

## Research Article

# Medical Training Affected During COVID-19 Pandemic and Measures to Overcome it

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### Abstract

**Background:** The COVID-19 pandemic has affected the medical training due to lockdowns and ever changing SOP's that has resulted in cancelling elective cases and restructuring of healthcare system. In all of this, the profound effect on resident's wellness and effects on their clinical skills have not been characterized.

**Objective:** To evaluate the impact of Covid-19 pandemic on training of plastic surgery residents in Pakistan.

**Methodology:** It is a cross-sectional survey based study done in Liaquat National Hospital. An online questionnaire comprising of 21 questions were sent using online platform and the study includes all current residents working in affiliated hospitals in Pakistan. Respondents were asked about healthcare restructuring, educational experiences and impact on their wellness.

**Results:** A total of 120 residents participated in the study, having response rate of 46.7 percent. Gender, postgraduate year, and city were well represented within the sample. Roughly all of the residents (82.1 percent) informed the restructuring of their residency program and most of them (75 percent) were assigned in the management of Covid-19 patients. Most of the residents has likely negative (4 percent) or somewhat negative (35.7 percent) impact on their training and wellness. Overall, 85.7 percent were discontented that they will not be able meet minimum case numbers due to reduced numbers of elective procedures. Most of the residents accepted that virtual lectures from professors outside the hospital were of the greatest value. Forty-six percent of the respondents felt isolated due to social-distancing during lockdown.

**Conclusions:** The COVID-19 pandemic had a great amount of impact on plastic surgery resident's education and wellness. Although reductions in elective cases may be temporary, this may represent a loss of critical clinical experience. Some effects were positive like conducting virtual meetings which have somewhat balanced the learning experience of residents.

**Keywords** | COVID-19, SAR-COV-2, Health, Adaptation, Psychologic, Surgery, Plastic

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### Introduction

This Covid-19 pandemic has hit the world so hard that medical training is also affected by lockdowns and newly formed SOP's. Due to this lockdown it has become so important to find different ways to improve the knowledge of residents.<sup>1</sup> Most teaching hospitals have reorganized their healthcare systems by cancelling elective surgical procedures and out-patients appointments which has caused missed diagnosis, delayed treat-

ment or getting no treatment at all.<sup>2</sup> This has also resulted a profound impact on training programs of Pakistan, but very limited data has been published so far. Other specialties like Urology and Ophthalmology were also published data about the impact of pandemic on resident training.<sup>3,4</sup> This pandemic has not just affected the learning capabilities of residents by reducing the number the patients but also affected the mental health of residents which may hinder their clinical skills learning.<sup>5</sup>

## Introduction

This Covid-19 pandemic has hit the world so hard that medical training is also affected by lockdowns and newly formed SOP's. Due to this lockdown it has become so important to find different ways to improve the knowledge of residents.<sup>1</sup> Most teaching hospitals have reorganized their healthcare systems by cancelling elective surgical procedures and out-patients appointments which has caused missed diagnosis, delayed treatment or getting no treatment at all.<sup>2</sup> This has also resulted a profound impact on training programs of Pakistan, but very limited data has been published so far. Other specialties like Urology and Ophthalmology were also published data about the impact of pandemic on resident training.<sup>3,4</sup> This pandemic has not just affected the learning capabilities of residents by reducing the number the patients but also affected the mental health of residents which may hinder their clinical skills learning.<sup>5</sup> The restructuring by hospitals include deployment of surgical residents to medical activities like Covid-HDU/ICU to cope with the burden of increasing number of corona positive patients. Although it was necessary but it has affected the training and wellness of plastic surgery residents.<sup>6</sup> In-house meetings were cancelled and training programs switched to virtual meetings/teaching classes which do not have such interactive sessions like physically attending a class.<sup>7</sup>

This COVID-19 pandemic has formed sudden stressors across numerous domains in departments of plastic surgery. We as a plastic surgery community must pay special attention to not only our patients but also ourselves and our community to go through this Covid-19 pandemic and its outcome<sup>8</sup>. Admitting the fact that mental health is important but during this pandemic it has become even more essential.

Based on the fact that rapidly changing healthcare system has affected the residents by redeployment, reduced number of cases, limited learning, social-distancing and fear of spread of infection to themselves or their family members, there has been limited data gathered and published in Pakistan. The goal of this was to evaluate the impact of the COVID-19 pandemic on the plastic surgery residency training program from resident perspective.

