

## RESEARCH ARTICLE

## The reduction in clinical and surgical exposure of trainees during COVID-19 and its impact on their training

Hassan Tahir, Mirza Arshad Beg, Faisal Siddiqui

### Abstract

**Objective:** To assess the impact of coronavirus disease on surgical training.

**Method:** The cross-sectional study was conducted at the General Surgery Department of Liaquat National Hospital, Karachi, from August 2019 to May 2020, and comprised surgical trainees from year 1 to 4. The subjects were interviewed and inquired about their opinion regarding the impact of coronavirus disease on their training. Data was prospectively collected in two equal phases of 5 months each, separating the phases on the basis of the application of preventive measures and changes relating to coronavirus disease. Data of cases from log books was divided into major and minor cases.

**Results:** Of the 24 surgical trainees available, 18(75%) participated; 12(66.6%) females and 6(33.3%) males. There was a significant difference between the two phases, with the number of surgical case going down drastically in the second phase ( $p=0.005$ ), affecting the training process.

**Conclusion:** Considering the ongoing pandemic, it may be worthwhile to look into the possibility of increasing the duration of training.

**Keywords:** Coronavirus disease, COVID-19, Surgical training, Pre-COVID-19, Per-COVID-19. (JPMA 70: S-18 [Suppl. 1]; 2021)

### Introduction

Coronavirus disease-2019 (COVID-19) pandemic has adversely affected the whole world and has caused mass destruction in the last few months in terms of affecting the economy, as well as social, personal and professional life. As per the World Health Organisation (WHO), COVID-19 is an international emergency<sup>1</sup> that has affected almost all countries around the globe with hundreds and thousands of infected cases. It is estimated that thousands have died, indicating a high case-fatality rate of around 3.5%.<sup>2-4</sup> It has also gravely affected the medical system from both patient care and training point of views. To combat these, there must be a strong healthcare and disaster/mass casualty incident response system available.<sup>5</sup>

Looking at the surgical training, which is a four- to five-year training programme consisting of clinics, ward rounds and routine patient care, operation room (OR) exposure to build surgical skills and exposure to Accident and Emergency Department, is part and parcel of the training. To excel in the training, one must be proficient. During the current time of COVID-19 pandemic, we can see that it is in a standstill phase due to decline in surgical cases.<sup>6</sup> During the pandemic, the elective surgical

procedures and outpatient department (OPD) are affected most which applies to both the patient and the trainees. Also, the academic activities of the residents are affected, especially those in their early years of training, who were attached to the COVID-19 unit and they were the most dissatisfied.<sup>7</sup> The number of active and fit healthcare workers is in a declining phase as they are contracting the disease, causing increased workload, mental and physical stress and decline in the quality of performance.<sup>8,9</sup> Also, the recent implementation in some hospitals and institutions that all medical professionals have to handle COVID-19 patients regardless of the specialty they belong to has also affected surgical training. The trainees, whether belonging to orthopaedics, neurosurgery, plastic and reconstructive surgery, general surgery or paediatric surgery, are all equally affected by the pandemic. As per the guidelines published by the American College of Surgeons (ACS), all elective ambulatory provider visits shall be delayed, elective and non-urgent admissions shall be rescheduled, inpatient and outpatient elective surgical and procedural cases shall be delayed, and routine dental and eye care visits shall be postponed.<sup>10</sup>

The current study was planned to look into the deficiencies in surgical training that may arise in such a situation, and to draw relevant conclusions that may lead to the development of early measures and counter-measures.

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Liaquat National Hospital, Karachi, Pakistan.

**Correspondence:** Hassan Tahir. Email: h.tahir1992@gmail.com

## Subjects and Methods

The cross-sectional study was conducted at the General Surgery Department of Liaquat National Hospital (LNH), Karachi, from August 2019 to May 2020. After approval by the ethics review committee, surgical trainees from year 1 to 4 currently working at LNH department were selected using convenience sampling technique. Registrars, senior registrars and rotational trainees were excluded.

Participants were interviewed and inquired about their opinion regarding the impact of COVID-19 on their training. Data was prospectively collected in two equal phases of 5 months each, separating the phases on the basis of the application of preventive measures and changes relating to COVID-19. Data of cases from log

books was divided into major and minor cases. Major surgery was defined as an invasive procedure during which a body cavity was entered, or a mesenchymal barrier was crossed, or a fascial plane was opened, or an organ was removed and normal anatomy was operatively altered with expected hospital stay. Minor procedures were defined as invasive operative procedures in which only skin, mucous membranes, or superficial connective tissue was manipulated.<sup>11</sup>

