

## Identifying competency gaps in intra- and post-learning of a pediatric residency program: a qualitative study

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### Abstract

**Background** The purpose of the pediatric residency program is for aspiring pediatricians to develop the core competencies needed to care for the children's health. Upon graduation, pediatricians encounter competency challenges related to diverse populations, cultures, and medical facilities across the nation. Enhancing the efficacy and efficiency of medical education in pediatric residency programs requires identifying and addressing gaps in the post-learning outcomes and intra-learning processes.

**Objective** To investigate competency gaps between the core competencies taught in the pediatric residency training program and the actual necessities in the professional experience of pediatricians.

**Methods** This qualitative study was conducted by a focus group discussion using semi-constructed questions. Twelve pediatricians who graduated from the Pediatric Residency Program of Universitas Sebelas Maret and had professional work experience of 3 to 18 months were included. Focus group discussions were held online and moderated by the research team using guided questions. Two FGD sessions of 5 and 7 subjects each were conducted. The discussions were recorded and transcribed for analysis in a stepwise manner involving data grouping, information labeling, and data coding to identify the main themes.

**Results** All subjects were working in type B, C, and D hospitals in six different provinces at the time of the study. The competency gaps in intra-residency learning domain covered two topics: curriculum content (core competencies, medicolegal education, effective communication, vaccination, and longitudinal case management) and training (case variations, patient complexity, and affiliated hospital rotations). The smallest competency gaps was core competency, and there was a need for improvement in other topics, particularly in effective communication and vaccination. The competency gaps in the post-learning domain included 4 topics: daily practices (demographic differences, popular topics, and effective communication), health facilities (the gap between individual competency and availability of health facilities), professional relationships with senior/other center colleagues, and strategic plans (continuing medical education). The cultural social background of the population and limited health resources were the main issues in the post-learning area that need to be acknowledged. Effective communication was the theme that emerged and should be taught in both areas of learning and post-learning.

**Conclusion** Pediatric residency graduates should address some gaps in learning after completing the pediatric residency program. Effective communication was identified as a learning gap during and after training. Based on our findings, we recommend for the program to provide additional steps to prepare pediatric residents before their graduation. [Paediatr Indones. 2024;64:527-35; DOI: <https://doi.org/10.14238/pi64.6.2024.527-35> ].

**Keywords:** *intra-learning process; paediatric residency program; post-learning; paediatrician*

Pediatric residency programs are designed to bridge the gap of competency between medical school and actual independent practice, equipping residents with the knowledge, skills, and attitudes necessary to provide high-quality care to children. However, a significant challenge in these programs is ensuring that the intra-learning processes - those learning activities and experiences that occur during the residency - are effectively translated into post-learning outcomes, such as the ability to practice independently, engage in

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lifelong learning, and apply theoretical knowledge to practice as pediatricians.<sup>1</sup> Study in US has identified gaps in this area, highlighting the need for innovative approaches to training that address the evolving needs of residents and the complex healthcare environment in which they operate.<sup>2,3</sup>

The post-learning requirements may not align with the competencies that pediatric residents acquire during the intra-learning phase. Completing the *Kolegium Ilmu Kesehatan Anak Indonesia's* (KIKAI/*Indonesian College of Pediatrics*) core competencies is mandatory in Indonesia when pursuing pediatric residency training.<sup>4</sup> In order to give children comprehensive care, pediatricians must possess the skills of professionalism, clinical reasoning, leadership, communication, and research aptitude. Goal-setting, reflective practice, clinical skill development, and feedback through coaching and direct observation are competencies to be improved by the intra-learning process for residents.<sup>5</sup>

Pediatricians encounter a range of obstacles and challenges upon graduating from residency training and entering professional life. They might experience a broader range of practice needs and may need to reflect on their own development and careers. To better serve the healthcare needs of children, they must adapt their skills through critical analysis of their work to pinpoint areas that still require improvement, ultimately leading to improved pediatric healthcare.<sup>1,3</sup> Study has identified gaps in this area, highlighting the need for innovative approaches to training that address the evolving needs of residents and the complex healthcare environment in which they operate.<sup>6,7</sup>

A significant challenge in these programs is ensuring that the intra-learning processes - those learning activities and experiences that occur during the residency - are effectively translated into post-learning outcomes, such as the ability to practice independently and engage in lifelong learning.<sup>8,9</sup> Identifying and filling the gaps in the intra-learning processes and post-learning outcomes in pediatric residency programs is critical to enhance the effectiveness and efficiency of medical education.<sup>6,7</sup> The aim of this study was to identify the competency gaps between core competencies taught during the pediatric residency training program and professional experiences as pediatricians.