## Methods and Materials:

This is a retrospective cross-sectional survey study done in Liaquat National Hospital after Institutional board approval in Pakistan. To evaluate the impact on resident

training and wellness a questionnaire was formed.

An online questionnaire comprising of 21 questions was sent using online platform and after accepting the informed consent, was completed by plastic surgery residents. The questionnaire was sent to current plastic surgery residents of whole Pakistan, regardless of gender. Those who have completed the residency but waiting for exams or those on leave during the time of study were excluded. The questionnaire consisted of 3 parts. In first includes demographic data like gender, city and training year and in the second part we evaluated the plastic surgery program restructuring like virtual mee-

**Table 1:** Demographic of Residents

	Frequency	Percent
<b>Gender</b>		
Female	28	50
Male	28	50
<b>PGY</b>		
R3	18	32.1
R4	10	17.9
R5	22	39.3
R6	6	10.7
<b>City</b>		
Faisalabad	2	3.6
Hyderabad	4	7.1
Islamabad	2	3.6
Karachi	32	57.1
Lahore	10	17.8
Quetta	2	3.6
Rawalpindi	2	3.6
Rehim yar khan	2	3.6
<b>Living Condition</b>		
Living alone	6	10.7
Living with an adult aged >65	14	25.0
Living with an adult not working in a healthcare field	8	14.2
Living with an adult working in a healthcare field	20	35.7
Living with your children	8	14.2

tings, number of procedures or redeployment and lastly residents were asked about psychological impact on their wellbeing like how they feel about it or has it affected their clinical approach. Data were collected without disclosing identity of residents.

Collected data was analyzed statistically using statistical Package for Social Sciences (SPSS) v.18 (IBM Inc.). Categorical data is shown as numbers or percentages for descriptive statistics. Collected data of questionnaire also analyzed according to resident's gender. Chi-square test was performed for all univariate analysis of dichot-

motous data and p-value less than 0.05 was considered significant.

## Results

From all over the Pakistan, 120 residents in Plastic surgery Program were invited but 56 of them have participated in the survey after giving informed consent. The response rate was 46.7 percent.

50 percent residents were male (n=28) and remaining twenty-eight of the respondents were female. 57 percent of the respondents were from Karachi city, 17.8 percent from Lahore city, 7.1 percent from Hyderabad and remaining 3.6 percent of the respondents were doing training in Faisalabad, Quetta, Rawalpindi and Rahim Yar Khan respectively. 32.1 percent of the respondents were R3, 17.9 percent were R4, only 10.7 percent of R5 participated in the study and 39.5 percent of R6 showed the greatest response. Only 10.7 percent of residents were living alone and most of them (89.3 percent) were living with someone. Almost one-third were living with

**Table 2:** Program Restructuring

	Frequency	Percent	P-Value
Restructuring of Residency	46	82.1	
Redeployment	42	75.0	
<b>Area Of Posting</b>			
Emergency Department	8	14.2	
ICU/HDU/Ward Covid specific	40	71.4	
Medicine Ward	8	14.2	
<b>Gender and redeployment</b>			
Male	22	47.8	0.485
Female	24	52.2	
<b>PGY and redeployment</b>			
R3	14	33.3%	0.051
R4	8	19.0%	
R5	18	42.9%	
R6	2	4.8%	

someone working in healthcare field, 14.2 percent were living someone not working in healthcare field and remaining 14.2 percent were living with a child in house. During the pandemic, roughly all of the residents (82.1 percent) informed the restructuring of their residency program and most of them (75 percent) were assigned in the management of Covid-19 patients. 71.4 percent were assigned to Covid-specific ICU/HDU/Ward and remaining 14.2 percent were redeployed to emergency department and medicine general ward respectively, so most of the residents were involved in the management

**Table 3:** Effects on Residency and postponement of cases

	Frequency	Percent
<b>Effects on residency due to postponement of cases</b>		
Maximally	4	7.1
Minimally	2	3.6
Not much	6	10.7
To full extent	20	35.7
To some extent	24	42.9
<b>Net Effect on training</b>		
Likely negative	26	46.4
Likely positive	4	7.1
No effect	6	5.3
Somewhat negative	20	35.7

of Covid-19 patients. Mostly the residents, who were redeployed, were males than females but this difference was statistically non-significant (p= 0.12, 57.1 percent vs 42.9 percent).

