



# Evaluation of a community-based training to promote responsible self-medication in East Java, Indonesia

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## Keywords

community health representatives; Indonesia; pharmacist; self-medication; training

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## Abstract

**Objective** To explore pharmacist/pharmacy staff trainers' perspectives on conducting community-based training to promote responsible self-medication, and to evaluate knowledge gained among community representatives participating in the training.

**Methods** Training was conducted in four districts/cities in East Java, Indonesia in 2016. A pre-test/post-test study was used to evaluate the knowledge of 129 community representatives (participants) before/after the training; pre-test and post-test scores as well as absolute gain were determined. Four focus group discussions with 20 pharmacist/pharmacy staff (trainers) were conducted after the training, and the data were thematically analysed.

**Key findings** Overall mean test scores for community representatives significantly improved from 14.11 to 15.70 after the training ( $P < 0.001$ ). The average total absolute gain was 1.85 (95% CI 1.29 to 2.39). To reach local communities, trainers suggested improvements to the content and structure of the module, training aids, trainer competency, approach and time allocation.

**Conclusions** Community-based training provides a potential strategy to improve community knowledge of medications. Findings from this study should inform strategies for a broader uptake amongst local communities in Indonesia.

## Introduction

Self-medication is 'the selection and use of medicines by individuals to treat self-recognised illnesses or symptoms'.<sup>[1]</sup> It generally involves recognising or self-diagnosing symptoms, selecting medicines, administering medicines and monitoring the outcomes.<sup>[2]</sup> Studies worldwide suggested that self-medication has been a common practice with most of the studies reporting prevalence values of between 20 and 60%.<sup>[3–8]</sup> Based on a population survey in Indonesia, 61% of the population practised self-medication in 2014<sup>[9]</sup>; other health-seeking behaviours included utilising health facilities (e.g. community health centres, hospitals, or doctor clinics), using herbal/traditional treatments, or no treatment at all. This indicates that self-medication practice has been an essential form of daily self-care behaviour among Indonesians.

Commencing in 2014, the Indonesian Government initiated *Jaminan Kesehatan Nasional*, a national health coverage, to provide affordable health care to the whole population.<sup>[10,11]</sup> In the light of an increasing demand for health care and limited health resources available in Indonesia,<sup>[11]</sup> self-medication has a pivotal role as the first action taken by the community in their health care. Self-medication behaviours move people towards greater independence to treat minor ailments, thereby optimising the use of accessible health resources for minor ailments and reducing (or at least optimising) the burden on governments due to health expenditure linked to the unnecessary medical treatment of minor ailments.<sup>[12]</sup> Self-medication, however, is far from being a completely safe behaviour. Potential risks of self-medication

behaviours might include incorrect self-diagnosis, delays in seeking medical advice when needed, significant drug interactions, infrequent but severe adverse reactions, incorrect choice of therapy, incorrect dosage, incorrect administration, masking of underlying severe disease and risk of drug dependence and abuse.<sup>[12,13]</sup>

Recognising the socio-economic value of responsible self-medication practices, in 2015, the Indonesian Government introduced a national health programme, 'Smart Use of Medication Campaign' (*Gerakan Masyarakat Cerdas Menggunakan Obat* – GeMa CerMat).<sup>[14]</sup> The programme aimed to empower Indonesian communities to practice responsible self-medication; this includes improving community knowledge on medication use through community-based training with health professionals as trainers.<sup>[14]</sup> Prior studies in Indonesia reported that the involvement of pharmacists in community-based interactive approaches could improve knowledge, attitudes and/or behaviours on medication use among patients with type 2 diabetes and tuberculosis.<sup>[15,16]</sup> Pharmacists – with their educational background on medications – are in an ideal position to provide quality drug information, thus are expected to be actively involved in the GeMa CerMat program as trainers. This is in line with the Government Regulation No. 51 of 2009 that pharmacists should extend their roles to patient care.<sup>[17]</sup> This study aimed to explore pharmacists (trainers)' perspectives on conducting training to promote responsible self-medication, and to evaluate the knowledge gained by community health representatives (participants) involved in the training.

