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A country-level national needs assessment of the Indonesian pharmacy workforce.

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Introduction

Drivers for pharmacy workforce investment

The World Health Organization (WHO) has indicated that country-level investment in the health workforce is a global challenge.¹ The WHO estimates worldwide shortages of around 18 million health workers by 2030, particularly in low and middle-income countries (LMICs).² This health workforce shortage exists due to insufficient investment in education and employment and inadequate wages.¹ The pharmacy workforce, globally, the third-largest health workforce, is a combined regulated workforce comprising pharmacists and additional (often, but not always, non-regulated) support workforce (pharmacy assistants). Echoing the WHO's prediction, the latest global report from the International Pharmaceutical Federation (FIP) shows that countries with low income have shown the slowest growth in pharmacists' capacity, and there might be an increasing income-based "capacity gap" between countries, which will continue to widen into the future. This report highlights a need to initiate a needs-based approach, particularly in low income and/or developing nations, to developing and transforming national strategies for workforce development.³

Additionally, the drive towards universal health care (UHC) is crucial, aiming to ensure all populations to have access to essential and quality health services without financial hardship.⁴ The optimisation of primary health care (PHC) services is one way to achieve UHC, reaffirmed at the Global Conference on Primary Health Care and the resulting Astana Declaration.⁵ There is an increasing worldwide demand for primary health care services. In almost all countries, pharmacists are the most readily accessible point-of-care for communities.⁶ Optimisation of pharmacists' role in providing pharmaceutical care, particularly in primary care settings, will enable communities to have more equitable access to medicines, medicines expertise, and preventative health care.⁶ There is an increasing need to ensure a sufficient, well-trained and motivated pharmacy workforce who are adaptable, flexible, and capable of providing better pharmaceutical care for population health improvement.^{7,8}

Global progress on pharmacy workforce transformation

The FIP has established a global vision to describe the pharmacy profession's future direction and how education can support the advancement of science and practice.⁹ The FIP global vision describes a transformed future in which advanced pharmacists are flexible in responding to the health system's evolving needs in achieving UHC.^{6,10} To support the vision, the FIP established a transformative workforce roadmap that sets milestones and outcomes for practice transformation, science innovation and education and workforce development through a series of integrated global

Development Goals (DGs).⁹ The DGs were developed through a globally engaged consultation process, input and iteration to develop a systematic tool to assess the country's development needs and facilitate progress towards the global goals.^{11,12}

In this study, the analytical framework used was the FIP Workforce Development Goals (the Nanjing Goals) published in 2016.¹³ In their initial format, these thirteen workforce Goals were categorised into three clusters: academy, professional development and systems. The academy cluster consists of three goals: "academic capacity", "early-career training strategy" and "quality assurance". The professional development cluster consists of five goals: "advanced and specialist development", "competency development", "leadership development", "advancing integrated services", and "working with others". Systems cluster consists of five goals: "continuing professional development strategies", "equity and equality", "impact and outcomes", "pharmacy intelligence", and "policy development".⁹

National health system and pharmacy development in Indonesia

Since July 2020, Indonesia is classed as an upper-middle-income country¹⁴ located in Southeast Asia with a large population of 270 million.¹⁴ There is unequal growth of the Indonesian population between the islands and municipal provinces and a changing demographic with relative increases in the aged population and a corresponding proportional decrease in the reproductive-age population.^{15,16} The increases in non-communicable and co-morbid diseases (NCDs) are increasingly important, with infectious diseases remaining a significant part of the disease burden and rising demand for health care.¹⁵ A Universal Health Coverage (UHC) programme was introduced in 2014 to facilitate better access to care and equity and strengthen NCDs outcomes.^{16,17} This UHC scheme has changed the healthcare system into a single national health insurance system.¹⁸ However, challenges remain, for example, critical shortages and distribution inequality of healthcare workers and facilities.¹⁶ The role of pharmacists in Indonesia is becoming ever more crucial as pharmacists contribute to the entire UHC support chain, covering primary health care clinics, enhanced hospital roles, medicines access and distribution, and also across the pharmaceutical industry sector. Pharmaceutical expertise features highly in the National Agency of Drug and Food Control, the Ministry of Health and in the Indonesian national health insurance organisation.¹⁹

Professional national leadership is held by the Indonesian Pharmacist Association (IAI), which is the professional body for pharmacists responsible for advocacy and policy development, which includes workforce development and professional competencies. There are currently seven special interest groups under the IAI: industry, traditional medicines, cosmetic, distribution, hospital, community and primary health care.²⁰

