INTRODUCTION

Coronaviruses (CoV) are enveloped RNA viruses that cause respiratory, enterohepatic and neurological diseases in humans, other mammals, and birds. Although these viruses are often encountered as causes of simple flu and colds, they sometimes cause serious illness and death. Middle East Respiratory Syndrome (MERS) which led to many deaths in Saudi Arabia and other Middle Eastern countries in 2010 and is thought to spread from camels, and severe acute respiratory syndrome (SARS) which affected millions of people and led to deaths in the Far East from 2002 to 2003 are different subtypes of CoV.2,3 Recently, CoV appeared...
in Wuhan, China in December 2019, and has led to a global pandemic. The disease causing the pandemic has been named the new coronavirus disease 2019 (COVID-19). Data dated 06.06.2020 released from the World Health Organization (WHO) indicated that the confirmed number of COVID-19 patients worldwide was 6 644 011, and the number of people who lost their lives to COVID-19 was 391 839.\(^4\)

COVID-19 can infect people through air born transmission as tiny droplets suspended in the air produced when someone sneezes or coughs. The virus can also spread through objects or surfaces being touched by infected people, and through close contact such as shaking hands, kissing, etc.\(^5\)\(^6\) Taking protective measures is very important during the COVID-19 pandemic. Furthermore, the compliance of healthcare professionals responsible for the care and treatment of suspected COVID-19 patients with personal protective measures is extremely important in terms of safe, quality and sustainable health services.\(^7\) In Turkey, isolation precautions in suspected COVID-10 patients were determined by the COVID-19 (SARS-CoV-2 Infection) handbook of the Ministry of Health.\(^8\) Essentially, the compliance of healthcare professionals with these isolation rules is essential for both their own health and the well-being of society. There is a high risk in emergency services where suspected COVID-19 patients come first and for the personnel exposed to the disease while working in these services. Isolation precautions are very important for emergency personnel faced with this high risk. Determining personnel’s compliance with isolation precautions is a critical process. Determining compliance is significant for the elimination of deficiencies, the correction of errors and for public health.

The awareness of healthcare professionals should be raised within the scope of both the national and international fight against COVID-19, which is easily, continuously and dangerously spread among the population. Therefore, this study was conducted to determine the compliance of emergency healthcare personnel with isolation precautions during the COVID-19 pandemic.

2 | METHODS

2.1 | Study type

This is a cross-sectional study.

2.2 | Population and sample

The study was carried out by meeting face-to-face with 138 healthcare professionals working in the emergency clinics of Erzurum Atatürk University and Erzurum Regional Training and Research Hospital and had treated suspected COVID-19 patients from May 2020 to June 2020. The population comprised 184 people working during the study dates, and the sample comprised 138 personnel who volunteered to participate in the study.

What’s known

- In the global COVID-19 epidemic, healthcare professionals in emergency units are at high risk of infection due to direct contact with COVID-19 patients.
- In Turkey, isolation precautions in suspected COVID-10 patients were determined by the COVID-19 (SARS-CoV-2 Infection) handbook of the Ministry of Health.

What’s new

- There is a high risk in emergency services where suspected COVID-19 patients come first and for the personnel exposed to the disease while working in these services.
- Emergency personnel had an average level of compliance with isolation precautions.
- Emergency healthcare personnel had high levels of knowledge about the COVID-19 pandemic.

2.3 | Collection of data

Data were collected using the “Healthcare Professionals Sociodemographic Form” and the “Compliance with Isolation Precautions Scale”. The participants completed the form individually. The information of the researchers who conducted the study was kept confidential. The completion time for the forms was approximately 5 minutes.

Healthcare Professionals’ Sociodemographic Form consisted of 14 sociodemographic questions regarding age, gender and occupational information of the healthcare professionals.

Isolation Precautions Compliance Scale consisted of 18 questions determining the compliance of healthcare professionals with isolation precautions. This scale is a 5-point Likert type scale developed by Tayran and Ulupınar,\(^9\) and the scale aimed to measure the compliance of healthcare professionals with isolation precautions, and included positive and negative questions. The responses on this scale, strongly disagree, disagree, neutral, agree and strongly disagree are evaluated respectively as 1, 2, 3, 4 and 5 points. 1st, 8th, 11th, 13th and 18th items are the negative expressions on the scale and they are scored 1 = 5, 2 = 4, 3 = 3, 4 = 2, 5 = 1. On the scale, the minimum score expected is 18 and the maximum score expected is 90. A high score showed that the compliance of healthcare professionals with isolation precautions had increased. There are four subscales on the scale: mode of transmission (3rd, 8th, 9th, 10th, 11th items), personnel and patient safety (2nd, 5th, 12th, 14th, 16th, 17th items), environment control (1st, 13th, 15th, 18th items) and hand hygiene-use of gloves (4th, 6th, 7th items). The scale had a Cronbach’s alpha level of 0.85. This study found a Cronbach’s alpha level of 0.71.
2.4 | Data evaluation

Data were evaluated using the SPSS V18 software package. Percentage distribution was used for statistical evaluation; t-test, variance analysis (ANOVA), Mann–Whitney U test and Kruskal–Wallis test were used to calculate the difference between the scale scores. The confidence interval for the analysis results were found as 95%; statistical significance was deemed $P < .05$.