## 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 at September 19, 2016 (No. 08/Ka.Kom.Et/70/KE/IX/2016).

## Module development

The training module was developed based on the Indonesian Ministry of Health module<sup>[18]</sup> which was followed with an expert panel [consisted of four pharmacists/academics in the area of pharmacy practice (AP, BP, ES, YW) and two policymakers (AZ, ASW)]. While the Government module consists of a broad range of topics on rational drug use (11 topics), the panel firstly needed to identify a specific goal for this training (i.e. to be able use medications safely and know when to seek health and/or professional advice), then to decide on what basic knowledge and skills were required to achieve the goal, and finally to categorise those knowledge and skills into basic competencies.

The final module consists of three basic competencies: (1) medication classification, (2) information on medication label/package/leaflet and (3) additional information (i.e. special dosage forms and safe disposal of medications) (Table 1). The module was accompanied with a medication pack that included four groups of medications, including analgesics-antipyretics (10 items), cough and cold medications (10 items), vitamins and minerals (10 items), and gastrointestinal medications (10 items). These therapeutic areas chosen were among the most common minor illnesses treated in primary health facilities in East Java, Indonesia.<sup>[19]</sup>

## Community-based training

The module was implemented in community-based training programmes conducted across four districts/cities in East Java, Indonesia in 2016: Ngawi (southern district), Blitar (western city), Nganjuk (western district), and Sumenep (northern district). The 2-day training programme consisted of Day-1 'training of trainers', and Day-2 'training of community health representatives'. At each site, the Chief of the Health Office purposefully

**Table 1** Summary of the module

<b>Competency 1: to understand medication classifications</b>	
Activities	
Provide a medication pack to a small group of participants	
Ask participants to classify medications based on the active ingredient – fill in Worksheet A-1	
Ask participants to classify medications based on the indication – fill in Worksheet A-2	
Ask participants to classify medications based on the logo <span style="color: green;">●</span> – general sale, <span style="color: blue;">●</span> – general sale with cautionary label, <span style="color: red;">●</span> – prescription only, <span style="color: red;">+</span> – narcotics) – fill in Worksheet A-3	
Discuss the classifications (trainer's notes on this topic were provided in the module)	
<b>Competency 2: to understand information on medication label/package/leaflet</b>	
Activities	
Ask each participant to choose 1 medication product	
Ask participant to read information on medication label/package/leaflet to identify active ingredient, indication, administration, adverse effects, contra-indication, cautionary label (if any), expiry date, storage – fill in Worksheet A-4	
Explain about the terms – e.g. what is indication (trainer's notes on this topic were provided in the module)	
<b>Competency 3: to understand additional information</b>	
Activities	
Explain about additional information (other than those in the label/package/leaflet) which is of importance in using medications, including special dosage forms (e.g. eye drop, suppository, dry syrup), and safe disposal of medications (trainer's notes on this topic were provided in the module)	

selected approximately 30 pharmacists/pharmacy staff to be invited in Day-1; pharmacists/pharmacy staff were selected to include a mixture of those working in community health centres, hospitals, community pharmacies and the health offices. On Day-1, academic speakers would explain and simulate the prepared training module to the selected pharmacists/pharmacy staff to prepare them as trainers. At the end of Day-1, five pharmacists/pharmacy staff were selected by the speakers based on their performance in the simulation to proceed to Day-2. On Day-2, the five selected pharmacists/pharmacy staff then acted as trainers; each of them would facilitate training using the module with approximately six community representatives (when necessary, the speakers from Day-1 would assist to ensure consistency).

### **Evaluation of community health representatives (participants)**

At each site, 40 community health representatives were invited verbally as participants on Day-2; they were purposefully selected by the Chief of the Health Office from people trained to support health activities in their local community health centres (*Puskesmas*). Participants' knowledge of the four medication groups related to the three basic competencies included in the module were evaluated before and after the training using the same 20-question true/false test. The test was developed by an expert panel [consisted of four pharmacists/academics in the area of pharmacy practice (AP, BP, ES, YW)] based on information covered in the module (Table 1). Each question was scored '1' (for correct answer) and '0' (for wrong answer), thus providing a range of 0–20. A short questionnaire to obtain participant characteristics data was also included with the test. The purpose and procedures of the study were described in an introductory letter, and written consent was obtained from those who were willing to participate. Community representative's knowledge improvement was determined using the pre-test and post-test scores (differences in the scores were analysed using the Mann–Whitney *U*-test), and absolute gain. The absolute gain was calculated by subtracting the pre-test score from the post-test score for each participant; the mean values ( $\pm 95\%$  confidence intervals) were then determined based on the combined data. Statistical analyses were performed using IBM SPSS Statistics, version 19.0 (IBM Corp, Armonk, NY, USA).