Most of the residents has likely negative (4 percent) or somewhat negative (35.7 percent) impact on their training and wellness, whereas 7.1 percent of the trainees has likely positive impact.

Thirty-five percent of the respondents reported that reduce number of cases has impacted their surgical skills training to full extent while forty-two percent have

**Table 4:** Trainee experience with restructuring

	Frequency	Percent
<b>Net effect of redeployment</b>		
It caused anxiety and psychological stress	22	39.2
It caused strain on physical health	4	7.1
To protect my family and reduce the spread it disrupted my life	30	53.6
<b>Would you volunteer again to manage covid -19 patients?</b>		
No	16	28.6
Yes	40	71.4
<b>Any Psychological support by institution?</b>		
No	16	28.5
Yes	40	71.4
<b>If there was insufficient support, why is it then?</b>		
Not adequate family services (e.g. childcare)	2	3.6
Not adequate financial support (e.g. Extra pay)	34	60.7
Not adequate PPE	7	12.5
Not adequate psychosocial support	13	23.2

been affected to some extent and ten percent were relieved that pandemic hasn't affected them at all. Overall, 85.7 percent were discontented that they were not or will not be able to meet minimum case numbers due to reduce numbers of elective procedures, however this varied greatly

**Table 5: Effects of Pandemic on education and career**

	Frequency	Percent
<b>Effective activity in increasing your knowledge?</b>		
Continuing hospital work	14	25.0
Practicing surgical skills	8	14.3
Reading	16	28.6
Virtual teaching	18	32.1
<b>Your career path has been affected in any way?</b>		
Delay in commencement of job	4	7.1
Delay in interview/match	2	3.6
None of the above	50	89.2

by institution and year of residency. Seventy-two percent of final year residents were fearful that they will not be able to reach the required number of cases.

Most preferred learning activity was virtual meeting followed by reading, continuing hospital work and then practicing surgical skills. 25.9 percent of residents admitted that 1-2 meetings were conducted per week during the pandemic but 59.3 percent revealed that no such meeting was conducted, whereas 95 percent of the respondents says 1-2 or 2-4 teaching classes were conducted before the pandemic. Most of the residents accepted that virtual lectures from professors outside the hospital who also shared their experiences were of the greatest value.

Only 11 percent reported that the pandemic has affected

**Table 6: Support from Department Or Institution**

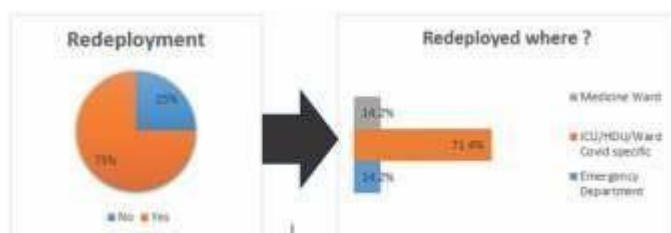
	Frequency	Percent
<b>How much your department was supportive during the pandemic?</b>		
Minimally	36	64.2
Reduced clinical work hours	20	35.7
<b>Did your department employed an on call rota or reduced workforce during pandemic?</b>		
No	10	17.9
Yes	46	82.1

their career pathway by delay in taking interview/match and delay in commencement of training, while a huge number of respondents say their career wasn't affected at all (89.2 percent).

The trainees who were redeployed revealed (64.2 percent) shockingly that they had no or minimal support from their department during the pandemic. Those who were redeployed, 82.1 percent of them had adequate PPE and those who were not satisfied (66.7 percent) with department support expected financial support and that was not given. Twenty-two percent were not satisfied due to lack of psychosocial support and remain-

**Table 7: Feeling of Isolation**

	Frequency	Percent
<b>Did social distancing made you feel isolated from your colleagues?</b>		
No	30	53.5
Yes	26	46.4
<b>How did you maintain contact with your colleagues?</b>		
In-person with social distancing	26	46.4
In-person without social distancing	8	14.3
Telecommunication (calls/sms)	22	39.3



ning 11.2 percent were dissatisfied due to lack of family services (like childcare) or adequate PPE. Though, 71.4 percent would happily volunteer again to help with the management of Covid-19 patients. Both male and females equally feel that there was no enough support from department or institution but this result was not significant statistically,  $p=0.58$ .

