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## Original Article

# Daily activities and training experience of urology residents during the COVID-19 pandemic in Indonesia: A nationwide survey

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**KEYWORDS**

Activities;  
Coronavirus disease 2019;  
Learning method;  
Training;  
Urology residents

**Abstract Objective:** To explore the impact of the coronavirus disease 2019 (COVID-19) pandemic on the training experience of urology residents in Indonesia.

**Methods:** A cross-sectional study using a web-based questionnaire (SurveyMonkey) involved all registered urology residents in Indonesia. The questionnaire was structured in Bahasa Indonesia, consisted of 28 questions, and divided into three sections: Demographic characteristics, current daily activities, and opinions regarding training experiences during the COVID-19 outbreak. The survey was distributed to all respondents via chief of residents in each urology center from May 26, 2020 to Jun 2, 2020.

**Results:** Of the total 247 registered urology residents, 243 were eligible for the study. The response and completeness rate for this study were 243/243 (100%). The median age of

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respondents was 30 (24–38) years old, and 92.2% of them were male. Among them, 6 (2.5%) respondents were confirmed as COVID-19 positive. A decrease in residents' involvement in clinical and surgical activities was distinguishable in endourological and open procedures. Most educational activities were switched to web-based video conferences (WVC), while others opted for the in-person method. Smart learning methods, such as joining a national/international speaker webinar or watching a recorded video, were used by 93.8% and 80.7% of the respondents, respectively. The respondents thought that educational activities using WVC and smart learning methods were effective methods of learning. Overall, the respondents felt unsure whether training experience during the COVID-19 pandemic was comparable to before the respective period.

**Conclusions:** The COVID-19 pandemic negatively affected urology residents' training experience. However, it also opened up new possibilities for incorporating new learning methodologies in the future.

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## 1. Introduction

Coronavirus disease 2019 (COVID-19) has affected various aspects of daily life, particularly socioeconomic and health care practices [1,2]. The disease, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has infected more than five million people and resulted in more than 300 000 deaths worldwide. In Indonesia, the first case of COVID-19 was reported on March 2nd, 2020 and its number has rapidly increased since then. This forced the Indonesian government to apply the first large-scale social restriction that started on April 10th, 2020 for almost two months. Therefore, it is considered the most significant challenge for health care services today [3]. Also, the exact time when the current pandemic situation will end remains obscure to this day.

The pandemic has also impacted health care services in the urological field. Pattern changes in daily clinical practices, reduction of patient visits to the outpatient clinic and surgical services, and careful selection of surgical patients were seen as a part of urological service adaptation during the COVID-19 pandemic [4,5]. Current literature shows a significant decrease in urology residents' clinical and surgical activities and a higher stress level during the COVID-19 pandemic in Italy and France [6,7]. Moreover, in Indonesia, where urology residents mainly gain surgical experiences from affiliated teaching hospital rotations, only one urology center continued rotation for residents at such hospitals [5]. To overcome this limitation, various mechanisms concerning smart learning technology were rapidly adopted, such as recorded video, webinar, virtual round, and surgery simulation [8,9].

In general, it can be assumed that the pandemic negatively impacted urology residents' quality of training. However, whether all urology residents at different levels negatively reflected their training experiences during the COVID-19 pandemic is still unknown. Besides, a previous study in Indonesia, which tried to evaluate the impact of COVID-19 on urology practice, did not specifically explore urology resident training [5]. Therefore, this study aimed to explore urology residents' daily activities and training experiences during the COVID-19 pandemic.

## 2. Methods

### 2.1. Study design and population

This study was an observational, cross-sectional study conducted using a web-based survey and involved all registered urology residents across Indonesia. Residents on leave were excluded from this study.

### 2.2. Questionnaire development

The questionnaire was constructed using Bahasa Indonesia (Indonesian language) in a cloud-based online survey called SurveyMonkey ([www.surveymonkey.com](http://www.surveymonkey.com)). The survey comprised of 28 questions and was divided into three sections to explore the demographic characteristics of the respondents, their current daily activities, and opinions regarding their training experiences during the COVID-19 period. The whole items in the questionnaire in both Bahasa Indonesia and English were presented in the [Supplementary file](#).

