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TABLE OF CONTENTS

EDITORIAL

- Health literacy: A field for pharmaceutical intervention** 3867
F.J. Ferreira Alfaya, M.J. Zarzuelo Romero

REVIEW ARTICLES

- Facilitating healthcare practitioners to deliver self-management support in adult cancer survivors: A realist review** 3870
K. Kantilal, W. Hardeman, H. Whiteside, E. Karapanagiotou, M. Small, D. Bhattacharya
- A systematic review on pharmacists' turnover and turnover intention** 3884
S.M. Thin, B. Chongmelaxme, S. Watcharadamrongkun, T. Kanjanarach, B.A. Sorofman, T. Kittisopee
- Mental health training programs for community pharmacists, pharmacy staff and students: A systematic review** 3895
C. Crespo-Gonzalez, S. Dineen-Griffin, J. Rae, R.A. Hill

ORIGINAL RESEARCH

- Acceptance and willingness to pay under the different COVID-19 vaccines: A contingent valuation method** 3911
V. Prasert, M. Thavorncharoensap, P. Vatcharavongvan
- Oral anticoagulant adherence and switching in patients with atrial fibrillation: A prospective observational study** 3920
S. Salmasi, A. Safari, A. Kapanen, A. Adalakun, L. Kwan, J. MacGillivray, J.G. Andrade, M.W. Deyell, P. Loewen
- Consumers' self-reported adherence to directions for non-prescription medicines and the role of risk perception** 3929
S.K. Vong, L. Kang, S.R. Carter
- Drug-related problems and satisfaction among patients receiving pharmacist-led consultations at the initiation of cardiovascular drugs** 3939
S. Bremer, S. Henjum, E.M. Sæther, R. Hovland
- Exploring community pharmacists' use of health literacy interventions in their everyday practice** 3948
T. Cork, S. White
- Effectiveness and sustainment of a tailored over-the-counter medication safety intervention in community pharmacies: A randomized controlled trial** 3953
M.A. Chui, M.E. Berbakov, A.M. Gilson, A.O. Morris, J.A. Stone
- Pharmacists' continuing professional development for non-communicable diseases management: A consensus study** 3964
B. Marjadi, R. Alfian, Y. Susanto, L. Tjandra, A.N.W. Pratama, C. Schneider
- Review of position statements on antimicrobial resistance and stewardship from professional pharmacy organisations** 3974
K. Lim, A. Olsen, A. Broom, H. Seale
- Cost-effectiveness of central automated unit dose dispensing with barcode-assisted medication administration in a hospital setting** 3980
J.G. Jessurun, N.G.M. Hunfeld, M. van Dijk, P.M.L.A. van den Bermt, S. Polinder
- Work productivity loss among adults aged 18–64 years with Multiple Sclerosis in the United States: A propensity score matched study** 3988
S. Bhattacharjee, Z. Yegezu, K. Kollecas, K. Duhrkopf, N. Greene, L. Hashemi

COMMENTARY

- State-level policy efforts to regulate pharmacy benefit managers (PBMs)** 3995
T.J. Mattingly II, M. Lewis, M.P. Socal, G. Bai

RESEARCH BRIEF

- The development of a taxonomy to support goal setting between mental health consumers and community pharmacists** 4003
V. Stewart, S.S. McMillan, A.J. Wheeler

CASE REPORT

- Severity of visual hallucinations worsened with lisinopril despite receiving sedative hypnotic therapy or antipsychotic therapy: First case report** 4009
M.A. Jalloh, K. Chung, S. Doroudgar

LETTER TO THE EDITOR

- Pharmacist interventions to deprescribe benzodiazepines in older adults: A missed opportunity?** 4012
C.A. Cadogan

CORRIGENDUM

- Corrigendum to “Using the behavior change wheel to link published deprescribing strategies to identified local primary healthcare needs” [Res. Soc. Adm. Pharm. (2022) 3350–3357]** 4016
I. Bai, J.E. Isenor, E. Reeve, A.M. Whelan, R. Martin-Misener, S. Burgess, N. Kennie-Kaulbach



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Pharmacists' continuing professional development for non-communicable diseases management: A consensus study

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ABSTRACT

Background: Pharmaceutical care for non-communicable diseases (NCD) in Indonesia needs improvement especially in provinces like Kalimantan Selatan (Kalsel) with increasing NCD prevalence. This research explored possible improvements for Kalsel pharmacists NCD Continuing Professional Development (CPD) programmes.

Objectives: The study aims to identify Kalsel pharmacists' engagement with, experiences of, and expectations for NCD-focused CPD activities, and CPD stakeholders' views on these expectations.

Methods: This sequential mixed-methods study used a quantitative survey to map Kalsel pharmacists' CPD engagement and preferences. The survey findings, and Kalsel pharmacists' knowledge and skills in NCD management, were further explored in four geographically-diverse focus group discussions (FGDs). Triangulated findings from the survey and FGDs were presented to pharmacist CPD stakeholders in a modified Nominal Group Technique (NGT) discussion, resulting in a prioritised list of CPD activities and allocation of local leadership for each activity.

Results: The survey response rate was 51% (249/490) with fair representation of the geographic spread. CPD sessions were seen as a social event to network with colleagues (34%) and improve knowledge (31%). Major hindrances for participation were work commitments (25%) and travel needs (22%). Most participants (64%), especially the more senior, preferred explicitly interactive CPD formats (adjusted odds ratio 0.94 for each additional year from graduation; 95% confidence interval 0.89–0.99; $p = 0.036$). The FGDs identified challenges in managing NCD, strengths and gaps in NCD knowledge, and preferences for NCD CPD. The modified NGT produced 12 actions which five major stakeholders agreed to lead.

Conclusions: An explicitly interactive NCD CPD programme based on a community of practice model and supported by blended learning is likely to be most effective for pharmacists in the Kalimantan Selatan province of Indonesia. A co-designed multi-stakeholder systems-based approach to CPD programme, as used in this study, is likely to increase the engagement and success of the programme.

