

## Impact of COVID-19 pandemic on postgraduate training in Paediatrics

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### Abstract

**Objective:** To assess the impact of the coronavirus disease-2019 pandemic on paediatric postgraduate training as perceived by the trainees.

**Method:** The cross-sectional exploratory study was conducted at the Department of Paediatrics, King Edward Medical University, Lahore, Pakistan, from May to June 2020, and comprised paediatric postgraduate trainees associated with various hospitals across the country who were approached online with a pre-designed 24-item questionnaire during the peak months of the pandemic. Data was analysed using SPSS 25.

**Results:** Of the 226 postgraduates, 134(59.2%) were females. The overall mean age was  $28.85 \pm 3.06$  years. Of the total, 200(88.5%) and 195(86.2%) reported that pandemic had adversely impacted their training and research. The number of trainees managing >30 patients and doing >5 procedures per week before the pandemic decreased from 126(55.8%) and 150(66.4%) to 38(16.8%) and 41(18.1%), respectively, during the pandemic ( $p=0.01$ ). Regarding e-learning, 168(74.3%) trainees thought it might partly compensate for training, 135(59.7%) showed readiness for it, and 179(79.2%) believed this could not replace actual patient interaction.

**Conclusion:** The coronavirus disease-2019 pandemic was found to have adversely impacted paediatric postgraduate training.

**Keywords:** COVID-19, Paediatrics, Impact, Postgraduate, Training. (JPMA 72: 912; 2022)

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### Introduction

The pandemic of coronavirus disease-2019 (COVID-19) disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) has become a global threat to the general population, healthcare professionals, medical training and academics.<sup>1,2</sup> The healthcare professionals face the unusual challenge of working as frontline warriors despite the pandemic harming their mental, physical and social wellbeing.<sup>3,4</sup> Moreover, medical education, especially subspecialty clinical training, has faced an unprecedented decline.<sup>2,5</sup> Because of the need for social distancing and disruption to hospital routines, both clinical and educational activities have decreased, which can be detrimental to the training of postgraduate trainees.<sup>6</sup> The clinical experience and hands-on skill acquisition have been drastically affected by the pandemic.<sup>2</sup> To cope with this situation, online teaching and e-learning are suitable alternatives, but have limited scope in clinical training, as witnessed during the previous SARS outbreak.<sup>7,8</sup>

During the COVID-19 pandemic wave, the patient turnover decreased significantly, mainly because of the lockdowns, and the outpatient departments (OPDs) were closed in most hospitals of Pakistan.<sup>9</sup> Similar

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findings of reduced patient exposure for learning purposes and reduced operative lists have also been documented in many centres around the globe.<sup>10-12</sup> This reduced patient exposure would understandably impact the training in clinical specialties, like Paediatrics, but has not been well documented in literature. The few studies documenting the impact on paediatric training had either a small sample size or were more reflective of subspecialties.<sup>13,14</sup> The current study was planned to assess the impact of COVID-19 on paediatric postgraduate training as perceived by trainees across Pakistan.

### Subjects and Methods

The cross-sectional exploratory study was conducted at the Department of Paediatrics, King Edward Medical University, Lahore, Pakistan, from May to June 2020. After approval from the institutional ethics review board, the sample size was calculated using Epi Info v. 7.2.4 calculator with 95% confidence level and 5% margin of error, assuming that 75% of the total trainees will be affected by the pandemic.<sup>15</sup> The sample was raised using non-probability convenience sampling technique from among the 700 postgraduate trainees (PGT) in paediatrics working in the various hospitals of Pakistan. They were approached online using Google forms and a pre-designed questionnaire. The responses were also collected electronically. Written informed consent was obtained at the beginning of the questionnaire. The

questionnaire comprised 24 items about the trainees' perception of the impact of the COVID-19 pandemic on their training and research as a whole, impact on the clinical workload, practical procedures planned educational sessions in the post-COVID period compared to the pre-COVID period; makeup planning for the lost training; opinion about the e-learning facilities and their readiness for it; and opinion about the examination timing and methodology.

The questionnaire's internal reliability and face validity were assessed using Cronbach's alpha coefficient (0.67) and expert opinion of three medical educationists, respectively.

In addition to the demographic details, like age, gender, year of training, and place of work, information about training, including clinical workload, procedures, and planned educational sessions, research, e-learning, and examinations were gathered. All fields in the questionnaire were mandatory to be filled. The responses were kept anonymous, and each trainee was allowed to complete only one form and retain a copy of their responses.

