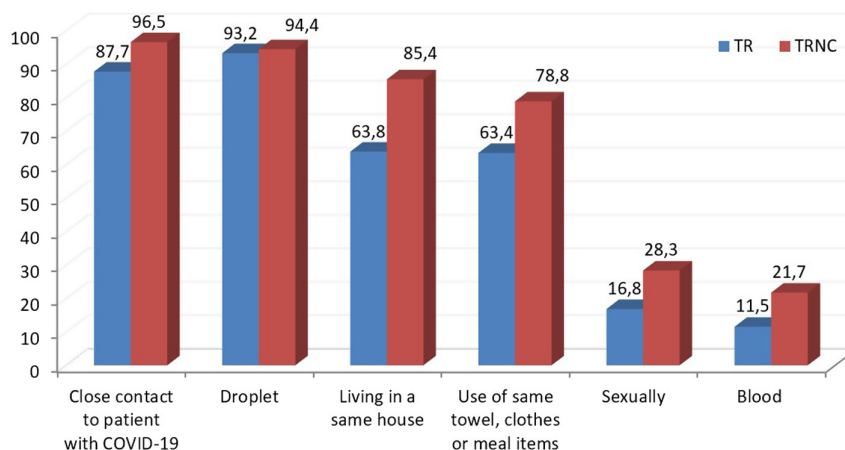


Figure 2. Transmission routes of COVID-19. TR, Turkey; TRNC, Turkish Republic of Northern Cyprus.

Table 2. The Knowledge of HCWs About the General Characteristics of the COVID-19 Infection

About COVID-19 Infection	Answers	TR %	TRNC %	P
It may be asymptomatic	Yes	96.2	90.9	.003
	No	0.8	5.1	
	No idea	3.1	4	
Patients are contagious even if they are asymptomatic	Yes	97.2	96.5	.8
	No	1.5	1.5	
	No idea	1.3	2	
It may affect both lungs and other organs	Yes	91.8	94.9	.3
	No	2.6	2	
	No idea	5.6	3	
It is more severe in patients of older age and chronic diseases	Yes	97.7	94.9	.2
	No	1.5	2.5	
	No idea	0.8	2.5	
Smokers are more vulnerable to the adverse outcomes of the virus	Yes	88.2	87.4	.04
	No	4.9	1.5	
	No idea	6.9	11.1	
The incubation period of the virus is 2-14 days	Yes	92.5	88.9	.3
	No	1.3	1.5	
	No idea	6.2	9.6	
There is an effective treatment and vaccination of COVID-19	Yes	3.8	1	.09
	No	86.2	86.1	
	No idea	10	13.1	
What should be the ideal hand washing time for protection?	1 minute	23.4	10.6	.001
	20-30 seconds	76.3	89.4	
	10 seconds	0.3	0	

A P value of <0.05 was considered statistically significant.
TR, Turkey; TRNC, Turkish Republic of Northern Cyprus.

There was a deep concern about the transmission of the virus to themselves (88.5%) and their relatives (96.8%). This concern was higher in the TRNC group (84.4% vs 96.5%; $P = .000$), and 92.2% of the HCWs thought they should stay in an alternative place instead of their homes.

DISCUSSION

Since March 2020, when the outbreak was declared a pandemic by the WHO,^{8,9} COVID-19 has been the main topic of discussion among the public, particularly among HCWs. As there is a