1. Background

Non-communicable diseases (NCD) – cardiovascular diseases, cancers, diabetes mellitus, chronic lung diseases¹ – are a growing concern in Indonesia. The increase of NCD prevalence has led to overruns in health costs.² Cardiovascular diseases are the main cause of NCD morbidity and mortality in Indonesia alongside diabetes mellitus.^{2–4}

The Kalimantan Selatan (Kalsel) province of Indonesia has been reported as having alarming NCD prevalences which have increased between the 5-yearly National Basic Health Research 2013³ and 2018.⁴ Across the 34 provinces nationwide, in 2018 Kalsel ranked 1st in hypertension prevalence (from 2nd in 2013), 5th for stroke (6th in 2013) and 14th for diabetes (17th in 2015). Between 2013 and 2018, there was an increase in the prevalence of medically diagnosed hypertension from

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30.8% to 44.1%, stroke from 9.2‰ to 12.7‰, and diabetes mellitus from 1.4% to 18%.^{3,4}

Indonesia has produced a framework for pharmacists' contribution to clinical care.⁵ One example of the application of that framework in NCD management is the role of pharmacists in providing patient education for lifestyle changes.¹ Such education is deliverable by community pharmacies in Indonesia in line with their increasing role in primary care,⁶ where pharmacists work with patients and other health professionals as partners in the delivery of pharmaceutical care.⁵ There has been evidence for the positive effect of Indonesian pharmacists in NCD management and education.^{7,8} However, the shortage of clinically trained and suitably-educated pharmacists constitutes a key barrier to a broad implementation of this role.⁹

All Indonesian pharmacists (*Apoteker = Apt.*) must complete a four-year Bachelor of Pharmacy programme (*Sarjana Farmasi = S. Farm.*) followed by a one-year Pharmacist Professional programme.^{10,11} The Bachelor of Pharmacy programme covers four broad areas of Pharmacy: Pharmaceutics, Pharmaceutical Biology, Pharmaceutical Chemistry, and Biomedical, Clinical and Social Pharmacy. The Pharmacist Professional Training programme includes Pharmacy Management and Pharmacy Practice in at least two settings: community pharmacy, hospital, pharmaceutical industry, community health centre (*Pusat Kesehatan Masyarakat = Puskesmas*), government organisation, pharmacy distributor, or other relevant institutions. Indonesia also has vocational degree in pharmacy, but the graduates cannot enrol to a Pharmacist Professional programme.^{10,11}

To complete the Pharmacist Professional programme, a candidate must pass the Indonesian Pharmacist Competency Examination (*Ujian Kompetensi Apoteker Indonesia = UKAI*) which consists of an Objective Structured Clinical Examination and a Computer-Based Test. Upon passing this examination, they obtain a Pharmacist Certificate of Competence which is required to apply for the Letter of Registration in the national registry database (*Surat Tanda Registrasi Apoteker = STRA*). A valid Certificate of Competence and Letter of Registration are required for a pharmacist to practice.^{5,12-14} Both the Pharmacist Certificate of Competence and the Letter of Registration need to be renewed every five years through re-certification.¹⁵ A pharmacist needs to collect 150 credits in the five-year period, with evidence of participation in several domains: professional practice (40–50% of total credits), education/learning through continuing professional development (CPD; 40–50%), community service (5–15%), scientific publication (0–25%), and pharmaceutical science development (0–25%).¹⁴ The re-certification uses an online system called the Pharmacist Information System (*Sistem Informasi Apoteker = SIAP*). All Indonesian pharmacists must register to this system. They can search available CPD events, register to attend, and receive certificate of participation directly on the system.

The amount of credit earned from a CPD programme is determined by the national or provincial Indonesian Pharmacist Association (*Ikatan Apoteker Indonesia = IAI*) after the CPD committee register their programme. The CPD amount of credit depends on one's role in the CPD (a speaker, moderator, audience, or organiser); CPD scope (from local to international); CPD length; and CPD mode (in-person or online).¹⁴ For example, attending a 3-h online seminar with two speakers (<https://p2ab.net/#!/cpd/showcase>) earns 3 credits; reading and answering questions of an online CPD article (<https://kalbemed.com/cpd>) gives 2 credits; and attending IAI national three-day online Annual Scientific Meeting (<https://www.iai.id/gallery/kongres-xxi-pit-virtual-iai-2022-2nd-announcement>) gives 30 credits.

A large proportion of practicing pharmacists in the Kalsel province graduated prior to the shift of focus in pharmacists' role from dispensing to a wider range of pharmaceutical care.¹⁶⁻¹⁸ The Kalsel chapter of the IAI has identified anecdotal evidence which indicated that Kalsel pharmacists may not be adequately equipped to manage NCD at the primary (community pharmacy and community health centre) and secondary (hospital) care levels. The Kalsel IAI had been running

seminars, mainly in the capital city of Banjarmasin; however, it was unknown whether this CPD model was optimal in meeting pharmacists' professional development needs. This concern concurred with research evidence which indicates that current CPD in Indonesia is perceived to be deficient in upskilling the pharmacy workforce.⁵

This paper reports the findings from a mixed methods consensus study which was co-designed by Kalsel IAI members and university-based researchers from Indonesia and Australia. The study aims were to identify: (a) Kalsel pharmacists' involvement with current CPD activities; (b) their experiences in managing NCD; (c) their expectations for NCD-focused CPD activities; and (d) Kalsel pharmacist CPD stakeholders' views on NCD-focused CPD activities. The findings of the study were expected to provide an evidence base for the Kalsel IAI in developing an optimised NCD CPD programme.

2. Methods

A sequential mixed-methods consensus design was employed. An initial quantitative survey of all Kalsel pharmacists on the Kalsel IAI registry was undertaken, followed by a series of focus group discussions (FGD), and concluding with a consensus-building meeting of the main pharmacist CPD stakeholders i.e. the Kalsel IAI, the Kalsel Provincial Health Department, and the Faculty of Pharmacy of Lambung Mangkurat University. Ethical clearance for this two-country collaboration project was obtained from Universitas Lambung Mangkurat, Kalsel (94/KEPK-FK UNLAM/EC/III/2019) and from Western Sydney University, Australia (H12803).

A participatory or co-design approach was employed, starting with the composition of the research team and the co-production of knowledge with participant stakeholders.^{19,20} The research team included Kalsel IAI members who had served on the Kalsel IAI Board (RA, YS), pharmacy academics from Indonesia (LT, ANWP) and Australia (CS), and an Indonesian public health academic who had taught in both countries (BM). The Indonesian researchers had completed master's degrees in Clinical Pharmacy (RA, YS), Medical Science (LT), and Public Health (ANWP). The Australian researchers had doctoral degrees and had supervised postgraduate research projects on the topic of pharmacy services in Indonesia. All researchers had had previous training on the methods used in this project (quantitative survey, FGD, and consensus building).