2.5 | Ethical considerations

The principles of the Declaration of Helsinki were followed throughout the study process. The Ethics Committee of Erzurum Atatürk University’s Faculty of Medicine gave permission (28.05.2020/250) to conduct the study. Prior to conducting the study, the participants were provided information about the purpose and method of the study, and the time they were asked to allocate for the study. The participants gave verbal consent after being informed that data collected in the study were to be used only within the scope of the study. Patients were assured that their personal details and identities would be kept confidential, that participation in the study was completely based on a voluntary principle, that they could leave the study whenever they wished, and that participation to the study constituted no risk. The principles of the Helsinki Declaration of Human Rights were used to protect the individual rights of the participants.

3 | RESULTS

Sociodemographic characteristics of the participants illustrated that 58.7% were male, 52.2% were married, 37% were high school graduates, 37.7% had worked 1-5 years, 31.2% were nurses, 79.7% were happy with their job and mean age was $30.78 \pm 7.17$ (Table 1).

| Characteristics                        | Number | Percentage |
|----------------------------------------|--------|------------|
| Current hospital                       |        |            |
| Regional Training and Research Hospital| 47     | 34.1       |
| Atatürk University Research Hospital  | 91     | 65.9       |
| Gender                                 |        |            |
| Female                                 | 57     | 41.3       |
| Male                                   | 81     | 58.7       |
| Marital status                         |        |            |
| Married                                | 72     | 52.2       |
| Single                                 | 66     | 47.8       |
| Education                              |        |            |
| Primary Education                      | 6      | 4.3        |
| High School                            | 51     | 37.0       |
| Associate Degree                       | 23     | 16.7       |
| Bachelor’s Degree                      | 30     | 21.7       |
| Postgraduate                           | 28     | 20.3       |
| Years worked                           |        |            |
| 1-5 y                                  | 52     | 37.7       |
| 6-10 y                                 | 49     | 35.5       |
| 11 y and above                         | 37     | 26.8       |
| Occupation                             |        |            |
| Doctor                                 | 34     | 24.6       |
| Nurse                                  | 43     | 31.2       |
| Emergency Medical Technician           | 13     | 9.4        |
| Triage Staff                           | 18     | 13.0       |
| Personnel (cleaning and transport)     | 5      | 3.6        |
| Other (medical secretary, X-ray technician, etc) | 25 | 18.1 |
| Job satisfaction                       |        |            |
| Yes                                    | 110    | 79.7       |
| No                                     | 28     | 20.3       |
| Age [Mean (SD)]                        |        |            |
|                                        | 30.78 ± 7.17 |          |
When assessing the participants’ understanding of isolation during the COVID-19 pandemic, it was determined that 76.1% received training on isolation precautions, 86.2% wanted to receive training on isolation precautions, 87% knew the type of isolation practiced, 81.2% were able to identify suspected patients, 84.1% knew that suspected patients were put into isolation and 60.6% were not satisfied with the working conditions (Table 2).

Table 3 shows the participants’ mean scores on the Compliance with Isolation Precautions Scale. The mean score was 22.47 ± 2.38 on the mode of transmission subscale of the Compliance with Isolation Precautions Scale; 17.10 ± 1.30 on the personnel-patient safety subscale; 17.78 ± 1.83 on the environment control subscale; and 10.26 ± 1.04 on the hand hygiene-use of gloves subscale. The total mean score was 67.63 ± 4.64.

When comparing the Compliance with Isolation Precautions Scale mean scores with the sociodemographic characteristics of the participants, it was found that there was no statistically significant difference affecting the participants’ compliance with the isolation precautions in relation to their sociodemographic characteristics (P > .05) (Table 4).

