

## Impact of COVID-19 Pandemic on Health Care Professional due to Emergency Surgical Practice: A Hospital Based Observational Study

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### Abstract

**Background and Objectives:** The effects of COVID-19 on surgical practice are extensive and include modifications to perioperative practice and ways of working, workforce and staffing difficulties, procedural prioritization, intraoperative viral transmission risk, and surgical training and education. There is a lack of information about the way this pandemic has impacted medical professionals because of surgical practice.

**Aims and Objectives:** The current study's goal was to determine the dispersion of COVID 19 through patients to healthcare professionals utilising PPE during emergency surgeries.

**Material and Methods:** The study was conducted as a hospital based retro prospective observational study at the Department of General Surgery, Government Medical College and hospital of central India. After receiving institutional ethical committee permission and the informed written consent, 36 patients receiving emergency surgeries during COVID-19 Era and 109 health care professionals involved in patient care were evaluated for the onset of any COVID 19 symptom for 5 days postoperatively. All the data collected were analyzed using SPSS statistical software version 26.

**Results:** Among these 36 emergency surgeries patients, 86.1% (n=31) had COVID positive report during admission, mostly had complain of respiratory symptoms. Out of 16 COVID positive health workers, 81.25% (n=13) suffered from respiratory symptoms, 43.75% (n=7) had G.I symptoms and 12.50% (n=2) were asymptomatic. Analysis showed a positive relation between COVID positive status and depression in health care professionals (p=0.028).

Out of 93 COVID negative health care workers involved in emergency surgeries, 90.32 % (n=84) were asymptomatic. Only 9.67% (n=9) health care workers had respiratory symptoms and 2.1% (n=2) had gastrointestinal symptoms.

**Conclusion:** The current study may aid in the development of mitigation measures to enhance mental well-being, as well as the identification of factors of poor mental state and therapies to treat people suffering from a mental condition. Postoperative assessments in a digital environment on an individual basis allow team members to voice their worries and comments to the system as a mitigating technique. Evidence-based training and education for HCWs on pandemic preparation has been shown to be critical for improving hospital staff expertise, abilities, and mental well-being during a pandemic.

**Keywords:** COVID 19; Emergency surgery; Health care professionals; Mental health; Pandemic.

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## Introduction

Following a number of instances of pneumonia of unknown origin in Hubei Province, China, the RNA virus causing 'Corona virus Disease 2019' (COVID-19) was identified as Severe Acute Respiratory Syndrome Corona virus-type 2 (SARS-CoV-2). This virus quickly spread around the world, and the World Health Organisation (WHO) declared it a pandemic on March 11, 2020, affecting numerous industries and having worldwide socioeconomic ramifications. [1-5]

COVID-19 has a wide-ranging influence on surgical practise, including workforce and staffing concerns, procedural prioritisation, and intraoperative viral transmission risk, as well as having an effect on surgical education.

Health care professionals were at the highest risk of COVID infection, accounting for 14–35% of all COVID-19 cases reported to the WHO. Health professionals in high-demand environments faced not just physical health concerns but also high levels of psychological stress due to their arduous work schedules, continual worry about contracting diseases, separation from their families, and social shame.

According to a recent systematic review and meta-analysis, one in three healthcare professionals experienced insomnia and one in four experienced depression and anxiety during COVID-19. [6]

The present study's goal was to determine how COVID-19 affected HealthCare professionals.

## Aim and Objectives

The purpose of present study was to estimate the contact spread of COVID 19 from patients to health care workers using PPE during emergency surgeries and to Evaluate effect of COVID 19 on Emergency surgeries.

## Material and Methods

Mundara *et al.*

The study was conducted as a hospital based retro prospective observational study at the Department of General surgery, Government Medical College and hospital of central India. The source of data for this study was patients underwent emergency surgery as well as health care workers who were involved in providing emergency care to those patients. The research was accepted by the Ethical Committee and complete informed written consent was acquired from the patients.

**Inclusion criteria:** Both males and females patients undergoing emergency surgery and health care workers who were affected prior to or through the exposure of emergency surgical procedure patient.

**Exclusion criteria:** Health care workers who had a confirm COVID - 19 exposure through close contacts including household with in previous 14 days were excluded from the study.

## Methodology

1. All patients and health care workers, involved in emergencies surgeries were tested with COVID 19 Rapid Antigen Kit test before taking patient to operation theatre.
2. Testing of health care workers after surgeries was done on arrival of any COVID 19 symptom or after 5 days if asymptomatic.
3. All health care workers were quarantined for 5 days or till COVID 19 Rapid kit test becomes negative.
4. Data were collected from patients and health care workers involved in emergency surgeries were summarized in presented performa.

## Statistical Analysis

Data was collected, compiled and tabulated in excel sheet. Qualitative data were represented as number with percentage.

