

The Impact of COVID-19 Pandemic on Ophthalmology Healthcare Workers at Military Healthcare Facilities in Saudi Arabia

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Abstract

Purpose: The study investigated the impact of COVID-19 on ophthalmology healthcare workers at military facilities in Saudi Arabia. The study was motivated by the worldwide spread of COVID-19, which has affected the majority of aspects of healthcare delivery. The study objectives were to evaluate the influence of COVID-19 on ophthalmology healthcare, to assess the psychological impact on ophthalmology healthcare and to study the professional implications for ophthalmology healthcare workers at military facilities. **Methods:** A descriptive quantitative design was used. The study included 174 ophthalmology healthcare practitioners serving at military healthcare facilities in Saudi Arabia. It employed a convenience sampling technique to recruit the ophthalmologists to participate in a questionnaire survey. The data analysis was descriptive. **Results:** The findings suggested that ophthalmologist facilities had to make changes to cope with the COVID-19 pandemic. In addition, the findings revealed that healthcare workers' emotional response in reaction to COVID-19 was low. Furthermore, the study found that the pandemic negatively affected the ophthalmologist profession through reduced patient volumes and changes to healthcare worker operations. Some ophthalmologists have had to consider using telehealth services to comply with social distancing policies. **Conclusions:** The study examined the effect of the COVID-19 pandemic on ophthalmology healthcare workers in Saudi Arabia. The disease has had effects on the ophthalmology landscape in Saudi Arabia.

Keywords: Eye; Ophthalmology; Saudi Arabia; Pandemic; Healthcare workers; Health services

Introduction

Coronavirus is a major pathogen that primarily targets the human respiratory system. Previous coronavirus outbreaks have included the outbreaks of severe acute respiratory syndrome (SARS)-COV and the Middle East respiratory syndrome (MERS)-COV which were characterized as considerable threats to public health. ^[1] The COVID-19 outbreak has affected many nations globally and has imposed profound constraints on the healthcare system and society. The pandemic has affected everyone in different ways, especially in terms of occupational risk, and people are likely to experience these effects every day. Frontline co-workers are putting their lives on the line to ensure the normal functioning of their communities.

As the world closely monitors the status of the pandemic, the World Health Organization (WHO) and its member states have been working to prevent and control the pandemic spread of the virus, especially to countries with limited healthcare systems. However, we acknowledge the efforts of Saudi Arabia in the prevention and control of COVID-19 through its adoption of a "Whole of Government" approach as recommended by the WHO for the national response to COVID-19. Saudi Arabia has taken all types of precautionary measures, including preparedness, detection, testing, tracing and isolation. ^[2]

Ophthalmic apparatuses can transmit coronavirus, and healthcare facilities may increase the likelihood of cross-infection amongst co-workers and military personnel. ^[3] Moravvej et al. mentioned that COVID-19 has different ocular manifestations, which increases the need for ophthalmologists to remain cautious when interacting with patients at military healthcare facilities to reduce potential transmission via ocular material. Some patients diagnosed with COVID-19 have reported instances of conjunctivitis. Other patients tested positive for COVID-19 through "reverse-transcription polymerase chain reaction (rRT-PCR), which is a method for detection of the pandemic through conjunctival fluids". ^[4]

Healthcare workers (HCWs) are susceptible to the nosocomial transmission of COVID-19 through the following pathways: HCW to HCW, patient to HCW, and patient to patient. ^[5] Hospitals manage suspected or confirmed cases of these

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infections by preparing isolation wards or containment facilities to minimize patient-to-patient infections. In this regard, there is a growing need to impose measures that will prevent or reduce patient-to-HCW transmission.

Some of the factors promoting patient-to-HCW infection include poor institutional sanitation and ineffective infection control procedures, a lack of preparedness and awareness of infection containment measures in the early stages of the pandemic, defiance toward the appropriate use of personal protective equipment (PPE), and inadequate training.^[5] Different scholars have acknowledged that the top risk factors for infection are close interpersonal contact during therapy and physical evaluations, cardiopulmonary resuscitation, endotracheal intubation, airway suctioning, and direct contact with patient excreta and body fluids.^[4-6] Essentially, PPE helps ensure that individuals are safe from the physical hazards that they may encounter in their work environments. Some PPE is recommended for attending eye surgeons and ophthalmology residents, and nursing staff, including disposable shoe sleeves, surgical-grade face masks, face shields or goggles (eye protection), and latex gloves.^[7] There has been an overall reduction in the number of patients reporting for ophthalmic emergency surgeries.^[8]

