## **Original Article**

# Changes in surgical practice by surgical residents and consultants during COVID-19 pandemic: A cross-sectional survey

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#### **ABSTRACT**

**Background:** During the COVID-19 pandemic, surgical practice is greatly changed as a strategy to prevent infection to the health care workers. This study was done to see what changes have been made in the surgical practice by the surgical consultants and residents in various surgical disciplines.

**Methods:** A Survey form was developed on the "Google Forms" application and distributed to surgical consultants and residents. The submission was received online during May 2020. The collected data were entered and analyzed using SPSS V.23. Qualitative data were presented as frequencies and percentages. Quantitative data were presented as mean and standard deviation.

**Results:** Overall, 272 consultants and residents from 45 teaching hospitals from Pakistan and around the world participated in the survey. Among the participants, 100 (36.8%) were surgical consultants and 172 (63.2%) were surgical residents. About 42% of participants were not performing elective surgeries during this pandemic of COVID-19 but almost all participants were performing emergency surgeries (93%). Over 60% of the respondents admitted that their practice is either reduced to more than 50% or completely shut down during this pandemic. Over 80% stated that their training activities were compromised due to the pandemic.

**Conclusion**: COVID-19 pandemic has greatly affected surgical practice both in the public and corporate sectors. Elective surgeries are affected the most in addition to the suspension of training activities of the residents.

Keywords: COVID-19, Surgical practice, Training, Elective surgery, Pandemic.

### INTRODUCTION

Pandemics have many times afflicted the world.[1-3] In December 2019, another pandemic originated from Wuhan- a province of China, caused by the novel coronavirus.[3] WHO declared Corona Virus Disease (COVID-19) a Public Health Emergency of International Concern on 1st February 2020. Across the globe, millions of human beings are affected and many of those have died by this disease.[4] Pakistan declared its first COVID-19 case on 26th February 2020. As of 20th June

2020, there are over 176,000 confirmed cases in Pakistan with a reported mortality of over 3500 patients.[5,6]

COVID-19 is a unique challenge that health care workers have ever faced. As the information on pathogenesis, management, and the outcome is still evolving, thus a great concern is noted in health care workers including surgeons and their residents. Governments and hospital administrations were urged to safeguard their workforce so that a healthcare-related disaster is avoided along

Correspondence\*: M. Kamran Azam, Department of Pediatric Surgery Unit-II, The Children's Hospital and the Institute of Child Health, Lahore

Email: Kamranazam1787@gmail.com Submitted on: 23-07-2020 Conflict of interest: Yes with the management of ongoing crises of COVID-19 cases. Death of various specialists including surgeons have been reported by China and other countries.[7] Moreover, reports of infecting many health care workers including surgical residents are also not uncommon. Therefore, healthcare systems rapidly reshaped their healthcare facilities to deal with this extraordinary situation.[8]

Many international surgical bodies such as American College of Surgeons, Royal College of Surgeons, and Association of Paediatric Surgeons of Pakistan have issued advisories for changes in surgical practice for safeguarding the surgical workforce, avoiding deficiency of medical/surgical supplies, and providing adequate care to those needing it during this pandemic.[9-12] Every department has made changes in surgical practice.[6] This study looked at the impact of COVID-19 pandemic on the practice of surgical consultants and residents in various surgical disciplines.

#### **METHODS**

This cross-sectional survey was conducted at the Department of Pediatric Surgery, the Children's Hospital, and the Institute of Child Health, Lahore. A questionnaire was developed on the "Google Forms" application and distributed to surgical consultants and residents via various social media groups (WhatsApp groups, Facebook groups), and personal email communications. The questionnaire was composed of two parts, the first part collected data regarding demography of the participants (anonymity ensured), and the second part collected information on current surgical practice in terms of workload, academic and teaching activities, and protective measures while dealing/operating the patients, during COVID-19 outbreak. The submission was received online during May 2020. The collected data were analyzed with SPSS V.23. Qualitative data were presented as frequencies and percentages. Quantitative data were presented as mean and standard deviation.