### **Views of pharmacist/pharmacy staff (trainers)**

At each site, one Focus Group Discussion (FGD) was conducted at the end of the training with the five selected pharmacists/pharmacy staff who had acted as trainers on

Day-2. Before the FGD, the nature of the study was explained and informed consent was obtained. Each FGD was facilitated by one moderator and one note-taker. The FGD questions explored issues on the training delivery. All FGDs were conducted in Bahasa Indonesia and lasted about 30 min; a summary was provided to the participants at the end of the discussion as a means of member-checking, ensuring credibility of the data.<sup>[20]</sup>

Audio-recorded data from the focus group meetings were transcribed and thematically analysed<sup>[21]</sup> – by one of the researchers (YW), who discussed and confirmed extracted themes with one of the researchers for consistency (AP). The data were analysed manually by cutting and pasting between documents. Data analysis was conducted in Bahasa Indonesia and the illustrative verbatim quotes, and theme labels were translated into English by YW.

## **Results**

### **Evaluation of community health representatives (participants)**

A total of 129 community representatives were involved: Blitar ( $n = 23$ ), Nganjuk ( $n = 37$ ), Ngawi ( $n = 31$ ), Sumenep ( $n = 38$ ) (Table 2), thus giving response rates from 57.5 to 95%. Most were women with a mean age of 42 years. The majority obtained their medications (the medications they used in general, not only for self-medication) from community health centres/hospitals or pharmacies (56 and 33%, respectively) and sought medicine information from health professionals or from medication packages (68 and 26%, respectively).

The mean test scores for all participants significantly improved from 14.11 (pre-test) to 15.70 (post-test) after the training ( $P < 0.001$ ). There was a significant increase between pre-test and post-test results for each site, with the highest improvement seen for Ngawi (14.97 to 17.04;  $P < 0.001$ ). The average total absolute gain was 1.85 (95% CI 1.29 to 2.39) (Table 3).

### **Views of pharmacist/pharmacy staff (trainers)**

A total of four FGDs – each involving five trainers – were conducted in four East Javan districts/cities. Characteristics of the trainers are summarised in Table 4. Data saturation was achieved after the third FGD.

There were five themes that emerged from the FGDs regarding issues in the training, including module, training aids, trainer competency, approach and time allocation. With regard to the module, participants suggested improvements in its contents, structure and instructions