International ophthalmology authorities have published recommendations through the International Council of Ophthalmology (ICO), but the creation and implementation of evidence-based clinical guidelines specific to COVID-19 for the assessment, investigation, and management of high-risk patients in eye clinics is necessary.^[9] Some guidelines to reduce the spread of COVID-19 have been released. For example, it was recommended that ophthalmology procedure and clients' appointments requiring ophthalmic examinations be cancelled and that no urgent appointments be postponed or rescheduled.^[10] One of the measures that military healthcare facilities have considered is the frequent disinfection of physical surfaces that patients and staff come in contact with, in accordance with the stipulations of the Centers for Disease Control and Prevention (CDC) guidelines.^[5]

In response to the COVID-19 pandemic, most of the national ophthalmology societies have recommended avoiding any treatment other than urgent or emergent care to reduce human-to-human virus transmission, to reduce the rate of new cases and to conserve disposable medical supplies needed for emergency departments treating infected patients.^[11] Professionals in "essential service" roles have continued with their responsibilities with less disruption but are at a higher risk of contracting the virus. The occupational risk for ophthalmologists is 88.4%, while that of ophthalmic medical technologists is 68.5%, and that of ophthalmic medical technicians is 62%.^[10]

There have been gradual transitions to telemedicine amidst concerns about the extended social distancing regulations provided by the CDC in an effort to reduce clinic visits in ophthalmology practice.^[12] The majority of patients are opting for virtual medicine, as seen through surges in telehealth institutions.^[13] Telemedicine supports patient access to eye care, and military healthcare facilities are implementing measures to

manage the spread of COVID-19 from patients to HCWs and from HCWs to HCWs.

There have been limited studies about COVID-19 related to ophthalmology. However, it is necessary to rearrange ophthalmologist and optometrist routine appointments to control viral spread and to try to maximize patient and healthcare provider safety. Current evidence suggests deferring all elective activities and providing assistance for only acute and chronic sight conditions or life-threatening conditions.^[11]

In the last three decades, three global infectious diseases have hit Saudi Arabia, affecting the social and economic status. These diseases include MERS which broke out in June 2012 and killing 866 people worldwide, and SARS which broke out in 2002, with more than 8000 cases and more than 700 deaths worldwide.^[14] The COVID-19 outbreak occurred in December 2019, leading to 3,024,059 cases and 208,112 deaths associated with the virus.^[14] Ophthalmology healthcare workers come in close contact with infected patients and contaminated environments; thus, they are at risk of being exposed to the virus if they do not take precautionary measures. Since the first COVID-19 outbreak, infections among healthcare workers have contributed to 3.5% of the global clinical cases.^[15] For instance, in China, there were more than 1716 confirmed cases of COVID-19 infection among healthcare workers in early February.^[16] Ophthalmologists are at greater risk than other HCWs because their routine practice involves close doctor-to-patient monitoring that requires contact. Research has shown that COVID-19 spreads through body droplets, including tears; thus, ophthalmologists remain at high risk during the pandemic.

The primary aim of this study was to examine the impact of COVID-19 on ophthalmology healthcare workers at military healthcare facilities in Saudi Arabia. The specific objectives were to evaluate the influence of COVID-19 on ophthalmology healthcare at military facilities, to assess the psychological impact on ophthalmology healthcare workers at military facilities and to study the professional impact on ophthalmology healthcare workers at military facilities.

Methodology

A descriptive quantitative design was used to describe the study variables and to examine the impact of the COVID-19 pandemic on ophthalmology healthcare workers at military healthcare facilities in Saudi Arabia. The data were collected through a survey; this collection technique helped acquire the necessary data from the participants through self-reporting. The participants were recruited from among all ophthalmology healthcare workers at different military healthcare facilities in Saudi Arabia. The participants were asked to complete an online survey questionnaire that was developed by the researchers. The survey link was provided to the participants through the King Abdullah International Medical Research Center (KAIMRC). The use of an electronic survey facilitated the completion of the survey by ophthalmology healthcare workers in all regions of Saudi Arabia, as well as the recruitment of a large number of participants for this study.

A convenience sampling technique was used, which may have limited the generalizability of the findings. A total of 200 ophthalmology healthcare workers at selected military hospitals in Saudi Arabia were invited to participate in this study via email, and there was a response rate of 87% (174 respondents). The survey questions were constructed by the researchers. A survey question and explanation letter about the purpose of the study were then given to the participants. The participants were asked to open the link and complete the survey at a convenient time. All the participants were informed that the data would be anonymous. The participants who agreed to participate in this study took approximately 3-6 minutes to fill out the survey.