Needs assessment approach

In general, a needs assessment is a term used to identify the gaps "between what is (current results) and what should be (desired results)", including a prioritisation of the gaps, and to identify possible activities to obtain gap closure.²¹ A needs assessment provides validated data to determine the

relevant criteria in identifying opportunities and challenges and designing ways for organisational success.²² It is sometimes used to guide the decision-making process in an organisation.²¹ While there are several designs of needs assessment models, there is a general consensus that a needs assessment should comprise four components: (1) consideration of goals; (2) procedures for determining the current status of goals; (3) methods for identifying, describing and analysing of gaps; and (4) methods for prioritising gaps.^{23,24} The scope of a needs assessment study can be strategic (mega level results – defining the relationship between organisations and the society), tactical (macro-level results - defining goals and objectives of the organisation), and operational (micro-level results – implementing projects to produce results).²¹

A range of techniques have been used to determine health needs, and there is no single best way of evaluating health needs.²⁵ The literature on pharmaceutical needs assessment is sparse but has been described as "a formal mechanism for patients to have a say in the pharmaceutical service they receive" of which one such study (of a local service area) was conducted using a series of techniques including gap analysis, a nominal group technique and a rapid participatory appraisal.²⁵ In this study, the needs assessment was set at the national level, focusing on the developmental needs of the entire pharmacy workforce in Indonesia. This study aimed to conduct a needs assessment process in order to prioritise gaps toward transforming the pharmacy workforce as a prelude to practice and pharmaceutical services reform in Indonesia.

Methods

The Theory of Change (ToC) model was used as a holistic approach for national workforce transformation.^{26–28} The fundamental principles of the ToC are (1) evidence-led, needs-based assessments of current workforce and service provision; (2) mapping to the endpoint of the FIP Development Goals (FIP DGs) workforce element; and (3) the implementation of national-level tools and mechanisms to support the transformation. Aligned with the ToC model, the needs-based assessment process in this study followed the three-step process introduced by Watkins et al. (2012), i.e. identifying needs, analysing needs and providing recommendation on transformation tools and mechanism.²¹ These processes were conducted to ensure that the needs assessment focused on the needs and goals, analysed the gaps before making a decision or prioritisation, and ensured the prioritisation was justified.

A prospective qualitative design was used in the needs assessment process (see Figure 1). The perceived needs were identified by exploring stakeholders' perspectives on the challenges in their practice and identifying existing national pharmacists' development projects in Indonesia. Both perceived challenges and national workforce development projects were mapped to the FIP DGs workforce element. The needs prioritisation or gaps analysis was conducted by comparing the mapping percentage of perceived challenges to the FIP DGs workforce element framework and mapping proportions (or overlap) of national workforce development projects to the FIP DGs framework. The FIP DGs structure was used as an analytical framework based on experiences of using these structured Goals as a needs assessment framework in other countries;^{11,12,29} there is no

functional framework available locally in Indonesia. The consolidated criteria for reporting qualitative research (COREQ) criteria were used in the reporting of this study.³⁰