Data was analysed using SPSS 25. Quantitative data, like age, was expressed as mean and standard deviation, while qualitative variables were expressed as frequencies and percentages. The pre-COVID and post-COVID periods were compared for items related to clinical workload, procedures, and planned educational sessions by applying Pearson Chi-square or Fischer exact test.  $P < 0.05$  was considered statistically significant.

## Results

Of the 226 postgraduates, 134(59.2%) were females. The overall mean age was  $28.85 \pm 3.06$  years. Responses from Mayo Hospital, Lahore, were 76(33.6%), while 150(66.4%) were from all the other hospitals, with leading contributions from Allied Hospital, Faisalabad, 40(17.7%) and Civil Hospital, Karachi, 35(15.5%). Maximum input was received from first-year trainees 66(29.2%), followed in 2nd year 54(23.9%), 4th year 56(24.7%), and 3rd year 50(22.1%).

Overall, 126(55.8%) trainees reported they were managing  $>30$  patients per week during the pre-COVID period compared to 38(16.8%) post-COVID ( $p < 0.01$ ). More than 10 procedures per week were reported by 156(69%) trainees pre-COVID compared to 57(25.2%) post-COVID ( $p < 0.05$ ). More than five individual procedures per week were performed by 150(66.4%) trainees pre-COVID compared to 41(18.1%) post-COVID ( $p < 0.01$ ).

In terms of training, 200(88.5%) trainees believed the

**Table:** Comparison of pre- and post-COVID-19 workload (n=226).

		Pre-COVID N (%)	Post-COVID N (%)	p-value
Average cases per week	< 30	100 (44.2)	188 (83.2)	0.01
	> 30	126 (55.8)	38 (16.8)	
Average educational sessions per week	< 5	85 (37.6)	221 (97.8)	0.16
	>5	141 (62.4)	5 (2.2)	
Departmental procedures per week	< 10	70 (30.9)	169 (74.8)	<0.001
	>10	156 (69.1)	57 (25.2)	
Individual Procedures per week	<5	76 (33.6)	185 (81.9)	<0.001
	>5	150 (66.4)	41 (18.1)	

COVID-19: Coronavirus disease-2019.

pandemic had adversely impacted their training, 195(86.2%) stated a reduction in their research activities. This perception of adverse impact on training and research did not vary across the year of training ( $p=0.32$ ;  $p=0.76$ ).

More than five educational sessions per week were attended by 141(62.4%) trainees pre-COVID compared to 5(2.2%) post-COVID ( $p=0.16$ ) (Table).

When asked about the compensation method for the lost training period, 167(73.9%) believed that extra work within the already defined training period should be enough, 14(6.2%) suggested increasing the training duration, and 45(19.9%) thought that no compensation was needed.

Regarding e-learning, 168(74.3%) PGTs believed that online lectures, case discussions and video conferences could partly compensate for the loss, 125(55.3%) stated that their department had started the e-learning activities, 135(59.7%) showed readiness to accept e-learning, 122(53.9%) said they had the necessary equipment to manage e-learning activities, and 129(57.1%) believed that it might positively impact their learning skills. When asked whether e-learning activities can replace actual patient interaction, 179(79.2%) were against this notion.

As far as examinations were concerned, 99(43.8%) favoured delaying them, 96(42.5%) were against the idea, while the rest were unsure. When presented with an option of giving a walkover without any formal exam, 110(48.6%) were against the idea, 70(30.9%) favoured it, while the rest were not sure. Regarding the replacement of various examination components from physical to online system, 176(77.8%) PGTs stated that the online examination might replace the theory part, 107(47.3%) wanted replacement of task-oriented-assessment of clinical skills (TOACS) to the online system, and 50(22.1%) favoured the clinical part.

## Discussion

The impact of the COVID-19 pandemic on patient outcomes has been widely studied, but very little has been documented regarding the trainees' perception of the pandemic's effect on their training.<sup>16-18</sup> The frontline workers involved in dealing with and more commonly affected by the pandemic are the PGTs, and, hence, the importance of understanding the situation as they perceive is necessary.<sup>17</sup> The current study explored the perception of paediatric PGTs across various institutions of Pakistan regarding the effects of the pandemic on their training, education, examination and research.