2.1. Quantitative survey

A quantitative survey was used to map Kalsel pharmacists' engagement with CPD activities and their preferences for future NCD CPD events. The questionnaire was based on the literature and guidelines on NCD and/or CPD in Indonesia and other countries^{1,21-23} and incorporated empirical insights from the Kalsel IAI leaders. The survey was developed in English by the research team, translated to Indonesian with back-translation by bilingual researchers (BM, RA), and delivered in Indonesian. The survey was distributed via paper and online (Qualtrics) formats to all Kalsel pharmacists on the Kalsel IAI registry. Participation in the survey was voluntary and anonymous. Participants expressed their implied consent by responding to and submitting the survey. Participants were offered two professional credit points (equal to the professional credit points for seminar attendance) for their participation through a de-linked provision of details at the end of the survey. Participants from three pre-determined districts (see FGD methods below) were asked if they were willing to attend a follow-up focus group discussion.

Participant characteristics were analysed descriptively (by BM, RA, YS, AP and CS). Logistic regression with a backward elimination method was conducted to obtain a model that best explained the most preferred CPD format as opted by the participants, categorised as 'explicitly interactive' or 'non-explicitly interactive'. Explicitly interactive CPD formats included seminars (defined as 'a lecture with audience

interaction'), case studies with peers, and learning from peers (mentoring, discussion and meetings). Non-explicitly interactive formats included postgraduate education, reading journal articles, scientific congress attendance, short courses (1–2 days), classes or lectures, internet materials, webinars, DVD or CD materials, textbooks, literature from drug or health device manufacturers, scientific workshops, peer-reviewing for academic journals and internship. Postgraduate education sessions and scientific congress presentations are categorised as non-explicitly interactive since in Indonesia they are mainly didactic with minimum amount of participants' active engagement. In most cases time for question-and-answer is very limited and, especially in congress sessions, only one or two questions could be raised.

Prior to undertaking the logistic regression, included explanatory variables were checked for multicollinearity using Pearson's product-moment correlation or Spearman's rho-rank order correlation as appropriate. Those explanatory variables were age, work experience, daily working hours, places of work, total number of workplaces, position in main pharmacy workplace, use of social media for CPD, opinion on whether CPD should be made compulsory, distance from the capital city, years from graduation, and monthly average CPD activities in the past year. All analyses were conducted by BM, ANWP and CS using STATA release 13 (StataCorp LP, College Station, Texas, US) with 0.05 as the level of statistical significance.

2.2. Focus group discussions

Focus group discussions (FGD) were held in three pre-determined districts based on geographical categories (rural, peri-urban and urban). The district selection was based on nominations from the Kalsel IAI leaders who were consulted throughout the project design. Two FGDs were run at the urban setting due to the high number of pharmacists in the area, which is a common phenomenon in Indonesia.²⁴

The FGDs were comprised of three phases. First, participants were asked about their day-to-day experiences in providing pharmaceutical services for patients with NCD. Second, two NCD case studies were presented to trigger participants' discussion on their NCD knowledge and skills. One case was a patient who took a mucolytic for an angiotensin converting enzyme (ACE) inhibitor-induced cough; this case was used in a previous study on self-medication advice by pharmacy staff in a rural Indonesian setting.²⁵ The second case was a patient with uncontrolled diabetes mellitus and poor kidney function who was prescribed metformin; this case was adapted from a US pharmacist CPD case study.²⁶ Lastly, participants were asked about their views on NCD CPD.

Each FGD was run face-to-face for approximately 90 min in the Indonesian language and was jointly facilitated by Indonesian research team members (BM, YS, RA). A non-Indonesian researcher (CS) participated via simultaneous bi-directional translation by BM. The four FGDs were run in the sequence of rural, peri-urban, urban 1 and urban 2 across four days to avoid facilitators' fatigue. Participants provided written informed consent. Member-checking²⁷ was conducted at the end of each FGD by presenting the researchers' notes to each group for correction and confirmation. The audio recordings were transcribed verbatim by Indonesian researchers (YS, RA, LT). Participants' identities and other identifying information were removed during the transcription process prior to data analysis. Themes were identified from content analysis of the transcripts in the Indonesian language by Indonesian-speaking researchers (BM, YS, RA, LT). A joint coding tree was developed after the four researchers independently coded one transcript and discussed initial codes to reach a consensus. Each of the remaining transcripts was analysed by a minimum of two of the four researchers and then jointly discussed to identify themes. The themes and illustrative quotes were translated to English by BM for discussion with the whole research team until a consensus was reached.

2.3. Consensus-building

Invitations to the consensus-building meeting were sent by a project administrative staff to the Heads of three main pharmacist CPD stakeholders in Kalsel through their respective Secretariat: the Kalsel IAI, the Kalsel Provincial Health Department, and the Faculty of Pharmacy of Lambung Mangkurat University. Participation in the meeting was voluntary. Participants provided written informed consent and received two professional credit points for their contribution. The meeting was structured as a face-to-face modified Nominal Group Technique (NGT)²⁸ which ran for 2 h. First, research team members (BM, YS, RA, and CS through simultaneous translation) presented the preliminary descriptive findings from the survey which were triangulated with FGD data. Participants were invited to ask clarification questions and share their impression of these preliminary findings. Participants were then asked to answer the NGT question: "What can be done by Kalsel IAI, Kalsel Health Department, and pharmacy educational institution to address the Kalsel pharmacists' CPD needs in managing NCD?" This NGT question was answered by each participant in turns according to the NGT protocol.²⁸ Participants' suggestions were listed on a board. In the next step, rather than rank-ordering the suggestions as in the conventional NGT,²⁸ participants were asked to categorise the suggested actions based on their importance and urgency using an Eisenhower Matrix (<https://www.eisenhower.me/eisenhower-matrix/>). The two-dimensional nature of the Eisenhower Matrix was deemed more suitable than the one-dimensional ranking of the conventional NGT for the purpose of prioritisation. Items were then scored as follows: Each categorisation as "urgent and important" was given a score of 3; "not urgent but important" = 2; "urgent but not important" = 1; and "not urgent and not important" = 0. The scores were tallied to create a priority action list. In the final step all participants discussed which Kalsel pharmacy groups would be most appropriate to take carriage of the suggested actions. Data from the consensus building process are reported descriptively.