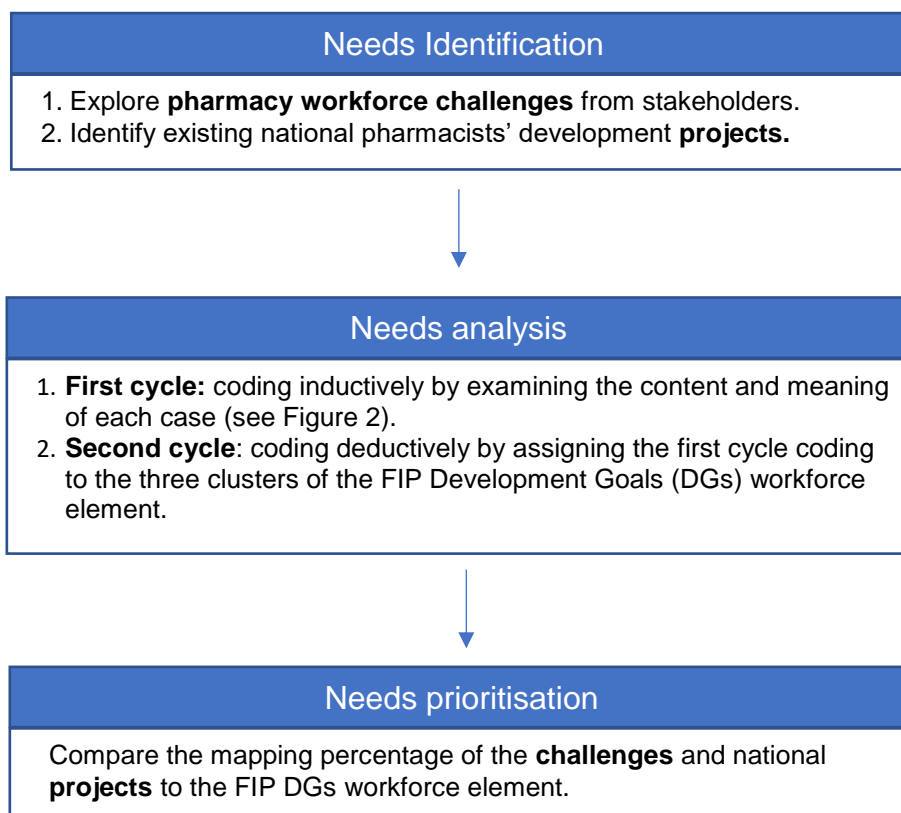


Figure 1. Summary of the needs-assessment process

Study design and data collection

This study openly invited participating pharmacists of the 2017 congress of the Indonesian Pharmacists Association from the six sectors (academic, community, government institution, hospital, industry and primary health care) to explore their challenges in their practice. A combination of convenience sampling and snowball sampling strategies were used to recruit participants. A multiple method qualitative study consisted of face-to-face group discussion, and online and in-person semi-structured interviews were conducted. A combination of the method was utilised based on the availability of participants.

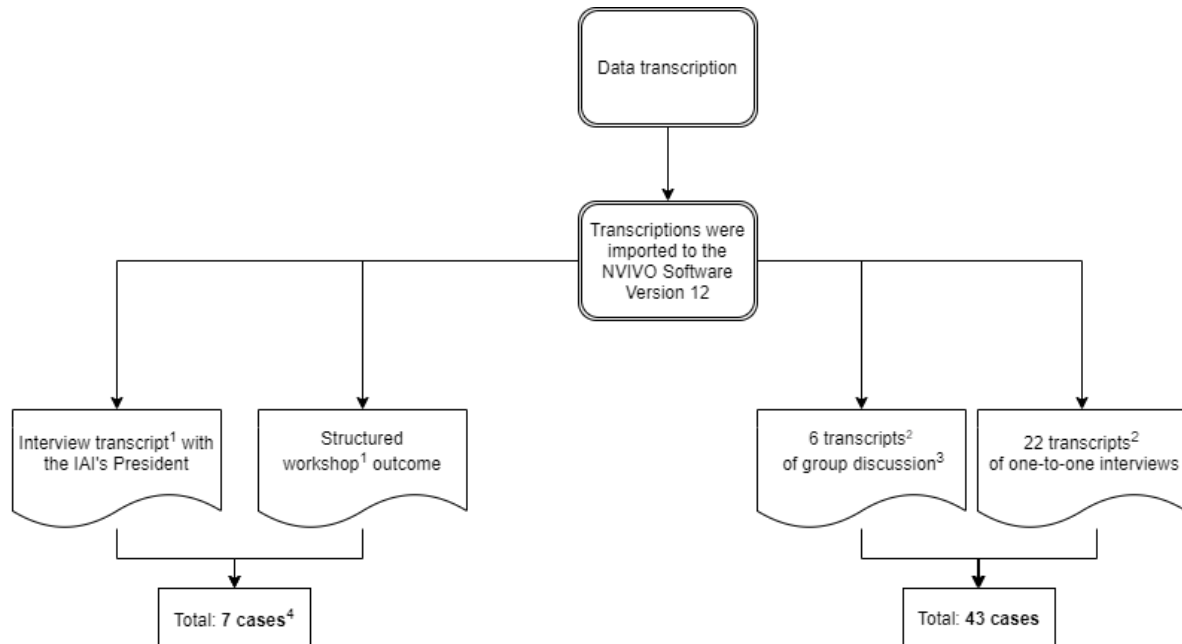
The topic guide included probing questions on the current workforce situation and the advanced and specialist practice development in Indonesia. The topic guide was tested in the English language for question neutrality and clarity and subsequently translated into the Indonesia language (Bahasa) by SM (the lead author). One pilot group discussion and three semi-structured interviews of pharmacists in differing practice sectors were conducted to check the ease of flow of questions and estimate timing. SM conducted the interviews and group discussions; she collated field notes in a self-reflection form.³¹

