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A pilot study of cadre training to promote responsible self-medication in Indonesia: Which is better specific or general modules?

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Abstract

In 2015, the Indonesian Government initiated 'Smart Use of Medications Movement' ('GeMa CerMat') which included cadre training to promote responsible self-medication. Evaluation of a pilot training conducted across Indonesia suggested the need to improve those training modules. This study aimed to assess cadre' knowledge gained following training with newly developed general or specific training modules. Five types of modules were developed and used to train cadres at five Community Health Centres (CHCs) in Surabaya, Indonesia: 1) Sidosermo CHC (general-drugs module), 2) Tenggilis CHC (common cold drugs module), 3) Gunung Anyar CHC (analgesic drugs module), 4) Kalirungkut CHC (anti-diarrhoeal drugs module), and 5) Jagir CHC (indigestion drugs module). Cadres' knowledge improvements were evaluated using pre-/post-test scores and the difference scores depending on the module being tested. Multifactorial ANOVA explored the effects of the type of module on difference scores. A total of 279 cadres across five CHCs were involved in the training, giving response rates from 65% to 93%. There was an increase in the post-test scores after the training with all modules. However, significant differences were reported only for the specific-drugs module groups (all $p < .001$). Furthermore, the general module group had the lowest difference score (1.12; 95% CI [−0.45, 2.92]) while the common cold module group had the highest gain (5.02; 95% CI [1.95, 5.17]). Multifactorial ANOVA revealed that there was a significant main effect of the type of modules on difference scores [F (4, 263) = 8.37, p <.001]. In conclusion, this preliminary study indicated that the development of modules for specific minor illnesses could be beneficial in facilitating effective community-based training to promote responsible self-medication in Indonesia. The priority for therapeutic areas chosen for the module should be based on the local needs. Further research is required to confirm the findings in broader community members.

KEYWORDS

cadre training, Indonesia, module, self medication

1 | INTRODUCTION

Indonesia is the world's largest archipelagic country with a current population of around 260 million (Statistics Indonesia, 2018). This large population presents challenges for access to healthcare in light of the limited health resources, as well as the increasing burden of non-communicable diseases in Indonesia (Republic of Indonesia (RoI) 2012; World Health Organisation, 2011). Hence, it is a priority of the Indonesian Government to improve the quality of life among Indonesians through a 'Healthy Indonesia' program. The program included three key components: 1) promoting a healthy living paradigm, 2) strengthening health services/facilities, and 3) implementing national health coverage (*Jaminan Kesehatan Nasional* - JKN) to provide basic healthcare to all Indonesians. Strategies to promote a healthy living paradigm include health promotion, disease prevention/control, as well as community empowerment (MoH-RI, 2016).

In 2015, the Indonesian Government initiated a national health program, 'Smart Use of Medications Movement' (*Gerakan Masyarakat Cerdas Menggunakan Obat* – 'GeMa CerMat') aiming to empower the Indonesian community to practice responsible self-medication (Directorate General of Pharmaceutical and Medical Devices MoH-RI, 2015). The World Health Organisation (WHO) defines self-medication as "the selection and use of medicines by individuals to treat self-recognised illnesses or symptoms" (WHO, 1998); it generally includes recognising or self-diagnosing symptoms or sickness, selecting medicines, administering medicines, and monitoring the outcomes (Holt & Hall, 1990). A population survey in Indonesia reported that 90.5% of Indonesians had practiced self-medication, indicating that self-medication has a pivotal role as the first action taken by Indonesians in their healthcare (Statistics Indonesia, 2014). Hence, promoting responsible self-medication through 'GeMa CerMat' is expected to move the Indonesian community towards greater independence to treat their minor ailments, thus optimising the use of health resources for minor ailments.

The initial step of 'GeMa CerMat' was to improve community knowledge on medication through community training with health professionals as trainers. Pharmacists – with their expertise in medications – are expected to be actively involved as trainers in the training (MoH-RI, 2015). Studies worldwide have reported the role of pharmacists in facilitating community members when purchasing non-prescription medications through pharmacies (Brata, Gudka, Schneider, & Clifford, 2014; Piecuch & Kozlowska-Wojciechowska, 2013; Rutter, 2015; Schneider et al., 2011; Suleiman, 2013). However, little is reported regarding pharmacists' proactive role in community education and empowerment to encourage responsible self-medication. Prior studies in Indonesia reported that the involvement of pharmacists in community-based interactive training improved knowledge and attitude of patients with diabetes and tuberculosis (Hartayu, Izham, & Suryawati, 2012; Susantini, 2006); the approach was then adopted to conceptualise community training in promoting responsible self-medication as part of the 'GeMa CerMat' program (MoH-RI, 2015).