The results showed a statistically significant adverse impact of the COVID-19 pandemic on postgraduate training in paediatrics across all years of the training. This was corroborated not only by the trainees' perception, but also by the decline in the number of trainees who could see enough patients and do sufficient practical procedures in the post-pandemic period. Because the hospitals, especially the OPDs, remained closed during the peak months of the pandemic, this decline seems understandable.<sup>2,4-7</sup> This would adversely impact the quality of the clinical training where exposure to patients is essential.<sup>6,8</sup> Hence, there is a need to develop mitigation strategies to compensate for the loss of training due to the pandemic. Interestingly, only a tiny proportion (6%) of the trainees thought that increasing the duration of their training would be helpful to compensate for their lost training. At the same time, about 74% were willing to do extra work within the same period to compensate. The 20% who did not think any compensation was needed may represent those who were already working in institutions with little baseline patient turnout or fewer teaching sessions compared to larger institutions, like Mayo Hospital, Lahore. Another interesting observation was that there was a sizeable proportion of about 38% trainees who did not have a chance to attend more than five educational sessions even before the pandemic, leading to insignificant p-value value as shown in the table.

The trainees in the current study reported a significant decline in their research activities. The research linked with paediatrics training is mainly clinical research, and with less turnover of the patients, this decline was inevitable. This phenomenon has been reported among the trainees of multiple specialties the world over due to limited in-person participation or social distancing, hampering data collection.<sup>14,19-21</sup> Moreover, doctors have used the most efforts, knowledge and infrastructure to conduct pandemic-related research.<sup>19</sup> Although there has been continuing support for a variety of pandemic and

non-pandemic-related research initiatives and grant applications, including special COVID-19 issues of national and international journals, the participation by the trainees in these is low.<sup>19,22</sup> It is important to note that in certain instances, this lapse in research may have affected the trainees' eligibility to appear for the exit examination, which is an area worth exploring and documenting. Another interesting finding, not mentioned in the results section, is that 5(2.2%) PGTs reported an increase in their research activities. This may represent either engagement of trainees in the pandemic-related research or that the trainees might have utilised the unspent time of clinical work to the pending research work.

Many modifications have been proposed or implemented to improve the training programmes and mitigate the pandemic's effects on trainees' professional competencies.<sup>5-8,23</sup> These include e-learning-based online portals for video conferences, case presentations and discussions, telemedicine, online presentations, and short assessments using various learning management system applications. Trainees in other parts of the world are readily accepting the changes and are satisfied by the positive impact of e-learning.<sup>18</sup> Most trainees in the current study not only acknowledged the usefulness, but were ready to utilise e-learning. A large proportion, however, disregarded that e-learning can replace actual patient interaction. E-simulation may partly compensate for the lost patient interaction, especially for specific skills, like resuscitation.<sup>24</sup> Considering that half of the trainees reported a lack of e-learning facilities in their centres, it is for the regulatory bodies to facilitate the institutions recognised for postgraduate training to start e-learning activities.

The opinion regarding delaying the examination was split, but only one-third of trainees favoured walk-over without examination. It is essential to understand the importance of the high-stake examination for a specialty clinical programme.<sup>25</sup> In these circumstances, virtual examinations can be a good option to which the majority of the participants of the current study agreed as far as the theory component was concerned. The same has been advocated by others centres globally.<sup>25,26</sup> The inherent structure of the clinical examinations - the long and short cases that cannot be conducted online concussively — might be why the vast majority in the current study did not agree with virtual assessment.

The current study has its limitations, as it used a self-designed questionnaire that underwent expert review, but the internal consistency of 0.67 was not robust, limiting the generalisation of the findings.

## Conclusion

The COVID-19 pandemic has adversely impacted paediatric postgraduate training in Pakistan. The trainees in various cities of Pakistan are highly concerned about their training, majorly due to the reduced number of patients and lack of alternate training options. Although e-learning has been started in several institutions, there are many centres where the trainees are looking forward to the start of e-learning.