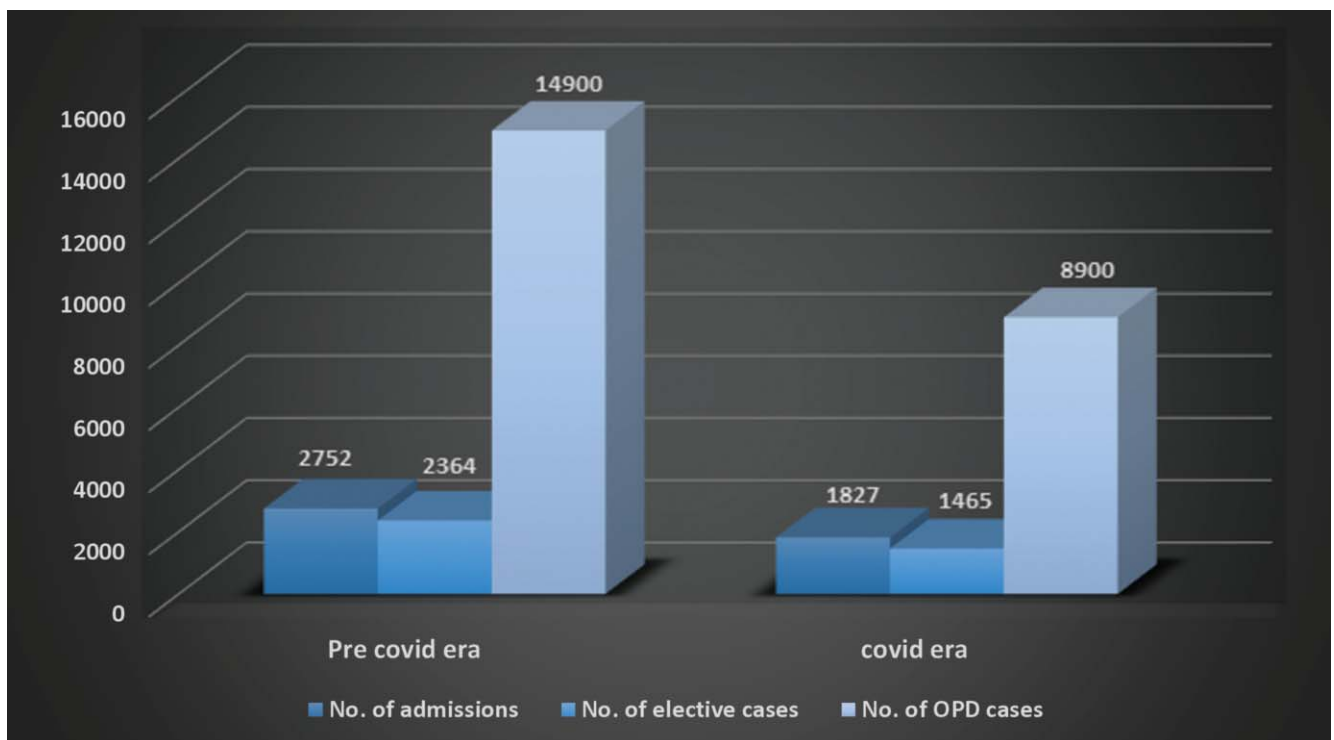
## Results

Of the 24 surgical trainees available, 18(75%) participated; 12(66.6%) females; 6(33.3%) males; 11(61.1%) from postgraduate year (PGY) 2; 3(16.6%) from PGY4; and 2(11.1%) each from PGY 1 PGY3. In the pre-COVID-19