What is known about the topic

- Studies worldwide have reported self-medication practices as well as pharmacists' role in facilitating/counselling community members when purchasing non-prescription medications through pharmacies.
- Prior studies in Indonesia reported the potential role of pharmacists in training to improve knowledge and attitude towards adherence among patients with chronic diseases.

What this paper adds

- Training by pharmacists has the potential to improve Over-the-Counter (OTC) medicines literacy among Indonesian cadres in order to promote community-based responsible self-medication.
- Modules focusing on drugs for specific minor illnesses facilitate better learning outcomes than general modules; the priority for therapeutic areas chosen for the modules should be based on the local needs and characteristics of the local communities.

In 2016, a 'GeMa CerMat' pilot training program was carried out across Indonesia. The training focused on cadres, i.e., local community members who were trained to assist with health activities organised by Community Health Centres (CHCs), to prepare them as 'change agent'. A module was developed to guide the training; the module consisted of three activities: 1) medication classification, 2) information on the medication label/package (i.e., drug name and active ingredient, indication, directions for use, adverse effects and storage), and 3) other information (i.e., special dosage forms and disposal) (Setiadi et al., 2017). The pilot training was then evaluated using focus group discussions with the pharmacist/pharmacy staff trainers. Some of the key findings from the discussions were the need to revise the current education modules in terms of its content and structure as well as the need to focus on the specific community needs (Setiadi et al., 2019). This present pilot study aimed to assess cadres' knowledge gained after training with newly developed general as well as disease specific training modules.

2 | METHODS

The data collection instrument and methodology used in this study were approved by the Ethics Committee of the Faculty of Medicine, Islamic University of Indonesia (No. 08/Ka.Kom.Et/70/KE/IX/2016).

This pilot study was conducted in Surabaya, the capital city of East Java Province and the second largest city in Indonesia. Surabaya covers 31 districts (*kecamatan*) with a population of approximately 3 million (Surabaya City Health Office, 2016). In 2015, there were 63 Community Health Centres (CHC, *Puskesmas*) in Surabaya,

with a ratio of 0.22 per 1,000 population (Surabaya City Health Office, 2016). A CHC is a functional unit of the regional Health Office; and they are overseen under the Ministry of Health and provide access to primary health services in the district area (MoH-RI, 2014). Five CHCs located near the researchers' office in Universitas Surabaya (southern part of Surabaya) were selected as the pilot research settings: Jagir CHC, Gunung Anyar CHC, Kalirungkut CHC, Tenggilis CHC and Sidosermo CHC. This convenience sampling was used for this pilot study to provide preliminary data on the effectiveness of the new specific modules before conducting a larger study; also, the five CHCs had planned to conduct GeMa CerMat events within the study timeframe.

2.1 | Development of general and specific training modules

Five training modules, including one general-drugs module and four specific-drugs modules ("indigestion drugs", "cough and cold drugs", "diarrhoea drugs" and"analgesics"), were drafted by the research team based on the evaluation feedback on the module used in the previous research (Setiadi et al., 2017, 2019); the four therapeutic areas chosen were among the most common minor illnesses treated in primary health facilities in East Java, Indonesia (Surabaya City Health Office, 2018). This was followed with an expert panel (consisting of four external experts - two pharmacists in the area of pharmacy practice or community pharmacy, and two policy makers) to discuss and finalise the module contents. The final modules included five basic competencies: 1) drug name and active ingredients, 2) drug indication, 3) drug classification, 4) drug directions for use, and 5) other information on medication label/package (adverse effects, expiry date, storage/disposal); differences between modules were based on the examples of drug included in the modules as well as the medication packs that accompanied the modules (Table 1 and Figure 1).