4 | DISCUSSION

COVID-19 is a highly contagious infection and the main mode of transmission is through droplets. The transmission occurs when other people come in contact with the respiratory secretions spread in the environment by symptomatic or asymptomatic people, or when people touch their own mouth, nose or eye mucosa with hands contaminated with these secretions.10,11 In the global COVID-19 epidemic, healthcare professionals in emergency units are at high risk of infection due to direct contact with COVID-19 patients. Protection of healthcare professionals who risk their lives is only possible through infection control and compliance with precautions.12

The participants’ total Compliance with Isolation Precautions Scale (CIPS) score was moderate and their CIPS subscale score levels were as follows: a high mean score on the mode of transmission subscale, an average mean score on the personnel and patient safety subscale, a high mean score on the environment control subscale, and an average mean score on the hand hygiene-use of gloves subscale.

A literature review revealed similar results with the results of this study.13-16 Participants showed high levels of receiving training, knowing the type of isolation practiced and putting patients with COVID-19 into isolation. The participants had high scores particularly on the mode of expression and environment control subscales. The moderate scores found on the personnel and patient safety subscale and the hand hygiene-use of gloves subscale may be due to the participants’ inability to be careful enough due to the high number of patients or due to lack of training on this topic. In fact, the majority of the personnel indicated they wanted to receive training (86.2%). Based on this, it is extremely important to provide training for healthcare professionals in areas they lack knowledge as this can raise their awareness.

The examination of the participants’ understanding regarding isolation during the COVID-19 pandemic showed that most of the participants received training on isolation precautions. Additionally, most of the participants wanted to receive training. This may be due to ineffective training and/or the need to have more information as the COVID-19 pandemic has newly emerged throughout the world. The participants had a considerably high rate of understanding

| Subscales                      | Min-max scores on the scale | Mean scores on the scale X ± SD |
|--------------------------------|-----------------------------|---------------------------------|
| Mode of transmission           | 16-25                       | 22.47 ± 2.38                    |
| Personnel-patient safety       | 13-20                       | 17.10 ± 1.30                    |
| Environment control            | 10-20                       | 17.78 ± 1.83                    |
| Hand hygiene-use of gloves     | 7-14                        | 10.26 ± 1.04                    |
| Total score                    | 54-76                       | 67.63 ± 4.64                    |
**TABLE 4** Comparison of the scale means with sociodemographic characteristics of emergency healthcare personnel

