Knowledge, Perception, and Practices toward COVID-19 among Healthcare Workers of Pediatric Surgery Specialty in a Tertiary Care Center of India: A Cross-Sectional Study

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ABSTRACT

Background: Coronavirus disease outbreak has affected more than 100 countries worldwide with more than 100,000 cases, during the first week of March 2020. As there are no approved therapeutics or vaccines for the treatment/prevention of COVID-19 till date, awareness among healthcare workers (HCWs) about the disease, mode of transmission, safety precautions, and early diagnosis plays a great role.

Objective: To investigate the knowledge, perception, and practices among HCWs of pediatric surgery toward COVID-19.

Materials and methods: A cross-sectional, web-based study was conducted among HCWs posted in the Department of Pediatric Surgery, PGIMER, during the first week of May 2020 who were supposed to be involved in the care of COVID-suspected or positive patients. A 26-item survey instrument was devised and circulated via e-mail. A Chi-square test was applied to know the levels of associations between variables, with p value < 0.05 set to be significant.

Results: Of 100 responders, 98 responded to a question regarding common symptoms with fever (98%), dry cough (89.8%), and sore throat (81.6%). While asked about the situations of pediatric surgical relevance like the progression of severity, majority (75.8%) opted for difficulty in breathing, followed by persistent high fever (78.9%). Regarding routine practices, HCWs were aware of procedures such as endotracheal tube suctioning (99%), tracheal sample collection (90.9%), changing of ventilator tubings (78.8%), and chest physiotherapy (60.6%) which are liable for transmission. Vertical transmission through breast milk and immediate postpartum care of babies born to infected mothers were associated with inadequate knowledge.

Conclusion: HCWs are high-risk group for COVID-19; only knowledge and training can help to prevent and contain the disease. HCWs involved in pediatric surgical specialty had accepted levels of perception. Regular scheduled educational and training programs are crucial to fight with this disease.

Keywords: COVID-19, Healthcare workers, Pandemic, Perception, Questionnaire.

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INTRODUCTION

COVID-19 has been a pandemic threat since its discovery in Hubei Province, China, in December 2019, where a cluster of patients were admitted with respiratory symptoms such as shortness of breath, fever, and cough.¹ Coronavirus infections (CoV) are known to manifest as mild respiratory illness to severe acute respiratory syndrome (SARS).² These are zoonoses where human-to-human and animal-to-human infections are well-documented.² The World Health Organization (WHO) declared COVID-19 as an international public health emergency on 30 January 2020.³ During the first week of March 2020, a devastating number of cases emerged globally, making it a pandemic. As of now, on 10 Aug 2020, 19.9 million people have been infected with 731,000 deaths worldwide. It has been rising steadily in India (2.22 million confirmed cases, 44,386 deaths) despite of 4 successive lock downs.

There are no vaccines or therapeutics approved for the treatment of this deadly disease which can spread through aerosols, fomites, or direct contact with an incubation period of 2–14 days.⁴ Suspicion, early diagnosis, and early administration of supportive symptomatic treatment help to prevent complications as well as to contain further transmission. Healthcare workers (HCWs) should be aware about the basics of this zoonosis because they are not only managing such patients but also getting exposed to undiagnosed load of population who are asymptomatic carriers. The WHO and Centers for Disease Control and Prevention (CDC) have published and continuously updating their recommendations for the practice of HCWs working in such sectors. Several online preparedness programs have been launched in multiple languages by WHO. Presently, almost all the hospitals and healthcare centers have training sessions for HCWs including the sanitation and disinfection protocols in regular intervals.

However, the perception of HCWs toward COVID-19 manifestations still remain unclear. In this regard, we evaluated the knowledge and practice of HCWs involved in the care of COVID-suspected or positive patients in pediatric surgery (Figs 1 to 3).

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Materials and Methods
A total of 100 HCWs including doctors (senior and junior residents) and nursing officers working in the pediatric surgery unit of a tertiary care hospital in North India were randomly provided with the set of web-based questionnaires through email. It was a 26-item questionnaire adapted from the current interim guidelines for HCWs published by CDC, United States (Annexure). Convenient data collection methods were adapted, and the distribution of responses was presented as frequencies and percentages. Descriptive statistics were applied for all groups based upon the percentage of correct responses per question. Our institute has a dedicated hospital block for COVID-19 patients with a team of variable specialties indulged in regular enrolment and training of HCWs involving doctors, nursing officers, technicians, and sanitation workers. Presently, as per 10 Aug 2020, 145 confirmed COVID-positive patients are admitted, of which 25 require intensive care. Our cross-sectional questionnaire was circulated on the first week of May, almost after 4 weeks of multiple cycles of COVID training in our institution.