Quantitative data were represented as mean with standard deviation. Statistical analysis was done by using SPSS 26.0 version software (IBM, SPSS, Inc.).  $p < 0.05$  value considered as a statistical significant.

## Results

In present study, we observed 36 patients who underwent emergency surgeries during COVID 19 Era. The mean age was  $40.36 \pm 10.74$  with age ranging from 21- 60 years. Male predominance (63.9%) was seen in present study. Most of the patients who came for emergency surgery were of pleural effusion 33.33% (n=12) and perforation peritonitis 25% (n=9) followed by other indications. (Table 1 & 2).

**Table 1: Demographic variables of patients who underwent emergency surgery during COVID 19 era**

Variables		No. of patients (n)	Percentage (%)
Age groups (years)	21-30	09	25.00
	31-40	16	44.44
	41-50	05	13.88
	51-60	06	16.66
Gender	Male	23	63.9
	Female	13	36.1
Indication of emergency surgery	Pleural effusion	12	33.33
	Perforation peritonitis	09	25
	Cellulites	05	13.88
	Diabetic foot	04	11.11
	Obstructed hernia	03	8.33
	Sub-acute intestinal obstruction	02	5.55
COVID status of patients	Appendicular perforation	01	2.77
	Positive	31	86.1
	Negative	05	13.9

**Table 2: Symptomatology of emergency surgery patients**

Symptoms		No. of patients (n)	Percentage (%)
Respiratory	Sore throat	27	75
	Cough	25	69.4
	Shortness of breath	11	30.6
	Running nose	02	5.6
GIT	Nausea	14	38.9
	Vomiting	04	11.1
	Diarrhoea	08	22.2
CNS	Seizures/Altered sensorium	00	00
Others	Loss of smell	34	94.4
	Headache	24	66.7
	Myalgia	22	61.1
	Fever	22	61.1
	Rash	00	00
	Conjunctivitis	00	00

In present study, total 109 health care workers were involved in 36 emergency surgeries, out of which 16 were tested positive for COVID 19. Testing was done as soon as residents developed any symptoms of COVID after emergency surgeries or after 5 days if asymptomatic. (Table 3)

**Table 3: Different variables in health care workers involved in emergency surgeries**

Variables		No. of patients (n)	Percentage (%)
Health care workers (n=109)	Nurse	36	100
	Junior Resident I	36	100
	Junior Resident II	25	69.4
	Junior Resident III	12	33.33
COVID Positive (n=16)	Nurse	01	2.8
	Junior Resident I	09	25
	Junior Resident II	04	16
	Junior Resident III	02	16
Depression	COVID (+) health care workers	12/16	75
	COVID (-) health care workers	42/93	45.1

Out of 16 COVID positive health workers most of them had respiratory symptoms 81.25% (n=13) , 43.75% (n=7) had G.I symptoms, none had CNS symptoms and only 2 health care workers were asymptomatic.

Out of 93 COVID negative health care workers involved in emergency surgeries, 84 (90.32%) were asymptomatic. Only 9 health care workers had respiratory symptoms and 2 had gastrointestinal symptoms. COVID positive health care workers are relatively 1.66 times higher risk of development of depression in Non COVID health care workers (Relative Risk= 1.66).

If COVID is eliminated from the same population then there will be a 9% reduction of ne incidence of depression in the same populations (Popular Attribution Risk=9%).

### Discussion

COVID-19 has resulted in considerable changes in surgical practise across the world. According to our assessment, the COVID-19 epidemic has had a significant impact on the majority of surgeons' practises in India. [6]

According to studies, several other centres throughout the world had to employ a multidisciplinary strategy and adapt their

operating processes to address special demands during this pandemic period. As Italy became the epicentre of Europe's initial epidemic, an Italian hospital reported a significant reorganisation attempt for emergency surgeries including triage infection in emergencies, allocating COVID-19 particular negative pressure operating theatres, and full surgical PPE. [7] Another report based on a Singapore hospital claimed the same severe COVID-19 surgical preparation with a few changes, such as using PAPR, minimising staff cross-contamination by assigning workers just to COVID-19 surgery, and the opportunity to pre-simulate with all staff. These methods, in principle, follow some criteria, but owing to financial and human resource limits, they are not appropriate in every institution. [8] A crucial difficulty for COVID-19 patients undergoing surgery is the increased waiting time necessary, with considerable delays attributed to screening and diagnostic tests for COVID-19. [9] The timing and availability of antigen test findings are critical in establishing the presence of COVID-19 infection. Delays are inevitable in underdeveloped nations because modern technology-based assays, such as PCR, may not be easily available. [10] The critical

function of HCWs as front-line responders during a pandemic is critical and vast, making them more vulnerable to stress and anxiety owing to overburdened health-care systems, as well as fear of infection. [11]

Present study had taken 36 patients operated by junior resident I, II and III and nursing staff during COVID era.