2.2 | Cadres training using general and specific modules

The five modules developed were evaluated in cadres training programs across the five CHCs in Surabaya in October-November 2017; each module was randomly allocated to one CHC: 1) Sidosermo CHC (general-drugs module), 2) Tenggilis CHC (module for common cold drugs), 3) Gunung Anyar CHC (module for analgesic drugs), 4) Kalirungkut CHC (module for anti-diarrhoeal drugs) and 5) Jagir CHC (module for indigestion drugs).

The training initially focused on CHC cadres, i.e., local community members who were trained to assist with health activities organised by the local CHC, as the training was expected to prepare them as 'change agents' for a broader uptake of the 'GeMa CerMat' initiative. At each research setting, lists of CHC cadres were obtained from the pharmacist-in-charge of the related CHC. All of the CHC cadres listed were then invited verbally to participate in the training: Jagir CHC (n = 85), Gunung Anyar CHC (n = 85), CHC Kalirungkut (n = 52), Tenggilis CHC (n = 70), Sidosermo CHC (n = 70). Each setting had different schedules of training. At the beginning of each training session, the researchers introduced the research and asked for participation; written consent was obtained from those willing to participate. Participants were then divided into small groups of approximately 10 people; each group was facilitated by a trainer using the developed modules. In this regard, 10 trainers were recruited from fourth-year pharmacy students in Universitas Surabaya (had completed/attended courses related to 'responding to symptoms' and 'clinical pharmacy'). They were briefed about the training modules and involved in a simulation training in April 2017 (under supervision of the researchers). The same trainers were involved in all settings.

Participants' knowledge of either the general-drugs or specific-drugs modules related to the five basic competencies included in the modules (Table 1) was evaluated using pre-/post-tests conducted just before and just after the training. The tests were developed by an expert panel (AP, YW, SV) and only differed in relation to the drugs used in the questions – which were chosen based on the modules (either general-drugs module; or specific-drug modules for indigestion, cough and cold, diarrhoea, or analgesics). For example, *Question 5: "This [drug name] can be used is to treat [indication]"*. Each test included 15 questions; each question was scored '1' (for wrong answer) '2' (for can't tell) and '3' (for correct answer), thus providing a total score ranging from 15 to 45. Similar tests have been used and validated in other studies (Setiadi et al., 2019). A short questionnaire obtained participant characteristics data were also included with the tests.

Drug Logo	Descriptions
Green	general sale
Blue	general sale with cautionary label
Red	prescription only
Red	narcotics

FIGURE 1 Drug logo descriptions

2.3 | Data analysis

IBM SPSS Statistics version 20.0 (IBM Corp, Armonk, NY, USA) was used for data analysis. Descriptive statistics summarised the participant characteristics across the five CHCs (five modules: general, indigestion, diarrhoea, analgesics, common cold and cough); characteristic differences were then evaluated using Kruskal–Wallis test or chi-square test, as appropriate. Participants' knowledge improvement across the five groups of modules was determined using pre-test and post-test scores (differences between pre-test and post-test

TABLE 1 Summary of the module training program developed

Characteristics	General-drug module	Specific-drug Module (indigestion)	Specific-drug Module (diarrhoea)	Specific-drug module (cough and cold)	Specific-drug module (analgesic)
Basic competencies	Competency 1: to understand drug name and the active ingredients Activities • Provide a medication pack to a group of participants • Ask participants to classify drugs based on the active ingredients – fill in Worksheet A • Discuss the information (based trainer's notes provided in the module)				
	Competency 2: to understand drug indication Activities • Ask participants to classify the medications based on the indications – fill in Worksheet B • Discuss the information (based on trainer's notes provided in the module)				
	Competency 3: to understand drug classification Activities • Ask participants to classify medications based on the logo (see Figure 1) – fill in Worksheet C • Discuss the information (based on trainer's notes provided in the module)				
	Competency 4: to understand drug directions for use Activities • Ask participants to identify dose, frequency and route of administration (dosage form) – fill in Worksheet D • Discuss the information(based on trainer's notes provided in the module)				
	Competency 5: to understand additional information on medication label/package Activities • Ask participants to identify information regarding (adverse effects, expiry date, storage/disposal) - fill in Worksheet E • Discuss the information (based on trainer's notes provided in the module)				
Example of drug used in the module	Varied: indigestion, antidiarrhoeal, cough and cold, or analgesic drugs	indigestion drugs	anti-diarrhoeal drugs	cough and cold drugs	analgesic drugs
Medication packs that accompanied the module	Varied: indigestion drugs (10 items), antidiarrhoeal drugs (10 items), cough and cold drugs (10 items) and analgesic drugs (10 items)	Indigestion drugs (30 items)	Anti-diarrhoeal drugs (30 items)	Cough and cold drugs (30 items)	Analgesic drugs (30 items)

