





# Impact of COVID-19 pandemic on obstetrics and gynecology residency training program in India: A national online survey

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## Abstract

**Objective:** The goal of this study was to analyze how the COVID-19 pandemic affected the Obstetrics and Gynecology (OBG) residency program in India.

**Study Design:** This was a cross-sectional questionnaire-based online survey aimed to assess the impact of the pandemic on the residency training program in Obstetrics and Gynecology. The questionnaire consisted of five sections: demographic details, information regarding COVID-19 status, clinical work load, teaching and research, and psychological impact.

**Results:** The questionnaire was completed by 280 OBG trainees from different medical colleges from India. Training activity in general was reduced considerably during the pandemic, according to 79.6% ( $n = 223$ ) respondents. According to 13.21% ( $n = 37$ ) and 5% ( $n = 14$ ) respondents, reduction in training activity were due to cancelation of elective operations and reduced patient foot fall respectively. In 74.3% ( $n = 208$ ) of cases, trainees reported worry about meeting the goals of their specialty training. Logistic regression showed that the extent of training reduction was not significantly associated with residents' age ( $p = 0.806$ ), gender ( $p = 0.982$ ), marital status ( $p = 0.363$ ), and status of their duty in COVID-19 dedicated hospitals ( $p = 0.110$ ). However, year of residency was a significant predictor of the perception about degree of training reduction.

**Conclusion:** The pandemic imposed a significant impact on OBG residency training in India. During the pandemic, exposure to learning opportunities, surgeries, and teaching were reduced, which may result in a decline in the quality of care offered to women in the future if training deficit is not overcome. At the same time, pandemic also gave birth to newer insights of learning and interaction by online mode.

**Key words:** COVID-19, Obstetrics and Gynecology residents, postgraduate training.

## Introduction

The novel Coronavirus 2019, also known as the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), emerged as the most dreadful virus of the century taking a huge toll on life. It has been linked to negative health, and adverse socioeconomic

and psychological outcomes. India was one of the most severely affected countries, with over 3.13 crore cases and over 4.19 lakh fatalities. After the declaration of COVID 19 pandemic by World Health Organization (WHO) in March 2020,<sup>1</sup> and improvisation of lockdown by Government authorities, public gatherings were prohibited and most travels got limited.

Received: December 24 2021.

Accepted: May 5 2022.

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The Healthcare System was also restructured, with elective surgical treatments and the majority of outpatient appointments being postponed.<sup>2,3</sup> This had a direct impact on the residents posted in various specialties, especially the surgical ones. Surgical branches are patient-driven. The more the residents observe and perform the surgeries, the more they learn.

Recent studies from disciplines like surgery and radiology have revealed a substantial influence on residents' training workflow during the outbreak.<sup>4</sup>

Therefore, this study was planned to assess the outcome of COVID pandemic on the training curriculum of residents posted in Obstetrics and Gynecology (OBG).

The survey's goal was to explore how the pandemic influenced OBG training in India from the perspective of a trainee. We believe that by doing this study, we will be able to offer an overview of the impacts of the pandemic on training, learning, and teaching so that trainees and trainers will be better equipped to address the weaknesses that have arisen as a result of the changes made during the pandemic. This will also give the insight to deal with such calamities in future.

## Materials and Methods

### Study design

This was a cross-sectional questionnaire-based survey aimed to assess the impact of the COVID-19 pandemic on the OBG residency training program in India. The study was conducted after ethical approval from the Institutional Ethics Committee (IEC) vide letter number AIIMS/IEC/2021/3705.

### Study population

All trainees in Obstetrics and Gynecology at the time of the COVID-19 pandemic or trainees who had recently finished their training during the time of the outbreak irrespective of gender were eligible to participate. Those on maternity leave or leave for more than 6 months were excluded.