## Methods

This qualitative study was conducted in pediatricians who graduated from the Pediatric Residency Program of the Faculty of Medicine, Universitas Sebelas Maret, Surakarta, Indonesia. This residency program started in 2003 and has had 136 graduates. The program is 7-8 semesters long. *The Indonesian College of Pediatrics* set the standard of the program's core competencies.<sup>4</sup> After graduation, alumni might scatter and practice across the provinces in Indonesia, but many remain in Java, the main island in Indonesia.

Subjects were 12 pediatricians with professional experience ranging from 3 to 18 months (6 subjects with 3-12 months experience and 6 subjects with 12-18 months experience). We restricted the inclusion criteria to those who had graduated less than 24 months before the study, in order to reduce professional bias due to their post-learning education, such as from continuing medical education that might increase their competencies. The subjects (10 females, 2 males) had completed the residency program in 8 to 11 semesters and were working in type B, C, and D hospitals in six different provinces: Central Java (4), West Java (2), East Java (2), Jakarta (2), Riau (1), and West Nusa Tenggara (1). Prior to the commencement of data collection, participants provided written informed consent.

Data were collected from focus group discussions (FGDs) using semi-constructed questions. The FGDs were held online via Zoom and moderated by the research team. All moderators used guided questions for the FGDs, as shown in **Table 1**. FGDs were held for 60-90 minutes. One author (AGM) was not involved in the FGDs, to avoid conflict of interest as head of the pediatric residency program. Two FGD sessions of 5 and 7 subjects each were conducted in July 2023. The discussions were recorded and transcribed for analysis. For analysis purposes, data were grouped, information was labelled and data coded to identify the main gaps (domain, themes, categories).

## Results

The qualitative information obtained from the focus groups. Data were categorized into two domains: the intra-learning process and the post-learning process.

Within each domain, distinct themes were further subdivided into specific categories (Table 2).

The first area that emerged during the focus groups comprised observations about the intra-learning process. Within this domain, we identified themes related to curriculum content and training.

Another significant domain identified in the focus groups was feedback on the post-learning process. Themes in this sector included daily pediatric practice, facility issues, inter/intra-professional interactions, and a strategic goal to reduce gaps.

## 1. Intra-learning process

### 1.1. Curriculum content

The participants mentioned several concerns during the learning process. However, all participants indicated that they had received sufficient core

competency materials or basic knowledge to become pediatricians.

...”The essential skills needed to work as a pediatrician are thoroughly covered throughout the residency program.”... ( subject #1).

...”The content given is adequate for preparing to become a pediatrician, although there are several areas that may be enhanced.”... ( subject #2).

The immunization program is a fundamental skill that pediatricians must excel in, the type, the schedules, the importance of vaccination, the side effect and other aspects related to immunization. While many vaccines are part of Indonesia's national immunization program, others are not included. Some subjects stated that they needed more experience in performing national immunization program (the type,

**Table 1.** Focus group discussion guided questions

1. What cases are mostly found in daily practice? Probing: the list of diseases
2. Based on the cases, what topics are not optimally taught? Probing: the topics/themes/subjects
3. Why topics are not optimally taught? What are the problems? Probing the causes: too many topics must be taught during residency, the topic was at the subspecialist level, especially for the centers without that do not have subspecialty programs, and other factors
4. What is the alumni's strategy to reduce the gaps? Probing: the options to reduce the gaps
5. What is your suggestions can you give to improve learning during residency to reduce the gaps? Probing: improvements of the residency program

**Table 2.** Domain, theme, and category gaps of the residency programme

Domains	Themes	Categories
Intra-learning process	Curriculum content	Core competencies Vaccination Effective communication Medico-legal education Longitudinal case management
	Learning process	Case variety Patient complexity Affiliate hospital rotation
Post-learning process	Daily practices	Demographic gaps Popular issues Effective communication
	Facilities	Gap between skills/competencies and health facilities as the workplace
	Inter- and intra- professional relationships	With senior physicians or colleagues at other centers
	Strategic plan	Continuing medical education

the schedules, the importance of vaccination, the side effect and other aspects related to immunization) which they did not get in teaching hospitals. Some subjects mentioned that they were unfamiliar with non-program vaccines.

