

The COVID-19 Pandemic Impact on Pediatric Surgery Residency Programs

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Research note

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Abstract

Objective: The COVID-19 pandemic has had an impact not only on clinical practices but also on residency programs as an important part of hospital medical services. We investigated the impact of the COVID-19 pandemic on the pediatric surgery residency program in our institution.

Results: A questionnaire was developed, consisting of 24 questions: a) the perspectives of residents about COVID-19 infection during their residency program; b) the learning process; c) academic evaluations; and d) residents' suggestions to improve the quality of their residency program during the outbreak. Most (85.7%) pediatric surgery residents agreed that elective surgeries should be postponed during the pandemic. Before the outbreak, almost all (90.5%) residents used textbooks and journals as their primary sources of learning, while during the outbreak, 71.4% of residents shifted to use online lectures either from the school or Association of Pediatric Surgeons. Interestingly, 95.2% of participants agreed that they had more time to complete their academic assignments during the pandemic. In conclusions, the pandemic has had a significant impact on the development of pediatric surgery residency programs. A comprehensive approach is needed to maintain the high standard of competence of pediatric surgery without compromising our safety from the COVID-19 infection risk.

Introduction

Since the World Health Organization (WHO) declared COVID-19 as a worldwide pandemic on March 11, 2020 [1], clinical practices have been severely affected worldwide. The residency program as a part of the clinical services itself has also been influenced by the outbreak [2, 3, 4].

Our institution was officially established in 1949 as a national university. Considered as one of the oldest universities in our country, our institution serves as a pillar of educational training and academic awakening in our country. Now, our institution has 18 Faculties, one Postgraduate School (master's and doctoral program), one Vocational School and 20 Residency Programs, including pediatric surgery training [5]. The pediatric surgery residency program has been established in our institution since 2006 with a length of training of 5 years [6].

Several reports have been published regarding the impact of COVID-19 on the residency programs; however, all studies were performed in developed countries [2, 3] or did not comprehensively analyze what residents think about the COVID-19 impact on their residency program [4]. Moreover, there is an uncertainty when the COVID-19 pandemic will end, and the number of cases is increasing, particularly in our province of 2.960 cases and 78 deaths per October 10, 2020. Therefore, we aimed to investigate the impact of the COVID-19 pandemic on the residency program in our institution, particularly pediatric surgery training, from the perspectives of residents.

Material And Methods

We developed and distributed a questionnaire to 21 pediatric surgery residents in our institution during July 2020. Twenty-one residents were registered from January 2015 – January 2020. The questionnaire was developed by educators/attending pediatric surgeons. The educators/attending pediatric surgeons convened to designing the questions. The questionnaire consisted of 24 questions concerning: a) the perspectives of residents about COVID-19 infection during their residency program (n = 5); b) the learning process during the outbreak (n = 12); c) academic evaluations (n = 6); and d) the residents' suggestions to improve the quality of their residency program during the outbreak (n = 1, open question) (Table 1).

The Medical and Health Research Ethics Committee of our institution approved this study (KE/FK/0718/EC/2020). Written informed consent was obtained from all participants before joining in this study.

Table 1

Questionnaire to evaluate the pediatric surgery residency program in our institution.

No	Question
A. Perspective resident on COVID-19 infection during the residency program	
1	<p>Do you feel worried about getting COVID-19 infection during performing surgeries?</p> <p>a. Yes</p> <p>b. No</p> <p>c. Don't know</p>
2	<p>In your opinion, do elective pediatric surgical procedures need to be reduced during the COVID-19 pandemic?</p> <p>a. Disagree</p> <p>b. Neutral</p> <p>c. Agree</p>
3	<p>During COVID-19, what is the percentage of decrease in the number of the elective pediatric surgeries?</p> <p>a. None</p> <p>b. < 25%</p> <p>c. 25-<50%</p> <p>d. 50-<75%</p> <p>e. 75-100%</p>
4	<p>During COVID-19, what is the percentage of decrease in the number of the emergency pediatric surgeries?</p> <p>a. None</p> <p>b. < 25%</p> <p>c. 25-<50%</p> <p>d. 50-<75%</p> <p>e. 75-100%</p>
5	<p>The compliance level of resident in following the guidelines of personal protective equipment use in the hospital during the pandemic is low.</p> <p>a. Disagree</p> <p>b. Neutral</p> <p>c. Agree</p>