Apart from identifying perceived challenges from practising pharmacists, the leaders from organisations, who play a role in pharmacist' development in Indonesia, were invited to attend a face-to-face structured workshop. This workshop was conducted to solicit their views on pharmacy

workforce challenges in Indonesia and identify their current programmes in developing pharmacists in Indonesia. The organisations approached were the professional body - Indonesian Pharmacists Association; the Association of Indonesian Pharmacy Higher Education; the National Pharmacy Committee; the Indonesian Collegium Pharmacy; and special interest groups. There were seven special interest groups under the Indonesian Pharmacists Association: industry, traditional medicines, cosmetic, distribution, hospital, community and primary health care.

Data analysis

The interviews and group discussions were recorded and transcribed. The analysis was performed in the Indonesian language (Bahasa) to maintain conceptual equivalence.³² Coding was conducted inductively by examining the content and meaning of each unit of observation. The codings were subsequently mapped to the FIP DGs workforce element. Two independent coders also coded a sample of 5 transcripts, followed by review and consensus on the first cycle of coding and mapping to the FIP DGs. This multiple coders strategy was conducted coding to enhance the credibility of the study.³³ The mapped codes were weighted against the national workforce projects using denominators as total cases or units of observation. A total of 30 projects were identified from the cases (organisations) sampled. The lead author (SM) conducted the prioritisation by comparing the mapping percentage of perceived challenges and national projects to the FIP DGs workforce element. The data management process is illustrated in Figure 2, including the anonymisation processes of the script and cases.



¹ These transcripts were analysed to identify both perceived workforce challenges and national workforce projects;

² These transcripts were analysed to identify perceived workforce challenges;

³ Each participant was assigned as a "case" in the NVivo software; however, the dynamic of group discussion was noted and documented. The reason for assigning each participant as a "case" was because the analysis aimed as an exploratory analysis, and the researcher were interested to know the individual's opinion or perception on each topic.

⁴The cases include (1) Indonesian Pharmacist Association; (2) Association of Indonesian Pharmacy Higher Education; (3) National Pharmacy Committee; (4) Indonesian College of Pharmacy; (5) Primary health care special interest group; (6) Hospital special interest group; (7) Traditional medicine special interest group.

Figure 2. Transcript anonymisation and case assignment for data analysis

Ethical consideration

An ethics approval was obtained from the University College London (UCL) Research Ethics Committee (Application 11819/002). Individual participants signed a consent form. Their responses were kept confidential, and the result was presented with no possibility of identifying individuals. The participants received no incentives for this study. All data collected were stored in a password-protected database, and document hard copies were kept secure. Access to the data is restricted to the researchers involved in this study.

Results

Forty-three individual practising pharmacists participated across 6 groups discussions (2 to 5 people) and 22 one-to-one interviews. The average duration of face-to-face group discussions was 67 minutes, and the average duration of a one-to-one interview was 48 minutes. There were no repeat interviews conducted. The majority of participants were female (n: 30, 70%). The participants worked in hospital (n:15, 35%), community (n:11, 26%), industry (n:6, 14%), academic (n:5, 12%), government institution (n:3, 7%), and in primary health care setting (n:3, 7%). The average of participants' practise experience was 5.93 years. The experience years were categorised as follows: less than 3 years (n: 15, 35%), 3 to 5 years (n:15, 35%), 6 to 10 years (n: 7, 16%), and more than 10 years (n:6, 14%). The majority of respondents worked in the central part of Indonesia (n: 34; 79%); 7 of them (16%) worked in the west part of Indonesia, and only two of them (5%) were from the east part of Indonesia. The structured workshop to identify challenges of organisations and existing national projects was attended by leaders or representatives from several organisations (n:7), namely the professional leadership body, the association of higher education, national pharmacy board, Indonesian pharmacy collegium, hospital special interest group, traditional medicines special interest group and primary health care special interest group.

Workforce challenges and national workforce development projects in Indonesia

The three clusters of the FIP Development Goals (DGs) workforce element were set as themes, and the thirteen goals were set as sub-themes. The findings are presented according to defined themes - clusters within the FIP DGs workforce element. The clusters are: "academic cluster"; "professional development cluster"; and "system cluster". An additional theme was created and labelled as "other perceived challenges", which described other challenges not mapped to the FIP DGs workforce element. To ease the comparison, the findings of workforce challenges and national workforce development projects are presented together.