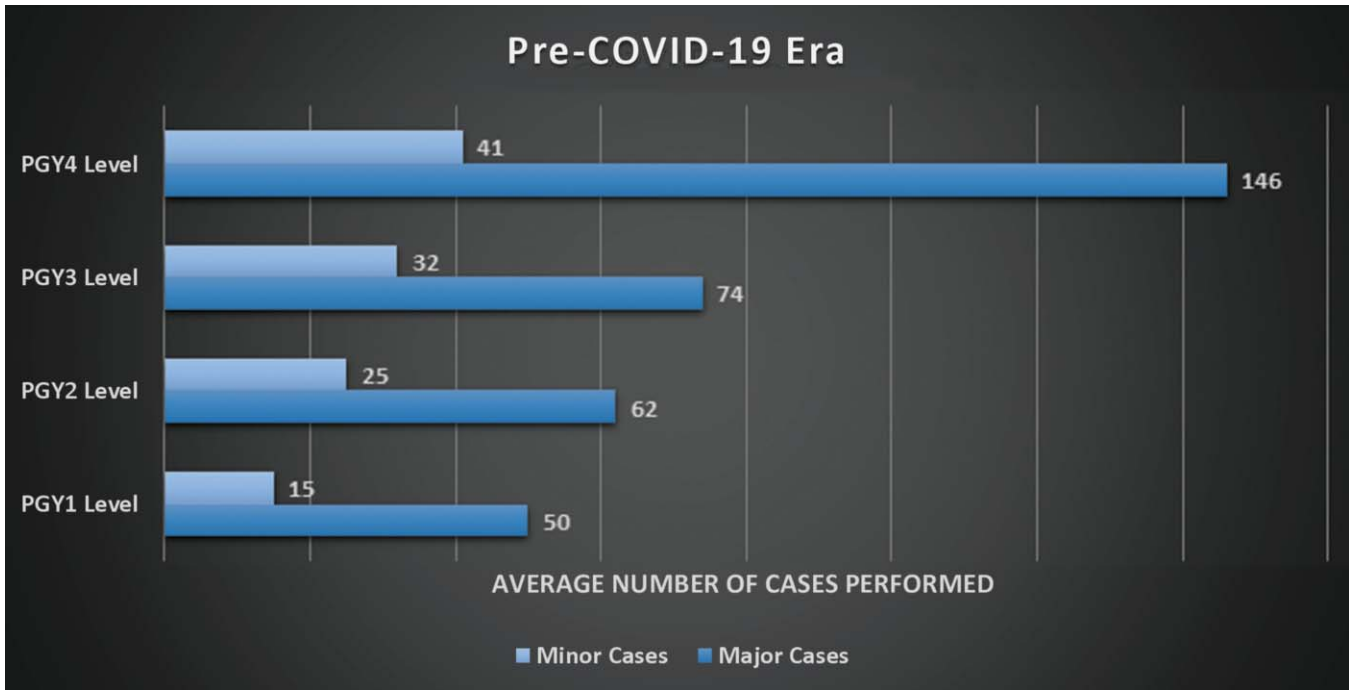
**Table:** Difference in the number of procedures conducted by surgical trainees in the two phases.

	Pre-COVID				Per-COVID			
	Minor		Major		Minor		Major	
	Assisted	Performed	Assisted	Performed	Assisted	Performed	Assisted	Performed
PGY4	16	25	110	36	05	06	30	10
PGY3	18	14	54	20	11	06	18	07
PGY2	15	10	47	15	08	04	20	05
PGY1	10	5	45	05	12	03	14	01

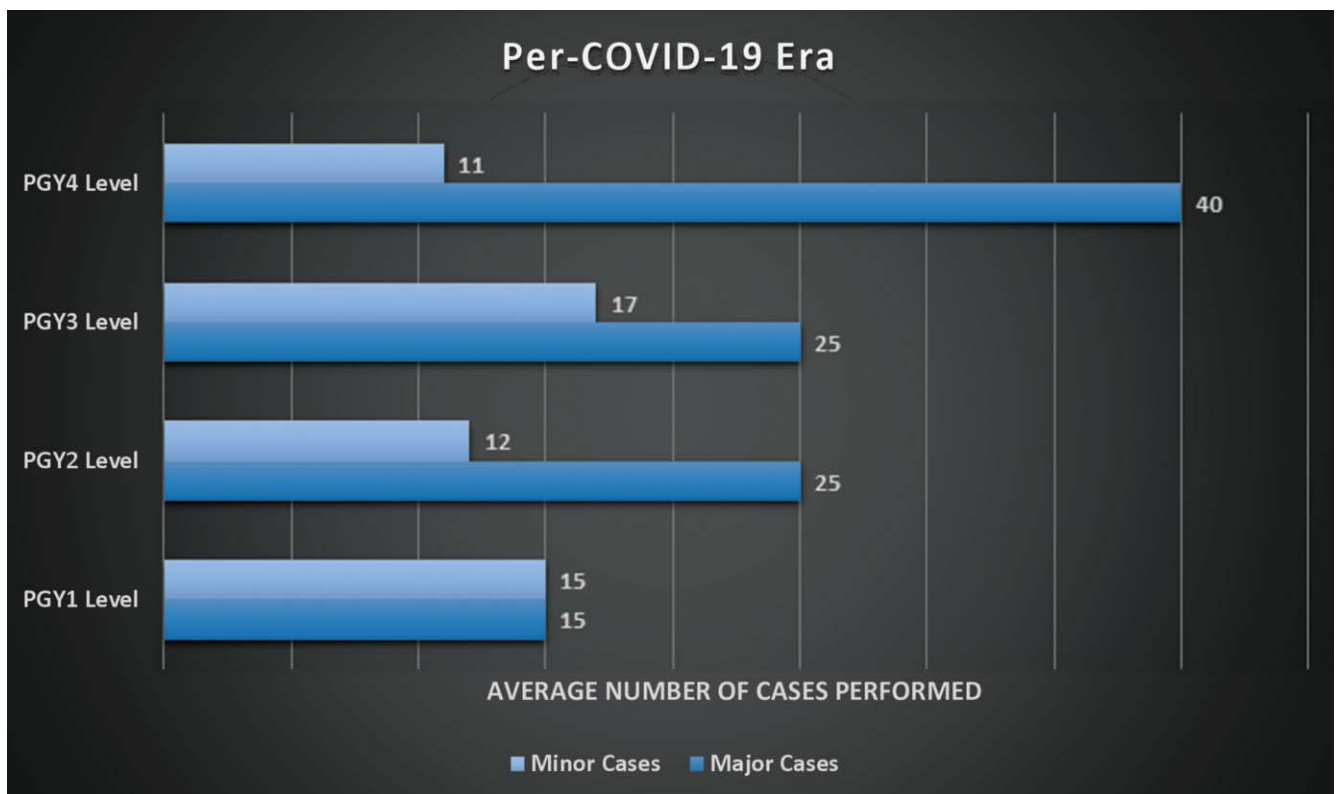
COVID: Coronavirus disease; PGY: Postgraduate year.