No	Question
	B. Learning process during the outbreak
6	<p>Which learning methods did you usually use before COVID-19 outbreak?</p> <p>a. Textbooks and journals</p> <p>b. Webinar, lectures and workshops held by the school or Indonesian Association of Pediatric Surgeon (PERBANI) or other Pediatric Surgery Association</p> <p>c. Virtual didactic tools (example: Virtual Reality Anatomy, Minimally Invasive Surgery Trainer-Virtual Reality, etc.)</p> <p>d. Others</p>
7	<p>Which learning methods do you usually use during the outbreak?</p> <p>a. Textbooks and journals</p> <p>b. Webinar, lectures and workshops held by the school or Indonesian Association of Pediatric Surgeon (PERBANI) or other Pediatric Surgery Association</p> <p>c. Virtual didactic tools (example: Virtual Reality Anatomy, Minimally Invasive Surgery Trainer-Virtual Reality, etc.)</p> <p>d. Others</p>
8	<p>During the pandemic, the online morning report is already good to achieve the skills and knowledge.</p> <p>a. Disagree</p> <p>b. Neutral</p> <p>c. Agree</p>
9	<p>Offline morning report is better than online meeting to achieve the skills and knowledge.</p> <p>a. Disagree</p> <p>b. Neutral</p> <p>c. Agree</p>
10	<p>The frequency of morning report should be increased during the pandemic.</p> <p>a. Disagree</p> <p>b. Neutral</p> <p>c. Agree</p>

No	Question
11	Live view surgery method is important to gain the surgical skill during COVID-19 pandemic. a. Disagree b. Neutral c. Agree
12	Live view surgery method is important for all pediatric surgical cases, including elective and emergency cases. a. Disagree b. Neutral c. Agree
13	Live view surgery method is important only for interesting pediatric surgical cases. a. Disagree b. Neutral c. Agree
14	The restriction of resident number in the outpatients' clinics during the outbreak hampers them from gaining the necessary skills and knowledge. a. Disagree b. Neutral c. Agree
15	The restriction of resident number during the ward rounds inhibits them from obtaining the necessary skills and knowledge. a. Disagree b. Neutral c. Agree
16	Virtual outpatients and ward round method are necessary to obtain the needed skills, particularly for residents who were not on duty in the hospital. a. Disagree b. Neutral c. Agree

No	Question
17	The competence gain is declining during the pandemic. a. Disagree b. Neutral c. Agree
C. Academic evaluation	
18	During COVID-19 pandemic, you have more time to finish the academic assignments. a. Disagree b. Neutral c. Agree
19	The completion of the academic assignments can be achieved on time. a. Disagree b. Neutral c. Agree
20	COVID-19 pandemic prolongs the study periods. a. Disagree b. Neutral c. Agree
21	COVID-19 pandemic hampers the completion of the thesis. a. Disagree b. Neutral c. Agree
22	COVID-19 pandemic inhibits the level up examination process. a. Disagree b. Neutral c. Agree

No	Question
23	National board examination is delayed by the outbreak. a. Disagree b. Neutral c. Agree
	D. Resident suggestions to improve the quality of residency program during the outbreak
24	What are your suggestions to gain the necessary skills and knowledge of pediatric surgery during the outbreak?

Results

Baseline Characteristics

The total number of pediatric surgery residents was 21, consisting of 14 males and 7 females (Table 2). All residents (100%) completely responded to the questionnaire.

Table 2
Baseline characteristics of pediatric surgery residents in our institution.

Characteristic	N (%)
Sex	
◆ Male	14 (66.7)
◆ Female	7 (33.3)
Pediatric surgery competence classification	
◆ Junior	6 (28.6)
◆ Middle	6 (28.6)
◆ Senior	9 (42.8)

Perspectives of residents concerning COVID-19 infection during the residency program

Most pediatric surgery residents (85.7%) agreed that elective surgeries should be postponed during the pandemic because they (100%) worried about getting infected with SARS-Cov-2 during the surgical procedures. Most of them (85.7% and 76.2%, respectively) thought that the number of elective and emergency surgeries decreased by approximately 25-<75% and 25-<50%, respectively, during the pandemic (Fig. 1a).

Learning process during the outbreak

Before the outbreak, almost all (90.5%) residents used textbooks and journals as their primary sources of learning, while during the COVID-19 pandemic, interestingly, 71.4% of residents used online lectures either from the school or Association of Pediatric Surgeons in addition to textbooks and journals. Only 23.8% of participants still used textbooks and journals as the primary sources of learning (Fig. 1b). During the pandemic, we changed the morning reporting of residents from off-line to online meeting. Most residents (85.7%) considered the online morning reports to be good; however, 71.4% of residents thought that off-line morning reports were better than online meeting. About 95.2% of participants agreed that live view surgery was very important to obtain the necessary skills' competence of pediatric surgery during the outbreak. While 85.7% of subjects assumed that live view surgery was important for all cases of elective and emergency surgeries, 81% of residents felt that live view surgery was necessary only for interesting cases (Fig. 1b).

