



# Challenges and Coping Strategies of Radiology Doctors During COVID-19 Era, Lahore, Pakistan

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## Abstract

**Objective:** To evaluate the challenges and coping strategies by Radiology Doctors during the COVID-19 Era. **Materials and Methods:** It is a mixed-method cross-sectional study done over one month in Radiology Department, Shaikh Zayed Hospital, Lahore, Pakistan with a convenient sampling technique. **Results:** 80% of the radiologists faced challenges during the pandemic. Age, gender, marital status, monthly income, residents, and years of residency showed significant associations with challenges faced by doctors in the radiology department during the COVID-19 pandemic. Many challenges in terms of management, psychological aspects, training education, and research work were faced by the radiologists but they coped with them heroically. **Conclusion:** COVID-19 posed a spectrum of unforeseen challenges to the radiologists of Shaikh Zayed Hospital, Lahore. Challenges related to management, psychological aspects for doctors, research work and training education were all tackled by the senior and junior doctors by using various coping strategies.

**Keywords:** COVID-19 Challenges, Radiology, Strategies

## 1. Introduction

COVID-19 pandemic brought an unforeseen turn of events all over the globe. After its declaration as an international health emergency by World Health Organization (WHO)<sup>1</sup>, there has been significant disruption of all the aspects of life. Healthcare professionals have been under substantial pressure since the beginning of this pandemic. An important reason is that they are fighting against a disease without a definite cure and a majority of their colleagues are affected or dying because of it<sup>2</sup>.

During acute health crises, there is excess pressure on the healthcare services, making working life more nerve-racking than it usually is. During a pandemic, there is a significant increase in the number of patients who need treatment, equally increasing the burden on healthcare personnel and the resources. The frontline healthcare professionals are further stressed because of a markedly increased risk of carrying the infection to their families. One of the ways for frontline doctors to reduce the spread of infection risk to their families is by social distancing. Social support and contact play a substantial

role in building morale during times of stress, while social distancing deprives the individual of this crucial buffer against mental health challenges precisely when they are at greater risk of stress<sup>3</sup>.

The pandemic has severely impacted the training activities that were preplanned for various residency programs. Radiology departments are no exception. Various hospitals postponed elective imaging examinations and interventions to limit exposure to COVID-19, thereby protecting both the medical staff and patients from the virus. Emergency and inpatient care were however not discontinued. These elective studies offer learning opportunities for the residents. However, because of the epidemic and a decline in patient influx, the residency programs have been significantly disrupted<sup>4</sup>.

Different studies have been carried out all over the world to determine the global impact of COVID-19. A study carried out in Pakistan was directed to look into the fears and expectations of doctors during the COVID-19 Pandemic<sup>2</sup>. Another study in the United States provided an overview of major problems faced by residents in training and some potential solutions<sup>5</sup>.

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Turkish research aimed at exploring the psychological effects of the COVID-19 pandemic on doctors treating COVID-19 positive patients<sup>6</sup>.

Currently, there is a paucity of data available in our local setting regarding radiology residency during the whole span of the global pandemic era. Hence, this interview-based study intends to discover challenges and coping strategies of radiology residents as well as consultants during one and a half years of this pandemic.

The previous studies in Pakistan were carried out to determine the challenges faced by various radiology departments. Our study however, also deals with the responses implemented at the administrative and departmental level.

## 2. Methodology

After taking Ethical clearance from Institutional Review Board (Ref. No: SZMC/IRB/Internal/379/2021), the prospective cross-sectional study was conducted. It was a mixed-method research involving both quantitative and qualitative studies of one month duration i.e., 26-10-2021 to 25-11-2021 in Radiology Department, Shaikh Zayed Hospital, Lahore, Pakistan. It included all the doctors (consultants, medical officers, house officers) currently working or who have left within 6 months while doctors who left their training 1 year ago was excluded. In a quantitative study, convenient sampling was done. The sample was collected via a structured questionnaire which was previously pre-tested through pilot testing; data were collected after written as well as verbal informed consent and analyzed through SPSS version 22. Whereas, in qualitative study in-depth interviews were conducted from the same respondents who were already included in the study and filled the questionnaire. As a result, themes emerged through probing, and data was collected till the saturation point reached in the study.