**Figure-1:** A brief audit of surgical out-patient department (OPD) and theatre during pre-coronavirus disease (COVID-19) and per-COVID-19 eras.



**Figure-2:** Average number of cases observed/assisted /performed independently by postgraduate trainees of all levels during pre-coronavirus disease (COVID-19) era. (Data based on trainee log books).



**Figure-3:** Average number of cases observed/assisted /performed independently by postgraduate trainees of all levels during per-coronavirus disease (COVID-19) era. (Data based on trainee log books).

phase, there were 14,900 patients compared to 8,900 during the COVID-19 phase. The number of admission reduced from 2,752 to 1827, and the number of elective cases performed went down to 1,465 from 2,364 ( $p < 0.005$ ) (Table).

The log books maintained by the trainees reflected a similar pattern (Figures-1, 2).

## Discussion

The study found a remarkable decrease in the number of surgical cases at all PGY in the per-COVID-19 era compared to the pre-COVID-19 era.

A study at the General Surgery Department, Trieste University Hospital, Trieste, Italy, looked into the effects of the pandemic on residents, comparing their surgical activity during the lockdown period with the one during the earlier two months of the same year while focussing on PGY6 training. It found that COVID-19 drastically reduced the practical activity for PGY6 trainees ceased in the per-COVID-19 era.<sup>12</sup> In another study conducted at the General Surgery Department, University Hospital Hairmyres, East Kilbride, Scotland, United Kingdom, due to disruption in training owing to COVID-19, the trainees were found to be stressed and the pandemic had adversely affected the training.<sup>13</sup>

It has been recommended that patients must be advised to avoid visiting wherever and whenever possible, or to visit primary or secondary healthcare setups, offloading the tertiary care setup which are the main hub of teaching and training for a surgical trainees. Patients themselves avoided to visit hospitals due to fear of acquiring the virus. Tele-healthcare system was introduced to overcome the problems of patients that partially resolved the matter from patients' point of view,<sup>14-16</sup> but there remains the issue of surgical training.

One study came to the conclusion that exposing trainees to reasonable volume and variety of patients in resident-run clinics with appropriate supervision was a valuable learning resource in orthopaedic surgery training.<sup>17</sup>

Pre-operative evaluation and taking care of post-operative patients is done on the surgical floor by interns and surgical trainees. This includes taking history, looking into medical record of the patient for any previous medical or surgical issues etc. All these aspects are of considerable importance in training of a health professional. A major part of surgical trainees' operating skill learning is dependent on the time spent in the OR, working either as observer or assistant, performing the procedure independently or under observation of an

attending. Although part of skill learning can be done through watching procedural videos and practising hands-on skills and simulation-based learning,<sup>18</sup> these cannot surpass the importance of the learning in OR. In the current situation, there is a decline in the number of surgeries performed in a day both as in-patient and day-case scenarios.

The number of patients admitted via emergency is already not a major contributor to OR list or daily learning. Routine cases are still presenting to the emergency room in the same number and frequency, but most of them are managed with medical therapy. Only those with non-resolving complaints or serious emergency issues are usually admitted for monitoring or non-monitoring for surgical intervention. All this has damaged surgical training in the COVID-19 era.

## Conclusion

The ongoing COVID-19 pandemic has adversely affected surgical training in all aspects. There is a need to look into the matter to help trainees in this situation. Measures should be taken to overcome this deficiency in training. Considering the present scenario, it may be worthwhile to look into the possibility of increasing the duration of training in specialties to compensate for the training opportunities being lost.

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