3. Findings

3.1. Quantitative survey

A response rate of 51% (249/490) was obtained, with 71% of participants (178/249) completing all questions. The majority of participants were female (129/178, 72%) and the median age was 29 years (interquartile range [IQR] 26, 33 years) (Table 1). Most participants were relatively early in their career with a median of five years' experience (IQR 2, 9 years) and holding the position of the primary pharmacist in community pharmacies (114/178, 64%). The majority of participants lived within <100 km of the provincial capital (105/177, 59.3%).

The main motivation to attend CPD was networking with colleagues (130/378, 34%) and to gain greater understanding of the CPD topic (116/378, 31%). The main barriers to attending CPD were work commitments (118/477, 25%), and the CPD venue being too far (104/477, 22%). No participant expressed disagreement with the idea of using social media for CPD and only 17% (30/178) disagreed that CPD should be compulsory. Almost two-thirds of participants (113/177, 64%) preferred explicitly interactive CPD formats.

Multicollinearity was found between age and work experience, ruling them out for further analysis. Among nine variables included in the logistic regression, the final model only retained one explanatory variable which was years from graduation. For every additional year from graduation, there were 0.94 adjusted lower odds of preferring an explicitly interactive CPD format ($p = 0.036$; 95%CI for adjusted OR 0.89–0.99; Chi-square = 4.37; pseudo R^2 0.0189; Fig. 1).

Table 1
Descriptive analysis of survey data (n = 178).

Characteristics	Categories	Number of responses	%	Number of respondents who answered the question	
Gender	Female	129	72.5	178	
	Male	49	27.5		
Age, median (lower quartile/LQ, upper quartile/UQ))		29 (26, 33)		178	
Years from graduation, median (LQ, UQ)		5 (2, 9)		178	
Work experience in months, median (LQ, UQ)		50.5 (19, 95)		178	
Position in pharmacy workplace	First pharmacist	114	64.0	157	
	Second pharmacist	18	10.1		
	Others	25	25.8		
	Academic	21	25.0		84
	Distribution	14	16.7		
	Hospital	17	20.2		
	Community health centre	13	15.6		
Department of Health		8	9.5	11	
	Other or unspecified		13.1		
Working hours per day, mean (SD)		7.2 (3.1)		174	
Places of work, total location	0	1	0.6	174	
	1	125	70.2		
	2	50	28.1		
	3	2	1.1		
Distance from capital city	<100 km	105	59.3	177	
	100–150 km	27	15.3		
	>150 km	45	25.4		
Monthly average CPD in past year, median (LQ, UQ)		1 (1, 1)		175	
CPD documentation preference*	Not attend	9	2.6	178	
	Not document	13	3.7		
	Note details	21	6.0		
	Keep certificate	149	42.3		
	Keep handout	75	21.3		
	Keep PPT file	51	14.5		
	Photograph slides	31	8.8		
	Others	3	0.9		
	Networking with colleagues	130	34.4		178
	Don't know much about the topic	116	30.7		
Already know much about the topic	6	1.6			
Motivation to attend CPD*	Good local speakers	38	10.1	177	
	Good external speakers	67	17.7		
	Love the food	3	0.8		
	Others	18	4.8		
	Fully booked	11	2.3		177
	Family commitments	75	15.7		
	Work commitments	118	24.7		
	Poor local speakers	2	0.4		
	Too tired	20	4.2		
	Not interested in topic	36	7.5		
Bad timing	99	20.8			
Too far	104	21.8			
Poor external speakers	3	0.6			
Others	9	1.9			
Use of social media for CPD	Strongly disagree	0	0.0	178	
	Disagree	0	0.0		
	Neutral	7	3.9		
	Agree	97	54.5		
	Strongly agree	74	41.6		
CPD should be made compulsory	Strongly disagree	1	0.6	178	
	Disagree	29	16.3		
	Neutral	39	21.9		
	Agree	84	47.2		
	Strongly agree	25	14.0		
CPD format preference	Explicitly interactive†	113	63.8	177	
	Non-explicitly interactive‡	64	36.2		

* Respondents can choose more than one option.

† Explicitly interactive CPD formats included seminars (defined as 'a lecture with audience interaction'), a case study with peers, and learning from peers (mentoring, discussion and meeting).

‡ Non-explicitly interactive formats included postgraduate education, reading journal articles, a scientific congress, short course (1–2 days), class or lecture, internet materials, webinar, DVD or CD materials, textbook, literature from drug or health device manufacturers, a scientific workshop, peer-reviewing for an academic journal and internship.

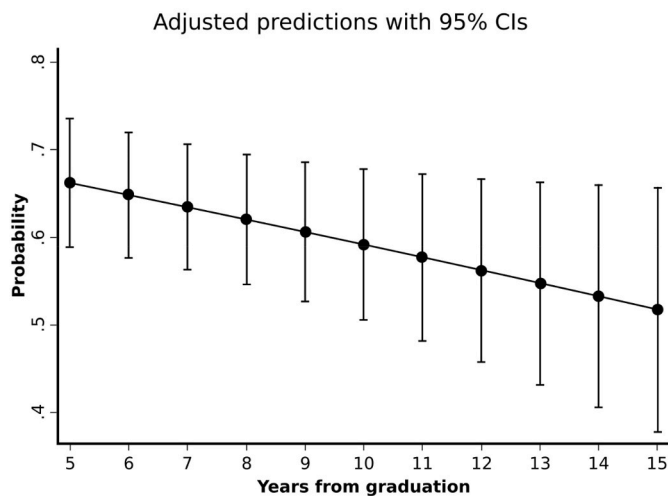


Fig. 1. Adjusted prediction of choosing explicitly interactive CPD based on the number of years post-graduation.

Table 2
Characteristics of FGD participants.

Characteristics	FGD1	FGD 2	FGD 3	FGD 4	Total
Setting	Rural	Peri-urban	Urban-1	Urban-2	
Number of participants	11	7	5	6	29
Gender:					
Female	7	1	2	4	14
Male	4	6	3	2	15
Work setting*:					
Community pharmacy	3	4	4	2	13
Hospital pharmacy	8	1	2	0	11
Community Health Centre	1	2	1	5	9
Government	1	0	0	0	1
Pharmaceutical Depot					
Academia	1	2	2	1	6

* Respondents can choose more than one option.