scores were analysed using Wilcoxon signed-rank test); the scores were calculated for each competency as well in total. In addition, the knowledge gain (score difference) was calculated by substracting the total pre-test scores from the total post-test scores for individual participants; the mean score differences (±95% confidence intervals) were also determined based on the combined data from each group. To explore whether type of module was associated with mean score knowledge gain, multifactorial analysis of variance (ANOVA) was used to account for other variables, i.e., participant demographics (age, gender, education, occupation, income) and self-medication frequencies. Bonferroni post-hoc tests were conducted for pairwise comparisons between the different module groups.

3 | RESULTS

A total of 279 CHC cadres were involved in training conducted at five CHCs: Jagir CHC (n = 79), Gunung Anyar CHC (n = 61), Kalirungkut CHC (n = 34), Sidosermo CHC (n = 52), Tenggilis CHC (n = 53) (Table 2); thus giving attendance response rates from 65% to 93%. All participants were females; while significant differences were reported in terms of participants' age range and occupation across the five CHCs, the majority was housewives in the age group of >30–50 years. Most participants reported to have practiced self-medication less than 10 times in the last month, and sought information regarding their self-medication from doctors and/or community pharmacists (see Table 2).

With regards to the baseline knowledge, Jagir CHC (indigestion module) group had the highest total pre-test score mean (37.58); while Sidosermo CHC (general module) group revealed the lowest score mean (31.44) (Table 3). In general, there was an increase in the total post-test scores (knowledge after the training) for the five groups of modules. While the difference between total pre- and post-test scores for the general module group was not significant (p = .112); significant differences were reported for the specific-drug module groups, including indigestion, diarrhoea, analgesic, cough and cold (all p < .001). Across five basic competencies, significant differences between pre- and post-test scores were reported for competency 1 "drug name and active ingredient", competency 2 "indication" and competency 3 "administration" for all specific-module groups (all p < .05).

Furthermore, knowledge gain (score difference) reported for the general module group was the lowest (1.12; 95%CI [−0.45, 2.92]); while the common cold module group had the highest (5.02; 95%CI [1.95, 5.17]) (Table 3). The effect of the type of modules on knowledge gain (score difference) was analysed using multifactorial ANOVA to account the effects of demographics data (i.e., age, education, occupation and income; gender was not included as all participants were females) and self-medication frequencies. The results revealed that there was a significant main effect of the type of modules on score difference values [F (4, 263) = 8.37, p < .001]. The post-hoc tests indicated that score difference values were significantly lower for the general module compared to indigestion, cough and cold, and analgesic modules (all $p \leq .001$); however, there was no significant difference with diarrhoea module (p = .218). In addition to the type of modules, age was reported to have a significant main effect on score difference values (p = .029).

4 | DISCUSSION

This present study has evaluated cadre training using five different types of modules (generic, indigestion, diarrhoea, cough and cold, and analgesic modules) which were developed based on the previous module (Setiadi et al., 2017, 2019). Although the pre-/post-test results in this present study could not be directly compared to those from the previous study since the tests had been modified (Setiadi et al., 2019), this study demonstrated the new modules' capacity to improve knowledge towards OTC medications. This was achieved among CHC cadres in Surabaya Indonesia, particularly with the introduction of specific-drug modules (total pre-test score means versus total post-test score means; all p < .001). It was acknowledged that adult learners tend to connect what they are learning to their previous experiences and they prefer to perceive what they are learning has application to something practical (Alhassan, 2012; Merriam & Caffaerella, 1999); thus, training materials should be designed to bring the experiential world of adults into the learning process. The use of specific-drug modules in this present study might provide those benefits as they made it easier for participants to connect the learning process with their experiences when using drugs suitable for specific illnesses.