...”During my residency, I rarely performed vaccine procedures, either for government program vaccinations or for independent ones. Consequently, I was not confident following the completion of my residency”... ( subject #3).

...”While in my residency, I frequently gave vaccines to newborns, although I still feel inadequate in my abilities. Residency participants should be assigned to community health centers (Puskesmas) to give vaccines more often and handle adverse post-immunization occurrences”... ( subject #4).

One of the aims of the residency program is to cultivate pediatricians who excel in core competencies and effective communication, particularly when interacting with patients and their families. Effective communication involves offering patient education about their health, from diagnosis to treatment plans, and conveying bad news to patients’ families. Ineffective communication might result in misunderstandings and increase the likelihood of medical-legal issues or legal claims being filed against the hospital and the physician.

“...We should acquire the skills to effectively convey and deliver unpleasant information to parents during our residency program...” ( subject #5).

...”History-taking and educating without causing offense to parents, particularly in delicate circumstances, has been difficult in private practice.”... ( subject #6).

“...A potential medical-legal dispute has arisen as a result of misunderstandings with patients’ families. I constantly follow the principle: “write what is done, and do what is written...” (subject #3).

“...In contemporary society, there is a high incidence of complaints and threats related to misconduct. I feel somewhat uneasy because these

topics were seldom addressed throughout my postgraduate specialist training (PPDS). The hospital management has been very supportive...” ( subject #3).

One aspect that was undervalued in the residency program, but resulted in practical benefits was in caring for longitudinal cases (presenting a specific case that is monitored for 18-24 months and assessed in terms of development, behavior, and social interactions).

“...Longitudinal cases can be used to track individuals with chronic illnesses and create supportive networks for monitoring their health conditions and addressing any additional concerns...” ( subject #4)

## 1.2. Learning process

The second theme identified in the domain of intra-learning process was the learning process itself. Learning in a residency program is comprised of interactions among participants, educators, and resources in the hospital learning environment. Patients/cases are utilized as learning tools in residency programs. Increasing the variety of cases leads to enhanced participant experience. Participants in FGDs noted a narrow variety of cases seen at the major teaching hospital.

“...Complex cases are frequently seen at the major teaching hospital, making more common daily cases rare. When visiting an affiliated hospital, numerous competency level 4 cases or more simple cases can be accessed...” ( subject #7).

To enhance the diversity of daily cases, one strategy is to assign students to affiliated hospitals in the district in order to access an expanded variety of simpler and additionally diverse cases.

“...During the senior year, which overlapped with the COVID epidemic, we were no longer assigned to member hospitals. The number of cases at the major teaching hospital fell, primarily due to a fall in COVID patients, resulting in a reduced diversity of cases...” ( subject #8).

## 2. Post-learning process

### 2.1. Daily pediatric practice in a cultural context

Challenges associated with daily practice topics involved demographic and socio-cultural shifts between the time participants completed the residency program and during their current role as a pediatrician. According to numerous FGD participants, demographic differences lead to variations in the nature of patients and their families, as well as in the prevalences of diseases in the community.

“Working in Province X has exposed me to a unique patient demographic with distinct cultural characteristics. Additionally, the vast majority of medical cases I encounter here are also rather different.” ( subject #9).

As a pediatrician, parents frequently inquire about health myths or community habits that are considered unimportant or irrelevant in daily practice. These questions are challenging due to the lack of discussion on prevalent issues or misconceptions regarding child health within the community during the educational process. Effective communication skills must be taught to enable residents to confront difficult issues related to social/community beliefs or culture.

“Parents frequently inquire about myths around child health and cross-reference / seek for second opinion the responses with opinions from other pediatricians...” ( subject #10).

### 2.2. Health facility issues

Former pediatric residents were educated in fully equipped referral hospitals with comprehensive facilities for diagnosing and treating patients. After graduation, they work in various types of hospitals with more limited facilities.

“Sometimes we have to deal with limited facilities, such as being unable to check basic laboratory examinations, so we go back to basic clinical judgment-based findings. Also, some hospitals don't have a Pediatric Intensive Care Unit, so our patients have to use the Adult Intensive Care Unit.” ( subject #6)

Due to limited facilities, graduates learned to collaborate with other health units to monitor the patient thoroughly.