Even though nurses and junior residents I equally involved in emergency surgeries, only one nurse (2.8%) was tested positive whereas, 25% Junior Residents (n=9) were tested COVID positive. Junior Residents I had more contact with patients during peri-operative period, during optimization before surgery, during shifting of patients in operation theatre and post operative management while nurses were involved only during surgeries. So, using preventions measures during surgeries has drastically decrease infection from 25% to only 2.8%.

Mental health turns out to be an important aspect in COVID era. In present study, out of total 16 COVID positive health workers , 12 complains of depression and out of total 93 COVID negative health care workers , 42 had depression symptoms .COVID positive status was significantly associated with depression in our study (p=0.0282). It was observed that COVID positive health workers had relatively 1.6 times higher risk of development of depression as compared to COVID negative health workers.

As a result, this study may aid in the development of mitigation measures to enhance mental well-being, as well as the identification of factors of poor mental state and therapies to treat people suffering from a mental condition. Postoperative assessments in a digital environment on an individual basis allow team members to voice their worries and comments to the system as a mitigating technique. As safety precautions, ensure the availability of PPE, encourage routine tracing, and provide swabs to employees. The healthcare facility must also offer therapy for

employees who caught COVID-19, as well as guaranteed pay for employees who were on sick leave owing to COVID-19. [10]

Evidence-based training and education of HCWs on pandemic preparation has been shown to be critical for improving the expertise, competencies, and emotional well-being of hospital personnel during a pandemic. [12] Furthermore, a lack of knowledge has been linked to a greater infection rate [9], and HCWs that are competent about infection control had the lowest amount of stress. [13]

As a result, this research will serve as a model for surgical preparation for the inevitable infectious disease disaster in future.

**Limitations of the study:** This study couldn't have been sufficiently large to be of sufficient precision because it was conducted with a small number of patients. COVID 19 also had a window time of 2-3 days. Those patients who tested negative throughout the window period might have influenced our findings. The unreliability of the swab's sensitivity and the unpredictability of shedding of the live/dead virus over undetermined periods of time may result in such perplexing outcomes.

### Conclusion

During an infectious pandemic, emergency surgeries must assure the handling of patients undergoing surgery with superior levels of care. If an emergency surgery is required, the responding surgeon must oversee the application of safety precautions in the operating room. A greater focus should be devoted to the psychological well-being of frontline medical personnel in the event of another COVID 19 outbreak in the future. This study emphasizes the present epidemic and serves as a model for surgical preparation for a future infectious disease disaster that will eventually occur.

### References

1. Zhu N., Zhang D., Wang W., Li X., Yang B., Song J., Zhao X., Huang B., Shi W., Lu

- R., Niu P., Zhan F., Ma X., Wang D., Xu W., Wu G., Gao G.F., Tan W. A novel coronavirus from patients with pneumonia in China, 2019. *N. Engl. J. Med.* 2020; 382:727–733.
2. Sohrabi C., Alsafi Z., O'Neill N., Khan M., Kerwan A., Al-Jabir A., Iosifidis C., Agha R. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19) *Int. J. Surg. Lond. Engl.* 2020;76:71–76.
  3. World Health Organisation WHO Director-General's opening remarks at the media briefing on COVID-19. 2020. <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-COVID-19-11-march-2020> accessed March 29, 2023.
  4. Nicola M., O'Neill N., Sohrabi C., Khan M., Agha M., Agha R. Evidence based management guideline for the COVID-19 pandemic - review article. *Int. J. Surg. Lond. Engl.* 2020.
  5. Nicola M., Alsafi Z., Sohrabi C., Kerwan A., Al-Jabir A., Iosifidis C., Agha M., Agha R. The socio-economic implications of the coronavirus and COVID-19 pandemic: a review. *Int. J. Surg.* 2020.
  6. Pappa S, Ntella V, Giannakou T, Papoutsis E, Katsounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. *Brain, behavior, and immunity.* 2020 Aug 1;88:901-7.
  7. World Health Organization. WHO Coronavirus (COVID-19) Dashboard [Internet]. Available from URL : <https://COVID19.who.int/>
  8. World Health Organization. Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected: interim guidance [Internet]. 2020.
  9. Chetterje P. Gaps in India's preparedness for COVID-19 control. *The Lancet Infectious Diseases.* 2020 May 1; 20(5): 544.
  10. Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta bio medica: Atenei parmensis.* 2020;91(1):157-60.
  11. NHS England .Next steps on NHS response to COVID-19 [Internet]. (2020). Available from URL: <https://www.england.nhs.uk/coronavirus/publication/next-steps-on-nhs-response-to-COVID-19-letter-from-simon-stevens-and-amanda-pritchard/>
  12. American College of Surgeons. COVID-19 guidelines for triage of cancer surgery patients [Internet]. 2020.
  13. Center for disease control and prevention. Healthcare Workers. Centers for Disease Control and Prevention [Internet]. 2020.