#### **RESULTS**

A total of 272 consultants and residents from 45 teaching hospitals from Pakistan and a few other countries participated in the survey (Fig.1). Fourteen centers outside of Pakistan provided 7% of the total contributions in the survey. The mean age of participants was  $34.83 \pm 9.27$  years with a male predominance (M:F 3.2:1). (Table 1)

Over 60% of the participants belonged to three institutions namely, the Children's Hospital and the Institute of Child Health Lahore (33.8%), Nishtar Hospital Multan (20.6%), and Services Hospital Lahore (9.6%). Among the participants, 100 (36.8%) were surgical consultants and 172 (63.2%) were surgical residents working mainly in the public sector (88.2%). Regarding specialty, pediatric surgery, and general

surgery consultants/residents participated the most in this survey. (Fig.2)



Figure 1: Showing the location of the participants.

Table 1: Showing the demography of the participants.

		Frequency	Percent (%)
Gender	Male	207	76.1
	Female	65	23.9
Status	Consultant	100	36.8
	Surgical Resident	172	63.2
Job place	Public sector	222	81.6
	Private sector	32	11.8
	Public sector, Private sector	18	6.6
Country	Pakistan	253	93.0
	Other countries	19	7.0

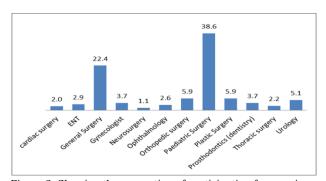


Figure 2: Showing the proportion of participation from various surgical specialties

Regarding changes in surgical practice, 42.3% of the participants were not performing elective surgeries during this pandemic, but over 93% of the participants were performing emergent surgeries during the same period. Over 67% of the respondents (consultant; 57%, residents; 72%) were attending patients in OPD, and 89% of the participants (consultant; 81%, residents; 94%) were managing patients in the wards during this pandemic, but due to ward-based arrangements during the pandemic, the frequency of their duties was reduced by 40-60%. In the corporate sector, 63% stated that they

have not performed any surgery during this pandemic. Over 42% of the participants observed >50% decline in their surgical practice, while 30% thought that effect was <50%. In comparison to female surgeons, male surgeons thought that their surgical work has decreased by more than 50% (Fig.3). The concern of decease surgical work was even greater in consultants, as 23% of consultants stated that their surgical work has completely shut down in comparison with 4.3% of surgical residents (p-value <0.001).(Fig.4) Interestingly, few participants claimed an increase in their surgical practice (Fig.3). Similarly, 67% of respondents from abroad said that their surgical work has decreased by more than 50%. About various specialties, reduction in surgical work is shown in Figure 5.

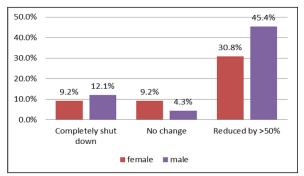


Figure 3: Showing a decrease in surgical practice among gender.

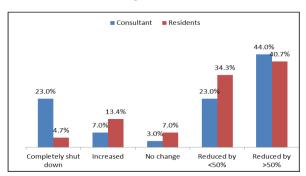


Figure 4: Showing decease in surgical work among surgical residents and consultants.