### 2.3. Data collection

Survey distribution and data collection were completed within 1 week (May 26, 2020 to Jun 2, 2020) in collaboration with the chief of residents in every urology center. The survey was filled in anonymously and, therefore, a single response option was activated in the questionnaire to prevent data duplication from the same respondent. The response rate was checked by matching the total number of residents and their semesters of study across each urology center database.

### 2.4. Data analysis and presentation

SPSS version 23 (IBM Corp, Armonk, NY, USA) was used for data analysis, and only the completed questionnaire was further analyzed. Data interpretation from three segments of the questionnaire was presented as five different

**Table 1** Respondents' demographic characteristic.

Characteristic	Value
Respondent, <i>n</i>	243
Age, median (range), year	30 (24–38)
Gender, <i>n</i> (%)	
Male	224 (92.2)
Female	19 (7.8)
Urology center, <i>n</i> (%)	
Jakarta	79 (32.5)
Bandung	50 (20.6)
Yogyakarta	27 (11.1)
Malang	29 (11.9)
Surabaya	58 (23.9)
Year of study, <i>n</i> (%)	
First-year	49 (20.1)
Second-year	53 (21.8)
Third-year	42 (17.3)
Fourth-year	45 (18.6)
Fifth-year	42 (17.3)
Sixth-year and above	12 (4.9)
Current hospital placement, <i>n</i> (%)	
Center teaching hospital	222 (91.4)
Affiliated teaching hospital	8 (3.3)
Has not entered hospital rotation yet	13 (5.3)
COVID-19 status, <i>n</i> (%)	
Never infected or be appointed as a suspected case	172 (70.8)
Suspected case, but has not been further examined	11 (4.5)
Suspected case, but has been confirmed negative	53 (21.8)
Currently positive by rapid test	1 (0.4)
Currently positive by swab/PCR test	1 (0.4)
Had been infected and was declared cured	5 (2.1)