Results
All the 100 HCWs completed the questionnaire provided (100% response rate), including doctors ($n = 26$, 26%) and nursing officers ($n = 74$, 74%). Most of the responders were females ($n = 66$, 66%) and rest were males ($n = 34$, 34%) in the age group below 40 years ($n = 65$).
Knowledge

When asked about the common symptoms of COVID-19 infection, 98 participants responded as fever being the most common symptom \((n = 96, 98\%)\), followed by dry cough \((n = 88, 89.8\%)\), sore throat \((n = 80, 81.6\%)\), and less severe symptoms such as myalgia \((n = 52, 53.1\%)\), nasal congestion \((n = 43, 43.9\%)\), and diarrhea \((n = 46, 46.9\%)\). Around 52 respondents were aware of the fact that the vertical transmission of COVID-19 has limited evidence, while 13 \((13.2\%)\) approved the idea. When asked about the transmission through breast milk, around 60 of 98 \((61.2\%)\) responders denied the idea, whereas 11 others \((11.2\%)\) supported the mode and the rest 27 \((27.6\%)\) had no thoughts regarding this transmission. As many as 75 of 99 responders \((75.8\%)\) were aware of the fact that dyspnea or difficulty in breathing is one of the predictors of severity of COVID-19 in children. Similarly, the responders opted for manifestations such as persistent high fever for 3–5 days \((n = 78, 78.9\%)\), poor cry tone activity with lethargy \((n = 56, 56.6\%)\), rapid progression of respiratory symptoms \((n = 59, 59.6\%)\) with radiological evidences like multilobar pulmonary infiltration in chest X-ray or computed tomography \((n = 64, 64.4\%)\) with less severe parameters like elevated myocardial enzymes \((n = 18, 18.2\%)\) and unexplained metabolic acidosis \((n = 17, 17.2\%)\), etc. As a general perception, 93 of 99 \((93.9\%)\) responders were aware of the fact that those aged > 65 years are vulnerable, whereas others \((n = 84, 84.8\%)\) also opted for chronic lungs disease, conditions of immunosuppression (cancers, bone marrow replacements) \((n = 93, 93.9\%)\), and uncontrolled diabetes \((n = 80, 80.8\%)\) as factors which make a person more vulnerable to COVID-19.

When asked about the mode of transmission, 91 of 99 responders suggested direct contact with body fluids, followed by fomites \((n = 67, 67.7\%)\).

Practices

The preventive measures followed by the HCWs were evaluated, where 97 of 99 were compliant for hand hygiene, whereas others opted for maintaining a safe distance from persons with respiratory symptoms \((n = 96, 97\%)\), avoiding frequent touching of face \((n = 94, 94.9\%)\) and use of facemasks \((n = 91, 91.9\%)\), etc. The measures taken by these HCWs for newborns were also evaluated where 62 of 97 responses suggested regarding maternal separation followed by expressed breast milk after proper hand and breast hygiene \((n = 55, 56.7\%)\), COVID-19 testing for newborns of COVID-19 infected mothers at 24 and 42 hours following birth \((n = 40, 41.2\%)\), and thorough postpartum bathing of the neonates \((n = 24, 24.7\%)\). The idea of maternal separation in suspected cases till the results of at least two consecutive nasopharyngeal samples turning negative was also supported by 93 of 97 responses \((95.9\%)\). The responses regarding the standard droplet and contact precautions included surgical gloves \((n = 95, 96\%)\), surgical face masks \((n = 94, 94.9\%)\), disposable water proof gowns \((n = 86, 86.9\%)\), eye protection \((n = 89, 89.9\%)\), and alcohol-based hand rubs \((n = 89, 89.9\%)\).