An explanatory letter about the study was sent to the KAIMRC to obtain permission to conduct the study. Additionally, the purpose of the study was explained to the participants before they completed the online survey. The participation was voluntarily and the participants were informed that they had the right to withdraw from the study at any time and could choose not to answer any of the questions. The anonymity of the participants was guaranteed after they completed the online survey, and they were informed that all the data would be stored in a secure place. The study questionnaire consisted of 22 questions. The data were collected during summer 2020 and were analysed using Survey Monkey and the Statistical Package for Social Sciences (SPSS) Enterprise guide.

Ethical considerations

The study protocol was reviewed and approved by the Institutional Review Board Office at the King Abdullah International Medical Research Center (KAIMRC).

Results

The primary demographic characteristics examined in this analysis were the distributions of ophthalmology healthcare workers by profession, nationality, gender, and age. The largest proportion of respondents (35%) were registered nurses. The second most common professional category was consultant doctors, with these participants constituting 13% of the sample. The optometrist and ophthalmology resident groups each constituted 8% of the sample. Patient care technicians constituted 7% of the sample, while optometry technicians constituted 7%. The proportions of clinical nurses and intern ophthalmology doctors were 4% and 2%, respectively. Healthcare workers in other professions that were not listed in the survey instrument accounted for 4%. Table 1 represents the distribution of respondents by profession.

The findings indicated that 57% of respondents were Saudi nationals, while the remaining 43% were non-Saudi nationals. In addition, females constituted 66% of the sample, while males constituted 34%. Furthermore, 39% of the respondents were 40 years or older, while 32% were aged between 30 and 39. The third most common age group between 21 and 29 years, with 28% of the sample in this age group. The least common age group was 20 years and younger, with 1% of the participants in this age group.

Table 1: Distribution of respondents by profession.

Profession	Frequency	Proportion
Registered Nurse/Staff Nurse	60	34.5%
Consultant Doctor	23	13.2%
Specialist Doctor	18	10.3%
Optometrist	14	8.0%
Ophthalmology Resident	14	8.0%
Patient Care Technician	13	7.5%
Optometry Technician	12	6.9%
Clinical Nurse Coordinator	7	4.0%
Intern Ophthalmology Doctor	3	1.7%
Other	10	5.7%
Total	174	100.0%

The respondents' work-related descriptions were collected to allow analysis according to their cities of duty, whether they were assigned to work during COVID-19, and whether they worked at the selected military healthcare facilities. The largest proportion of respondents was from Al-Madinah, while the smallest proportion was from Jeddah. Table 2 shows the distribution of the respondents by city. During the COVID-19 pandemic, 81.6% of the respondents were given full-time assignments, while 18.4% were not given full-time assignments.

One of the key thematic issues in this study was the availability of PPE at healthcare facilities. Table 3 shows the respondents' answers regarding the availability of PPE during the pandemic.

Another issue of interest was the preparedness of healthcare workers to work during COVID-19. A total of 72.4% of the respondents reported having taken a course on COVID-19, while 27.6% did not. This finding suggests that most healthcare workers were well equipped to handle the pandemic in the workplace. Another question was related to whether the respondents' facilities had local protocols for the management of COVID-19, with 94.8% having such protocols in place and 5.2% not having such protocols.

The study also investigated the expression of emotional responses to COVID-19 by the ophthalmology healthcare workers. The aim was to capture how the respondents expressed the emotions shown in Table 4, which summarizes the distribution of responses across the four response options.

The study also sought to establish the impact of COVID-19 on ophthalmology practice by examining its effect on workers and patient volume. The first parameter capturing the effect of COVID-19 on the profession concerned its effect on healthcare workers. The findings indicated that most respondents felt that the disease had an extreme effect on them, with 38.5% of the 174 respondents selecting this response. The respondents who reported that COVID-19 had little effect were the second largest group, with 26.4% of the sample indicating this option, while 21.8% reported a moderate effect. The least common response category was 'no effect,' with 13.2% of the total sample selecting this option. Regarding the effect of COVID-19 on the number of ophthalmology patients seen in a day, the study found that 69.5% of healthcare workers believed that they had observed fewer patients during the pandemic period. Only 12.6% of

Table 2: Distribution of respondents by city.

City	Frequency	Proportion
Jeddah	23	13.2%
Alhassa	36	20.7%
Al-Madinah	41	23.6%
Riyadh	37	21.3%
Dammam	37	21.3%
Total	174	100.0%

Table 3: Availability of PPE.

Option	Frequency	Proportion
Often available	73	42.0%
Always available	60	34.5%
Sometimes available	38	21.8%
Rarely available	2	1.1%
Never available	1	0.6%
Total	174	100.0%

Table 4: Frequency of emotional response among healthcare workers at ophthalmology clinics.