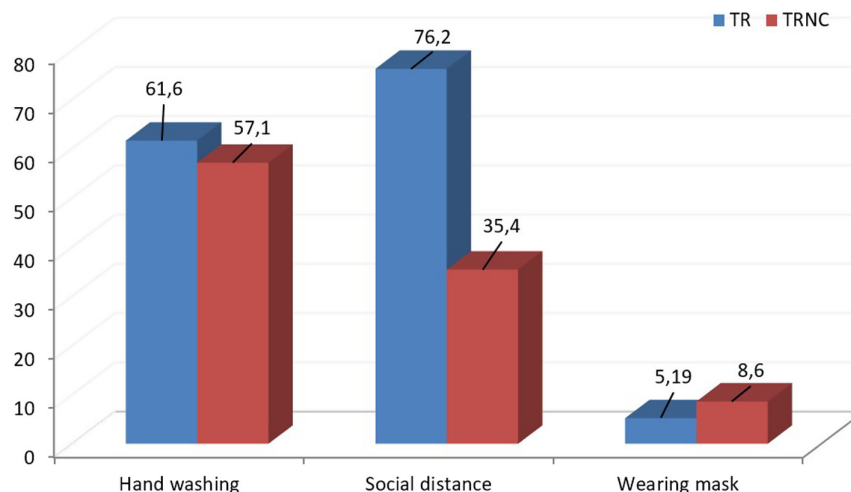


Figure 3. Protective precautions for transmission of COVID-19. TR, Turkey; TRNC, Turkish Republic of Northern Cyprus.

Table 3. Knowledge of Protective Precautions for COVID-19 Infection and Concerns About Transmission Risk

		TR %	TRNC %	P
I have a concern about the transmission risk of COVID-19 to myself	Agree	84.4	96.5	.000
	Uncertain	5.9	1.5	
	Not agree	9.7	2	
I have a concern about transmission of COVID-19 to my relatives	Agree	95.6	99	.09
	Uncertain	2.1	0.5	
	Not agree	2.3	0.5	
HCWs should stay in an alternative place instead of their homes during the pandemic	Agree	90	96.5	.02
	Uncertain	7.4	3	
	Not agree	2.6	0.5	
Patients with COVID-19 infection should wear a surgical mask	Agree	96.7	61.6	.000
	Uncertain	1.8	33.8	
	Not agree	1.5	4.5	
It is sufficient to wear a surgical mask for protection in HCWs	Agree	23	27.8	.000
	Uncertain	30.3	6.1	
	Not agree	46.7	66.2	
Ventilation of the room is important for reducing contamination	Agree	98.5	91.4	.000
	Uncertain	1	8.1	
	Not agree	0.5	0.5	
Washing hands with soap and water has the same effect as hand antiseptics	Agree	62.6	75.3	.000
	Uncertain	17.9	17.7	
	Not agree	19.5	7.1	
Do you believe the pandemic will end in the coming months?	Agree	14	6.6	.000
	Uncertain	64.5	86.3	
	Not agree	21.5	7.1	

A P value of <0.05 was considered statistically significant.

TR, Turkey; TRNC, Turkish Republic of Northern Cyprus; HCW, healthcare worker.

wide range of unverified and deceptive information available on the internet, the present study was designed to assess and compare the knowledge and perceptions about COVID-19 among HCWs in 2 different university hospitals in 2 other countries.

Coronavirus disease 2019 is a disease with a broad spectrum ranging from asymptomatic infection to acute respiratory distress syndrome and death. It may cause constitutional symptoms such as fever, sore throat, myalgia, malaise, respiratory symptoms (cough and shortness of breath), and gastrointestinal symptoms (nausea, vomiting, and diarrhea).¹⁰ Anosmia and loss of taste are also symptoms of the COVID-19 infection.¹¹ Our study revealed that most study participants in Kyrenia (TRNC) and Kocaeli (Turkey) University hospitals were well aware and had general knowledge about COVID-19 except for its gastrointestinal symptoms and effects on taste and smell. The awareness of anosmia and loss of taste were lower in the Kyrenia group compared to the Kocaeli group. Similar to our study, the understanding of anosmia and loss of taste was relatively low compared to other symptoms of COVID-19 infection in HCWs in Saudi Arabia.¹² On the other hand, awareness of most symptoms was significantly lower in the Kyrenia group. It might be related to a lower number of COVID-19 cases in TRNC during the study period.

The primary mechanism in transmitting the severe acute respiratory syndrome coronavirus-2 virus, responsible for COVID-19 infection, is respiratory droplets and indirect contact with the infected person.¹³ Generally, most participants had good knowledge about the general characteristics of COVID-19 disease and its routes of transmission. Still, nearly one-fifth of all participants thought that the infection could be transmitted sexually and 15.4% of them via blood. Similar to our results, 18% of the HCWs reported that COVID-19 could be transmitted by blood in Rabbani et al's¹⁴ study.