Amongst the specific-drug module groups, the highest knowledge gain was reported for CHC cadres trained using the cough and cold module (difference score mean 5.02; 95%CI [1.95, 5.17]). Based on Surabaya Health Office statistics in 2014, upper respiratory disorders, such as cough and cold, were ranked first among the top 10 health problems across CHCs in Surabaya (Surabaya City Health Office, 2018). While CHC cadres in this present study might be familiar with cough and cold as the commonest health problem in Surabaya, they would easily connect it to their past experiences and/or possible future situations, thus facilitating a more effective learning process. Furthermore, the specific modules have demonstrated significant benefits in improving knowledge, particulary related to drug name and active ingredients, indication and administration. Further improvements, however, would be required for the module to facilitate improved understanding towards drug classification and additional information (i.e., adverse effects, expiry date, storage/disposal).

Across CHCs (five different types of modules), CHC cadres' characteristics were similar with regards to gender (all were females) and education (approximately 50% were high-school graduates). This is in line with East Java Provincial Health Office data that CHC cadres mainly are mothers who are actively involved in Posyandu– a monthly clinic for women and children (a routine health programme of CHCs) (East Java Provincial Health Office, 2018). Furthermore, based on East Java Provincial Statistics in 2015, the average study

TABLE 2 Characteristics of participants in the training program using general- and specific-drug modules

Characteristics	Sidosermo CHC -General module (*N* = 52) *n* (%)	Jagir CHC -Indigestion module (*N* = 79) *n* (%)	Kalirungkut CHC -Diarrhoea module (*N* = 34) *n* (%)	Tenggilis CHC -Cough and cold module (*N* = 53) *n* (%)	Gunung anyar CHC -Analgesic module (*N* = 61) *n* (%)	*p*-value*
Demographics						
Age						
≤30 years old	3 (5.8)	1 (1.3)	2 (5.9)	20 (37.7)	14 (23.0)	.001
>30–50 years old	36 (69.2)	43 (54.4)	20 (58.8)	27 (50.9)	35 (57.4)	
>50 years old	13 (25.0)	35 (44.3)	12 (35.3)	6 (11.3)	12 (19.7)	
Gender						
Male	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	N/A
Female	52 (100.0)	79 (100.0)	34 (100.0)	53 (100.0)	61 (100.0)	
Education						
Primary school	1 (1.9)	1 (1.3)	1 (2.9)	3 (5.7)	4 (6.6)	.540
Junior high school	9 (17.3)	13 (16.5)	8 (23.5)	9 (17.0)	12 (19.7)	
Senior high school	36 (69.2)	53 (67.1)	23 (67.6)	34 (64.2)	32 (52.5)	
Bachelor degree	6 (11.5)	12 (15.2)	2 (5.9)	7 (13.2)	13 (21.3)	
Occupation						
Housewife	51 (98.1)	62 (78.5)	31 (91.2)	45 (84.9)	49 (80.3)	.019
Others (employee, student, entrepreneur)	1(1.9)	17 (21.5)	3 (8.8)	8 (15.1)	12 (19.7)	
Monthly income (in Rupiah)						
<500,000	10 (19.2)	14 (17.7)	12 (35.3)	9 (17.0)	12 (19.7)	.120
>500,000–1,500,000	16 (30.8)	26 (32.9)	11 (32.4)	17 (32.1)	19 (31.1)	
>1,500,000–3,000,000	22 (42.3)	22 (27.8)	10 (29.4)	19 (35.8)	20 (32.8)	
>3,000,000	4 (7.7)	17 (21.5)	1 (2.9)	8 (15.1)	10 (16.4)	
Self-medication behaviour						
Frequency of self-medication (in the last month)						
<5 times	19 (36.5)	45 (57.0)	14 (41.2)	50 (94.3)	27 (44.3)	.095
5-<10 times	31 (59.6)	33 (41.8)	19 (55.9)	3 (5.7)	32 (52.5)	
>10 times	2 (3.8)	1 (1.3)	1 (2.9)	0 (0.0)	2 (3.3)	
Source of self-medication information**						
Community pharmacist	19 (36.5)	8 (10.1)	9 (26.5)	23 (43.4)	29 (47.5)	N/A