### Data collection

The survey was conducted through electronic communication from 16th August 2021 to 15th September 2021 and was created and conducted using an online google form (<https://docs.google.com/forms/u/0/>). A questionnaire in English was used as a survey tool. The primary investigator developed the questionnaire draft. It was revised by other co-investigators and

then reviewed by IEC and finalized as per the suggested modifications. The final survey questionnaire consisted of five sections about demographic details of participants, their COVID 19 test status and awareness about the updated protocols and guidelines, clinical work load; teaching and research and psychological impact. The majority of questions were multiple choice while few were open-ended. Participating in the survey was completely voluntary and an online implied consent was taken. Anonymity and confidentiality of the participants were maintained. The link was posted and forwarded to different WhatsApp groups of OBG residents.

Response data were directly downloaded as an Excel sheet and processed for grossly incomplete and duplicate responses for exclusion from analysis and apparent discrepancy for possible correction.

### Statistical analysis

The Statistical Package for Social Sciences (SPSS) v. 23.0 was used for statistical analysis (IBM Inc). Data are displayed as means with SDs or as an absolute number (percentage). For sociodemographic variables, descriptive statistics were computed.

By utilizing logistic regression analysis, questionnaire scores were also examined according to the residents' gender, year of residency, and COVID-19 positive status.

For multivariate analysis, binomial logistic regression was applied. A two-tailed *p* value less than 0.05 was considered statistically significant.

## Results

A total of 298 responses were received from which 18 were found to be incomplete and therefore, excluded. Overall, 280 responses were analyzed.

### Demographic details

Out of 280 participants, 86.42% (*n* = 242) were female and 13.57% (*n* = 38) were male. The age of the participants ranged from 24 to 41 years with mean age  $27.75 \pm 2.431$  years. Forty-nine (17.5%) were first-year residents, 70 (25%) were second-year, 108 participants (38.57%) were final-year, and 53 were residents who recently passed out in COVID-19 pandemic. The majority of the residents; 83.9% (*n* = 235) worked in COVID-19 dedicated hospitals.

### Information regarding COVID-19 exposure among the residents and awareness about COVID-related updates

The majority trainees, 90.7% ( $n = 254$ ) admitted that they were tested for COVID 19 by a real-time reverse-transcriptase-polymerase-chain-reaction (RT-PCR) assay of nasal and pharyngeal swab specimens, and 51.8% ( $n = 145$ ) got positive for SARS-COV-2. Among all, only 20% ( $n = 56$ ) of residents were tested for SARS-COV-2 antibodies. The residents responded in open-ended questions that the waiting period for test results and the quarantine after positive result also influenced their teaching and training activity apart from increasing their anxiety. Many of them even missed their important semester exams and could not go home for days.

As far as personal protective equipment (PPE) is concerned, 80.6% ( $n = 226$ ) of residents received training for PPE kit donning and doffing. About 78.2% ( $n = 219$ ) reported receiving adequate gear, and 93.9% ( $n = 263$ ) felt adequately informed on preventive and management methods as well as the updated guidelines on COVID-related care.

Regarding vaccination, 75% ( $n = 210$ ) residents were vaccinated with Covishield vaccine, 19.64% ( $n = 55$ ) with Covaxin, none of them got Sputnik vaccination and 5.37% ( $n = 15$ ) did not get vaccinated for COVID-19.

### Impact of COVID pandemic on clinical work

When asked about their COVID duties, 86.8% ( $n = 243$ ) residents admitted that they were posted in COVID specific wards during their residency. 92.9% ( $n = 260$ ) residents managed COVID-19 patients independently. 90.7% ( $n = 254$ ) performed delivery/cesarean of COVID positive patients in PPE. Training activity, in general, was reduced considerably during the COVID-19 pandemic according to 79.6% ( $n = 223$ ) of respondents. About 67.14% ( $n = 188$ ) of residents opined that hampering of training was mostly because of restructuring of work shifts (posting in COVID specific wards). According to 13.21% ( $n = 37$ ) and 5% ( $n = 14$ ) respondents, reduction in training activity was due to the cancellation of elective operations and reduced patient load respectively. While 5.71% and 8.93% had to restrict their activity due to medical illness or obligatory quarantine.

