



ORIGINAL RESEARCH PAPER

General Surgery

IMPACT OF COVID-19 PANDEMIC IN THE TRAINING OF SURGICAL POSTGRADUATES, IN TEACHING MEDICAL COLLEGES AND HOSPITAL ACROSS KARNATAKA, INDIA

KEY WORDS: COVID-19, Coronavirus, Pandemic, General Surgery, Education, Post graduates.

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ABSTRACT

Purpose of the study Post Graduate surgical training is a well-structured, surgically oriented program which helps in training and grooming of PG students to excel as surgeons and teachers in the future. COVID-19 pandemic has altered the lives of the whole medical fraternity to say the least, but this impact over the PG Training programs has been enormous, especially on the surgical fraternity. Our aim was to understand the impact of covid-19 pandemic in the training of surgery residents in hospitals across Karnataka and to come up with a suitable solution to mitigate the effect of covid 19 pandemic on the training programme. **Design** An online survey of 11 questions with sub-questions having multiple choice answers were circulated amongst post-graduate students in surgery department and faculty members to study the impact of the pandemic in post-graduate surgical training. **Results** 156 PG trainees and 55 trainers participated showing there was significant impact on elective and emergency surgical training. Majority of the surgical trainees haven't performed elective or emergency surgeries required for their level. 78% responded that there was inadequate exposure to Post-operative and in patient care. 89% said their clinical skills were inadequate and 75% responded that post graduates are mentally stressed and have low confidence. **Conclusion** Covid 19 pandemic had a significant impact on the surgical post graduate training programme on trainee as well as on the trainers, across Karnataka. As a result of the pandemic, most of the young postgraduates are mentally stressed with low confidence in performing or assisting surgeries and in clinically evaluating patients. The Government and medical council should take serious consideration of the plights of PGs and come up with a suitable solution to control the damage and to be prepared in future to face such a problem with minimal effect on training programmes.

INTRODUCTION

In December 2019, COVID-19 was first identified in Wuhan, China, as a respiratory tract infection causing symptoms, such as fever, chills, dry cough, fatigue, and shortness of breath¹. This atypical viral pneumonia has disabled the world, causing catastrophic health and economic losses. The novel coronavirus belongs to the family of SARS and MERS-CoV, but the impact of the former is more crippling as illustrated by the exponential increase in infectious cases². To contain and prevent the pandemic, Government of India announced many steps such as nationwide lockdown on March 25, 2020, promoting social distancing and infection control guidelines including the use of masks, personal protective equipment (PPE).^{3,4} Incidence of covid-19 was low when the lockdown began. Though cases rose after the lockdown eased, they were successfully contained from around mid-September onwards. By early January 2021, daily cases, deaths, and test positivity rates had plummeted and victory was declared.⁵ By the end of April this sentiment was replaced by alarm at a surging second wave that threatened to spill over into other countries, along with variants of SARS-CoV-2⁶.

Surgical trainees have been uniquely affected by changes occurred due to COVID-19 which includes suspension of all elective surgeries, reduction in patients walking into the clinics, educational curricula moved toward completely online platform to avoid large gatherings, etc.⁷. Throughout the course of the pandemic and both waves, medical fraternity was one the most affected system as COVID

patients piled up in numbers hampering the normal functioning of the hospitals and medical colleges. This effect has been enormous especially in surgical branches including general surgery where elective and emergency surgical practices came to a halt due to this deadly virus, which in turn had a devastating effect on post graduate surgical training in our country.

We have conducted an online survey among currently pursuing PG students of general surgery and faculty members of general surgery in Karnataka to find out the impact of COVID-19 on PG teaching and learning.

AIM AND OBJECTIVES:

To understand the impact of covid-19 pandemic in the training of surgery residents in hospitals across Karnataka and to come up with a suitable solution to mitigate the effect of covid 19 pandemic on the training programme. This is a descriptive study survey done during the period of October 2021. (1 month)

INCLUSION CRITERIA:

The General surgical post graduate trainees of the department of general surgery who consented for the study during the COVID-19 pandemic (i.e. from March 2020 to June 2021) across 15 teaching hospitals in Karnataka.

The Trainers/ Staff/ teaching faculty for PG surgical trainees/students in General Surgery who consented for the

study across the state of Karnataka.

EXCLUSION CRITERIA:

Post graduates who have withdrawn from the course after joining.

Post graduates who do not consent for the study.

The Trainers/ Staff/ teaching faculty for the training of PG surgical trainees/students who do not consent for the study.