| Characteristics | Isolation precautions conformity scale |
|-----------------|---------------------------------------|
|                 | Subscales                              |
|                 | Mode of transmission | Personnel-patient safety | Environment control | Hand hygiene-use of gloves | Scale total score |
|                 | $\bar{X} \pm SD$ | $\bar{X} \pm SD$ | $\bar{X} \pm SD$ | $\bar{X} \pm SD$ | $\bar{X} \pm SD$ |
| Current Hospital|                          |                        |                    |                    |                  |
| Regional Training & Research Hospital | 23.02 ± 2.21 | 17.31 ± 1.33 | 17.87 ± 1.81 | 10.12 ± 0.99 | 68.34 ± 4.08 |
| Atatürk University Research Hospital | 22.19 ± 2.43 | 17.00 ± 1.28 | 17.73 ± 1.84 | 10.32 ± 1.06 | 67.26 ± 4.89 |
| Test and $p$ value | $t = 1.94$ | $t = 1.36$ | $t = 0.412$ | $t = -1.08$ | $t = 1.29$ |
|                  | $P = .054$ | $P = .174$ | $P = .681$ | $P = .282$ | $P = .198$ |
| Gender          |                          |                        |                    |                    |                  |
| Female          | 22.59 ± 2.37 | 17.01 ± 1.10 | 17.89 ± 1.68 | 10.19 ± 1.07 | 67.70 ± 4.41 |
| Male            | 22.39 ± 2.40 | 17.17 ± 1.42 | 17.70 ± 1.93 | 10.30 ± 1.02 | 67.58 ± 4.82 |
| Test and $p$ value | $t = 0.48$ | $t = -0.68$ | $t = 0.60$ | $t = -0.64$ | $t = 0.15$ |
|                  | $P = .627$ | $P = .493$ | $P = .548$ | $P = .523$ | $P = .880$ |
| Marital status  |                          |                        |                    |                    |                  |
| Married         | 22.76 ± 2.27 | 17.26 ± 1.29 | 17.95 ± 1.94 | 10.30 ± 1.05 | 68.29 ± 4.66 |
| Single          | 22.16 ± 2.47 | 16.93 ± 1.29 | 17.59 ± 1.69 | 10.21 ± 1.03 | 66.90 ± 4.55 |
| Test and $p$ value | $t = 1.47$ | $t = 1.46$ | $t = 1.17$ | $t = 0.52$ | $t = 1.75$ |
|                  | $P = .142$ | $P = .145$ | $P = .240$ | $P = .600$ | $P = .081$ |
| Education       |                          |                        |                    |                    |                  |
| Primary Education | 21.83 ± 2.31 | 16.83 ± 1.47 | 17.16 ± 3.76 | 11.16 ± 1.60 | 67.00 ± 7.32 |
| High School     | 22.62 ± 2.48 | 17.00 ± 1.37 | 17.78 ± 1.59 | 10.31 ± 0.86 | 67.72 ± 4.49 |
| Associate Degree | 22.21 ± 2.66 | 16.69 ± 1.06 | 17.73 ± 1.42 | 10.26 ± 1.35 | 66.91 ± 4.74 |
| Bachelor’s Degree | 22.70 ± 2.32 | 17.53 ± 1.33 | 17.73 ± 2.08 | 10.03 ± 0.99 | 68.00 ± 5.11 |
| Postgraduate    | 22.32 ± 2.14 | 17.25 ± 1.23 | 18.00 ± 1.80 | 10.21 ± 0.91 | 67.78 ± 3.89 |
| Test and $p$ value | $F = 0.317$ | $F = 1.637$ | $F = 0.271$ | $F = 1.565$ | $F = 0.220$ |
|                  | $P = .866$ | $P = .169$ | $P = .896$ | $P = .187$ | $P = .927$ |
| Years worked    |                          |                        |                    |                    |                  |
| 1-5 y           | 22.03 ± 2.48 | 17.25 ± 1.25 | 17.32 ± 1.93 | 10.05 ± 0.99 | 66.67 ± 4.53 |
| 6-10 y          | 22.59 ± 2.29 | 16.77 ± 1.22 | 18.06 ± 1.71 | 10.32 ± 1.10 | 67.75 ± 4.79 |
| 11 y and above  | 22.94 ± 2.30 | 17.35 ± 1.41 | 18.05 ± 1.74 | 10.45 ± 0.98 | 68.81 ± 4.43 |
| Test and $p$ value | $F = 1.669$ | $F = 2.600$ | $F = 2.645$ | $F = 1.779$ | $F = 2.359$ |
|                  | $P = .192$ | $P = .078$ | $P = .075$ | $P = .173$ | $P = .098$ |
| Characteristics                        | Mode of transmission | Personnel-patient safety | Environment control | Hand hygiene-use of gloves | Scale total score |
|----------------------------------------|----------------------|--------------------------|---------------------|---------------------------|------------------|
|                                        | $X \pm SD$           | $X \pm SD$               | $X \pm SD$          | $X \pm SD$                | $X \pm SD$       |
| Occupation                             |                      |                          |                     |                           |                  |
| Doctor                                 | 22.23 ± 2.16         | 17.44 ± 1.37             | 17.97 ± 1.88        | 10.35 ± 1.06              | 68.00 ± 4.23     |
| Nurse                                  | 22.20 ± 2.59         | 17.06 ± 1.20             | 17.67 ± 1.74        | 10.06 ± 0.96              | 67.02 ± 4.86     |
| Emergency Medical Technician           | 23.30 ± 1.70         | 17.07 ± 1.03             | 18.61 ± 1.12        | 10.38 ± 0.65              | 69.38 ± 3.45     |
| Triage Staff                           | 21.80 ± 2.77         | 16.40 ± 0.54             | 17.80 ± 1.09        | 10.00 ± 1.41              | 66.00 ± 3.53     |
| Personnel (Cleaning and Transport)     | 23.50 ± 1.91         | 17.00 ± 1.49             | 17.61 ± 2.37        | 10.66 ± 1.08              | 68.77 ± 4.85     |
| Other (Medical secretaryship, X-ray technician, etc) | 22.24 ± 2.71         | 16.96 ± 1.45             | 17.40 ± 1.87        | 10.16 ± 1.17              | 66.76 ± 5.26     |
| Test and $p$ value                     | $F = 1.301$          | $F = 0.830$              | $F = 0.885$         | $F = 1.037$               | $F = 1.081$      |
| Happy with their Job                   |                      |                          |                     |                           |                  |
| Yes                                    | 22.67 ± 2.29         | 17.13 ± 1.22             | 17.84 ± 1.73        | 10.30 ± 0.99              | 67.96 ± 4.26     |
| No                                     | 21.71 ± 2.62         | 17.00 ± 1.61             | 17.53 ± 2.20        | 10.07 ± 1.21              | 66.32 ± 5.83     |
| Test and $p$ value                     | $t = 1.91$           | $t = 0.49$               | $t = 0.79$          | $t = 1.07$                | $t = 1.68$       |

$X \pm SD$ represents the mean ± standard deviation.
the type of isolation practiced, identifying suspected patients and putting suspected patients into isolation. This may be due to the participants' being highly trained and COVID-19 being in the news constantly. Table 2 shows that participants were not satisfied with their working conditions. Healthcare professionals can have very difficult working conditions. With the global pandemic, working conditions have become even more difficult and this can impact satisfaction of healthcare professionals with their working conditions.