3.2. Focus group discussions

Four FGD sessions were run: one each in rural and peri-urban districts and two in an urban district. Each FGD was attended by 5–11 participants totalling 29 pharmacists (Table 2). Participants worked in community pharmacies, hospitals, community health centres, and educational institutions. Several participants held multiple positions.

FGD findings are reported below under three themes: Challenges in managing NCD; Strengths and gaps in pharmacists' NCD knowledge; and Preferences for NCD CPD. Participants are coded using pseudo-initials and actual work setting (urban/peri-urban/rural).

3.3. Theme 1: Challenges in managing NCD

3.3.1. 1a: NCD risk factors

Participants' accounts on the increasing number of NCD cases they saw in their practice confirmed the growing problem of NCD in Kalsel, notably cardiovascular disease and diabetes mellitus. One participant reported identifying 280 cases of hypercholesterolemia among 325 hajj pilgrims [RO/urban]. **Dietary factors** were the most often cited risk factor since many local traditional foods were high in saturated fat, salt, and sugar. Three examples were reported by participants as often being consumed locally including by NCD patients with cardiovascular diseases and/or diabetes mellitus: *ketupat Kandangan*, a traditional dish of rice cake and fish in thick coconut cream [RO/urban]; sweetened tea and *bingka* (a traditional sweet snack) [RE/peri-urban]; and salted fish [NA/peri-urban]. Local beliefs such as 'We haven't had breakfast until

we eat *ketupat Kandangan*' [RO/urban] added to the complexity of NCD prevention and management.

Lack of patients' knowledge further compounded NCD risk factors. Lack of NCD knowledge among patients was widely reported, as reflected by questionable self-diagnosis and self-medication.

"[A patient] came to the pharmacy asking for captopril, although they didn't know what their blood pressure was. When I asked, they said they got [captopril] from their neighbour, who told them to buy it." [BR/rural]

Even patients with long-standing NCD may not fully understand how to manage their condition. Another participant reported a case of polypharmacy:

"[During a home visit] I asked 'May I please look at all the drugs you have here? Be it hypertension or diabetes mellitus drugs, or other drugs you have been taking?' I was given one full box. I asked 'Where did you get these drugs?' Clearly and proudly the patient explained 'These are from my daughter, one plastic bag; these are from the doctor, one plastic bag; and these are from the community health centre, one plastic bag.' So I asked him 'Did you know that these drugs are the same? How do you take these drugs?' 'I take them all at once.' 'Do you have any complaint when taking all these drugs together?' 'Yes, my heart is racing.' I found in the box: [generic] spironolactone, Letonal [branded spironolactone], furosemide, and hydrochlorothiazide." [RA/urban]

3.3.2. 1b: Challenges to pharmacists' role

Participants acknowledged that not all pharmacists were keen to provide **patient education** to improve patient knowledge. Some community pharmacies did not prioritise patient education because it was time-consuming and not considered revenue-generating [RE/peri-urban]. Rural participants reported a shortage of pharmacists; but even in better-resourced peri-urban and urban areas, heavy patient load limited their ability to provide patient education [RA/urban; RE/peri-urban]. A participant also lamented the futility of patient education when patients could not afford to purchase medications or had no access to continuity of care [FA/urban].

The contested role of pharmacists was identified as another hindrance to NCD management. Pharmacists had an integral role in several national NCD prevention and management programmes such as *Prolanis* (*Program Pengelolaan Penyakit Kronis* = Chronic Diseases Management Programme), *Gema Cermat* (*Gerakan Masyarakat Cerdas Menggunakan Obat* = Community Movement for the Smart Use of Medications), *Dag-usibu* (*Dapatkan, Gunakan, Simpan, dan Buang* = Obtain, Use, Store, and Discard [medications]), *Nusantara Sehat* [= Healthy Indonesia, a national primary health care strengthening programme], and *PIS-PK* [*Program Indonesia Sehat dengan Pendekatan Keluarga* = Healthy Indonesia Programme using the Family Approach, a door-to-door survey and health examination]. However, this role of pharmacists was dismissed or supplanted by other health professionals:

"I think as far as policy makers are concerned, pharmacists are not seen to have significant added value [to the programmes]. I mean, anybody can provide medications, so when a service programme is designed, involving doctors and nurses would suffice to run the programme, and we are left behind. Because [the policy makers] think anybody can deliver drug services and explain how to use drugs, and this conception remains among policy makers to date. Pharmaceutical care is actually within our areas of competency, but sometimes other health professionals think that they can also deliver it." [RA/urban]

Challenges to the pharmacists' role were also reported from patients. Many patients still perceived dispensing as the only role of pharmacists, and they were confused or disinterested when pharmacists tried to provide education [RA/urban]. Other patients dismissed education

effort by pharmacists since “[patients] assume that they have known [everything]. So when we try to provide additional counselling, they see it as boring.” [ER/peri-urban].

Some participants admitted **lacking self-confidence** in patient education due to perceived gaps in their pre-registration education. Examples of such gaps included the pharmacists’ lack of general NCD knowledge [multiple participants], management of co-morbidities [TO/rural], interpretation of pathology results [LU/urban], and communication skills [ER/urban].

3.3.3. 1c: Practice context

Participants reported different challenges for NCD management between community pharmacies which were mostly separated from the doctor’s surgery, and hospitals or community health centres where doctors and pharmacists were co-located. In the case study discussion of the patient with ACE inhibitor-induced cough, a participant compared the two contexts:

“The context of this scenario is quite difficult in community pharmacies, because patients may think if they have to go back to the doctor that means they have to pay again. Whereas in a community health centre, we could facilitate [the return consultation], we could take the patient back to the doctor.” [RA/urban]

Participants also reported that many NCD patients went to community pharmacies with prescription copies which often did not contain the prescriber’s contact details, which prevented pharmacists from contacting the prescriber if they had concerns. Community pharmacists could only advise patients to return to the doctor, which patients may refuse due to the possible out-of-pocket and non-financial costs such as time. Some community pharmacists also expressed doubt whether their suggestion for treatment review would be taken collegially by doctors. Hospital and community health centre pharmacists reported a much closer work relationship with their doctors where they could take patients directly back to the doctor and have a three-way discussion to review the treatment.