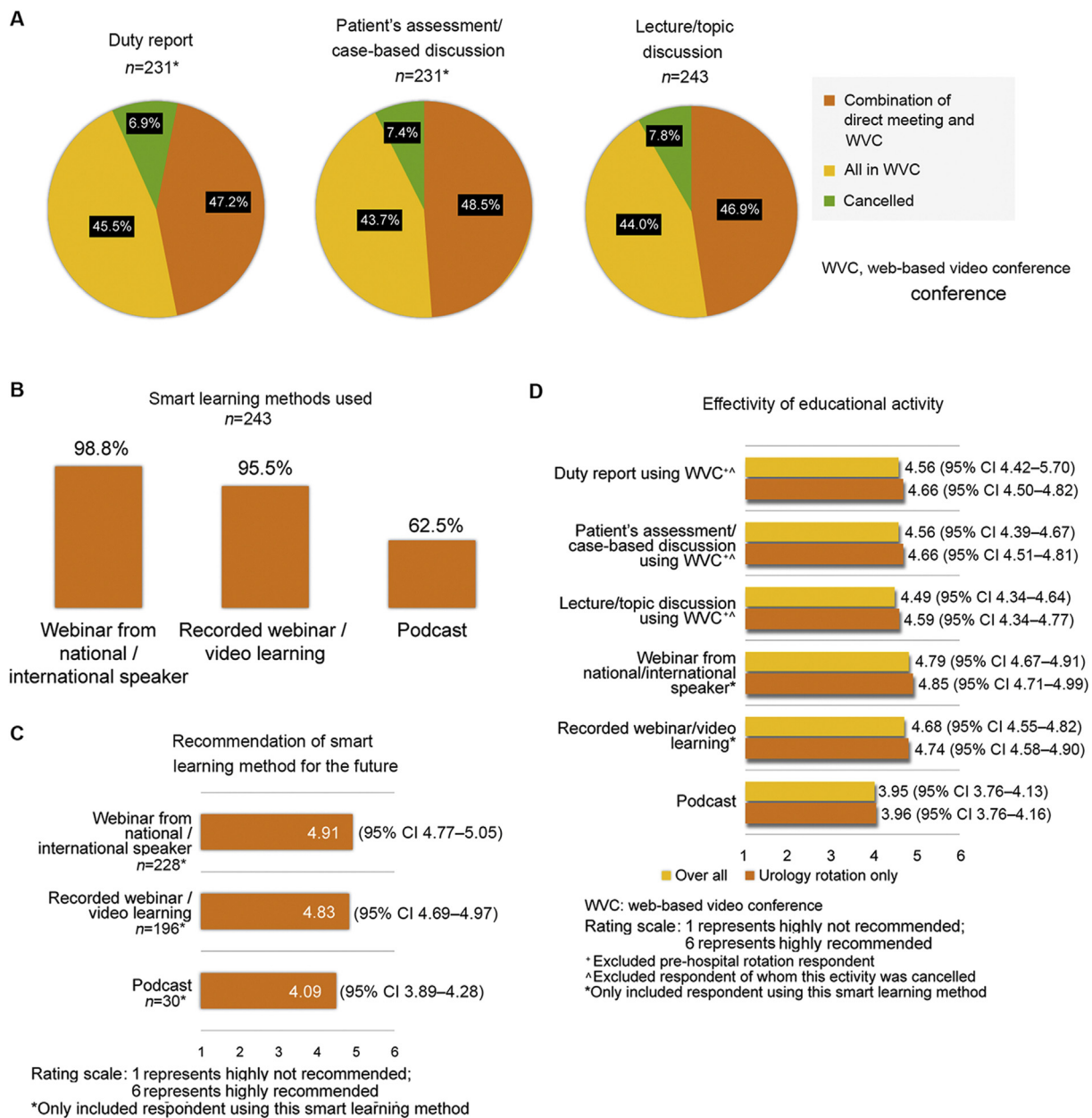
COVID-19, coronavirus disease 2019; PCR, polymerase chain reaction.

subsections in the result section, which were respondents' demographic characteristics (subsection 1), COVID-19-related training and duty (subsection 2), residents' activities and opinions concerning educational activities (subsection 3), residents' activity and opinion on clinical and surgical activities (subsection 4), and residents' opinion related to research activity and overall experience during COVID-19 pandemic and future direction (subsection 5). Tables and graphs were used in the study for convenient data interpretation. Scale question within the residents' opinion section was treated as numerical data and presented as means without a 95% confidence interval if it had a skewed data distribution to give more information to the readers. The residents' opinions regarding self-assessment of COVID-19 knowledge were compared between those who received training and those who did not. The residents' opinion regarding the effectiveness of educational activity was presented as overall respondents and urology rotation only (*i.e.*, urology rotation and board exam candidate) respondents. Moreover, the analyses of the residents' opinions in subsections 4 and 5 were compared based on their current rotation and competency level. Lastly, the analysis of opinion in subsections 3–5 excluded candidates who did not participate in the activity or did not use smart learning methods. A non-parametric test (Mann–Whitney test for two independent variables or Kruskal–Wallis test for >2 independent variables) was used to analyze the residents' opinion if it had a skewed data distribution and *p*-value <0.05 was considered as statistically significant. This study assigned three cut-off values of <2.75, 2.75–4.25, and >4.25 to classify the mean of respondents' responses to the opinion-related question. A cut-off value of <2.75 was considered as non-functional for the learning method effectivity question. Thus, this item was not suggested as the learning method recommendation question or contradictory to the statement for the statement question. On the other hand, a cut-off value of >4.25 was considered adequate for the learning method effectivity question and was recommended for the learning method recommendation question or was found to be in line with the statement question. Lastly, a cut-off value of 2.75–4.25 was consid-