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## References

- Lai C, Shih T, Ko W, Tang H, Hsueh P. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. *Int J Antimicrob Agents* 2020; 55: 105924.
- Edigin E, Eseaton PO, Asemota IR, Shakaa H, Ojemolon PE, Asemota IR, et al. Impact of COVID-19 pandemic on medical postgraduate training in the United States. *Med Educ Online* 2020; 25: 1774318.
- Sethi BA, Sethi A, Ali S, Aamir HS. Impact of Coronavirus disease (COVID-19) pandemic on health professionals. *Pak J Med Sci* 2020; 36(COVID19-S4): S6-11.
- Gallagher TH, Schleyer AM. We signed up for this! Student and Trainee Responses to The COVID-19 pandemic. *N Engl J Med* 2020; 382: e96.
- Imielski B. The detrimental effect of COVID-19 on subspecialty Medical education. *Surgery* 2020; 168: 218-9.
- Potts JR 3rd. Residency and Fellowship Program Accreditation: Effects of the Novel Coronavirus (COVID-19) Pandemic. *J Am Coll Surg* 2020; 230: 1094-7.
- Bianchi S, Gatto R, Fabiani L. Effects of the SARS-COV-2 pandemic on Medical Education in Italy: Considerations and tips. *Euromediterranean Biomedical J* 2020; 15: 100-1.
- Lim EC, Oh VM, Koh DR, Seet RC. The challenges of "continuing medical education" in a pandemic era. *Ann Acad Med Singap* 2009; 38: 724-6.
- Hussain S, Malik QU, Ahmed Z, Razzaq A, Ikram F, Shoaib M et al. The impact of corona virus disease-19 (COVID-19) on postgraduate paediatric residents. *Pak Armed Forces Med J* 2020; 70 (COVID-19): S198-205.
- Amparore D, Claps F, Cacciamani G, Esperto F, Fiori C, Liguori G, et al. Impact of the COVID-19 pandemic on urology residency training in Italy. *Minerva Urol Nefrol* 2020; 72: 505-9.
- Caruana EJ, Patel A, Kendall S, Rathinam S. Impact of coronavirus 2019 (COVID-19) on training and well-being in subspecialty surgery: A national survey of cardiothoracic trainees in the United Kingdom. *J Thorac Cardiovasc Surg* 2020; 160: 980-7.
- Khalafallah AM, Jimenez AE, Lee RP, Weingart JD, Theodore N, Cohen AR, et al. Impact of COVID-19 on an Academic Neurosurgery Department: The Johns Hopkins Experience. *World Neurosurg* 2020; 139: e877-84.
- Mallon D, Pohl JF, Phatak UP, Fernandes M, Rosen JM, Lusman SS, et al. Impact of COVID-19 on Pediatric Gastroenterology Fellow Training in North America. *J Pediatr Gastroenterol Nutr* 2020; 71: 6-11.
- Hussain S, Malik QU, Ahmed Z, Razzaq A, Ikram F, Shoaib M et al. The impact of corona virus disease-19 (COVID-19) on postgraduate paediatric residents. *Pak Armed Forces Med J* 2020; 70: S198-205. [same as ref 9]
- Centre for Disease Control and Prevention. Epi Info for Windows. [Online] 2020 [Cited 2021 June 20]. Available from: URL: <https://www.cdc.gov/epiinfo/pc.html>
- Coronavirus disease (COVID-19) - World Health Organization. [Online] 2021 [Cited 2021 May 10]. Available from: URL: <https://www.who.int/emergencies/Diseases/novel-coronavirus-2019>
- Nguyen LH, Drew DA, Graham MS, Joshi AD, Guo CG, Ma W, et al. Coronavirus Pandemic Epidemiology Consortium. Risk of COVID-19 among frontline health-care workers and the general community: a prospective cohort study. *Lancet Public Health* 2020; 5: e475-83.
- Whitby T, Cleary G, Halfhide CP. Impact of COVID-19 on training: a single-centre survey of trainees. *BMJ Paediatr Open* 2020; 4: e000757.
- Weiner DL, Balasubramaniam V, Shah S, Javier JR; Pediatric Policy Council. COVID-19 impact on research, lessons learned from COVID-19 research, implications for pediatric research. *Pediatr Res* 2020; 88: 148-50.
- Sahi Pk, Mishra D, Singh T. Medical Education Amid the COVID-19 Pandemic. *Indian Pediatr* 2020; 57: 652-57.
- Alvin MD, George E, Deng F, Warhadpande S, Lee S. The Impact of COVID-19 on Radiology Trainees. *Radiology* 2020; 296: 246-8.
- Adarmouch L, Sebbani M, Amine M. Research Activity among Academic Medical Staff during the COVID-19 Pandemic in Marrakesh. *Educ Res Int* 2020; 2020: 6648406.
- Maatuk AM, Elberkawi EK, Aljawarneh S, Rashaideh H, Alharbi H. The COVID-19 pandemic and E-learning: challenges and opportunities from the perspective of students and instructors. *J Comput High Educ* 2021; 3: 1-18.
- Miller A, Guest K. Rising to the Challenge: The Delivery of Simulation and Clinical Skills during COVID-19. *Compr Child Adolesc Nur* 2021; 44: 6-14.
- Tan CK, Chua WL, Vu CK, Chang JP. High-stakes examinations during the COVID-19 pandemic: to proceed or not to proceed, that is the question *Postgrad Med J* 2021; 97: 427-31.
- Pettit M, Shukla S, Zhang J, Kumar KHS, Khanduja V. Virtual exams: has COVID-19 provided the impetus to change assessment methods in medicine? *Bone Jt Open* 2021; 2: 111-8.