N=174	Several days	Nearly every day	Over half the days	Not at all
Inability to stop or control worrying	84	14	33	43
Trouble relaxing	51	33	45	45
Feeling nervous, anxious, or on edge	45	36	45	48
Worrying too much about different things	63	29	44	38
Being so restless that it's hard to sit still	39	36	43	56
Becoming easily annoyed or irritable	55	31	43	45
Feeling afraid	45	37	43	45

respondents indicated that the number of ophthalmology patients had remained the same.

In addition, the study aimed to establish whether the respondents offered telehealth services during or before the pandemic. The findings showed that 46.6% of the respondents used these services after the outbreak, while a similar percentage indicated that they did not use them. An additional 6.9% stated that they only used telehealth services before the pandemic.

Another essential objective of the study was to determine the methods used by healthcare workers to practice telehealth. The most popular was the telephone, with 37.9% of the participants reporting using this method. The respondents who reported using both telephone and video methods followed at a distant second, with 8.6% reporting these methods. The respondents who used only video accounted for 2.9%, while those using other platforms accounted for 1.7%. Healthcare workers who did not use any of these methods accounted for 48.9%.

Discussion

The study found that the majority of the respondents continued to be assigned to duty even during the COVID-19 pandemic. Globally, the healthcare profession has experienced a busier period as it has been inundated with patients. [17,18] Many facilities have recruited more professionals for this reason. The selected military healthcare facilities seemed to have ensured that its workers had ready access to PPE. In many countries, such as the United States, this equipment and materials were not as accessible in the first phases of the outbreak. [19,20] Healthcare workers in Saudi Arabia were well prepared, as they underwent

relevant training to equip personnel with the skills to combat COVID-19.

The emotional response of healthcare workers serving at the selected healthcare facilities was reasonable, as it was arguably low. Patients and the public expect health workers to exude confidence because they are the individuals who provide assurance to the rest of society. [21,22] The uncertainty regarding the novel coronavirus nevertheless instilled some fear among them. Large numbers of healthcare professionals have succumbed to the disease, which has made others feel scared as they come into contact with potential COVID-19 patients. [23,24]

The study comprehensively examined the impact of the pandemic on the ophthalmology profession in Saudi Arabia. The number of patients has decreased sharply because of COVID-19. These findings may be explained by government restrictions on lockdowns and curfews. [4,25] People's movement was restricted in Saudi Arabia until the policy was lifted between June and July 2020. Healthcare workers also experienced extreme effects, as they had to employ measures to safeguard themselves against contracting the disease. The use of hand sanitizer and masks became mandatory. [4,5,11]

Some ophthalmology professionals decided to offer telehealth services to curb the spread of the pandemic. However, a significant proportion of them did not consider using these services. Some telehealth services require technical skills, and some healthcare workers may find them difficult to use. Other methods, such as the telephone, are simple enough for anyone to deploy. [7,9] For this reason, most healthcare workers found this method the most convenient. Additionally, most patients

have access to a phone, and it is a reliable means through which physicians may communicate with their patients. [3,6]

Conclusion

The study has examined the effect of the COVID-19 pandemic on ophthalmology healthcare workers at military healthcare facilities in Saudi Arabia. Its findings established that the disease indeed had a tremendous effect on the ophthalmology landscape in Saudi Arabia. Because COVID-19 has persisted for a long time without definite therapeutics and/or vaccines being identified, the future seems bleak. However, as health authorities continue to learn more about the disease, healthcare workers (including those in ophthalmology) will increase their power over the virus. It is challenging for the ophthalmology industry to return to normal if COVID-19 persists. The WHO and other bodies are working tirelessly to develop reliable and safe vaccines. However, their success is still distant, as the process requires more than a year of clinical trials. Therefore, the Saudi ophthalmology sector should expect the pandemic's effects to extend for the long term.

This study may not have comprehensively covered all areas that may spark the interest of critics. Viable research areas that will add value to the findings of this investigation include best practices for ophthalmologists in curbing the spread of COVID-19, the roles ophthalmologists can play in reducing the spread of COVID-19, and the mitigation of the effects of COVID-19 on healthcare service provision from the ophthalmologist's perspective.

Competing Interests

The authors declare that they have no competing interests.