### 2.1 Data Analysis

To analyze the data, the Statistical package for social science (SPSS version 22) was used. Appropriate statistics were applied for qualitative and quantitative variables. Quantitative including sociodemographic were determined through frequency, percentage, p-value, 95C Interval and Qualitative by in-depth interviews. P-value 0.05% was taken as significant.

## 3. Results

This study evaluates respondents' socio-demographic characteristics and their association with the COVID-19 era's impact while working in the radiology department (through quantitative research method) along with challenges faced and coping strategies adopted by them during their tenure

in Radiology Department in the COVID-19 pandemic era (through qualitative research method).

### 3.1 Socio-demographic Factors and their Association with COVID-19 Pandemic Affect on Respondents' Working

Respondent's socio-demographic characteristics such as age, gender, marital status, monthly income, resident/consultant, year of residency/experience, and prior infection with COVID-19 and their association with COVID-19 affects on respondents working in the radiology department during the pandemic were tabulated with the help of frequency, percentage, 95% Confidence Interval and, p-value. This identified 12 (80%) respondents faced problems during COVID-19 pandemic whereas, 3 (20%) respondents faced no issues during the pandemic.

Table 1 shows that age, gender, marital status, monthly income, residents, and years of residency/experience showed significant associations with challenges faced by doctors in the radiology department during the COVID-19 pandemic. Among the age group, the high odds ratio was found in 20-30 years of age i.e., 2.65 (2.22-3.06) than 41-50 years (1.84 (1.51-2.42)). The high odds ratio was also observed among females (1.30 (1.62-2.16)), married respondents (2.36 (1.88-2.60)) and respondents with 1 lac monthly income (2.00 (1.53-2.49)) as compared to males, single and respondents with 2 lac monthly income respectively. Residents showed high odds i.e. 2.50 (1.90-2.98) than consultants; whereas; doctors with 3-4 years of residency/experience showed high odds than doctors with 0-2 years residency/experience i.e. 1.75 (1.57-2.25) and 1.21 (1.01-1.49) respectively.

### 3.2 Challenges Faced by Doctors and Coping Strategies Adopted by them during the COVID-19 Era

We interviewed all the participants in detail about their views regarding challenges faced by them and coping strategies adopted during COVID-19 era individually and at departmental level during one and a half years of global pandemic till the saturation point reached. The results were divided into different themes and subthemes.

#### Theme 1: Management

##### (a) Challenges

5/15 participants stated management problems and an initial lack of resources. Doctors' strength was reduced, meanwhile emergency for different radiological investigations ran 24/7 with an increased burden of COVID positive patients. There was an increased risk of infection. Afterwards, there was

**Table 1.** Socio-demographic characteristics of respondents and its association with COVID-19 effect on respondents working in the Radiology Department