**Table 2** The relation between residency year with their rotation and competency level (respondents were 243).

Category	Residency year					
	First	Second	Third	Fourth	Fifth	Sixth and above
Resident rotation, <i>n</i> (%)						
Pre-hospital	12 (4.9)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
General surgery	32 (13.2)	13 (5.3)	0 (0)	0 (0)	0 (0)	0 (0)
Urology	5 (2)	40 (16.5)	42 (17.3)	45 (18.5)	24 (9.9)	2 (0.8)
Board exam candidate	0 (0)	0 (0)	0 (0)	0 (0)	18 (7.4)	10 (4.1)
Competency level, <i>n</i> (%)						
Level I (red)	49 (20.2)	45 (18.5)	8 (3.3)	0 (0)	0 (0)	0 (0)
Level II (yellow)	0 (0)	8 (3.3)	34 (14)	42 (17.3)	2 (0.8)	2 (0.8)
Level III (green)	0 (0)	0 (0)	0 (0)	3 (1.2)	40 (16.5)	10 (4.1)

Red, enrichment stage, lowest residents' competency level; yellow, assistance stage, middle residents' competency level; green, highest residents' competency level.



**Figure 1** Residents' activities and opinions on educational activity during the COVID-19 pandemic. (A) The method used in education activities; (B) Smart learning method used; (C) Residents' opinion on the future use of smart learning methods; (D) Residents' opinion on the effectiveness of the current educational method used during the COVID-19 pandemic. COVID-19, coronavirus disease 2019.

ered uncertainty depicted by the respondents regarding their opinion. This cut-off value was determined based on the author's agreement before the start of the study.

### 3. Results

#### 3.1. Respondents' demographic characteristics

Of 247 registered urology residents, four were on leave; hence, 243 urology residents with a median age of 30 years

(interquartile range: 24–38 years) were eligible for this study. More than 90% of the respondents were male and currently worked in a teaching hospital. About 21.8% respondents were suspected of having COVID-19 but confirmed to be negative, and less than 5% of respondents were confirmed as positive cases. The completeness and response rate in this study was 100%. Respondents' demographic characteristics and characteristics of current rotation and level of competency with its correlation with the year of study can be seen in [Tables 1 and 2](#), respectively.

**Table 3** Residents' opinion on educational activities.

Statement and variable	Mean (95% CI)	p-Value <sup>c</sup>
<b>Opinion on educational activities</b>		
"I preferred duty report using WVC compared to direct meeting" <sup>a,b</sup>		
Overall	3.66 (3.47–3.84)	N/A
Urology rotation only	3.76 (3.53–3.99)	
"I preferred patient's assessment or case-based discussion using WVC compared to direct meeting" <sup>a,b</sup>		
Overall	3.66 (3.48–3.84)	N/A
Urology rotation only	3.74 (3.53–3.96)	
"I preferred lecture/topic discussion using WVC compared to direct meeting" <sup>b</sup>		
Overall	3.60 (3.42–3.78)	N/A
Urology rotation only	3.71 (3.49–3.94)	
"I am satisfied with theory learning during COVID-19 pandemic."		
Overall	4.19 (4.02–4.36)	N/A
Urology rotation only	4.32 (4.11–4.52)	
<b>Opinion on clinical and surgical activities</b>		
"I am satisfied with the case exposure during COVID-19 pandemic" <sup>a</sup>		
Overall	2.78 (2.60–2.96)	0.250 <sup>d</sup>
General surgery rotation	2.93 (2.55–3.32)	
Urology rotation	2.85 (2.64–3.07)	
Board exam candidate	2.43 (1.93–2.93)	
Level I (red)	3.08 (2.79–3.37)	0.052 <sup>d</sup>
Level II (yellow)	2.65 (2.37–2.93)	
Level III (green)	2.67 (2.31–3.04)	

COVID-19, coronavirus disease 2019; CI, confidence interval; N/A, not available; WVC, web-based video conference; Red, enrichment stage, lowest residents' competency level; yellow, assistance stage, middle residents' competency level; green, highest residents' competency level.