(Continues)

TABLE 2 (Continued)

Characteristics	Sidosermo CHC -General module (*N* = 52)	Jagir CHC -Indigestion module (*N* = 79)	Kalirungkut CHC -Diarrhoea module (*N* = 34)	Tenggilis CHC -Cough and cold module (*N* = 53)	Gunung anyar CHC -Analgesic module (*N* = 61)	*p*-value*
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	
Doctor	33 (63.5)	52 (65.8)	25 (73.5)	22 (41.5)	33 (54.1)	
Family/friend/relatives	8 (15.4)	3 (3.8)	6 (17,6)	8 (15.1)	8 (13.1)	
Advertisement/media/internet	10 (19.2)	20 (25.3)	8 (23.5)	11 (20.8)	15 (24.6)	
Others	5 (9.6)	3 (3.8)	0 (0.0)	7 (13.2)	1 (1.6)	

*p-value from Kruskal–Wallis Tests.

**participants may choose more than 1 answer.

duration of the Surabayan population was 10.44 years which was equivalent to high-school level (Statistics East Java, 2017). Despite the similarities, significant characteristic differences were found in terms of age and occupation of cadres across CHCs (five different types of modules). To account for the characteristic variability, a multifactorial ANOVA was used when exploring any associations between type of module and knowledge gained.

Results from the multifactorial ANOVA confirmed that the type of module significantly contributed to the knowledge gained with specific modules generally provided higher knowledge gain than a general module. With regards to participant characteristics, age was found as a significant contributor to the knowledge gain; younger and older participants were reported to obtain higher gains than those in the age range of 30–50 years (5.3 versus 4.6 versus 3.3, respectively; $p = .004$). Women in this age range might bear a larger burden of motherhood responsibilities compared to younger and older women (Monghadam, Khiaban, Esmaeili, & Salsali, 2017), which might result in less motivation and non-optimal learning process. Studies worldwide have confirmed the effects of socio-demographic factors, such as age, to knowledge and the practice of medicine use, although the findings has been inconsistent (Dawood, Hassali, & Saleem, 2017; Gualano et al., 2015; Lim & Teh, 2012).

In addition to the importance of a well-designed module with respect to knowledge gain, this present study highlighted that Surabayan communities have seen doctors as their primary source of self-medication advice. A prior study in East Java reported that the majority of CHC cadres sought health professionals for self-medication advice, yet the type of health professionals was not differentiated (Setiadi et al., 2019). This might reflect the need for Indonesian pharmacists to establish their roles in promoting responsible self-medication. Community pharmacists are uniquely placed to provide accessible support and advice to the general public compared with other health professionals; moreover, a high level of public trust and confidence in pharmacists' ability to advise on self-medication has been reported (Lynas, 2012; Rutter, 2015; Saxena, 2018). Thus, in addition to pharmacists' established advisory role in pharmacies (Brata et al., 2014; Piecuch & Kozlowska-Wojciechowska, 2013; Rutter, 2015; Schneider et al., 2011; Suleiman, 2013), the 'GeMa CerMat' initiative could be seen as an opportunity for Indonesian pharmacists to strengthen their role in promoting responsible self medication.

There are some limitations to this study. This study did not provide sample size calculation; however, significance findings between types of modules and score differences ($p < .001$ which was less than alpha of 0.05) and the post-hoc power calculation of >0.9 might indicate that the power was adequate to detect a difference that was statistically significant. Also, this study included conveniently selected CHCs and cadres who might have different characteristics compared to the actual community members visiting CHCs across Surabaya, thus some caution should be exercised in generalising the findings. Furthermore, the allocation of cadres to the five types of modules (interventions) was non-random rather this was based on the setting (CHC), e.g., cadres at Sidosermo

TABLE 3 Pre-/post-test scores and mean score gain of participants in the training using general- and specific-drugs modules