Association of socio-demographic characteristics with COVID-19 effects on doctors working in the Radiology department (N=15)					
Socio-demographic characteristics	Frequency (%)	Does Covid-19 affect respondents working in the radiology department?		Odds Ratio 95% CI <sup>a</sup>	p-value
		Yes (n=12)	No (n=3)		
<b>Age of respondents (years)</b>					
20-30	9 (60%)	8 (66.7%)	1 (33.3%)	2.65 (2.22- 3.06)	<b>0.03*</b>
31-40	3 (20%)	2 (16.7%)	1 (33.3%)	2.41 (1.99-2.86)	
41-50	1 (6.7%)	1 (8.3%)	0 (0%)	1.84 (1.51-2.42)	
51-60	2 (13.3%)	1 (8.3%)	1 (33.3%)	<b>reference</b>	
<b>Gender</b>					
Male	8 (53.3%)	6 (50%)	2 (66.7%)	<b>reference</b>	<b>0.01*</b>
Female	7 (46.7%)	6 (50%)	1 (33.3%)	1.30 (1.62-2.16)	
<b>Marital Status</b>					
Married	10 (67%)	8 (66.7%)	2 (66.7%)	2.36 (1.88-2.60)	<b>0.002*</b>
Single	5 (33%)	4 (33.3%)	1 (33.3%)	<b>reference</b>	
<b>Monthly Income</b>					
Unpaid	1 (6.7%)	0 (0%)	1 (33.3%)	<b>reference</b>	<b>0.001*</b>
1 lac	12 (80%)	11 (91.7%)	1 (33.3%)	2.00 (1.53-2.49)	
2 lac and above	2 (13.3%)	1 (8.3%)	1 (33.3%)	1.82 (1.31-2.28)	
<b>Resident/Consultant</b>					
Resident	12 (80%)	10 (83.3%)	2 (66.7%)	2.50 (1.90-2.98)	<b>0.007*</b>
Consultant	3 (20%)	2 (16.7%)	1 (33.3%)	<b>reference</b>	
<b>Year of Residency/Experience (years)</b>					
0-2	3 (20%)	2 (16.7%)	1 (33.3%)	1.21 (1.01-1.49)	<b>0.05*</b>
3-4	9 (60%)	8 (66.6%)	1 (33.3%)	1.75 (1.57-2.25)	
Greater than and equal to 5	3 (20%)	2 (16.7%)	1 (33.3%)	<b>reference</b>	
<b>Ever Infected With COVID-19</b>					
Yes	11 (73%)	11 (91.7%)	0 (0%)	<b>reference</b>	<b>0.062</b>
No	4 (27%)	1 (8.3%)	3 (100%)	0.70 (0.29-1.43)	

<sup>a</sup> CI (Confidence Interval); reference category =1;

\*Significant associations

an increased time gap between elective procedures. Social distancing had to be implemented.

Two residents faced travel restrictions due to lockdown. One of the residents didn't face any of the above-mentioned issues. The roster was changed and so did the routine. Screening of patients was a difficult task.

Eight doctors themselves got infected with this deadly virus but recovered.

One stated;

'We faced a shortage of PPEs, sanitizers, and other protective equipment. We re-used PPEs or had to manage them on own or got a donation from different NGOs. N95 was suffocating. It was very uncomfortable to wear them, especially in hot weather.'

Other said:

'Social distancing was difficult to observe as we have close interaction with patients while performing the ultrasound exam, CT, etc. There was a lack of cooperation from the general population as people considered the pandemic a myth initially.'

One of the residents stated that:

'Stress of working in that environment, especially in pregnancy was challenging.'

The consultants found difficulty in managing the roster initially and to keep up with administrative issues as there was a lack of funds and with no backup plan. Several COVID positive patients came for radiological testing without screening.

One participant said:

'There was so much chaos regarding fear of being infected. The roster was modified and normal routine disrupted.'

**(b) Strategies**

Many residents stated that the workload was reduced deliberately to 50% and elective procedures were postponed. The roster was re-defined and adjusted with the help of cooperation. residents said;

‘Despite its challenges, we got a lot of family time due to the divided roster. Thanks to COVID, a blessing in disguise.’

Patients were screened and prioritized. After some time, patient turnover decreased. The doctors waited for the travel restrictions to end. Few of them made arrangements to stay at hostels and perform the duties consecutively.

One resident said:

‘Initially, there was chaos but eventually, we get used to it and managed as a team, otherwise, it wouldn’t have been possible without cooperation.’

One of the residents froze her training as she was immunocompromised.

The consultants organized a meeting with residents to address their concerns and boost their morale in the trying times of the pandemic. Most of the elective procedures were deferred to limit the transmission of the deadly virus. This step, however, was not well received by the patients as the procedures were mostly delayed for an undetermined period.

One of the consultants said:

‘We couldn’t control workload being an investigating department. However, elective procedures were delayed.’

Cooperation and teamwork were advised. The administration was involved to provide basic protective equipment.

SOPs were observed by the department as a whole according to WHO guidelines. Not only patients’, but colleagues’ interactions were also reduced. Classes were called off. Machines got contaminated which had to be disinfected which needed a lot of time and resources.