Rating scale: 1 represents strongly disagree; 6 represents strongly agree.

<sup>a</sup> Excluded pre-hospital rotation respondent.

<sup>b</sup> Excluded respondent for whom the activity was cancelled during COVID-19 pandemic.

<sup>c</sup> Statistically significant.

<sup>d</sup> Nonparametric analysis.

### 3.2. COVID-19-related training and duty

COVID-19 training were given to 120/243 (49.4%) urology residents. A majority of the training (91.4%) given to the urology residents were organized by the hospitals that employed them. Webinar/online source, not organized by their hospital, became the other source of training, accounting for 7.8% of the respondents, and one respondent did not specify his source of training. Overall, the residents felt uncertain whether they had enough knowledge about COVID-19 patient management (mean: 3.79). Even though trained respondents (mean: 3.97) had a statistically higher score ( $p$ -value = 0.007) than their counterparts (mean: 3.64), both groups expressed that they were unsure in this regard.

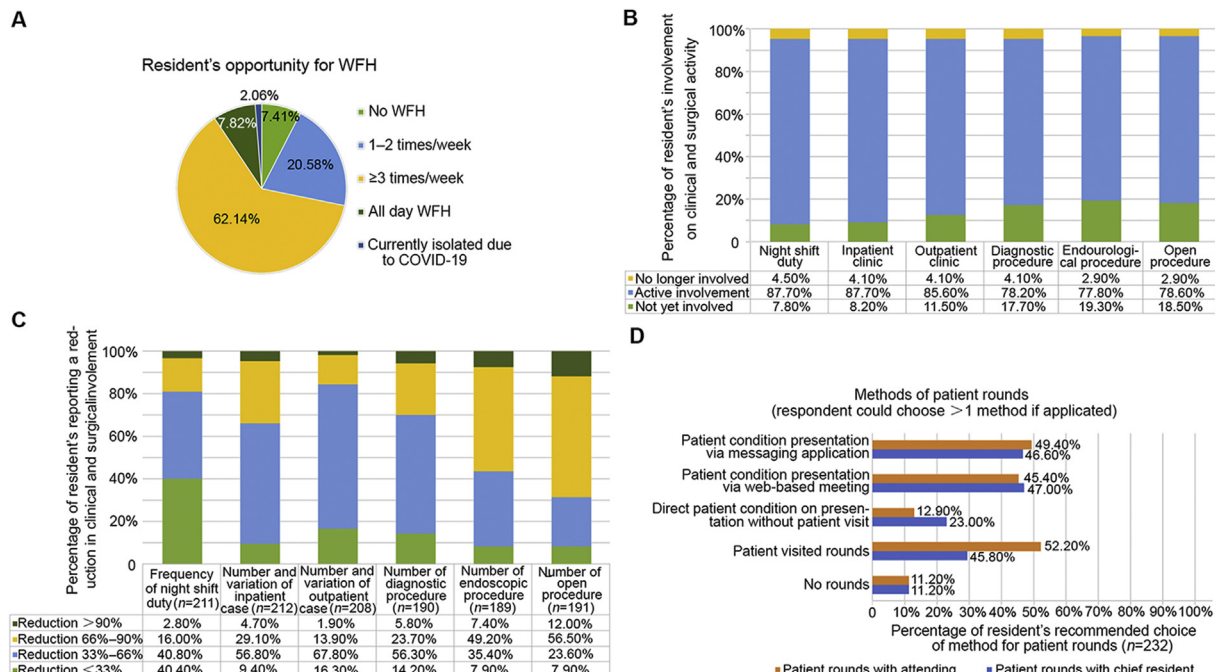
Regarding COVID-19-related duties outside the spectrum of the urology residents' usual tasks, 95/243 (39.1%) residents were offered roles such as that of a swab test officer, COVID-19 triage or screening officer in the emergency room and at the hospital entrance, and COVID-19 volunteer doctor. However, only 29/243 (11.9%) agreed to these duties, including the service as a triage or screening officer in the emergency room (51.7%), duty doctor in COVID-19

emergency room or ward (41.4%), and COVID-19 volunteer doctor (6.9%). Moreover, 122/243 (50.2%) urology residents were unwilling to become COVID-19 volunteers.