**Table 2** Characteristics of participating community health representatives

Demographics <sup>a</sup>	Blitar ( <i>n</i> = 23) <i>n</i> (%)	Nganjuk ( <i>n</i> = 37) <i>n</i> (%)	Ngawi ( <i>n</i> = 31) <i>n</i> (%)	Sumenep ( <i>n</i> = 38) <i>n</i> (%)	Overall ( <i>N</i> = 129) <i>N</i> (%)
Age (years; mean ± SD)	44 ± 7.5	41 ± 7.1	46 ± 9.2	40 ± 11.2	42 ± 9.3
Female gender	23 (100)	32 (86)	25 (81)	35 (92)	112 (87)
Number of children					
<1	1 (4)	12 (33)	6 (17)	6 (16)	25 (19)
2	16 (70)	16 (43)	15 (43)	21 (55)	68 (53)
3	4 (17)	4 (11)	6 (17)	2 (5)	16 (12)
>4	0 (0)	3 (8)	4 (12)	1 (3)	8 (6)
Highest education					
<Junior high school	3 (13)	6 (16)	2 (6)	2 (6)	13 (10)
Senior high school	19 (83)	13 (35)	10 (29)	23 (61)	65 (50)
Bachelor degree	1 (4)	16 (43)	17 (49)	11 (29)	45 (35)
Other: Diploma	0 (0)	2 (5)	2 (6)	2 (5)	6 (5)
Occupation					
Student	0 (0)	0 (0)	0 (0)	1 (3)	1 (1)
Government employee	0 (0)	18 (49)	11 (31)	9 (24)	38 (29)
Private employee	0 (0)	2 (5)	5 (14)	2 (5)	9 (7)
Entrepreneur	1 (4)	1 (3)	0 (0)	6 (16)	8 (6)
Other (e.g. teacher, farmer, tailor, housewife, retired person)	22 (96)	16 (43)	15 (43)	20 (53)	73 (57)
Monthly income (in Rupiah)					
<500 000	5 (22)	7 (19)	1 (3)	15 (40)	28 (22)
500 000–1 000 000	9 (39)	7 (19)	7 (20)	7 (18)	30 (23)
>1 000 000–2 500 000	4 (17)	7 (19)	8 (23)	4 (11)	23 (18)
>2 500 000–5 000 000	2 (9)	13 (35)	12 (34)	11 (29)	38 (29)
>5 000 000	0 (0)	2 (5)	3 (9)	0 (0)	5 (4)
Monthly health care spending (in Rupiah)					
<250 000	23 (100)	27 (73)	21 (60)	25 (66)	96 (74)
250 000–500 000	0 (0)	7 (19)	5 (14)	8 (21)	20 (16)
>500 000–1 000 000	0 (0)	0 (0)	3 (9)	2 (5)	5 (4)
>1 000 000–Rp 2 000 000	0 (0)	1 (3)	1 (3)	0 (0)	2 (2)
>Rp 2 000 000	0 (0)	2 (5)	1 (3)	1 (3)	4 (3)
Source of medicines					
Drug store	3 (13)	4 (11)	1 (3)	3 (8)	11 (9)
Doctor clinic	0 (0)	1 (3)	2 (6)	3 (8)	6 (5)
Hospital or community health centre	15 (65)	16 (43)	18 (51)	23 (61)	72 (56)
Pharmacy	5 (22)	18 (49)	11 (31)	9 (24)	43 (33)
Source of medicine information					
From friends, relatives, or neighbours	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
From brochure or advertisement	1 (4)	6 (16)	2 (6)	1 (3)	10 (8)
From the medicines' packages	10 (44)	13 (35)	6 (17)	4 (11)	33 (26)
From doctor or other health professional	12 (52)	24 (65)	19 (54)	33 (87)	88 (68)

<sup>a</sup>Some missing data.**Table 3** Pre-test and post-test scores and absolute gain of participating community representatives by sites of training

	<i>n</i>	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	Absolute gain (95% CI)
Overall	129	14.11 ± 2.68	15.70 ± 2.21*	1.85 (1.29 to 2.39)
Blitar	23	13.83 ± 2.02	15.12 ± 1.73*	1.41 (−0.20 to 2.84)
Nganjuk	37	15.06 ± 1.80	16.21 ± 1.97*	1.10 (0.43 to 1.77)
Ngawi	31	14.97 ± 2.26	17.04 ± 1.67*	2.40 (1.65 to 3.15)
Sumenep	38	12.56 ± 3.43	14.59 ± 2.46*	2.31 (0.85 to 3.74)

\*Statistically significant differences between pretest and posttest (*P* < 0.05).

**Table 4** Characteristics of participating trainers

Characteristics	Blitar ( <i>n</i> = 5)	Nganjuk ( <i>n</i> = 5)	Ngawi ( <i>n</i> = 5)	Sumenep ( <i>n</i> = 5)
Age (years)	31–44	28–58	29–45	31–58
Gender	5 females	1 male, 4 females	5 females	1 male, 4 females
Education	4 pharmacists, 1 diploma in pharmacy	4 pharmacists, 1 diploma in pharmacy	5 pharmacists	4 pharmacists, 1 diploma in pharmacy
Occupation	3 pharmacists/staff from community health centres, 2 hospital pharmacists	2 pharmacist/staff from community health centres, 3 pharmacists from Health Office	2 pharmacists from community health centres, 3 community pharmacists	2 pharmacists/staff from community health centres, 3 pharmacists from Health Office

to fill the worksheets. Participants also suggested that the training aids should include visual aids in addition to an appropriate medication pack. Furthermore, a multilevel approach (trainer-community health representative-local community) was suggested for this programme to reach a broader population. Trainer communication skills and careful time allocation were also perceived as important for this programme to be successful. Details on the emerging themes and the illustrative quotes are presented in Table 5.