**Theme 2: Psychological Aspect**

**(a) Challenges:** Almost every doctor was stressed and depressed due to COVID and its implications. Not only were they but their families were also at risk of getting exposed.

One said:

‘It was an overall difficult phase. I was overwhelmed at a peak of COVID-19. There was fear of getting infected. I missed my family who lives in another city and I have faced travel restrictions.’

Another said;

‘As I was far from my family, I was at lowest psychological balance.’

Consultants were also overwhelmed.

‘Since the disease was new to the world there was a lot of panic and harassment.’

**(b) Strategies:** SOPs were followed to minimize the risk of infection.

Doctors communicated with each other and gave moral support through social networking websites. One participant said;

‘I indulged myself in charity work to gain peace of mind.’

Consultants kept spirits of residents high. Malicious news were ignored.

**Theme 3: Research Work**

**(a) Challenges:** Most of the residents were already facing stress and fear, they didn’t get their mind on research as patient-interactions were limited.

**(a) Strategy:** Despite the hurdles, some doctors especially consultants carried out research work and surveys during the COVID pandemic.

**Theme 4: Training Education**

**(a) Challenges:** The resident training program was highly affected. Morning classes were suspended. There was an effect on workshops, exam schedules, and compulsory rotations. Group studies were postponed.

One participant said:

‘There was an abrupt decline in learning opportunities. Since I had 2 years course that was almost spent in the COVID-19 era, I am thinking of extending my training program.’

Many residents complained that direct interaction with seniors was reduced which eventually led to hampered learning.

Even consultants felt this as a major setback to residents’ training program and said;

‘Training was compromised. Our students have little to observe.’

Many residents found it difficult to interpret Chest XRAY/CT to screen COVID-19 positive patients initially. There was a lack of resources to start virtual learning like in other parts of the world.

**(b) Strategies:** WhatsApp groups were made to maintain interactions with seniors and tricky radiological films were shared so that other doctors could benefit as well. Links for Foreign virtual classes on Zoom were shared and promoted.

One said:

‘I didn’t know about zoom classes before COVID-19. Online classes became popular.’

While other said;

‘Online classes were not that good as compared to hands-on learning with seniors.’

Exams were rescheduled after great uncertainty.

Chest XRAYs/CT were shared on social media to understand radiological findings of COVID-19. Data

regarding radiological films for screening COVID that was available online proved to be helpful for so many of the doctors. Consultants thought during the pandemic, the residents were doing better academically as they got time to study well at home.

## 4. Discussion

### 4.1 Socio-demographic Factors and their Association with the Effects of COVID-19 Pandemic on Respondents

COVID-19 brought an unforeseen turn of events all over the globe. Like all other domains, the healthcare and education system has suffered the consequences. The radiology department is no exception. 80% of the respondents in this study faced significant hurdles during the pandemic era, while 20% reported having minimum difficulty in coping with the abrupt change during this period.

Amongst the residents the average age of the respondents was  $31 \pm 3$  years while it was  $51 \pm 3$  years amongst the consultants. 53% (n=8) were males while 46.7% (n=7) were females. Moreover, 10 of them were married 5 were unmarried. 80% of the doctors in the study were trainee residents while the rest were consultants. Amongst the trainee residents, the majority were in a four-year training program while only 20% were in a two-year training program. The trainee residents who participated in the survey were all working at the Department of Radiology except one who had completed the training just 4 months before the study. This pattern was similar to that of the study carried out by Veerasuri et al., in which one trainee was pregnant during the survey and was not working full time while the rest of them were<sup>7</sup>. All the consultants had an experience of more than 5 years, in Radiology. Amongst the respondents, 80% had a monthly income of about Rs. 1 lac, 13% had an income of 2 lac or above while 6.7% were unpaid. 73% of the doctors in the study had been affected by COVID-19 by the time the study was carried out.