Approximately 71.4% of residents expressed that the restriction of resident number in the outpatient clinics during the outbreak did not hamper them from gaining the necessary skills; however, 43% of participants said that the restriction of resident number during the ward rounds inhibited them from obtaining the needed skills (Fig. 1b). Accordingly, most residents (85.7%) thought that their competence was declining during the pandemic. Some residents (43%) assumed that virtual outpatient and ward round methods are necessary to obtain the necessary skills, particularly for residents who were not on duty in the hospital (Fig. 1b).

Academic evaluation

During the pandemic, 95.2% of participants agreed that they had more time to complete their academic assignments, including thesis completion (42.8%), extended length of study (42.8%), and level up examination (71.4%). Moreover, 38.1% of participants thought that the pandemic would delay their taking the national board examination (Fig. 1c).

Residents' suggestions to improve the quality of their residency program during the outbreak

There were several suggestions from residents to gain the needed skills and knowledge during the outbreak as follows: 1) virtual didactic methods; 2) maintain and improve the quality of the online learning process; 3) comprehensive scheduling for elective surgeries; and 4) gradually increase the number of elective surgeries.

Discussion

Here, we show that the pediatric surgery residency program at our institution has been significantly affected by the COVID-19 pandemic. Our findings further confirmed previous reports [2, 3]. However, there are several novelties of our study: 1) pediatric surgery residency program (vs. plastic surgery training [2]);

2) developing country (vs. developed countries [2, 3, 4]); 3) prospective design using questionnaire (vs. retrospective design [3]); and 4) comprehensively developed the questionnaire into four aspects that might affect the residency program: a) the perspectives of residents about COVID-19 infection; b) learning process; c) academic evaluations; and d) residents' suggestions for residency program improvement (vs. general questionnaire [2] or authors' perspective [4]).

All residents are worried they will become infected by COVID-19 during their residency program in the hospital. Accordingly, they agreed that elective surgeries should be postponed during the pandemic. When compared with the importance of the residents safeguarding the well-being of their families from the possibility of getting cross-infected by COVID-19 due to the residents' potential exposure at the hospital, the training program was no longer considered as important anymore for the residents [3].

Moreover, since the COVID-19 pandemic, we have shifted our morning reporting from off-line to online meetings. Most residents are satisfied with the changes, although some residents thought that offline morning reporting was better to gain skills and knowledge than online meetings (Fig. 1). Interestingly, approximately 5% of residents used the virtual didactic methods for their learning process during the pandemic, while they never used it before the outbreak. The use of virtual didactic methods is not common in pediatric surgery, at least in our institution. A recent study suggested that virtual methods will not substitute for conventional didactic approaches, but they will give advantages for residents to encourage their positive eagerness and enthusiasm [2].

We also evaluated the learning process regarding the competence gained during the pandemic. Our data showed that most residents believe that their competence is declining during the pandemic. This finding might be associated with the fact that almost all elective surgical cases were postponed during the pandemic. Postponing elective surgeries occurred in every country affected by the COVID-19, including the USA [3] and Australia [7]. Most residents agreed that live view surgery with virtual outpatient services and ward rounds will be useful to solve this challenge.

While there are limited activities to gain the skills of pediatric surgery during the pandemic, intriguingly, most residents claimed that this outbreak gave them more time to finish their academic assignments, including extended study time for level up examinations and completion of their thesis. These advantages might be related to the policy that restricted the number of residents during the outpatient services, ward rounds and surgical procedures. As a result, most of them stayed at home, and only a limited number of rotating residents (*i.e.*, three per round) were allowed to perform residency tasks each day in the hospital.

One of the residents' suggestions was to gradually increase the number of elective surgeries. This response reflects that it is not clear whether the COVID-19 pandemic will end in a few months or even in the next few years, and as a proper response, our government declared a "new normal" policy on June 1, 2020 to begin the adaptations of the daily activities to the COVID-19 pandemic, involving clinical and surgical services [8]. Our pediatric surgery services have adapted our scheduling practices as well starting

on June 8, 2020, when we began to perform a) only one major surgery every week on Tuesdays; and b) two or three minor procedures on another working day each week [9].

Conclusions

The pandemic COVID-19 has had a significant impact on the development of pediatric surgery residency programs. A comprehensive approach is needed to maintain the high standard of competence of pediatric surgery without compromising our safety from the risk of COVID-19 infection.