3.4. Theme 2: Strengths and gaps in pharmacists’ NCD knowledge

Discussion of the two case studies revealed a range of participants’ NCD knowledge levels with **knowledge gaps across multiple aspects**. Most participants were able to correctly identify the pharmacology of the drugs involved and the pharmaceutical management of the clinical problems. Participants also correctly identified appropriate patient education components including advice for physical activities and dietary control for diabetes mellitus.

In the case of ACE Inhibitor-induced cough, most participants correctly identified the pathophysiology and the need to review the anti-hypertensive treatment. However, participants differed in what they would do for management of the cough. Some participants suggested exploring the possible causes of the cough through establishing a timeline in relation to captopril treatment (MA/urban) and excluding other causes such as allergies to pets or house dust (PO/urban). Some correctly stated that the mucolytic was unnecessary because the cough would cease once the ACE-inhibitor was substituted; yet, others suggested the use of an antitussive or expectorant to manage the cough. Participants who suggested the use of an antitussive or expectorant were primarily concerned with symptomatic relief for the patient, including what they believed the patient would want, rather than the underlying pathophysiology of the iatrogenic cough:

“In community health centres, the patients are mainly from middle and low [socio-economic class] and therefore if they have symptoms regardless of the underlying condition they insist on getting what they want. [They] must get some medication. [...] For example, for elderly women [like in this case study] their favourite [cough medication] in our community health centre is OBH [an

expectorant]. So if she could get OBH she would be happy, and hopefully that happiness could increase her immune system [all participants laughed] ... Or we could just give her vitamin B complex, that would be okay, too.” [AR/urban]

In the diabetes mellitus case discussions, most participants correctly identified key issues with the patient such as poor kidney function as a contraindication for metformin. Although only a few participants identified the significance of an elevated HbA1c level without prompting, discussions around HbA1c and random blood glucose levels demonstrated participants’ understanding of diabetes mellitus management in the case study.

3.5. Theme 3: Preferences for NCD CPD

All participants confirmed the need for NCD-focused CPD for Kalsel pharmacists. They discussed barriers to attending CPD and offered a wide range of suggestions.

3.5.1. 3a. The need for NCD CPD

Several participants expressed their wish to have regular NCD CPD similar to CPD provided to the medical profession in order to increase their knowledge level to be on par with doctors. They believed such CPD would facilitate a more collegial relationship. Several participants pointed out superior CPD systems for doctors which they aspired to have. Some participants reported their avoidance of discussing cases with doctors, such as during inter-professional hospital ward rounds, for fear of displaying a lack of knowledge which they would find embarrassing [AM/rural; BR/rural; RI/peri-urban]. Three urban participants discussed the importance of keeping on par with doctors:

GU: I think this has more to do with updates ... In the past drug A was allowed, not anymore. There is this interaction, that interaction.

LU: The thing is, doctors know this first. So, when we receive a prescription, [we think] ‘Why is this patient given this drug, isn’t it forbidden?’ But what we thought to be forbidden as it turned out was already allowed. Those kinds of updates.

RA: So, we are lagging in information.

GU: If we are lagging, we will end up being laughed at.

3.5.2. 3b: CPD content

Participants agreed on the importance of tailoring CPD content and format to the **three main practice domains** of Indonesian pharmacists: clinical pharmacists (in hospitals, community health centres, and community pharmacies); industry pharmacists; and distribution pharmacists. Certain CPD topics would benefit from deeper discussion with a more focused group; for example, CPD on cytotoxic medications would be mainly relevant for hospital pharmacists because community pharmacies did not commonly distribute them. A few community pharmacists indicated their need for seminars about business development strategies, which may not be relevant for the community health centres which are a part of the public healthcare system [GU/urban]. Other topics such as hypertension may be delivered as a seminar to all pharmacists, followed by separate group discussions for clinical, industry, and distribution pharmacists to explore setting-specific issues [IK/peri-urban].

3.5.3. 3c: CPD format

Most participants stated that didactic seminars with a large audience, which is the common CPD format provided to them, had limited effectiveness. Didactic events prompted participants to “Come, pay, go home” [JU/urban]. Participants unanimously expressed a desire for **case discussions in small groups** – preferably based on practice settings – to apply the theoretical knowledge from seminars to day-to-day practice. Several participants suggested the FGD used for this research

project, with its two case studies, as an ideal model for NCD CPD.

A few participants suggested a **coaching** format where a combination of seminar and case discussion is followed by field practice with regular discussion with and feedback from experts. A few participants, supported by the majority, raised the need for a **systematic NCD CPD curriculum** and to move away from one-off sessions with seemingly random and unrelated topics. Participants suggested CPD events to focus on a disease for a period of time, where the disease would be discussed from various angles involving multiple health professions, interspersed by practice training to improve clinical skills related to its management.

3.5.4. 3d: Resource persons

Participants believed that the ideal speakers for NCD CPD would be **practice experts** who could discuss day-to-day practice instead of, or in addition to, academics who were perceived as theoretical experts. Speakers should understand the practical needs of the audience – such as what to do in patient care – and pitch their presentations accordingly, rather than focusing too much on theories [ER/urban; IK/peri-urban]. External speakers from the most developed island of Java were appreciated; however, as these guest speakers may not have the contextual knowledge of local situations, **local experts** must also be included. One participant suggested having **policy makers** as speakers so that they could discuss the challenges faced by frontline pharmacists and take them into account in future policy-making [IK/peri-urban].

Many participants suggested an **interprofessional learning approach** for NCD CPD, noting the complex nature of NCD clinical care. Participants suggested involving medical, nursing, midwifery, pathology and allied health professionals as both speakers and participants in NCD CPD, in a combination of uni-professional and multi-professional lectures and discussions [LU/urban; JU/urban; HA/peri-urban].

3.5.5. 3e: NCD CPD barriers

Participants identified **time** as the biggest barrier for undertaking CPD. Some participants worked six days a week and struggled to find a cover for their clinical duties when attending CPD [LU/urban]. Participants also lamented the difficulties in obtaining **permission** to attend CPD. Unlike doctors, many pharmacists could not claim work time for CPD; some managers considered CPD as personal (not professional) development and thus required pharmacists to take personal leave to attend CPD. This time barrier was more prominent for rural pharmacists because most CPD events were held in the provincial capital which required them to add travel time and possible overnight accommodation.