The areas most affected by this reduction were those involving elective surgical operations. Table 1 shows the various fields in OBG practice where reduction, total shut down of procedures, no effect or increase was witnessed by the trainees. According to 54.6% ( $n = 153$ ) responses, labor and delivery activity were not altered at all. However, in maximum cases, a negative trend in cessation of training activities can be seen as depicted in Figure 1.

**TABLE 1** Impact of COVID pandemic on clinical work

Training in various fields	Total respondents (%) $N = 280$				
	Total suspension	Reduced	Not affected	Increased	Previously also not done in the hospital
Training activities in general during COVID pandemic	31 (11.1)	223 (79.6)	26 (9.3)	0	0
Elective major gynecological open surgeries	143 (51.1)	134 (47.9)	3 (1.1)	0	0
Elective major gynecological laparoscopic surgeries	151 (53.9)	903 (2.1)	2 (0.7)	0	37 (13.2)
Elective minor procedures	65 (23.2)	198 (70.7)	17 (6.1)	0	0
Diagnostic laparoscopic hysteroscopic procedures	137 (48.9)	117 (41.8)	3 (1.1)	0	23 (8.2)
Labor/delivery	1 (0.4)	126 (45)	153 (54.6)	0	0
Prenatal invasive procedures	27 (9.6)	102 (36.4)	26 (9.3)	0	125 (44.6)
Infertility treatment	56 (20)	187 (66.8)	37 (13.2)	0	0
Urogynecology-related activity	103 (36.8)	156 (55.7)	21 (7.5)	0	0
Oncologic screening clinic and colposcopy	88 (31.4)	172 (61.4)	20 (7.1)	0	0
Oncological surgery	115 (41.1)	142 (50.7)	23 (8.2)	0	0
Family planning services	31 (11.1)	188 (67.1)	61 (21.8)	0	0
Outpatient department (OPD) services workload	12 (4.3)	174 (62.1)	48 (17.1)	46 (16.4)	0

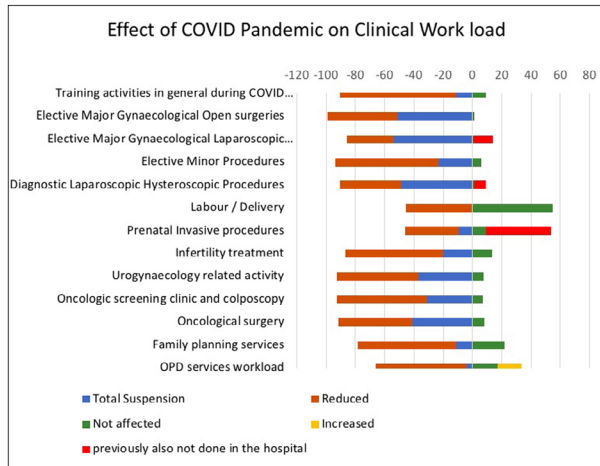


FIGURE 1 Effect of COVID pandemic on clinical work load

Contrarily, an increase in outpatient department (OPD) workload was reported by 16.4% ( $n = 46$ ) of residents. Figure 2 shows the change in the working hours as mentioned by the residents.

More than the half (57.1%) of the residents commented that Telemedicine OPD was not fruitful at all and high-risk antenatal patients were missed. Moreover, the internet and communication was the major challenge faced during telecommunication.

Logistic regression showed that the degree of training reduction was not significantly associated with residents' age ( $p = 0.806$ ), gender ( $p = 0.982$ ), marital status ( $p = 0.363$ ), and status of their duty in COVID-19 dedicated hospitals ( $p = 0.110$ ). But the year of residency was a significant predictor of the perception about degree of training reduction.