On evaluating the routine intensive care procedures liable for disease transmission, 98 of 99 \((99\%)\) HCWs opted for routine endotracheal tube suctioning while other responses were in favor of routine collection of tracheal aspirate samples \((n = 90, 90.9\%)\), handling patients linen and soiled diapers along with other fomites \((n = 57, 57.6\%)\), chest physiotherapy \((n = 60, 60.6\%)\), and vigorous changing of ventilator tubes \((n = 78, 78.8\%)\), etc. Around 85 of 96 responses \((88.5\%)\) were seen in favor of avoiding overcrowding of patients per bed \((n = 83, 86.5\%)\) followed by minimizing traffic and flow of contaminated air by restricting the entry of attendants \((n = 83, 86.5\%)\), the use of heat and moisture exchange (HME) filters in ventilated patients \((n = 70, 72.9\%)\), dedicated medical appliances such as stethoscopes, dressing kits, thermometers, glucometers, etc., per bed \((n = 61, 63.5\%)\), and surface disinfection by quaternary ammonium chloride \((n = 32, 33.3\%)\). The routine aerosol-generating procedures were answered by 96 HCWs such as endotracheal intubation \((n = 88, 91.7\%)\), followed by bronchoscopy \((83, 86.5\%)\), nebulization \((n = 78, 81.3\%)\), mechanical ventilation \((n = 69, 71.9\%)\), and noninvasive ventilation like CPAP \((n = 36, 37.5\%)\), etc. When asked regarding measures to be taken in operation theaters, maximum HCWs \((96 of 99\%)\) opted for COVID-19 testing of all the patients planned for surgery while the use of safety devices...
(n = 88, 90.7%) followed by limiting procedures (n = 55, 56.7%) like laparoscopy, high energy devices like harmonic scalpel, restricting the trafficking of staffs in the operating room (n = 69, 71.1%), etc.

Postoperative follow-up of patients using telephonic consultation was supported by 85 of 96 responders (88.5%) while others supported direct communication using social media like WhatsApp (n = 70, 72.9%) with an online provision report tracing (n = 63, 65.6%).

**DISCUSSION**

COVID-19 has emerged as a global pandemic affecting almost 215 countries with more than 4,400,000 cases while 81,970 cases in India, claiming 2,649 lives till date (as on 15 may 2020). During this public health crisis, the perception and practices adopted by the frontline HCWs are crucial not only to contain further transmission but also for safeguarding themselves. Our study has been targeted to evaluate the awareness among such HCWs serving in the pediatric surgery unit.

Many of the recently published studies have focussed on various aspects of challenges being faced by the HCWs worldwide in the last few months. A survey conducted by Taghrir et al. found a high level of COVID-19-related knowledge and preventive behavior among 240 Iranian medical students with moderate risk perception. The average rate of preventive behaviors was 94.47%, and 94.2% had high level of performances in preventive behaviors.

This denoted a perspective regarding the level of perception among HCWs, who are quite updated with the guidelines published by different official health authorities with special reference to the pediatric surgical patients. A cross-sectional study conducted on HCWs assessing their knowledge and perception by Bhagavathula et al. suggested a poor knowledge regarding disease transmission (n = 276, 61%) and symptoms onset (n = 288, 63.6%); however, they (total n = 453) harbored positive perceptions about COVID-19. Another cross-sectional study assessing the dentists’ awareness conducted by Khader et al. which included a total of 368 Jordanian dentists concluded adequate knowledge regarding symptoms, mode of transmission, and preventive measures to be taken in dental clinics. This study suggested updating the recent guidelines by national and regional dental associations to all the registered dentists. A multinational study regarding the awareness among dentists (n = 860) globally was conducted recently by Kamate et al. using an online questionnaire showed a high level of knowledge among 92.7% of responders. Good knowledge scores were significantly associated with qualification (p = 0.02) and year of practice (0.03). A questionnaire-based assessment among the HCWs of Mumbai metropolitan region covering 1,562 responders by Modi et al. reported 71.2% of correct answers (highest from the undergraduate medical students). However, less than half responders could define the close contacts. Khan et al. assessed the preparedness of Pakistani HCWs including physicians (10.9%), nurses (1.32%), lab staffs (1.65%), and academic individuals (86.42%) to conclude an alarming lower level of awareness for this emerging pandemic. The attitudes of anesthesiologists toward COVID-19-infected patients are also assessed by Dost et al. in Turkey. This study included 346 responders to an online questionnaire, which exhibited a correct attitude toward the airway management while following protective algorithm.

Two of such web-based studies (already enumerated) have been published from India evaluating the knowledge, attitude, and protective practices among HCWs; however, studies focussed on surgical units have not been come up. Our study has tried to cover up the generalized algorithms and perceptions among HCWs as well as the perioperative pediatric surgical aspects.

**CONCLUSION**

Healthcare workers are high-risk group for COVID-19; only knowledge and training can help to prevent and contain the disease. The early diagnosis and quarantine would help to limit the transmission. Healthcare workers involved in pediatric surgical specialty had acceptable level of perception; however, regular scheduled educational and training programs are crucial to improve and update the knowledge and practices about COVID-19.

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