Participants reported that some CPD activities **were not recognised** in the national professional re-certification guidelines, such as reading journal articles and case discussions with peers via social media, and thus could not be used as evidence to obtain professional credit points. Some CPD activities were also not recognised for job promotion in the public sector:

“For us in community health centres, for scientific updates we can use [online methods], but for the purpose of acknowledgment for us the format needs to be a training. So for only updating science for knowledge we don’t mind using social media, but for a valid certificate we look for training, not seminar. In public institutions, the organising institution [for CPD] must be accredited [to be acknowledged] as scoring points for human resources for health, for competitions, or for job promotion.” [AR/urban]

The time and permission barriers to undertake recognised CPD activities led some pharmacists to become “professional credit point hunters” using **illegitimate means**, as reported in all FGDs. Some pharmacists were reported to “consign” CPD certificates by paying for CPD events but not attending it, and then asking a colleague who attended to collect the certificates for them [HA/peri-urban]. This practice was reported to be more prominent among the more geographically- and time-constrained rural pharmacists [JU/urban].

However, participants also acknowledged that once the required professional credit points for re-certification were obtained, they tended to be more selective in attending CPD based on their view of the topic’s relevance to their daily work [ER/peri-urban].

3.5.6. 3f: Suggestions for improvement

Participants suggested that the **focus of CPD recognition** should be on evidencing learning, rather than attendance. For example, rather than relying on certificates of attendance, pharmacists should be required to submit written summaries of their learning for re-certification [peri-urban group]. Some participants suggested **examinations** such as the Objective Structured Clinical/Practical Examinations (OSCE/OSPE) as the sole pathway to re-certification. However, other participants were quick to point out that OSCE/OSPE were not suitable for industry and distribution pharmacists whose work domain did not include direct patient care. A few urban and peri-urban participants suggested **formal recognition** upon completion of a series of CPD, from a micro-credentialing model to status as a specialist pharmacist, akin to specialities for doctors and nurses.

Some suggestions were proposed to overcome the difficulties of rural pharmacists in attending CPD events which were mainly held in the provincial capital. Kalsel IAI could capitalise on the existing **social media networks**, mainly via WhatsApp and Telegram mobile applications. The national *Gema Cermat* programme, for example, had an extensive Telegram group with over 3000 members nationally including Indonesian diaspora overseas. Although these networks were used in Kalsel, participation levels varied and was sometimes limited to the same people. Not all pharmacists had the technical skills to make full use of the applications’ functionalities such as for videoconferencing [JU/urban]. Others were reluctant to join social media discussions, particularly if they had to scroll through a high number of posts at the end of a long working day [TI/rural; RA/urban].

Participants also discussed the possibilities for **web-based online learning**. Interactive, small group videoconference was suggested by rural participants; however, some rural and peri-urban areas have unreliable internet access which only supported text discussions and not live streaming. Meanwhile, accessing online literature was not a popular CPD method:

“For pharmacists who, pardon me, those who only think about revenue, they will think ‘What is this clinical article for? It is not that important because all I’m looking for is revenue.’ [...] Those of us who are academics find journal articles interesting, but not for others.” [JU/urban]

A few rural and urban participants suggested a **peer training scheme** for rural pharmacists which could be established following a **train-the-trainer programme**. However, lack of confidence was identified as a demotivating factor by an urban group:

“We as pharmacists ... since undergraduate years our tagline is ‘I am afraid of making a mistake’.” [JU/urban].

A few participants suggested **inter-professional learning at university** as one method to build self-confidence for future pharmacists.

Table 3
Characteristics of consensus building participants (n = 11).

Characteristics	Number
Gender:	
Female	5
Male	6
Work setting:	
Community pharmacy	3
Hospital pharmacy	8
Community Health Centre	1
Government Pharmaceutical Depot	1
Academic staff	1

Table 4
Consensus on priority actions to improve NCD CPD for Kalsel pharmacists.

Action item	Score	Responsibility
A. Surveying suggestions for CPD content	24	IAI, Faculty
B. Develop a CPD curriculum	24	IAI, Faculty
C. Develop practice setting-specific CPD	18	IAI, special interest groups, Health Department, hospitals, community health centres, community pharmacies
D. Advocate for a review of NCD-related policies	18	IAI
E. Start online discussions in social media	17	IYPG, Apoteker AoC
F. Certification of specialist skills	17	IAI, BNSP, Faculty
G. Establish a community of practice	17	IAI, special interest groups
H. Conduct webinars	16	IYPG, Faculty
I. Post-CPD coaching	14	IAI
J. Invite other professions in pharmacist CPD	14	Special interest groups
K. Collaborate with hospitals in CPD	12	Special interest groups
L. Establish an internship programme with inter-professional component	11	IAI
M. Develop a series of workshops	10	–removed from priority list–
N. Training of trainers to deliver NCD CPD	10	–removed from priority list–

Notes: IAI = *Ikatan Apoteker Indonesia*/Indonesian Pharmacist Association; Faculty = Faculty of Pharmacy, Lambung Mangkurat University; IYPG = Indonesian Young Pharmacists Group; Apoteker AoC = Pharmacist as Agents of Change; BNSP = *Badan Nasional Sertifikasi Profesi*/National Agency for Professional Certification.

Another suggestion to improve CPD accessibility for rural pharmacists was to establish **regional CPD centres** at district capitals and their hospitals. Invited speakers could deliver face-to-face sessions at these centres, while district hospitals may provide training sessions as part of the proposed peer training, micro-credentialing and specialisation schemes.

Lastly, a few participants suggested the establishment of communities of practice (CoP) to provide peer support as an adjunct to NCD CPD. The CoP idea was based on the existing special interest groups within the Kalsel Pharmacist Association and pharmacists groups such as the Indonesian Young Pharmacists Group (IYPG), a national network of new generation of leaders in pharmacy under IAI National²⁹ and 'Apoteker (= Pharmacist) Agents of Change' (AoC) which was an integral part of the national programme *GeMa CerMat* (*Gerakan Masyarakat Cerdas Menggunakan Obat* = Community Movement for the Smart Use of Medications).³⁰ The proponents of CoP expressed their hope that the COP would help maintaining the interest in professional development in between and beyond NCD CPD events.