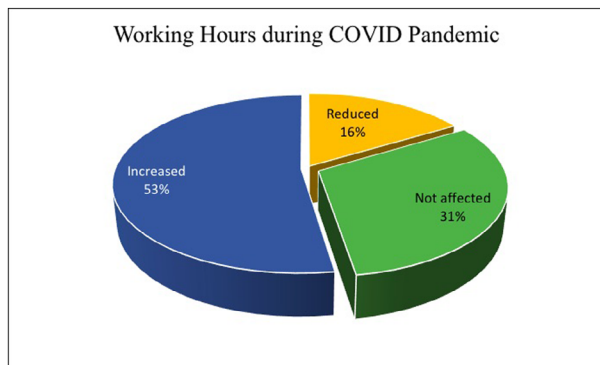


FIGURE 2 Working hours of OBG residents during COVID pandemic

### Teaching and research during Covid-19 pandemic

According to 74.3% ( $n = 208$ ) residents, the thesis goals were not achieved due to COVID pandemic. Clinical teaching and bed-side teaching were significantly declined. Online mode of teaching was adopted by 54.6% ( $n = 153$ ) residents, physical classes in 17.5% ( $n = 49$ ) cases, and total suspension was seen in 27.9% ( $n = 78$ ) cases. According to 91.07% ( $n = 255$ ) residents, online teaching was not at all fruitful as there were many issues related to it like connectivity problems, less interaction, more distractions and practical aspects that could not be covered. (Table 2) Additionally, for research, data collection and meeting the sample size was the major challenge that the residents faced.

### Psychological impact of COVID-19

The effect of COVID-19 on residents' approach to patients was described as unaltered in 15.7% ( $n = 44$ ) of cases, significantly changed in 38.9% ( $n = 109$ ) of cases, somewhat changed in 39.3% ( $n = 110$ ) of cases, and completely changed in 6.1% ( $n = 17$ ) of cases.

About 78.9% ( $n = 221$ ) of residents expressed anxiety during invasive and non-invasive procedures due to fear of contracting the virus and due to the discomfort of wearing PPE; 96.1% ( $n = 269$ ) reported anxiety about transmitting the infection to their family members. Overall, 82.8% ( $n = 232$ ) respondents indicated that COVID-19 had a negative psychological impact in terms of mood changes. In 43.2% ( $n = 121$ ) cases psychological support was provided by the hospital administration (Table 3).

TABLE 2 Teaching during COVID-19 pandemic

Parameters	Frequency of respondents $N = 280$	Percent (%)
Thesis goals achieved during pandemic		
No	208	74.3
Yes	72	25.7
Mode of Postgraduates (PG) teaching adopted during pandemic		
Online	153	54.6
Physical	49	17.5
Suspended	78	27.9
Bedside teaching continued during pandemic		
No	218	77.9
Yes	62	22.1
Clinical teaching		
Reduced	202	72.1
Total suspension	49	17.5
Not affected	29	10.4
Total	280	100.0

**Table 3** Psychological impact of COVID-19 on residents

Parameters	Frequency of respondents <i>N</i> = 280	Percent (%)
Effect of COVID on residents approach to patients		
Considerable change	109	38.9
Little bit change	110	39.3
No change	44	15.7
Totally change	17	6.1
Anxiety fear of infection during procedure		
No	59	21.1
Yes	221	78.9
Anxiety of transmitting infection to family		
No	11	3.9
Yes	269	96.1
Psychological impact		
Depressive	79	28.2
Low mood	153	54.6
No effect	48	17.1
Psychological support by hospital department		
No	159	56.8
Yes	121	43.2
Anxiety related to professional future due to compromised training		
No	36	12.9
Yes	244	87.1
Total	280	100.0

Gender (odd's ratio [OR] = 2.67, 95% confidence interval [CI]: 1.08–6.58) and work in covid-19 dedicated hospitals (OR = 4.94, 95% CI: 1.13–21.67) were the significant predictors of mood impairment on multivariate analysis. While age, gender, and year of residency were not significantly associated with mood impairments.