### 3.3. Residents' activity and opinion on educational activities during COVID-19 pandemic

Resident educational activity during the COVID-19 pandemic can be seen in Fig. 1A and B. A web-based video conference was the most used method for educational activity during the pandemic, even though direct meeting was still used occasionally. Webinars from national/international speakers were used as a smart learning method by 98.8% of the respondents.

The residents' recommendations for future usage of smart learning methods and their opinion on the effectiveness of the learning method can be seen in Fig. 1C and D, respectively. All types of smart learning methods such as webinars from national/international speakers, recorded webinar/video learning, and podcast were recommended. Overall, respondents' most effective educational activity was webinars from national/international speakers (mean: 4.78), followed by recorded webinar/video learning (mean: 4.69).



**Figure 2** Residents' activity and opinion on clinical and surgical activities during the COVID-19 pandemic. (A) Residents' working from home opportunity; (B) Residents' involvement in clinical and surgical activity ( $n = 243$ ); (C) Reduction in residents' involvement in clinical and surgical activities; (D) Method used in patient rounds. COVID-19, coronavirus disease 2019; WFH, working from home.

The residents' opinion on the statement given regarding educational activity during COVID-19 can be seen in Table 3. The highest respondent's satisfaction in educational activity during the COVID-19 pandemic was seen in theory learning.

### 3.4. Residents' involvement and opinion regarding clinical and surgical activities during the COVID-19 pandemic

The residents' involvement in clinical and surgical activities and their opinion toward it can be seen in Fig. 2 and Table 3, respectively. During this pandemic, 86/243 (35.4%) respondents had worked with COVID-19 suspected or confirmed cases, of whom the attending physician accompanied only 20.9%. Moreover, 70/243 (28.8%) respondents accompanied the attending physician to visit other hospital's patients outside their teaching hospital.

### 3.5. Residents' opinion on research activity and overall experience during COVID-19 pandemic and future direction

The residents' opinion on research productivity and overall satisfaction concerning training experience during the COVID-19 pandemic can be seen in Table 4. Overall, the respondents felt uncertain whether the workload and mental burden were heavier during the COVID-19 pandemic than before. Research activity was more productive during the COVID-19 pandemic for pre-hospital rotation respondents.

The residents' suggestions for future training methods can be seen in Fig. 3. Most respondents agree to increase discussion through online method (76.7%) and increase training in the wet lab or using phantom (67.0%). Other preferred methods used to replace training experience during the COVID-19 pandemic, which the respondents mentioned, were creating a web-based learning module, increasing the production of surgical videos, and making surgeries available through online streaming service. Lastly, most respondents (88.3%) were willing to go to an affiliated hospital even amid the current status of COVID-19.

## 4. Discussion

COVID-19 pandemic has become the greatest challenge to health care service and an obstacle for residency training. This study evaluated urology residents' training experience using a web-based questionnaire and retrieved a 100% response rate and completeness rate. Therefore, it can provide a clear picture regarding urology residents' training experience during the COVID-19 pandemic in Indonesia. Residency training during the COVID-19 pandemic was endangered due to the limited building capacity and, more importantly, the residents' health and well-being. However, this study showed that 26.3% and 2.5% of urology residents had been appointed as COVID-19 suspected and positive cases through a swab test, respectively.