## Discussion

This study found that a well-developed community-based training programme has the potential to improve community knowledge on medication, as evidenced by significant improvements between pre-test and post-test scores on module knowledge among community health representatives across four areas in East Java Indonesia before and after the training. However, the approach of using pharmacist/pharmacy staff as trainers in this study revealed prime areas for improvement in that programme, including aspects of the materials as well as the delivery of the training programme to ensure a broader uptake.

There are some limitations to this study. This study included purposefully selected community health representatives who might have different characteristics compared to the actual community members, thus some caution should be exercised in generalising the findings. However, the positive results (significant pre-test/post-test differences) found among community representatives across different settings in East Java provided insights on the potential use of the community-based training to promote responsible self-medication practices in Indonesia. With regard to the FGDs of pharmacist/pharmacy staff trainers, it should be noted the qualitative data are a product of views, experiences and perceptions of respondents; thus it can be biased if respondents are not sharing their true views.<sup>[22]</sup> To ensure validity in the analysis, however, the results of this study were provided to the trainers ('member-checking').<sup>[20]</sup> No new themes emerged after

the third FGDs (data saturation), suggesting that all possible issues had been included.<sup>[22]</sup>

A pre-test/post-test methodology, a common methodology in education research,<sup>[22]</sup> was selected as a straightforward approach to evaluate the impact of the programme on participants knowledge acquisition which was an important goal of the programme. A qualitative approach – using FGD<sup>[22]</sup> – was adopted for the trainers so that broader feedback could be provided on the material as well as the delivery which could be then used to improve both the materials and the delivery approach.

Improved pre-test/post-test results in this study are consistent with a previous study in Indonesia where community-based interventions significantly improved medication knowledge among diabetes patients (pre-test score of 13.1 to post-test score of 15.4,  $P < 0.05$ ).<sup>[16]</sup> Based on the Health Belief model, knowledge and attitudes (rooted in knowledge) are the basis of behaviour changes.<sup>[23]</sup> Furthermore, studies reported that knowledge has been noted as one of the patient-centred factors contributing to behaviours on medication use.<sup>[24–26]</sup> Thus, this community-based training has the potential to provide a basis for knowledge to improve behaviours toward responsible self-medication.

Similarities between research settings in this study were found regarding demographical characteristics of the community health representatives, such as age and gender. Most community health representatives in this study were women; this is in line with East Java Provincial Health Office data that community health representatives mostly are mothers who are actively involved in *Posyandu* – a monthly clinic for women and children (a health programme of community health centres). However, the education levels in Blitar and Sumenep were reported to be lower than those in Nganjuk and Ngawi. The European Health Literacy Survey showed that health literacy is significantly lower among people with less education in all participating European countries.<sup>[27]</sup> When stratifying the results by research settings, community health representatives in Sumenep had the lowest pre-test scores, while Nganjuk had the highest pre-test score. Higher pre-test