## Discussion

The purpose of this cross-sectional survey was to assess the influence of the COVID-19 pandemic on the OBG residency training program in India. To the best of our knowledge, this is the first study from India to assess the influence of COVID-19 on OBG residency training. The study results revealed that the COVID-19 pandemic resulted in substantial training impairment among the residents in Obstetrics and Gynecology. The cross-sectional study design limited the scope of this investigation. Because, we solely included trainees from India, the data from this study may not be extrapolated to other nations. However,

the existing studies more or less depict the same scenario in different nations.<sup>5,6</sup>

Since March 2020, when the pandemic was declared by WHO,<sup>1</sup> the residents have faced the ups and downs of the two waves. COVID-19 had not only affected the patient care but also had far-reaching implications for undergraduate medical teaching, learning and surgical training programs for the post-graduate residents and research.<sup>7,8</sup> Residents' participation in regular gynecologic outpatient services and minor and major elective gynecologic operations were drastically reduced. However, most emergency and labor and delivery services remained unaffected. We discovered that the majority of residents in all training institutions had "some" to "full" interruptions in their varied instructional learning experiences.<sup>9</sup> Previous research has also linked the COVID-19 pandemic to major reductions in resident training and medical education in several specialities.<sup>10</sup>

In surgical specialities, where hands-on training cannot be substituted by distance instruction, the harm may be more severe.<sup>11</sup> A survey of Indian dermatology residents revealed a substantial decrease or full suppression of training in up to 50% of the residents.<sup>12</sup> Another article by Sarkar et al. has highlighted the impact of the second wave on post-graduate training when all physical and offline classes were suspended.<sup>13</sup> For a medical scholar, it is very important to interact and communicate with patients, do case presentations, present their skills and work in conferences and perform various procedures repeatedly to enhance skill and confidence. The Obstetrics and Gynecology residency training program is one of the largest and most diverse in the country, with the inculcation of clinical, surgical, and emergency management abilities. Daily practice, in conjunction with sufficient theoretical preparation, is critical in gaining autonomy in carrying out clinical duties, and for the overall development of skills. This trajectory suffered significantly due to the pandemic, as the residents were bound to work in COVID-centered wards and they missed this curriculum.

Our study observed that 78.9% of the residents were anxious about the spread of disease.

Studies have also revealed that the COVID-19 pandemic had a significant psychological impact on a variety of populations, including patients and healthcare personnel.<sup>14,15</sup>

While online sessions cannot replace the hands-on training and clinical exposure required for trainees, they have proved to be a useful tool for mitigating the

effects of pandemics and leading to a beneficial conclusion. Our findings can be utilized to develop innovative solutions to reduce the influence of such future pandemics on the quality of residency training programs. To cope with training inadequacies, new organizational strategies are required. Although not equivalent to actual exercise, there can be a novel alternative accessible, including online practice questions, teleconferencing, engaging residents in telemedicine clinics, using simulators and using surgical videos.<sup>16</sup>

The hybrid conferences and webinars will continue to provide the opportunity for the residents to showcase their work and presentations. Data collection for research through online tools is another solution for continuing research in such pandemics. While the pandemic has significantly influenced the residents training, it has also opened the Pandora box of new realms of learning. Residents can learn from simulators. Many take-home simulators for short tasks are available and more can be innovated in future.

## Conflict of interest

None declared.

## Author contributions

MG contributed to project development, questionnaire development, data management, data analysis and manuscript writing. PS contributed to data management, questionnaire development. CS contributed to data collection and manuscript editing. GY contributed to data collection, data analysis. MKG contributed to data analysis. All authors read and approved the final version of the manuscript.

## Data availability statement

Data available on request from the authors.

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