Although many of the residents felt that their department has provided psychosocial support that they needed while 20 percent of the respondents did not feel the same way. Only forty-six percent of the respondents felt isolated due to social-distancing during lockdown because most of them (46.4 percent) maintained contact in-person with social distancing and 39.3 percent maintained contact through telecommunication (calls/sms), whereas 14.3 percent did not maintain social-distancing while meeting with the colleagues during the lockdown period.

**Figure 1: Percentage of redeployment shown in pie chart while location of postage is shown in a bar chart.**

**Discussions:**

The surgical skills is the core dogma of training in residency and consists of several key factors of learning<sup>9</sup>. Our cross-sectional study is aimed towards the impact of COVID-19 pandemic on resident training in Plastic Surgery in Pakistan. Our study was done only in Pakistan and does not reflect the data of other countries. Like in all over Pakistan, our institution also reacted to pandemic and imposed limitations of resident training. When program restructuring was done several key elements

of resident training was affected and our study shows that this pandemic was associated significantly with impairment of training. This has also affected the residents negatively on their wellness as shown by our survey. The damage to residency was more severe in surgical specialties where surgical hands-on was key element in towards learning and it cannot be replaced by virtual meetings<sup>10</sup>. Almost all of the plastic surgery residents were redeployed to COVID-19 related ICU/HDU or Ward due to the restructuring of the training. May be plastic surgery residents were more fit for redeployment, partly due to their critical care experience during their training in General surgery. This has caused fear of contagion related anxiety among most of the residents as showed by our study and in previous studies, there is significant psychological impact on different populations including healthcare workers and patients<sup>11-13</sup>.

In our study, several plastic surgery residents reported that restructuring in their training has negative impact on surgical education. Reduction in number of cases, cancellation of in-person conferences, reduced hands-on experience has resulted in a negative impact on education. Maximal effect on surgical experience was reported by half of residents during the pandemic. This perception was more pronounced who were at the end of their training program. More residents showed their interest in pursuing fellowship programs or employment hospital-based environment due to the pandemic. Final year residents who were about to complete their residency already had significant financial stress and job instability due to COVID-19 pandemic further caused exaggeration on anxiety levels.<sup>14</sup> This stress amongst plastic surgery residents may cause shift in career paths in the coming years due to the pandemic.

As the surgical hands-on experiences suffered, other new educational ways were adopted and became available.<sup>15</sup> Residents of plastic surgery noted that zoom-meetings and virtual education has become most important for learning as a medium. This has allowed residents to learn from outside the institution and improve their knowledge by lectures from visiting professors. Residents also reveal that the number of these virtual meetings increased significantly and the number in-person meetings were low to none. This showed that switching to virtual education has significantly improve the knowledge that was lacking among the residents during the pandemic. This can prove that innovative solution can provide equity to surgical training and further expand resident knowledge outside the surgical operating room.

Residents, especially those doing training in surgical specialties, are already facing burnout and attrition<sup>16</sup> but this pandemic has multiplied the negative impact on wellness of residents which is often overlooked.<sup>17</sup> Our study showed that significant number of residents think that this restructuring has impacted negatively on psychological health. These findings are alarming, as previous studies already showed that there is increasing burnout and stress among plastic surgery residents and adding the impact of this pandemic further caused detrimental effects on resident wellness. This stress and burnout have negative impact on patient care and further cause residents to make medical error.<sup>18</sup> The redeployment of residents caused stress, guilt and grief connected with managing COVID-19 patients can be tough for some who are not familiar with loss/death. After all this, residents still volunteer for redeployment and this shows the passion of these residents towards management of patients.

#### **Limitations:**

Our study was limited as like all other survey-based studies. This is a cross-sectional study and long-term challenges and their impact were not explored in this study. The questionnaire and study methods were constructed with multi-institutional expert input but reliability was not tested. We still think that 47% response rate is strong and can reflect the results to be generalized. It is also limited in that we captured the feelings of residents at single point in time and as the pandemic continues to adapt, the well-being and surgical education may change significantly. Further studies will be needed to find the full extent of COVID-19 pandemic on the wellness of plastic surgery residents.

#### **Conclusion**

This cross-sectional survey reveals that most Pakistani residents had a considerable negative impact on plastic surgery training program and deleterious effects on their personal well-ness. As surgical hands-on decreased, virtual meetings augmented the surgical education and much appreciated as an alternative to in-person teaching among residents.

**Conflict of Interest:** None

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