METHODOLOGY:

Data are collected through questionnaire which was circulated through Google forms through WhatsApp and other means of social media. Our questionnaire consisted of 11 questions with sub-questions with multiple choice answers. The questioner included the following headings:

- Impact on Core Surgical training
- Impact on surgical emergencies training
- Surgical patient care (in patient and post-operative)
- Clinical Skills
- Academic training
- Auxiliary Surgical Training
- Research and evidence based training
- Thesis work
- Utilization of social media and virtual platform for training and learning purpose
- Mental health condition of post-graduate trainees.
- Suggestions to alleviate problems.

RESULTS

Results were compared with responses that we got from post graduates to the number of surgeries that the faculty members who participated actually wanted a post graduate to do in a year (ideal for learning of the surgical skill requires).

1. Impact on Core surgical Training:

The 7 elective surgical procedures which included in the study are:

I. Breast surgery:

Our study shows that, over 61% of faculty suggested that a student in surgical training must have had assisted more than 5 breast surgeries and less than 22% of the students were able to achieve this target in assisting breast surgeries. Also, over 41% of the faculty told that a surgical trainee should have independently performed more than 5 breast surgeries, but only 19.80% of the trainees performed more than 5.

Table 1 – Breast surgeries

	PG (156)	Staff (55)
Breast surgeries	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5(0-5)	78.80% (123)	38.18% (21)
Assisted more than 5	21.15% (33)	61.80% (34)
Performed less than 5(0-5)	80.12% (125)	58.18% (32)
Performed more than 5	19.80% (31)	41.80% (23)

ii. Thyroid surgery:

With regards to thyroid studies our study shows that over 87% of faculty suggested that a student in surgical training must have had assisted more than 5 thyroid surgeries, however only less than 4% of the students were able to achieve this target in assisting thyroid surgeries. Also over 18% of the faculty told that a surgical trainee should have independently performed more than 5 thyroid surgeries, but only 2.5% of the trainees

performed more than 5.

Table 2 –Thyroid surgeries

	PG	Staff
Thyroid surgeries	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5	96.13% (150)	12.7% (7)
Assisted more than 5	3.8% (6)	87.27% (48)
Performed less than 5	97.4% (152)	81.81% (45)
Performed more than 5	2.5% (4)	18.18% (10)

iii. Laparoscopic surgeries:

Over 61% of faculty suggested that a student in surgical training must have had assisted more than 5 laparoscopic surgeries, however only 34.6% of the students were able to achieve this target in assisting laparoscopic surgeries.

Table 3 - Laparoscopic surgeries

	PG	Staff
Laparoscopic surgeries	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5	65.3% (102)	38.18% (21)
Assisted more than 5	34.6% (54)	61.81% (34)
Performed less than 5	96.7% (151)	96.36% (53)
Performed more than 5	3.2% (5)	5.45% (3)

iv. Hernia Repairs:

In our study over 72% of faculty suggested that a student in surgical training must have had assisted more than 5 hernia surgeries, however only 37.82% of the students were able to achieve this target in assisting hernia surgeries. Also over 78% of the faculty told that a surgical trainee should have independently performed more than 5 hernia surgeries, but only 20.51% of the trainees performed more than 5.

Table 4 – Hernia Surgeries

	PG (156)	Staff (55)
Hernia repairs	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5	62.17% (97)	27.27% (15)
Assisted more than 5	37.82% (59)	72.72% (40)
Performed less than 5	79.48% (124)	21.81% (12)
Performed more than 5	20.51% (32)	78.18% (43)

v. Elective Laparotomies:

Over 76% of faculty suggested that a student in surgical training must have had assisted more than 5 elective laparotomies, however only 33.3% of the students were able to achieve this target in assisting elective laparotomies. Also, 60% of the faculty told that a surgical trainee should have independently performed more than 5 elective laparotomies, but only 22.43% of the trainees performed more than 5.

Table 5- Elective Laparotomies.

	PG	Staff
Elective Laparotomy	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year

Assisted less than 5	66.6% (104)	23.6% (13)
Assisted more than 5	33.3% (52)	76.36 (42)
Performed less than 5	77.5% (121)	40% (22)
Performed more than 5	22.43% (35)	60% (33)

vi. Skin Grafting:

Around 76% of faculty suggested that a student in surgical training must have had assisted more than 5 skin grafts, however only 23.07% of the students were able to achieve this. Also, 63% of the faculty told that a surgical trainee should have independently performed more than 5 skin grafts, but only 21.79% of the trainees performed more than 5.