Handwashing, wearing a mask, and physical distancing are essential compounds of protection from COVID-19 infection. Wearing a mask is related to a considerable reduction in the risk of disease. The physical distancing of 1 m or more is related to adequate protection, and protection is increased as the distance is lengthened.¹⁵ The necessity of wearing a surgical mask on sick individuals was less known in the Kyrenia group. Although the knowledge regarding handwashing was found excellent and similar in both groups for the protection of COVID-19, social distancing and mask recommendation were found to be lower in the Kyrenia group.

Turkish Republic of Northern Cyprus is a defection-dependent republic with a population of 350 000, located in the Eastern Mediterranean. After the first case of COVID-19 identified on March 2020, a combination of precautions taken on time by the country's council of ministers depending on a science boards decisions helped TRNC successfully control the first wave of the pandemic, and the country became COVID-free for about 2.5 months.¹⁶ When the study was conducted, TRNC was easing its preventive measures to re-open its economy regarding the significant decline in COVID-19 cases. We believe that the difference in the awareness and knowledge level in both hospitals may be related to the increased number of COVID-19 cases in Turkey.

A finding of possible concern is that more than 80% of HCWs used television and social media as a source of information. It is unfortunate because the vast majority of the information available through the internet is unverified and deceptive information that can misguide HCWs. As the pandemic keeps going dynamically with the currently circulating variants and vaccines rolling out, an important question arises regarding managing mass media information to help HCWs.

High rates of anxiety and depression and fear of being infected have been reported in HCWs in recent studies.^{17,18} Furthermore, the fear of transmitting the virus to the family has been reported as the most critical stress factor in HCWs.¹⁹ The majority of HCWs in our study also had a very high level of concern about getting infected themselves and transmitting the virus to their relatives. This concern was also more profound in the TRNC group than TR, which may be related to the perception of limited resources of trained staff and equipment in the island to manage COVID-19. Furthermore, in the early phase of the COVID-19 pandemic, the rate of those who said "No" to the question "Do you think the pandemic will end in the next months?" was 64.5% in Kocaeli group and 86.3% in Kyrenia. Although this answer was thought to be related to the high anxiety of HCWs, the continuing pandemic justified this idea.

Health care professionals are frontline workers at high risk because of prolonged and repeated exposure to COVID-19 patients. Besides, HCWs work in a team where physical distancing is not usually possible.²⁰ Lack of knowledge and misunderstanding among HCWs has been related to poor management of COVID-19 patients.²¹⁻²³ Therefore, HCWs must use scientific and authentic content as information sources.

There are some limitations of our study. Firstly, this study was conducted among the HCWs in university hospitals with good access to continuous medical education and webinars. So the results might not be generalized to other health care facilities like rural public hospitals. Secondly, only the awareness and knowledge were assessed, not practices. Besides, countries were facing the first wave of the pandemic during the time our study was being conducted. Since the survey was conducted in the early phase of the pandemic, the unknowns about this mysterious virus were more than we knew. Therefore, these data may not reflect the current level of knowledge and awareness in the first year of the pandemic.

In conclusion, the awareness and knowledge level of COVID-19 is higher in Kocaeli than in Kyrenia, related to the increased number of COVID-19 cases in Turkey. There is a deep concern about the contamination of the virus in both groups. It is suggested that arrangements of training seminars and experience sharing can contribute to increasing the level of knowledge and reducing anxiety.

Ethics Committee Approval: The study was approved by the medical ethics committee of Kocaeli University (Approval No: 2020/180).

Informed Consent: Written informed consent was obtained from the patients who agreed to take part in the study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – S.A.B., F.Y., E.Ü.E., H.E.; Design – S.A.B., F.Y., E.Ü.E., H.E.; Supervision – S.A.B., F.Y., E.Ü.E., H.E., İ.B., H.B.; Resources – S.A.B., F.Y., E.Ü.E., H.E.; İ.B., H.B.; Materials – S.A.B., F.Y., E.Ü.E., H.E., E.Ş., G.S.; Data Collection and/or Processing – E.Ü.E., H.E., E.Ş., G.S.; Analysis and/or Interpretation – S.A.B., İ.B., F.Y.; Literature Search – S.A.B., E.Ü.E., H.E., E.Ş., G.S.; Writing Manuscript – S.A.B., E.Ü.E., H.E., E.Ş.; Critical Review – S.A.B., İ.B., E.Ü.E., H.E., H.B., F.Y.

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