“From the residency program, I've learned how to monitor my patients. I gathered all the patients that need to be monitored in a peer group, and then I advocated on their behalf to stakeholders and created programs based on risk factors to prevent the disease. Collaboration with social health centers (Puskesmas) is needed to collect follow up information.” ( subject #4)

### 2.3. Intra- and inter-professional relationships

Some graduates found it difficult to have professional relationships with senior pediatricians in the workplace, especially when they trained in different universities. Even though the guidelines and consensus are the same, some professionals practice according to their experience, which may differ from the guidelines. Conflicts arose when they shared the same patients, replacing each other's treatment plans when they were off duty.

“I have to modify some therapy to some patients since I work in a different area from my teaching hospitals.” ( subject #11)

“Some patients came to me from a previous pediatrician who told them to consume anti-tuberculosis drugs, but did not educate them about the disease. They asked my opinion if their child suffered from tuberculosis, since the previous physician said no. I think stigma from society made the previous physician not clearly state facts about the disease. But I think, if we want to eradicate tuberculosis, patients should be clearly educated according to the Guidelines.” ( subject #6)

### 2.4. Individual strategic goals to reduce gaps

Some graduates said the best way to keep up their clinical skills was to pursue continuing medical education, updated to the latest guidelines. While teaching, engaging in collaborative research, or active participation as a speaker in scientific events are all means of achieving lifelong learning, these avenues are rarely used as strategic objectives. Some graduates consulted senior pediatricians to obtain another point

of view.

“To keep my knowledge and skills updated, I read the textbooks again and took part in symposia and workshops held by professional organizations. Sometimes I also imitate senior pediatricians who like to give online education to public.” (subject #3)

“If I found a difficult case, I tried to contact my senior pediatric consultant to share the case and ask their opinion about specific case management.” (subject #12)

## Discussion

This study is the first to identify competency gaps between the intra-learning process and the post-learning needs of graduates from a pediatric residency program in Indonesia. Although the *Indonesian College of Pediatrics* and our medical school have outlined competencies for residents to acquire, given the diverse social, cultural, and technological resources in Indonesia, there is a lack of skill to their needs upon graduation. Pediatricians must have knowledge, decision-making skills, emotional stability, a collaborative approach, compassion, empathy, resilience, flexibility and an attitude of lifelong learning to adapt to changes in healthcare.<sup>2</sup> Our curriculum also does not directly prepare pediatric residents with the full range of skills, attitudes, and knowledge appropriate for the development and transitioning into the complex needs of diverse communities in Indonesia. The FGDs identified pediatricians' needs relating to their previous residency training as well as concerns about the curriculum content and its implementation in the learning process. The FGDs also highlighted the participants' challenges in their careers.

Our study revealed two domains related to the gaps in the required intra- and post-learning competencies. While the general curricular content (to achieve core competencies) and practical benefits in longitudinal case management are suitable for their future work, we found that some categories of the curricular content and the learning process could be improved in the intra-learning process. Skills for several kind of vaccination types and their information, good communication, and medico-legal education were the three main areas of crucial additional knowledge that

was lacking. During residency training in Indonesia, experiences/skills in several kind of vaccination types may not be met, especially for primary care and non-governmental programs. A previous study showed that pediatricians could not perform procedures in practice if they had never learned them.<sup>10</sup> Another study highlighted the importance of teaching ethics to pediatric residents, to help them deal with moral dilemmas that arise in clinical settings.<sup>11</sup> Each stage should have an efficient way to teach medico-legal topics. *The Indonesian College of Pediatrics* guidelines state that residency programs should emphasize professionalism in the curricular topics.<sup>4</sup> The curriculum is important in shaping professionalism among medical students and residents and should include explicit teaching of professionalism, ethical principles, communication skills, cultural competence, and professional values.<sup>12</sup> For example, prior studies have shown that mental health issues in children and the transition to adult care are important topics that need to be addressed.<sup>9,13</sup> To prepare for pediatricians' challenges in their future careers, we have a greater opportunity to improve curriculum content. Also, we can collect and effectively evaluate alumni feedback to gain insight into the data pediatricians need for their practice.