Table 6 – Skin Grafting.

	PG	Staff
Skin grafting	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5	76.9% (120)	23.63% (13)
Assisted more than 5	23.07% (36)	76.36% (42)
Performed less than 5	78.20% (122)	36.36% (20)
Performed more than 5	21.79% (34)	63.63% (35)

vii. Excision of Swellings/Lumps :

About 91% of faculty suggested that a student in surgical training must have had assisted more than 5 excisions of lumps and swellings, however only 50% of the trainees were able to achieve this. Also, 85.54% of the faculty told that a surgical trainee should have independently performed more than 5 excisions of lumps and swellings, but only 36.53% of the trainees performed more than

Table 7 – Excision of Lump

	PG (156)	Staff (55)
Excision of lump	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5	50% (78)	9.09 (5)
Assisted more than 5	50% (78)	90.90% (50)
Performed less than 5	63.46% (99)	14.54% (8)
Performed more than 5	36.53% (57)	85.54% (48)

2. Impact on Emergency Surgical Training:

The 6 emergency surgical procedures which included in the study were:

I. Appendectomy:

With over 69.09% and 63.63% of the faculty suggest that it should be necessary to assist and perform emergency appendectomy respectively. Only 20.15% of the surgical trainees have only been able to assist and 12.8% of the trainees have performed emergency appendectomy during the course of the pandemic.

Table 8 – Appendectomy

	PG (156)	Staff (55)
Appendectomy	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5	79.48% (124)	30.90% (17)
Assisted more than 5	20.51% (32)	69.09% (38)
Performed less than 5	87.17% (136)	36.36% (20)
Performed more than 5	12.8% (20)	63.63% (35)

ii. Emergency Laparotomy:

67.27% and 45.45% of the faculty expect that a surgical trainee should have assisted and performed more than 5 Emergency Laparotomies in a typical training year, however only 28.20% of the trainees have assisted more than 5 laparotomies and 15.38% of them have independently performed more than 5 laparotomies.

Table 9 – Emergency Laparotomy

	PG	Staff
Emergency Laparotomy	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5	71.15% (111)	32.72% (18)
Assisted more than 5	28.20% (44)	67.27% (37)
Performed less than 5	84.61% (132)	54.54% (30)
Performed more than 5	15.38% (24)	45.45% (25)

iii. Incision & Drainage:

Over 90% of the faculty expect that the trainees to have assisted and performed more than 5 incision and drainage procedure for abscess. 44.87% and 53.20% the surgical trainees have only performed and assisted more than 5 incision and drainage procedures during the covid 19 pandemic, respectively.

Table 10- Incision and Drainage

	PG (156)	Staff (55)
Incision and drainage	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5	55.12% (86)	9.09% (5)
Assisted more than 5	44.87% (70)	90.90% (50)
Performed less than 5	46.79% (73)	7.27% (4)
Performed more than 5	53.20% (83)	92.72% (51)

iv. Wound Debridement:

Around 95% of the faculty said that a surgical trainee should have performed more than 5 wound debridement and only 42.30% of the trainees have performed this.

Table 11- Wound Debridement

	PG	Staff
Wound Debridement	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5	61.53% (96)	16.36% (9)
Assisted more than 5	38.46% (60)	83.63% (46)
Performed less than 5	57.69% (90)	5.45% (3)
Performed more than 5	42.30% (66)	94.64% (53)

v. Amputations :

63.63% and 70.90% of the surgical training faculty suggest that a surgical trainee should have assisted and performed more than 5 amputations respectively. And only 42.30% of the trainees have assisted and 46.16% of the trainees have performed more than 5 amputations.

Table 12 - Amputations

	PG	Staff
Amputations	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5	57.69% (90)	36.36% (20)

Assisted more than 5	42.30%	(66)	63.63%	(35)
Performed less than 5	53.84%	(84)	29.09%	(16)
Performed more than 5	46.15%	(72)	70.90%	(39)

vi. Strangulated Inguinal Hernia:

Only 1/4th of the faculty indicated that a trainee should have assisted in more than 5 strangulated hernias.