Limitations

Although the response rate of our study was 100%, a relatively small number of pediatric surgery residents involved in this study should be taken into consideration during interpretation of our findings. Another limitation of our study was limited to the subjective opinion of the residents without objective support.

Abbreviations

COVID-19: Coronavirus Disease 2019; WHO: World Health Organization; SARS-CoV-2: severe acute respiratory syndrome coronavirus 2

Declarations

Ethics approval and consent to participate

The Medical and Health Research Ethics Committee of our institution approved this study (KE/FK/0718/EC/2020). Written informed consent was obtained from all participants before joining in this study.

Consent to publish

Not applicable.

Availability of data and material

All data generated or analyzed during this study are included in the submission. The raw data are available from the corresponding author on reasonable request.

Competing interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Authors' Contributions

G, EP, AD, NA and AM conceived the study. G drafted the manuscript, and EP, AD, NA and AM critically revised the manuscript for important intellectual content. NB, ASK, WW, FF, and AKT collected the data and G analyzed the data. All authors have read and approved the manuscript and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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References

1. World Health Organization. <https://www.who.int/news-room/detail/27-04-2020-who-timeline—covid-19> Accessed on June 1, 2020.
2. Zingaretti N, Contessi Negrini F, Tel A, Tresoldi MM, Bresadola V, Parodi PC. The Impact of COVID-19 on Plastic Surgery Residency Training. *Aesthetic Plast Surg.* 2020;1-5.
3. Davenport M, Pakarinen MP, Tam P, et al (2020) From the editors: the COVID-19 crisis and its implications for pediatric surgeons. *J Pediatr Surg* <https://doi.org/10.1016/j.jpedsurg.2020.04.009>
4. Boyd CJ, Inglesby DC, Corey B, Greene BJ, Harrington MA, Johnson MD, King TW, Rais-Bahrami S, Tavana ML. Impact of COVID-19 on Away Rotations in Surgical Fields. *J Surg Res.* 2020;255:96-98.
5. Universitas Gadjah Mada. <https://www.ugm.ac.id/en/about> Accessed on October 1, 2020.
6. Residency Program of Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada. <https://ppds.fk.ugm.ac.id/program-studi/> Accessed on October 1, 2020.
7. Australia Government. <https://www.health.nsw.gov.au/Infectious/covid-19/Pages/elective-outpatient.aspx> Accessed on October 1, 2020.
8. Indonesian Government. <https://www.thejakartapost.com/news/2020/06/01/102-areas-with-zero-covid-19-cases-allowed-to-start-new-normal.html> Accessed on October 1, 2020.

9. Gunadi, Idham Y, Paramita VMW, Fauzi AR, Dwihantoro A, Makhmudi A. The Impact of COVID-19 pandemic on pediatric surgery practice: A cross-sectional study. *Ann Med Surg (Lond)*. 2020;59:96-100.

Figures

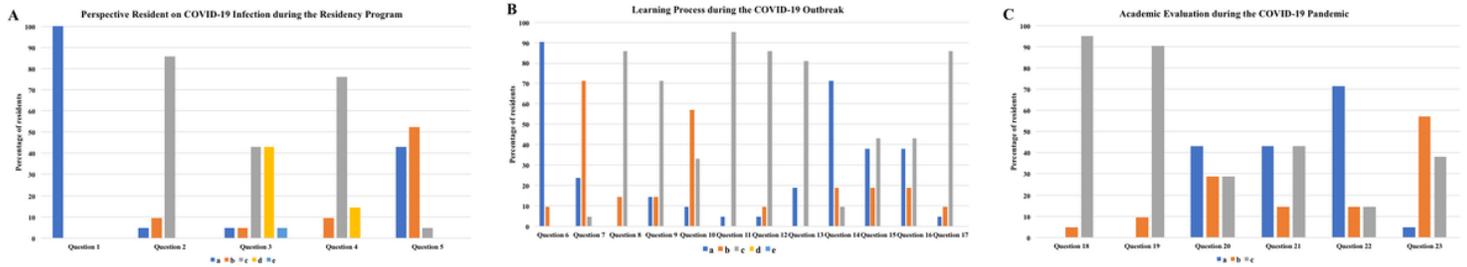


Figure 1

Resident responses on the questionnaire concerning the effect of the COVID-19 pandemic on the pediatric surgery residency program, consisting of a) the perspectives of residents about COVID-19 infection; b) the learning process; and c) academic evaluations during the outbreak.