Academic cluster

The importance of early career training strategy (FIP DG2: "early-career training strategy") emerged from practising pharmacists, especially from those who practice in community settings or universities.

They highlighted this perceived need due to the variation of pharmacists' competency and their readiness to practice.

Participants who worked in hospital and community settings expressed that the movement between sectors (career change) might impact patient safety. They perceived a competency gap when the career change happened, particularly when pharmacists working in an industry setting changed their career to a patient care setting. The splitting of the pharmacy curriculum in the university between the clinical curriculum and the industrial curriculum might be one of the reasons for the competency gap:

"When my friends working in the industry changed their career to work in the clinic, I felt their competencies were very different compared to others. It is not because they were not competent as a pharmacist, but because...they attended more lectures focused on practising in industrial than lectures on practising in patient-facing role setting (Group 1, participant 2, hospital setting, one-year experience).

Most pharmacists who practised in community settings or universities stated that interprofessional education in university was essential to prepare pharmacists for the workplace ("academic capacity"). Also, participants from various experience levels expressed that gaps in the existing curriculum with current practice needs and variety of universities' accreditation might lead to variations in lecturer quality, in education competency standards and graduated pharmacists ("academic capacity" and "quality assurance"). This was also emphasised by participants who worked in hospitals, in the community setting or in universities.

Similarly, the majority of the projects currently being conducted in Indonesia were linked with "academic capacity" and "quality assurance", which was related to university accreditation, revision of the educational standard, interprofessional education and practice-based education, and quality assessment of the workplace for pharmacy students' training. Progress has been made by the Indonesian Pharmacists Association, who works collaboratively with the Institute of Independent Accreditation of Health Education to conduct university accreditation to assure the universities' quality in Indonesia. When this study was conducted, the Indonesian Pharmacists Association was in the process of internship programme development post-initial education and training.

Professional development cluster

As there is an increase in medicine complexity and technology, pharmacists need to be forward-thinking to improve their competencies ("advanced and specialist development").

"There is an increasing number of patients need more advanced services; the technology becomes more advanced; if we do not develop our competency, we, therefore, could not provide holistic care to our patients. Specialistic is needed, e.g. nuclear pharmacy" (Participant 34, government institution, thirty one-years experience).

When this study was conducted, there has been an ongoing project to establish competency standard for some specialist programmes through formal education ("advanced and specialist development").

Apart from the specialist programmes, a need for competency and professional development ("advanced and specialist development" and "competency development") was expressed by participants with less than three years' experience and working in a patient care setting. This need was also highlighted by all special interest groups who attended the structured workshop.

Related to "advancing integrated services" (FIP DG7), substandard pharmaceutical care was emphasised by participants working in a patient care setting:

"...when, we are a patient in the hospital or at a pharmacy; most pharmacists only explain how to take the medicines, that's it. Also, for example, now in pharmacies; pharmacy technicians conduct pharmaceutical care." (Participant 23, community setting, eight-months experience).

FIP DG8: "working with others" had the most challenges mapped. Participants, who work in the community and hospital settings, perceived that barriers from other healthcare workers, especially from the medical doctors, become a challenge for them in practice:

"I think working with the other health care professional like doctors or nurses, in Indonesia, can still be a challenge. The doctors sometimes think us as a competitor, while we want them to be our partner..." (Group 5, participant 20, community setting, four-years experience)

To promote service provision and workforce education and training, the national professional leadership body encourages its members to participate in some health events to promote the branding and recognition of pharmacists in collaboration with other healthcare professionals ("advancing integrated services" and "working with others"). Branding tools, such as "pharmacists' suits" and "practice board pharmacists in community pharmacies" were also established to introduce the pharmacist's role in Indonesian society. Furthermore, as there had been some natural disasters in Indonesia, the national professional leadership body formed an emergency response team that included pharmacists ("advancing integrated services" and "working with others").

System cluster

The leader of the national professional leadership body expressed that Continuing Professional Development (CPD) had not been a lifestyle for pharmacists, and its impact has not been felt. This issue might be because the pharmacists' motivation to develop their profession was still low. They performed the CPD only to maintain their licenses by collecting the CPD credits. This minimum initiative was also emphasised by participants from various sectors of practice and years of experience. On the other hand, CPD was the second most frequently conducted project in Indonesia. The projects conducted were related to the improvement of CPD methods and the recertification and training of CPD trainers.