Table 13 – Strangulated hernia

	PG	Staff
Strangulated hernia	Cases assisted or performed during pandemic	Minimum to be assisted and performed in a year
Assisted less than 5	91.6% (143)	74.54% (41)
Assisted more than 5	8.33% (13)	25.45% (14)
Performed less than 5	96.79% (151)	81.81% (45)
Performed more than 5	3.20% (5)	18.18% (10)

3. Impact on surgical patient care (in patient and post-operative):

Around 3/4ths of the surgical trainees aren't confident in in patient and post-operative care of surgical patients. This is also the similar situation with the faculty, in which 82% of the faculty reported that their trainees aren't confident in in-patient and post-operative care of surgical patients.

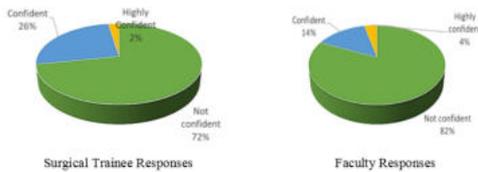


Figure 1.

4. Impact on exposure to clinical materials:

95% of the faculty believe that the exposure to clinical material during the COVID-19 pandemic has been inadequate and 82% of the surgical trainees also concur with the same.

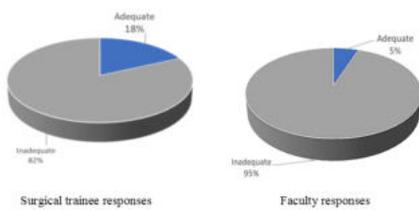


Figure 2.

5. Impact on clinical skills:

Only 13% of the surgical trainees are confident about their clinical skills and only 9% of the faculty are confident about their surgical trainees' clinical skills.

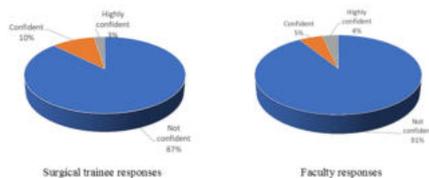


Figure 3.

6. Impact on Academic training:

With over 80% of the responses suggesting that there were less than 2 academic and training sessions held per week, 78% of the faculty indicated that this was inadequate.

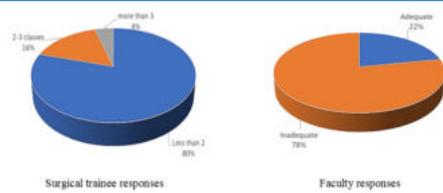


Figure 4.

7. Impact on Auxiliary Surgical Training:

The surgical trainees indicated that there have been less than 3 events aiding to the auxiliary surgical training in the form of conferences and workshops, continued surgical education programs (CSEP).

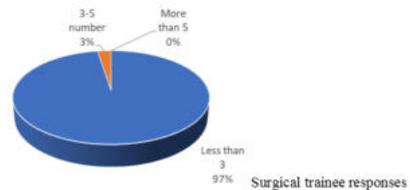


Figure 5.

8. Impact on Research and evidence based training:

Due to the dire situation of the pandemic there have been a significant reduced in the numbers of conferences in turn translations to fewer opportunities for papers and poster presentation opportunities for the surgical trainees with around 89% of them indicating that they have had less than 2 events to accommodate such a scientific presentation.

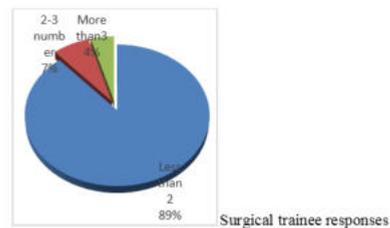


Figure 6.

9. Impact on dissertation/thesis:

The situation also negatively impacted the Dissertation/Thesis work, with over 56% of the trainees reporting that the numbers of surgeries have reduced and 11% of patients have been lost to follow up and 33% of them suggested that the OPD case load has reduced.

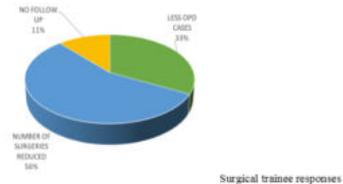


Figure 7.

10. Utilization of social media and virtual platform for training and learning purpose:

Difficult situations require different approaches, with over 96% of the surgical trainees using the social media for surgical training. We also noticed that around 80% of the faculty adopted this technique to train.

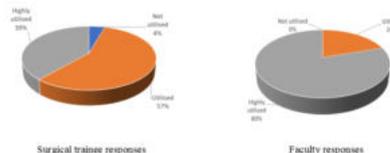


Figure 8.