3.6. Consensus building

The consensus building meeting was attended by 11 participants representing all invited stakeholder groups (Kalsel IAI, Kalsel Provincial Health Department, and the Faculty of Pharmacy of Lambung Mangkurat University). Most of the participants listed hospital pharmacy as their primary work setting (Table 3) but they reported during the discussion to work in additional settings, just as the survey and FGD participants.

Fourteen actions were suggested by participants. The consensus building process identified "Surveying suggestions for CPD content" and "Develop a CPD curriculum" as the top priority actions (Table 4). The two lowest scoring actions "Develop a series of workshops" and "Training of trainers to deliver NCD CPD" were removed by participants from the priority list. The IAI was appointed to take carriage of 75% (8/

12) of the prioritised actions.

4. Discussion

Our study findings clearly identify both a need and a desire for a tailored CPD programme to develop the pharmacy workforce for management of NCD in Kalsel, Indonesia. To the best of our knowledge this study is the first Indonesian pharmacist-specific CPD needs assessment that a) employed a mixed-method strategy and b) a co-design approach.

The International Pharmaceutical Federation (FIP) stated in 2002³¹ that pharmacists are required to demonstrate a commitment to CPD. The FIP also states that national pharmaceutical associations in co-operation, where appropriate, with schools and faculties of pharmacy and other education providers have a responsibility to facilitate CPD, and that regulatory bodies for pharmacists should put a system in place that assures the public that pharmacists maintain competency throughout their career. The findings of a 2014 international survey²² suggest that half of the 66 countries represented have implemented or partly implanted the 2002 FIP recommendations. A systematic review of the literature up until 2014³² identified that CPD or a process of life-long learning that incorporates individualised planning, learning and reflection results in superior outcomes than continuing education without these elements. However, there is a great deal of variation in how CPD is conducted between countries and individual pharmacist preferences. It is important to consider that although CPD requirements may be global, CPD preferences and even specific learning needs are *contextual*. Thus, the findings of this study are pertinent to the local practice setting. This approach is supported by other researchers of pharmacist CPD in low- and middle-income countries.³³

The need for Indonesian pharmacist CPD for NCD is supported by contemporary research in the area. Pharmacy service in Indonesia has shifted toward patient-oriented pharmacy care¹⁰ and mandatory CPD requirements for Indonesian pharmacists have been in place since 2010.^{5,12,34} Despite these developments, our findings corroborate a previous qualitative study that found Indonesian pharmacists perceive themselves as having inadequate knowledge and skills for the management of chronic NCD.² Hermansyah et al.⁶ confirm our findings that apart from knowledge, confidence, interprofessional collaboration and communication skill are some of the common challenges for Indonesian pharmacists.

Our findings suggest that Kalsel pharmacists had reasonable pharmacological knowledge but would benefit from further education in pathophysiology. However, knowledge improvement was of lower need than skill acquisition. Pharmacists identified the need for CPD that would facilitate efficient and effective patient education for NCD. Such skill would include how to educate patients in the context of an environment that facilitates misinformation. Additionally, pharmacists identified health inequity concerns with respect to the management of NCD in Kalsel, as well as the challenges that pharmacists face as a profession in being able to effectively contribute. A potential area for CPD is that of advocacy, both for the patient i.e. health advocacy,³⁵ and the profession itself.³⁶

It was apparent that the preferred type of CPD of activity was explicitly interactive. This finding, coupled with the finding that main reason for participating in CPD is to network with colleagues and how to overcome the challenges of performed pharmaceutical care within the current healthcare system, provides a clear direction for the design of a future CPD curriculum in Kalsel. It is recommended that small group CPD activities are designed that are easily accessible and allow for collaborative inquiry. A community of practice model may be a useful approach to the design of the overall CPD strategy. Specific use of 'learning circles'^{37–39} may foster a learning culture and facilitate change. This approach may be supplemented in a hybrid fashion with online or blended learning large-scale activities, such as a Community of Inquiry model.⁴⁰ Such model may accommodate both the geographic challenge (through online components) and Kalsel pharmacists' desire for

explicitly interactive discussion (through face-to-face gathering). A blended learning design might also accommodate the different learning mode preferences between the more experienced pharmacists and the more recent graduates.

The International Pharmaceutical Federation (FIP) has recognised the importance of CPD in advancing the pharmacy workforce to optimise their role in primary health care, including the management of NCD.⁴¹ The findings of our study indicate that the participants not only recognised the need for knowledge and skill acquisition for patient care; they also recognised the importance of working in a collaborative manner. A recent country-wide workforce needs assessment of the Indonesian pharmacy workforce noted that respondents considered interprofessional education as a critical component of university education to develop the Indonesian pharmacist workforce.⁴² Our findings align and extend this work by identifying Indonesian pharmacists' desire for interprofessional CPD as part of post-registration education.

The final stage of this study was the co-production of consensus priority actions with key stakeholders. Importantly, stakeholder representatives identified parties responsible for the conduct of each action and the need to employ a multi-level systems-based approach to effectively deliver CPD to the Indonesian pharmacy workforce. A co-production process not only increases stakeholder engagement and promotes sustainability of actions, it has been reported to lead to increased utilisation of the knowledge produced.⁴³

A key strength of this study is the use of a mixed method approach to identify the NCD CPD needs and preferences of pharmacists i.e. the service users. The quantitative survey obtained a response rate of over 50% of the population of interest, thereby providing a largely representative sample. Triangulation of the data with follow-up focus groups provides confidence that the findings are credible. The main limitation of this study is its single-province population which was deemed reasonable for a pilot project. Although the sample is representative of the population of interest, it is unclear whether the findings are generalisable to other settings in Indonesia and similar countries. That said, commonality of findings with the wider literature suggest that they are.

5. Conclusion

In conclusion, this study has identified the type of professional development suitable for pharmacist workforce development for NCD care by pharmacists in the Kalimantan Selatan province of Indonesia. The key need to design a community of inquiry-based CPD curriculum manifested. It is also important for a multi-stakeholder systems-based approach to CPD programme development to be conducted. These findings, co-produced with identified stakeholders across the pharmacy sector, allow for informed decisions with regard to pharmacy workforce education and development.

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Conflicts of interest

The authors declare there was no conflict of interest in this research project.

Authors' statement

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Declaration of competing interest

None.

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