Moreover, only 47.7% of the residents had received training related to COVID-19. Thus, increased advocacy and awareness among the residents and the head of the urology training program regarding resident safety and related

**Table 4** Residents' opinion on research and overall activities.

Statement and variable	Mean (95% CI)	p-Value <sup>b</sup>
<b>"I am more productive in doing research during COVID-19 pandemic"<sup>a</sup></b>		
Overall	4.03 (3.87–4.20)	0.156 <sup>d</sup>
Pre-hospital rotation	4.58 (3.84–5.32)	
General surgery rotation	3.93 (3.59–4.28)	
Urology rotation	4.11 (3.91–4.32)	
Level I (red)	4.05 (3.80–4.30)	0.490 <sup>d</sup>
Level II (yellow)	4.24 (3.99–4.49)	
Level III (green)	3.85 (3.21–4.49)	
<b>"I feel that training experience during COVID-19 pandemic is not different or even better compared to before."</b>		
Overall	3.03 (2.85–3.21)	0.433 <sup>d</sup>
Pre-hospital rotation	3.50 (2.40–4.60)	
General surgery rotation	3.09 (2.69–3.49)	
Urology rotation	3.02 (2.79–3.24)	
Board exam candidate	2.79 (2.33–3.24)	
Level I (red)	3.17 (2.88–3.46)	0.330 <sup>d</sup>
Level II (yellow)	2.93 (2.63–3.23)	
Level III (green)	2.93 (2.57–3.28)	
<b>"I feel a heavier workload during COVID-19 pandemic compared to before."</b>		
Overall	2.68 (2.53–2.83)	0.004 <sup>c,d</sup>
Pre-hospital rotation	3.00 (2.19–3.81)	
General surgery rotation	3.02 (2.72–3.33)	
Urology rotation	2.63 (2.44–2.82)	
Board exam candidate	2.18 (1.76–2.60)	
Level I (red)	2.89 (2.64–3.14)	0.018 <sup>c,d</sup>
Level II (yellow)	2.59 (2.37–2.81)	
Level III (green)	2.40 (2.08–2.72)	
<b>"I feel a greater mental burden or stress during COVID-19 period compared to before."</b>		
Overall	3.43 (3.25–3.60)	0.724 <sup>d</sup>
Pre-hospital rotation	3.75 (3.08–4.42)	
General surgery rotation	3.52 (3.15–3.89)	
Urology rotation	3.36 (3.14–3.59)	
Board examination candidate	3.36 (2.75–3.97)	
Level I (red)	3.52 (3.25–3.79)	0.422 <sup>d</sup>
Level II (yellow)	3.26 (2.99–3.53)	
Level III (green)	3.45 (3.03–3.88)	

COVID-19, coronavirus disease 2019; CI, confidence interval; Red, enrichment stage, lowest residents' competency level; yellow, assistance stage, middle residents' competency level; green, highest residents' competency level.

Rating scale: 1 represents strongly disagree; 6 represents strongly agree.

<sup>a</sup> Excluded board exam candidate respondent.

<sup>b</sup> Statistically significant.

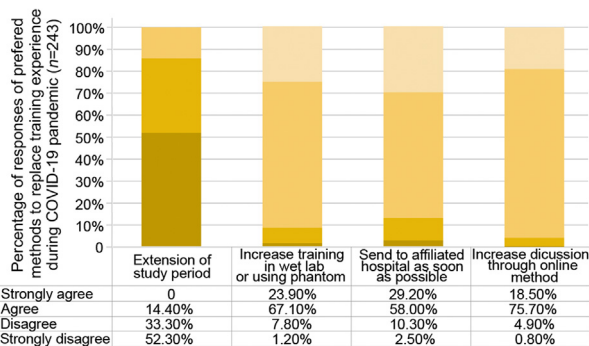
<sup>c</sup> Nonparametric analysis.

COVID-19 training could provide a way forward. The residents who received COVID-19 training were more confident as compared to the ones who did not. However, the question did not specifically explore the effect of training on residents' awareness.

During the COVID-19 pandemic, some of the residents' duties were diverted to facilitate COVID-19 care, which could cause higher stress [6,10]. In Indonesia, only 11.9% of urology residents participated in COVID-19-related duties on top of their usual daily tasks. Moreover, half of them were not willing to become COVID-19 volunteers. The lack of contribution might be caused by fear toward SARS-CoV-2 and its risk for the residents' families [11,12]. Such fears can be alleviated by disseminating accurate COVID-19 knowledge and assuring the availability of personal protective equipment [6,13,14].