	Sidosermo CHC -General module (*N* = 52)	Jagir CHC –Indigestion module (*N* = 79)	Kalirungkut CHC - Diarrhoea module (*N* = 34)	Tenggilis CHC - Cough and cold module (*N* = 53)	Gunung anyar CHC -Analgesic module (*N* = 61)
Competency 1 (Q1, Q13, Q7, Q9; range score 4 – 12)					
Pre-test (mean ± SD)	8.75 ± 1.48	9.38 ± 1.50	8.53 ± 1.66	7.08 ± 1.25	11.15 ± 0.91
Post-test (mean ± SD)	10.04 ± 1.66	10.91 ± 1.22	9.62 ± 1.33	9.38 ± 1.93	11.82 ± 0.50
p-value[a]	.001*	<.001*	.001*	<.001*	<.001*
Competency 2 (Q5, Q15; range score 2 – 6)					
Pre-test (mean ± SD)	4.65 ± 0.84	5.59 ± 0.69	4.97 ± 0.97	5.15 ± 1.01	5.46 ± 0.81
Post-test (mean ± SD)	5.00 ± 0.97	5.95 ± 0.32	5.71 ± 0.68	5.70 ± 0,82	5.84 ± 0.55
p-value[a]	.068	<.001*	<.001*	.002*	.005*
Competency 3 (Q6, Q10, Q12; range score 3 – 9)					
Pre-test (mean ± SD)	5.77 ± 1.23	8.05 ± 0.99	6.56 ± 1.40	6.87 ± 1.41	6.62 ± 1.28
Post-test (mean ± SD)	5.80 ± 1.65	8.96 ± 0.19	7.35 ± 1.18	8.40 ± 1.15	8.39 ± 1.10
p-value[a]	.904	<.001*	.010*	<.001*	<.001*
Competency 4 (Q11, Q14; range score 2 – 6)					
Pre-test (mean ± SD)	3,23 ± 1,00	5.49 ± 0.92	5.74 ± 0.67	5,75 ± 0,59	5.02 ± 0.90
Post-test (mean ± SD)	3,12 ± 1,22	5,92 ± 0,38	5.82 ± 0.58	5,79 ± 0,60	5.87 ± 0.50
p-value[a]	.672	<.001*	.396	.927	<.001*
Competency 5 (Q2, Q3, Q4, Q8; range score 4 – 12)					
Pre-test (mean ± SD)	9,04 ± 1,52	8.96 ± 1.48	8.97 ± 1.98	9,64 ± 1,29	8.16 ± 2.01
Post-test (mean ± SD)	8,60 ± 1,49	10,84 ± 1,21	9.32 ± 1.49	10,25 ± 1,69	9.20 ± 1.93
p-value[a]	.117	<.001*	.382	.037*	.001*
Total** (range score 15 – 45)					
Pre-test (mean ± SD)	31.44 ± 2.58	37.58 ± 3.08	34.76 ± 2.50	34.49 ± 2.76	36.41 ± 3,31
Post-test (mean ± SD)	32.58 ± 3.97	42.53 ± 1.77	37.82 ± 3.04	39.51 ± 4.19	41.11 ± 2.61
p-value[a]	.112	<.001*	<.001*	<.001*	<.001*
Pre – Post mean gain (95% CI)	1.12 (−0.45–2.92)	4.95 (3.39–5.61)	3.06 (1.98–4.14)	5.02 (1.95–5.17)	4.70 (3.70–6.24)

Abbreviations: CI, confidence interval; Q, question number; *SD*, standard deviation.

**p*-value from Wilcoxon Signed-Rank Test between pre-test versus post-test scores.

***total scores from 15 questions.

CHC for general module. However, analysis using multifactorial ANOVA – taking into account the variability of cadres' characteristics across intervention groups (i.e., age, education, occupation and income, and self-medication frequencies) has confirmed the significant effect of type of module to knowledge gain. In addition, the consistent positive results (significant pre-test/post-test differences) among specific-drug module groups might indicate the potential development of modules focusing on specific therapeutic classes for effective community training towards responsible self-medication.

In conclusion, this preliminary work involving CHC cadres has indicated that the development of modules focusing on drugs for specific minor illnesses could be beneficial in facilitating effective community-based training to promote responsible self-medication in Indonesia. The priority for therapeutic areas chosen for the modules should be based on the local needs and characteristics of the local communities. Further larger scale research would be required to confirm the benefits of specific modules to improve cadres skill to promote responsible self-medication, as well as the impacts to a broader population, including community members.

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CONFLICTS OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

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