11. Suggestions to alleviate the problems:

In a survey to attempt to try to alleviate the problem, over 70% of the faculty suggested that the training program be extended, to be able to train the students better and 33.33% of the trainees suggested that there be a relaxation in the sample size for the dissertation.

Table 14.

SOLUTIONS	POST GRADUATES (156)	FACULTY MEMBERS (55)
LIKE TO CHANGE THESIS TOPIC	41 26.28%	3 5.4%
RELAXATION IN SAMPLE SIZE AND STUDY DURATION	52 33.33%	6 10.9%
EXTEND THE POST GRADUATION COURSE	25 16.02%	39 70.90%
MODIFY RULES FOR TRAINING AND EXIT EXAM	12 7.6%	2 3.6%
LEARNING SKILLS FROM VIRTUAL WORKSHOPS	14 8.97%	2 3.6%
INCREASING NUMBER OF CONFERENCES	12 7.6%	3 5.4%

12. Impact on the mental health condition of post-graduate surgical trainees:

Mental health was also negatively impacted in this pandemic, with 65.38% of the trainees reporting low levels of confidence in surgical skills and over 21% of them feeling stressed and unhappy. And around 83.36% of the faculty felt that their surgical trainees had a low confidence in surgical skills, negatively impacting their mental wellbeing.

Table 15- Mental health of surgical trainees.

	Surgical trainees (156)	Faculty members (55)
Feeling stressed	33 21.15%	6 10.90%
Low confidence in surgical skills	102 65.38%	46 83.63%
Uncertainty about future	16 10.25%	3 5.4%
Fear of contracting the virus	5 3.20%	0 0%

DISCUSSION

Most of surgeons have difficulty in balancing professional and private life and no time in taking part in extracurricular activities due to high workload and long working hours. 8 Surgeons not only perform surgeries but are also responsible for patient care before, during, and after surgery⁹.

It is estimated that around 300 million operations takes place per year all around the world¹⁰.

Surgical demand in India is estimated to be 3646 surgeries per 100,000 Indian population per year. Out of 3646 surgeries, 26% are general surgical procedures followed by obstetrics and gynecological and ophthalmological surgeries¹¹.

This surgical demand in India and all around the world was changed when WHO has declared COVID-19 as a pandemic.

Covid-19 pandemic has caused enormous effect on PG surgical teaching programmes in all aspects. This impact was two-fold.

Firstly, there was a significant reduction in Elective and emergency procedures done as most of the elective cases were postponed to accommodate covid patients as majority of teaching hospitals were converted to Covid hospitals. This was evident from the reduction in number of cases assisted and performed by post graduates in the covid year as compared to the minimum number that should have been done according to faculty members and RGUHS. [Table 1-13]. Secondly, there have been a number of surgical trainees who have been redeployed to the care of covid-19 patients away from their surgical practice.

Our survey also showed that there was a reduction in other aspect of training like post operative and in patient care

where 78% of Post graduates responded they are not confident. (Pie chart 1). 82% Post graduates responded that there was inadequate exposure of clinical material. (Pie chart 2).

87% post graduates were not confident in clinical skills (Pie chart 3) and 78% faculty thought that the academic training was inadequate. (Pie chart- 4)

There was an increase in online learning, web based platform and social media utilization, our survey showed 80% high usage of social media. (Pie chart 7). 56% Post graduates and 73% faculty responded that there was a reduction in number of surgeries and this had a negative impact on dissertation. (Pie chart 8).

70.90% and 16% of faculty members and post graduates respectively said extension of PG course as a solution to mitigate the damage. (Table 14)

There was significant impact on mental health and well being of post graduates as 65.38% of PGs are low in confidence in surgical skills and 83.63% faculty thinks that the post graduates are low in confidence in their skills. (Table 15)

CONCLUSION:

COVID-19 pandemic has severely disrupted the education and training of the Surgical PG students. No such study has yet analysed, in depth, about the problems faced by these young trainees. There has been a significant reduction in the elective and emergency cases, PG classes, clinical and practical training. Significant reduced flow of patients to the hospital, and has directly affected the training of the PGs, through much lesser attendance in the OPDs, in patients, and surgical work. The PGs also have serious problems in completing their dissertations and learning from attending the workshops and conferences. In addition, the trainees have increased mental stress and many feel that they may not pass the exit exam and practice independently after their PG course, due to inadequate training.

We also shed some light in our study as to possible solutions like extending the course or to take the post graduate back in department as Senior resident after passing of examination to continue his/her training, so that the lost confident in skills and academics can be solved to a point.

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