The workforce impact (FIP DG11) has not been recognised, especially for pharmacists who practice in the patient care setting:

"Their general understanding [society] is pharmacy practice only related to medicines stock management...Pharmaceutical care services do not seem well acknowledged, so this is a big obstacle..." (Participant 32, community setting, two-years' experience).

The leader of the national professional leadership body and one participant working in the hospital setting perceived that evidence-based research was vital in supporting regulations for pharmacists ("policy development"). Evidence-based research showing the impact of the pharmacy workforce was also imperative to conduct.

"I think the main key is research.....I still believe there is a need for the data coming from Indonesia itself, and it is done in a research way. I think if the result is collected, it will also be a source or a foundation to make an excellent policy." (Participant 29, hospital setting, four-year experience).

Workforce challenges

One significant challenge perceived by participants across all practice sectors and years of experience was low initiatives for self-development. Pharmacists with less than five years' experience and practising in a hospital or community setting suggested a differing perception between the younger and older generation of pharmacists, illustrated here:

"In my opinion, there are two types of pharmacists in Indonesia. Maybe for pharmacists who still have a vision of moving forward where they will practice for a long time, who is young. They might be interested in developing themselves. However, for older pharmacists, who has already a stable job, they might not care about their development" (Group 1, participant 1, hospital setting, four-months experience).

Another challenge mentioned by pharmacists across sectors was the optimisation of the pharmacy organisations' role. The professional leadership body needs to collaborate with other health workforce organisations:

"Well, I think the role of the IAI (national professional leadership body), should be strengthened, should listen more to the inputs from all pharmacists, and the IAI (national professional leadership body) must have a good relationship with other health professional organisations." (Participant 43, community setting, one-year experience).

Gaps and priorities between perceived challenges and existing projects

The mapping visualisation of perceived workforce challenges and the existing projects to the FIP DGs can be seen in Figure 3. The colour emphasis in Figure 3 indicates the mapping emphasis found on both the challenges or the existing national projects.