As seen from different residency fields worldwide, a decrease in the clinical and surgical activity of urology residents during the COVID-19 pandemic was inevitable [7,15,16]. The decrease in residents' involvement was more clearly seen in surgical activity (endoscopic and open surgery). The findings were coherent with a previous study, which showed that 70% of urologists in Indonesia decreased more than 66% of their elective surgeries or stopped all the elective surgeries during the COVID-19 pandemic [5]. A clear decrease in both clinical and surgical activity was also shown in Italy by Busetto et al. [16], specifically in the more prevalent COVID-19 region and COVID-19 hospital. Even though the residents felt unsure about their satisfaction on case exposure during the COVID-19 pandemic, green and yellow competency level residents felt unsatisfied. Moreover, this COVID-19





**Figure 3** Residents' suggestion of preferred methods to overcome lack of experience during coronavirus disease 2019 pandemic.

situation also decreased the relationship between colleagues during residency training [16].

The declining residents' involvement in clinical and surgical activities explained why urology residents felt a lighter workload during the COVID-19 pandemic. The study showed different results from France, which indicated a higher level of stress during the pandemic. This factor may be attributable to lighter workloads and lower involvement in COVID-19-related tasks for urology residents in Indonesia [6].

Even though some of the residents still maintained in-person educational activities, the study showed that most of them switched to the web-based video conference (WVC) method. Virtual learning was recommended to maintain relevant educational activities; however, maintaining physical distance was the highest priority. Even though this study could not show the superiority of the duty report, the patient assessment or lecture using WVC compared to in-person activity denotes that the residents considered the former more effective. Many of the residents also used a smart learning method, such as joining a national/international speaker webinar or watching a recorded video, and considered them effective for learning and recommended them to be used as an integral part of urology resident training. The effectiveness of webinars as a "cognitive" learning method compared to the face-to-face meeting was showed by Hameed et al. [17]. Furthermore, webinars were also considered more cost-effective and practical for urology residents. However, webinars limited the social networking interactions that would have been made in an offline seminar. We propose a hybrid meeting as a part of the Urology resident training program in the future, where the practicality of an online webinar is held in conjunction with a face-to-face meeting in hopes to reach a broader audience. However, we also should be aware that this method is more beneficial in terms of cognitive area. Therefore, we also have to find a better method for resident's surgical skill training during this pandemic.

Overall, urology residents in Indonesia felt unsure whether training experience during the COVID-19 pandemic was comparable to the status before the pandemic. The residents expect that the reopening of affiliated hospitals rotations, an increased focus in phantom model training,

and online discussions can overcome the lack of training experience during the COVID-19 pandemic. However, extending the study period was not their choice. Other studies also encouraged an alternative learning approach to adapt to the current situation, such as free access to surgical video libraries, using software to learn anatomy and surgery in tandem with simulation [15,18,19].

The authors are aware that this study might have a limitation due to the nature of survey studies wherein respondents could easily misunderstand the question and options given within a questionnaire. Moreover, the situation of the COVID-19 pandemic grows dire daily and could yield different situations compared to the one described in this study. However, this research still has value regarding how the pandemic affected urology residents' training experience. Furthermore, this study also assessed several learning methods used during the COVID-19 pandemic and highlighted how they might be helpful in the future of urology resident training.

## 5. Conclusion

It can be concluded that the COVID-19 pandemic has impacted the clinical, surgical, and educational activities of urology residents, which tended to be more negative. Nevertheless, the pandemic has also helped identify new learning methodologies, which could be an integral part of future urology resident training.

## Author contributions

*Study concept and design:* Ponco Birowo, Nur Rasyid, Chaidir A. Mochtar.

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## Conflicts of interest

All authors declare no conflict of interest.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ajur.2021.12.005>.

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