Certain learning processes could be improved. The main problems encountered were lack of case variation, insufficient patient complexity, and limited affiliated non-tertiary hospitals. In teaching hospitals, general pediatricians need more cases to practice, but they also need more simple cases than complex ones. One way to get around this would be to send the pediatric residents to affiliated hospitals that have different facilities. Affiliated hospitals must adhere to curriculum content and specialty programs must ensure that a variety of case experiences are regularly assessed. Joint lectures can help balance opinions about the course materials, which include updated guidelines and recommendations. Updates in managing children' health can be followed even after graduation. AI-based simulation of rare cases could be utilized by pediatricians and residents to enhance case exposure and eliminate technological differences.<sup>14</sup> *Workplace-based Assessment (WBPA)* and *Entrustable Professional Activities (EPA)* are assessment tools for clinical teaching now widely used in developed countries. Otherwise, in Indonesia, the application

of EPA is presently still restricted. The WPBA tools formatted to assess a range of clinical skills by a learner in its working environment.<sup>15</sup> Another assessment tool is EPA, which is defined as a unit of professional practice that can be fully entrusted to a trainee, once he or she has demonstrated the necessary competence to execute this activity unsupervised.<sup>16</sup> These two assessments should be linked.<sup>17</sup>

A number of themes emerged from the post-learning phase evaluations: cultural influence on daily practice, healthcare facility limitations, professional relationship building, and strategic individual plans to address the gaps. Some of the problems stem from graduates' experiences during their residency, even if they occurred after graduation. The residency program is designed to prepare participants with their competencies to ultimately care for patients, particularly in resource-limited settings.<sup>3</sup> Pediatricians should utilize continuing medical education to stay current on guidelines and recommendations regarding children's health and illness and to maintain competency beyond graduation.<sup>1,18</sup> Another way for alumni to share their daily practice experiences with other pediatricians and pediatric residents is to have them speak at CME conferences. Additional strategies to maintain clinical competencies included teaching and cooperative research. A prior study found that, despite the challenge of heavy workloads and long hours, pediatricians had highest levels of satisfaction compared to other subspecialists.<sup>19</sup>

Using data from both areas, we propose several approaches to address the gaps in intra-residency training and post-learning. To close the gaps, the pediatric residency program should be expanded and redesigned to include new learning activities and processes (Table 3).

This study had some limitations. Our participants came from a single pediatric residency program, thus we cannot generalize our findings to other programs in Indonesia. Other pediatric residency programs should undergo similar evaluations to deepen understanding and note which gaps are general to many programs or specific to certain ones. In addition, hospital directors should also take part in FGDs, in order to fully evaluate the gaps in learning.

In conclusion, the curriculum standard is almost sufficient to meet the requirements of professional work as a pediatrician. However, there are some gaps

that graduates should address after completing the pediatric residency program, especially in medico-legal topics and daily practice communication skills. Effective communication with patients and their parents is one of the most important skills needed during and after learning to interact with different social/cultures. The program should provide additional steps to prepare pediatric residents before their graduation in the following areas: medico-legal knowledge, parental communication skills, CME, improved use of medical tools (like shots) and case variety, and how to practice in a facility with limited resources.

## Conflict of interest

None declared.

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**Table 3.** Proposed strategies to address gaps in pediatric residency education

	Strategies	Benefit	Challenges
Curriculum content	Medicolegal issues	<ul style="list-style-type: none"> <li>Avoid malpractice and maladministration</li> <li>Improve communication and education skills in interactions with patients and guardians</li> </ul>	Determine effective teaching method for medicolegal material in each level of residency program
	Collect alumni feedback and evaluation of the implemented curriculum	<ul style="list-style-type: none"> <li>Provide valuable insights on the outcomes of implemented curriculum</li> <li>Improve graduate competencies</li> </ul>	Collect & analyze alumni feedback systematically & effectively, both qualitatively and quantitatively
Intra-learning process	Optimize use of affiliate hospitals to increase variety in case types	Increase case variety specifically in rural hospitals and those with limited resources	Ensure that affiliate hospital adhere to the curriculum content
	Information dissemination through lectures	Equalize perceptions regarding teaching material, such as updated recommendations and guidelines	Partnership between teaching center or collegium college, program consistency
	AI-based rare cases simulation	Enrich case exposure	Technological limitations
	Bridging WPBA and EPA	<ul style="list-style-type: none"> <li>Improving competency-based assessment</li> <li>Achieve essential competencies to become proficient to meet society's health needs</li> </ul>	<ul style="list-style-type: none"> <li>Limited studies hady conducted in pediatric residency program in Indonesia</li> <li>Need innovative methods to use the both tools (of WPBA andwith EPA) in clinical assessment</li> </ul>
Post-learning process	Continuing medical education	Up-to-date on recently updated recommendations and guidelines on pediatric health and disease	More resources needed for offline teaching
	Alumni involvement as speakers in CME	Share experiences in limited resources	Selecting the appropriate alumni Confidence to share

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