The participants' mean score was average. The literature review revealed similar results with the results of this study on different topics carried out with healthcare professionals. A study by Parikh et al. on the knowledge of the public and healthcare professionals on COVID-19 revealed that more than 90% of the healthcare professionals knew and complied with the precautions. In another study, Modi et al. investigated healthcare students' and professionals' awareness regarding COVID-19; the study found that the general awareness was at an adequate level with 71.2%. Also, it was found that the participants' awareness was 45.4% for wearing a mask and 52.5% for hand hygiene. A study by Giao et al. investigated healthcare professionals' knowledge on and attitudes toward COVID-19; the study found that 88.4% of the participants had adequate knowledge. A study by Khasawneh et al. investigated medical students' knowledge, attitudes and precautions regarding COVID-19 and determined that the participants had knowledge at expected levels and practiced appropriate strategies to prevent the spread of the virus. A study by Hussain et al. investigated a tertiary hospitals' healthcare professionals' knowledge, attitudes and practices regarding COVID-19 and determined that the participants had adequate knowledge about the virus and carried out practices accordingly. A study by Aydin and Balci which investigated nurses' knowledge on COVID-19 showed that the participants had comprehensive knowledge about COVID-19.

Most of the participants had worked 1-5 years. The average scores on the Compliance with Isolation Precautions Scale can be linked to fewer working years of the participants, average mean age and low education status. Studies indicate that the more years healthcare professionals have worked, the more they comply with isolation precautions. Moreover, COVID-19 has rapidly entered our lives and caught the global population unprepared. Therefore, there might have been delays in the adaptation process. To ensure high levels of compliance with isolation and to raise awareness on COVID-19, healthcare professionals should carry out studies on this topic and participate in trainings at the institution where they work.

The comparison of the participants' mean scores on the Compliance with the Isolation Precautions Scale with the introductory features revealed no difference. Looking at the participants' features regarding isolation, it was observed that the majority of them (76.1%) received training. Also, it can be said that no difference was found due to the worldwide influence of the COVID-19, as it is an extremely serious illness, it is constantly covered by the media, and there are introductory posters in many places.

5 | STUDY LIMITATIONS

The study was conducted in the centre, and the study sample reflects only one area of Turkey. The results of this study can be generalized to the study group.

6 | CONCLUSION

It was concluded that the emergency healthcare personnel had high levels of knowledge about the COVID-19 pandemic; however, they had an average level of compliance with isolation precautions. The examination of the participants' understanding regarding isolation during the COVID-19 pandemic showed that most of the participants received training on isolation precautions. Additionally, most of the participants wanted to receive training.

This study is considered to serve as a reference in examining or discussing the role of healthcare personnel affected by a significant pandemic during this period, the rates and reasons of becoming ill among the healthcare personnel, and the status and reasons of adhering to the isolation precautions. In this regard, it is recommended that every institution assess the adherence to the isolation precautions, remedy the deficiencies found during the assessment based on the troubles they experience, and take precautions. To remedy the deficiencies, information should be updated through in-service training. In addition, healthcare personnel's quality of working conditions should be improved, which in turn improves the quality of care provided by emergency healthcare personnel and reduces the rate of healthcare-related infection.

ACKNOWLEDGEMENTS

The authors wish to thank and acknowledge the participants for sharing their experiences with us.

DISCLOSURE

The authors declare no conflict of interest in this study.

AUTHOR CONTRIBUTIONS

İÖ, ZKÖ and TŞ were responsible for the conception and design of the study. İÖ, ET and ZKÖ were responsible for acquisition and analysis of data; furthermore, İÖ was in charge of statistical analysis. İÖ, ZKÖ, ET, TŞ and NCO drafted the manuscript and approved the final version. All authors read and approved the final manuscript.
ETHICS APPROVALS
We further confirm that any aspect of the work covered in this manuscript that has involved human has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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How to cite this article: Özlü İ, Karaman Özlü Z, Tekin E, Onur Can N, Şöhret T. The compliance of emergency healthcare personnel with isolation precautions during the COVID-19 pandemic: A cross-sectional questionnaire study. J Clin Pract. 2021;00:e14492. https://doi.org/10.1111/jctp.14492