### 4.2 Challenges Faced by Doctors and Coping Strategies Adopted by them during the COVID-19 Era

#### Theme 1: Management

33% of the doctors stated that there was a vexatious approach for the impending pandemic at the beginning of the global health crisis. This response is consistent with the study carried out by Mahmud Mossa-Basha et al.,<sup>8</sup> whereby it was stated

that most countries other than China, Italy, and Iran had only about two months to prepare for the pandemic. This time was not enough as there was mass hysteria and a majority of the people refused to believe that pandemic could take the predicted toll. Lack of PPEs was one of the major hurdles faced by the majority of doctors at the beginning of the pandemic. This was following the study carried out by Mendel, in which there was an affirmation of shortage of supplies, including the PPEs, because of the exponential spread of COVID-19<sup>9</sup>.

One of the salient coping strategies adopted by the Department of Radiology was to modify the duty rosters and reduce the duty hours of doctors by one-half. This was a crucial step taken to limit the exposure of doctors to patients and hence reduce their risk of getting infected by COVID-19. Moreover, all the elective procedures, such as ultrasound-guided biopsies, in the Radiology Department were postponed to reduce patient exposure. This step was also taken by the Department of Radiology, University of Cincinnati, Cincinnati, Ohio as reported by A. Vagal et al. They stated that all the nonemergent imaging and procedures in their hospitals and outpatient centers were rescheduled<sup>10</sup>.

#### Theme 2: Psychological Aspects

The pandemic also had a significant impact on the mental health of doctors. The majority of the respondents in our study were apprehensive of catching the deadly virus and transmitting it to their family members. This concern was also reported by Sadia Malik et al., who asserted that there was a strong relationship between workplace panic anxiety and the fear of COVID-19<sup>11</sup>.

The COVID-19 era strengthened the collaboration between the doctors, especially regarding roster management. The residents and consultants worked as a better team during this period and morally supported each other through the tiring experience of the pandemic.

#### Theme 3: Research Work

The mystifying pandemic provided a vast range of opportunities in research work for medical staff. But since most of the residents were already struggling to cope with the distress brought about by the pandemic, a majority of them did not engage in research work. However, the consultants managed to conduct quite a few researches. Deferral of research work was also reported in the study carried out by Mayur Virakar et al., whereby they reported that all the research work at their institute was postponed. Moreover, the deadlines for abstract submissions for the then-upcoming yearly Radiological Society of North America meeting were also extended to provide extra time to work on the meetings.<sup>4</sup>

#### Theme 4: Training Education

To implement social distancing, classes were suspended. The majority of the residents considered it a consequential drawback as their interaction with seniors, including consultant radiologists, was restricted and this led to an abrupt decrease in one-to-one learning. The scheduled exams and workshops for residents were postponed for an undetermined period. This was also a stress-inducing factor that disrupted the course of training for the residents.

Most of the doctors, including the consultants, struggled with reporting chest x-rays and HRCT Chest of COVID-19 patients. They claimed as the disease was new and had an unpredictable course, they were mostly unaware of its radiological presentation. There was an added pressure on the radiologists since the physicians relied heavily on them for diagnosis because of the poor credibility of RT-PCR tests. This concern was also raised by NS Gezer et al., where they stated the radiologists struggled with decision-making and reporting because of the diversity of imaging findings with an increase in the number of patients undergoing radiological investigations for COVID-19<sup>12</sup>. To cope with this hurdle, the doctors in radiology department availed online resources regarding imaging findings of COVID-19. Online social platforms were established to promote case-based discussions to assist residents and consultants alike.

## 5. Conclusion

Covid-19 posed a spectrum of unforeseen challenges to all the doctors at the radiology department of Shaikh Zayed Hospital, Lahore. There were challenges related to the management, psychological aspects, research work and training education. The department with the cooperation of administration, came up with various coping strategies and fought back in the face of the pandemic by better team work, ensuring radiology operations, efficient prevention and protection and long-term planning for Covid-19.

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## 7. Statement for Competing Interest

None.

## 8. Funding

None.

## 9. Limitations of Study

The study was limited by a small number of doctors participating in the interview-based study. Further, it reflects the challenges and responses in a single hospital setting in only one department.

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