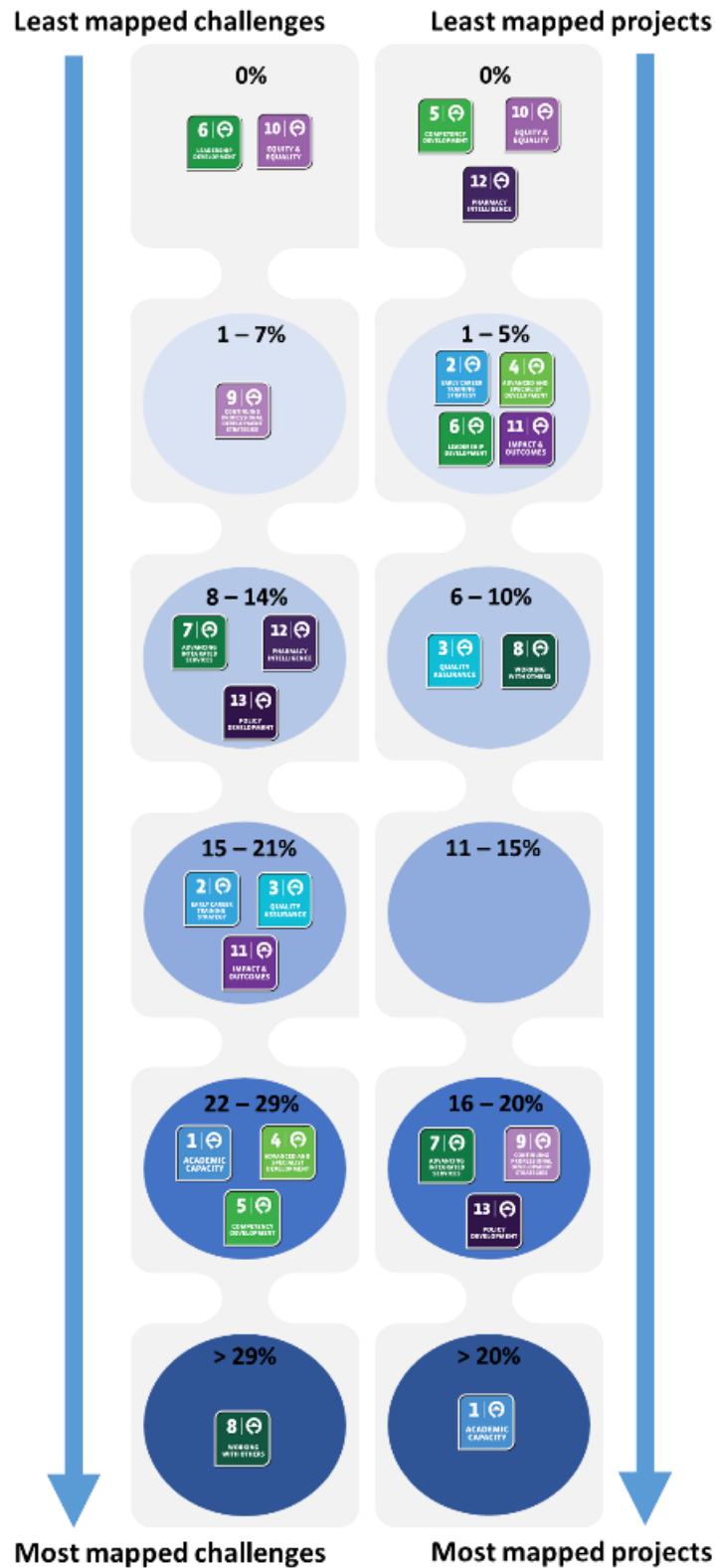


Figure 3. Mapping of challenges and existing projects to the FIP Development Goals workforce element

There were no workforce challenges mapped to the "leadership development" and "equity and equality" goals. In contrast, there were no workforce development projects mapped to "competency

development", "pharmacy intelligence" and "equity and equality" goals when this study was conducted.

The prioritisation was identified by comparing the left side of Figure 3 (the perceived workforce challenges) with the righthand side (current national workforce projects). For example, while there were challenges identified in the mapping process with "competency development" and "pharmacy intelligence", there were no ongoing national projects aligned with these goals. There was a higher mapping proportion of current workforce projects than workforce challenges with "academic capacity", "advancing integrated services", "CPD strategies", "policy development", and "leadership development". Conversely, there was a higher mapping proportion for workforce challenges than for current national projects in the areas of "working with others", "advanced and specialist development", "competency development", "early-career training strategy", "impact and outcomes" and "pharmacy workforce intelligence".

Based on this gap analysis, the priorities of workforce development (from high to low) were: "competency development" initiatives, "advanced and specialist development" initiatives, strategic pharmacy workforce intelligence data, initiatives to strengthen "working with others", a lack of clarity on infrastructure for early-career training strategies and workforce impact. For instance, there were no ongoing national projects on the "competency development" framework to support Indonesian pharmacists, while high proportional mapping of challenges found related to the need for a professional development framework to support pharmacists. Another example was in the "early career training strategy"; a high proportional mapping of challenges was found related to a need for structured training to support career change and career break. Only one project was mapped to the "early career training strategy" which was related to an internship programme after pharmacists graduates.

Discussion

The study informs some perceived challenges of the pharmacy workforce in Indonesia. Consistent with the literature, this study found that participants perceived a lack of knowledge and skills amongst the pharmacists in practice.^{18,34-38} This might be due to the pharmacists' unpreparedness in practice,³⁹ which might also relate to pharmacy education's relevance to the current needs of pharmacy practice.^{18,34,36,37} Barriers from other healthcare workforces - especially from the medical doctors - expressed by participants in this study are consistent with other studies.^{18,34-36,38,40,41} For example, doctors' perceptions that pharmacists were purely medicine providers, with no involvement in patient therapy, became obstacles to the communication of drug therapy optimisation.^{35,42} In some studies conducted in Jordan, Kuwait and Sudan, it was found that doctors were comfortable for pharmacists to provide patients' education, while, they were not comfortable for pharmacists to recommend drug therapy to patients, such as for minor ailment.⁴³⁻⁴⁵ Research suggests interprofessional collaboration (between health care providers) might be essential to deliver effective and comprehensive patient care. Health policymakers have used interprofessional collaboration as a fundamental approach to

improving patient care quality and safety. There have been increasing numbers of studies conducted related to the interventions to strengthen interprofessional collaboration in patient care services.⁴⁶

The possible explanation of the substandard pharmaceutical care found in this study seems consistent with other studies conducted in Indonesia.^{34,36} This might be because pharmacy technicians delivered pharmaceutical care instead of pharmacists. However, some studies conducted in other countries showed that working collaboratively between pharmacists and pharmacy technicians may allow greater opportunities for pharmacists to provide more impactful patient care services.^{47,48} Many authorities in the United States, the United Kingdom, Canada and Europe began to develop formalised frameworks for pharmacy technicians regulation.^{49,50} Having regulatory standards on role clarify can support effective skill mix configuration between pharmacists and pharmacy technicians.^{48,49}