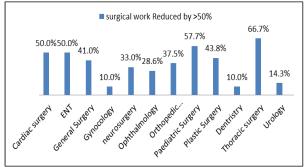


Figure 5: Showing a decrease in surgical practice among different specialties

Over 83% stated that clinical and academic activities were compromised due to the pandemic. This feeling of specialty in surgical practice was common among respondents of different gender, work status, and specialty. Among various surgical specialties, 90% of the residents from pediatric surgery thought that their training is being compromised by this pandemic while only 57% of urology and 60% of gynecology residents agreed. The practice of using online teaching through zoom, webinar, and skype was more prevalent (>50%) while the use of traditional methods of training like small group discussion and assignment was less often used (25%). The use of digital methods of teaching was quite popular in respondents of other countries (78.9%) in comparison to Pakistani (56.5%) responders. Conventional methods of teaching were still being used in Pakistan (30%) while the world has completely abandoned them altogether. (Fig.6)

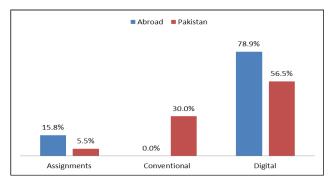


Figure 6: Showing comparison of teaching methods during COVID-19 in Pakistan and abroad

The majority of participants (91.8%) were taking various measures before attending the patients. A good proportion (71%) was using gloves along with hand disinfectant,(70%) and hand washing (63%) while attending the patients. The survey showed that the participants were using various types of masks (surgical mask: 54%, N95: 58%, non-specific cloth masks: 26%). Social distance was being observed by 47% of the respondents. (Fig.7)

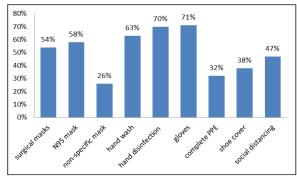


Figure 7: Showing extra measures taken by the participants while attending patients during the COVID-19 pandemic.

While in theater, 73% of the respondents were observing extra-measures while operating non-COVID-19 patients. Over 40% were using coverall during surgery. Details of the extra measures are given in Figure 8. Interestingly, very few were protecting face/eyes with glasses or face shield. About 20% of respondents stated that they had to

operate suspected/confirmed cases of COVID-19. Of these, 20% got the symptoms of dry cough and fever and 13% were tested positive for COVID-19.

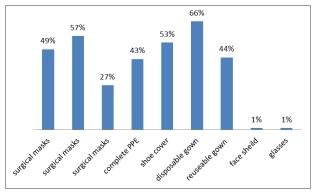


Figure 8: Showing extra measures taken by the participants while operating patients during the COVID-19 pandemic.

#### **DISCUSSION**

This survey established that COVID-19 pandemic has significantly affected contemporary surgical practice and training activities. Although the majority of the residents were doing ward-calls and emergency duties, however, the frequency of their duties was reduced because of special duty rosters implemented to reduce the exposure of the surgical workforce to the corona virus.

During the pandemic, the surgical cases were categorized based on the urgency of surgical intervention, into:

- 1. Emergency (need operation within 24 hours)
- 2. Emergent (need operation in 24 to 72 hours)
- 3. Semi Elective A (in less than one month)
- 4. Semi Elective B (till 3 months)
- 5. Elective (more than 3 months)[9-13)

Based upon the above-mentioned categorization, emergency, and emergent surgeries were given priority and the rest of surgical case categories were cut down in both the public and private sectors. Although this study has not evaluated a decline in number and category of surgical cases being operated during this outbreak, however, a decline in elective surgeries can be reflected by our study as over 40% of the participants were not exclusively operating any of the elective category cases and over 90% were operating only emergency cases. This study revealed that overall surgical practice was markedly reduced in various disciplines of surgery especially in pediatric surgery and general surgery. We believe that the surgical practice is also similarly affected in other surgical specialties; but due to variable participation as to the number of participants from other specialties, this has not been reflected in our results. This can be considered a limitation of our study.

The impact of COVID-19 on surgical work must have led to a great backlog of surgical cases. Various hospitals though tried their best to manage their OPD work flow using telemedicine media such as using Skype, or WhatsApp service for online consultations.[14] Our survey did not include the question on individual use of telemedicine medium for patient consultations, but we have inquired about the institutional practice on online patient consultation, separately. Over 80% of the institutions of the participants of this survey have been providing online consultations to facilitate their patients. Online clinics have already been effectively run on a small scale, but in this scenario, we need to opt telemedicine judiciously to get ample benefits.[15] Nevertheless, managing the backlog of surgeries would be a hard nut to crack.[16,17] This situation is especially grim in the case of under-resourced countries like Pakistan where many patients were already on long waiting lists for surgical services.