References

- Bogoch I, Watts A, Thomas-Bachli A, Huber C, Kraemer M, Khan K. Pneumonia of unknown aetiology in Wuhan, China: potential for international spread via commercial air travel. *J Travel Med.* 2020;27.
- WHO EMRO | Home | Saudi-Arabia | Countries. emro.who.int.
- Chen P, Zhang G, Zhan Y. Management strategies of autoimmune bullous diseases during the outbreak of 2019 Novel Coronavirus disease (COVID-19). *J Dermatol Treat.* 2020:1-2.
- Moravvej Z, Soltani-Moghadam R, Ahmadian Yazdi A, Shahraki K. COVID-19 pandemic: Ophthalmic practice and precautions in a tertiary eye hospital in Iran. *Infect Control Hosp Epidemiol.* 2020;41:1237-1238.
- Xiao J, Fang M, Chen Q, He B. SARS, MERS and COVID-19 among healthcare workers: A narrative review. *J Infect Public Health.* 2020;13:843-848.
- COVID-19 Updates - EuroTimes. <https://www.eurotimes.org/COVID19/>. Published 2020.
- Livingston E, Desai A, Berkwits M. Sourcing Personal Protective Equipment During the COVID-19 Pandemic. *JAMA.* 2020;323:1912.
- Hick J, Thorne C. Personal Protective Equipment. *Disaster Med.* 2006;246-254.
- Gharebaghi R, Desuatsels J, Moshirfar M, Parvizi M, Daryabari S-H, Heidary F. COVID-19: Preliminary Clinical Guidelines for Ophthalmology Practices. *Med Hypothesis Discov Innov Ophthalmol.* 2020;9:149-158.
- Gittinger J. Survey of ophthalmology in the time of COVID-19. *Surv Ophthalmol.* 2020;65:495.
- McGlacken-Byrne A. Reply to Facing COVID-19 in Ophthalmology Department. *Curr Eye Res.* 2020;45:757-758.
- Saleem S, Pasquale L, Sidoti P, Tsai J. Virtual Ophthalmology: Telemedicine in a COVID-19 Era. *Am J Ophthalmol.* 2020;216:237-242.
- Tsai C. Personal Risk and Societal Obligation amidst COVID-19. *JAMA.* 2020;323:1555.
- Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, et al. The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *Int Surg J.* 2020;78:185-193.
- Farooq I, Ali S. COVID-19 outbreak and its monetary implications for dental practices, hospitals and healthcare workers. *Postgrad Med J.* 2020:2020-137781.
- Greenberg N, Docherty M, Gnanapragasam S, Wessely S. Managing mental health challenges faced by healthcare workers during COVID-19 pandemic. *BMJ.* 2020:m1211.
- Peeri NC, Shrestha N, Rahman MS, Zaki R, Tan Z, Bibi S, et al. The SARS, MERS and novel coronavirus (COVID-19) epidemics, the newest and biggest global health threats: what lessons have we learned?. *Int J Epidemiol.* 2020;49:717-726.
- Jun IS, Anderson DE, Kang AE, Wang LF, Rao P, Young BE, et al. Assessing Viral Shedding and Infectivity of Tears in Coronavirus Disease 2019 (COVID-19) Patients. *Ophthalmology.* 2020;127:977-979.
- Romano MR, Montericchio A, Montalbano C, Raimondi R, Allegrini D, Ricciardelli G, et al. Facing COVID-19 in Ophthalmology Department. *Curr Eye Res.* 2020;45:653-658.
- Elston D. Occupational skin disease among health care workers during the coronavirus (COVID-19) epidemic. *J Am Acad Dermatol.* 2020;82:1085-1086.
- Rasmussen S, Smulian J, Lednický J, Wen T, Jamieson D. Coronavirus Disease 2019 (COVID-19) and pregnancy: what obstetricians need to know. *Am J Obstet Gynecol.* 2020;222:415-426.
- Smith AC, Thomas E, Snoswell CL, Haydon H, Mehrotra A, Clemensen J, et al. Telehealth for global emergencies: Implications for coronavirus disease 2019 (COVID-19). *J Telemed Telecare.* 2020;26:309-313.
- Ong JJ, Bharatendu C, Goh Y, Tang JZ, Sooi KW, Tan YL, et al. Headaches Associated With Personal Protective Equipment – A Cross-Sectional Study Among Frontline Healthcare Workers During COVID-19. *Headache: J Headache Pain.* 2020;60:864-877.
- Mehta P, McAuley D, Brown M, Sanchez E, Tattersall R, Manson J. COVID-19: consider cytokine storm syndromes and immunosuppression. *The Lancet.* 2020;395:1033-1034.
- Wu P, Duan F, Luo C, Liu Q, Qu X, Liang L, et al. Characteristics of Ocular Findings of Patients With Coronavirus Disease 2019 (COVID-19) in Hubei Province, China. *JAMA Ophthalmol.* 2020;138:575.