Advocacy and evidenced-based research on the impact of the pharmacy workforce for health improvement is needed. With the changing role and future demand of pharmacy professionals, a system or mechanism to formally recognise pharmacists is needed. In some countries, this system is called a professional recognition system or credentialling.⁵¹⁻⁵³ There is evidence suggesting that, relative to non-credentialed practitioners, credentialed practitioners have better performance in delivering quality care and improved therapeutic outcomes.⁵² This will provide trust in pharmacists' role and ensure the quality of services for the public.

Apart from the perceived challenges, this study also identified existing projects on pharmacy workforce development in Indonesia. There have been several programmes and activities to support pharmacy workforce development initiated by the professional leadership body in Indonesia. Comparing the pharmacy workforce's challenges and existing projects identified needs or gaps in workforce development, as shown in this study.

This study is the first study describing a needs assessment process of pharmacists' development in Indonesia using the FIP Development Goals (FIP DGs) in the Southeast Asia Region. The use of a Theory of Change (ToC) model guided the principles of the mapping process to the endpoint of the study; using the FIP DGs workforce elements as a framing device is a systematic way of prioritising national transformation of the pharmacy workforce in Indonesia and driving workforce development for Indonesian pharmacists. The FIP DGs workforce element have been used to identify policy gaps and priorities of the national and regional workforce planning strategies.^{11,12,29,54} Prioritisation is essential to help countries to be more effective and efficient in transforming their workforce. For instance, if there is a vast need for the specific goal, and there were no ongoing projects in the specific goal, this could mean that there is a need to start developing a project or an initiative to achieve this goal. These FIP DGs are adaptable to local needs and support the country to work towards implementing global health workforce development goals in the pharmaceutical context plan.

The authors acknowledge that this study has several limitations. First, the authors recognise that the sample may not reflect the entire population of pharmacists in Indonesia. The nature of the sampling

strategy by inviting participants who attended the national congress might limit the findings' generalisability. The perspective of pharmacists who were interviewed might be different from those who did not participate in the conference or to those who did not respond to the invitation. However, the pharmacists and stakeholders included in this study were from various sectors and locations, a wide range of experience. It was sufficient to ensure data saturation and to identify key challenges to reporting. Moreover, the key findings found in this study were supported by published literature conducted in Indonesia. Second, the interviewer's presence and the other persons' presence during data gathering could affect the participants' responses. There might be a possibility where participants may respond differently in groups or one-to-one interviews. However, SM kept reflection on the group discussion interaction to ensure that participants' opinion was covered and highlighted. This reflexivity was also to preserve the study's transferability and dependability.^{33,55} Finally, this study only focused on the perceived needs of the pharmacy workforce. Having views from other stakeholders such as patients, health care providers and employers may provide a more in-depth view and extend the confirmation of the findings. Despite these limitations, as the first step of needs assessment, this study identified and prioritised the needs, and it has signposted some valuable area for further research and exploration on the further development of the pharmacy workforce.

Conclusion

This study is unique in demonstrating an evidence-based needs assessment analysis on identifying workforce development priorities in Indonesia, using multiple qualitative methods and multiple stakeholder perspectives. The FIP DGs' mapping priorities found that initiatives on "competency development", "advanced and specialist development", pharmacy workforce intelligence data, "working with others" strengthening, infrastructure for "early-career training" and "workforce impact" are recommended to start. These priorities have been proposed to key stakeholders in Indonesia and have been used to develop transformation programmes in Indonesia.^{56,57} The ongoing national programmes focus on developing national-level tools and mechanisms to support the achievement of these goals, in particular, the development of advanced practice framework^{17,58} in Indonesia and foundation framework⁵⁹ for early career pharmacists in Indonesia. These frameworks could be used to develop a professional recognition system and national progression pathway for Indonesian pharmacists to support them with their career progression. Future research should investigate the impact of these programmes in developing pharmacist competency in Indonesia. Also, further investigation on the progress monitoring of transformation programme is therefore recommended. This study could also be used as a guide to conduct a needs-based assessment in other Low and Middle-Income Countries (LMICs) because the use of the global framework, i.e. FIP DGs, to aid the analysis.

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