Organizations like Public Health England (PHE), WHO, and Centers for Disease Control (CDC) have recommended the use of PPE for procedures on patients with suspected or confirmed COVID-19.[8,18,19] In this survey, we found that 57% of participants were using N95 masks while 66% were using surgical masks while operating on these patients. Complete PPE in the form of coverall was also being used by over 40% of the participants. Unfortunately, only 1% were using face shields and glasses for the protection of the eyes. The protection of face/eyes is especially important in procedures that can generate aerosols. Though we have not collected information on the type of surgeries being performed during this pandemic, still steps should be taken for self-protection as a splash of patient's secretions cannot be predictable in any surgery.

Similarly, while attending patients in the ward and the OPD, the participants were using disposable surgical PPE, observing good hygiene, and using a different variety of masks. In this study, 19% of respondents had to operate suspected cases of COVID-19, and 20% of those got the symptoms of dry cough and fever and 13% were ultimately turned positive for COVID-19. This suggests that partial preventive measures are not fully effective in limiting the spread of infection to healthcare workers. This further highlights the need to ensure the appropriate use of PPE for HCWs especially while dealing or operating the patients. This has become even more important as the resumption of complete surgical services is now in the air and many surgical societies have published guidelines on anesthesia protocols, theatre setup, and peri-operative care, etc. [12,17]

Training of postgraduate residents is another victim of this pandemic.[20] Due to governmental advisory on maintaining social distance, classroom-teaching and bedside teaching were kept limited. As about half a year has been passed in this situation, we believe the training of surgical residents may be hampered. Moreover, due to the decline in surgical workload, both clinical and operative, also deprived the residents of exposure to the

important learning experience.[20,21] As pandemicis feared to linger for a longer period, surgical supervisors should emphasize on virtual and online surgical education.[14] In this survey, over 50% of the participants were using online teaching tools such as attending classes/presentations/webinars on Zoom, Skype, etc. This change in practice was more frequently reported by participants from other countries compared to participants from Pakistan, but this comparison may not be valid as the total participation of foreign participants was only 7% of the total respondent's pool. But still, over 30% of the participants from Pakistan reported the use of traditional methods of teaching including bedside teaching, group discussions, etc. during the outbreak.

The limitation of this study is that it included a limited number of participants from specialties other than pediatric surgery and general surgery. Similarly, participation from foreign countries was also inconspicuous. Moreover, the survey was conducted when the situation about the pandemic was not very clear and different strategies/changes in practice were in the process of being implemented. Future research should attempt to identify further changes that must have been consolidated in surgical practice. This survey identified the need for effective programs for surgical services, teaching and training of surgical residents, and implementing effective use of PPE for the current and

future pandemics. This appears the only way forward as we are unsure when this pandemic will be over.

#### CONCLUSION

This survey has provided a spectrum of changes in surgical practice by participants across 45 institutions of Pakistan and other countries. A general decline is noted in patient load in OPD/Wards, the number of surgical procedures especially elective and semi-elective procedure, and teaching/training activities of the residents. Online teaching and clinical activities have evolved even in Pakistan during this pandemic. Surgical consultants and residents are taking several measures before attending/operating a patient, but effective use of PPE has not seen as very few participants were using glasses or face shields while operating.

**Conflict of Interest**: MBM, and NT are the members of the editorial board. However, the manuscript was independently handled by another editor and the authors were not involved in decision making of this manuscript.

#### Consent to Publication: NA

**Authors Contribution**: Author(s) declared to fulfill authorship criteria as devised by ICMJE and approved the final version. Authorship declaration form, submitted by the author(s), is available with the editorial office.

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