**Table 5** Themes generated from FGDs of trainers

Categories	Sub-categories	Example quotations
1. Module		
Content	Suitable for community health representatives	'(Community health representatives) already have adequate health literacy that make it easier for us (to use the module)'. (Pharmacist NW3)
	Simplify to reach local community	'if (the module) is like this, it might not work; we might need to revise it in order to reach local community. . . some of them might not even finish their primary education'. (Pharmacist NW1)
Structure	Divide into several meetings	'It would be better to break the module into several meetings, so that it would be easier to follow' (Pharmacist NK1)
Instructions to fill worksheets	Provide example on how to fill Worksheet A-1	'For worksheet A-1, it would be better to provide an example of the active ingredient where the participants would be asked to find the brand-name products and fill the box (under that active ingredient)'. (Pharmacist BL1)
	Provide column for expired date and storage in Worksheet A-4	'(I saw the participant) add columns for storage and expired date'. (Pharmacist BL1)
2. Training aids		
Medication pack	Choose appropriate range of medications	'Please select medications that are commonly used by the local people'. (Pharmacist NW3)  'Most of the community health representatives here are not familiar with brand-names. Hence, it is better to provide some examples of brand-name products for a generic drug'. (Pharmacist BL3) 'At this stage, do not include products with too many active ingredients'. (Pharmacist SM2) 'It should cover all dosage forms available in the market which are commonly used by communities'. (Pharmacist BL5)
	Choose medications with complete attributes	'There is no red logo on the Ambroxol product, so they are confused whether it is a prescription only or not'. (Pharmacist BL1) 'I saw some mouthwash products, but I can not find the cautionary label <i>do not swallow</i> P2 (types of cautionary label P1 to P6)'. (Pharmacist BL5)
Visual aids	Provide magnifying glass	'The problem is particularly related to reading small print (on the label/package/leaflet). Magnifying glass could be provided'. (Pharmacist NK 3)
	Use slide presentation, picture/image or poster	'Maybe we can use slides (to help us to explain information on the label/package/leaflet)' (Pharmacist BL2) 'Use pictures to explain how to take the medications'. (Pharmacist NW5) 'We can use a poster – hang it in the health centres for example'. (Pharmacist NK5)
3. Trainer competency		
	Communication skill	'Maybe we should make an appropriate introduction to get to know the participants'. (Pharmacist BL5) 'The way we communicate should be easily for them to understand'. (Pharmacy staff BL4)
4. Approach		
	Multi-level (trainer – community health representative – local community)	'I think this might work for community health representatives; then they could continue the process to the local community'. (Pharmacist NW1) 'We hope that the community health representatives could disseminate the knowledge to the people around them. They can invite pharmacists to back them up'. (Pharmacists SM4)
5. Time allocation		
	Community meeting	'Most community meetings here – such as Integrated Service Post (Posyandu – a monthly clinic for women and children) – are running well, not only good on paper. Thus, the training could be integrated with such meetings'. (Pharmacist BL5)
	Adequate time	'I guess we should allocate adequate time (about 2 hours) to conduct this training appropriately'. (Pharmacist NK2)



score in Nganjuk could indicate that education and counselling on medication use for community members might not be homogenous in East Java region.

In addition to education, higher pre-test scores in Nganjuk might relate to the fact that approximately 50% of participating community representatives in Nganjuk were government employees, thus might have better understanding of medications. While community representatives in other settings mainly obtained medications from health centres/hospitals, community representatives in Nganjuk mainly get their medications from pharmacies which might reflect higher tendencies of practicing self-medication. Thus, GeMa CerMat and the use of community-based training could be seen as a critical tool to improve health literacy across Indonesia and to empower Indonesian communities to practice responsible self-medication.

While this study reported the potential of the training model to improve knowledge of community health representatives, adjustments may be required to target the actual community members. Trainers suggested a multi-level approach in which pharmacists train community representatives who would later train local communities. In this case, there is a need to establish clear guidance for community health representatives to be recognised as trainers (ensuring their ability to deliver information to the community members), such as post-test marks, experience in conducting training under pharmacists/pharmacy staff supervision, and performance appraisal.

In addition, trainers believed that the module would need to be simplified (i.e. use of simple language) and might be divided into several separate meetings to allow adequate time for the actual community members to assess the information. A careful selection of medication packs (e.g. medications with complete attributes, limited active ingredients, common use) and visual aids (e.g. pictures/images, magnifying glass, slides) would further assist the module delivery among general communities. This is in line with Weiss<sup>[28]</sup> who suggested, for greater clarity and patient understanding, written material should use simple words, short sentences in bulleted format and lots of white space; medical jargon should be avoided and simple pictures should be used when helpful.<sup>[28]</sup>

In addition to a well-designed module and training aids, trainers' communication skills have been perceived as important in ensuring patient understanding. It should be noted that health professionals' training comes with its own vocabulary and can further encrypt health information presented to patients. Thus, effective communication would be required to bridge the gap between the literacy of health professionals and that of general communities.<sup>[29]</sup> Furthermore, the trainers suggested the integration of the training programme into established community meetings (e.g. *Posyandu – a monthly clinic for women and children*)

for a better uptake. Although the training has been part of the national health programme (GeMa CerMat), there is a need to establish a clear road map as well as the technical guidance of GeMa CerMat, thus providing a long-term systematic approach to improve self-medication practices in Indonesia. The impact of the training programme on self-medication practices to the actual community members needs to be evaluated in a future research programme.

## Conclusions

The community-based training initiative had a positive impact on the knowledge gain of Indonesian community representatives, thus may contribute to promoting positive self-medication behaviours in Indonesia. The training, however, needs to be improved in relation to the materials and the delivery approach in order to reach local communities. Further follow-up is required to pilot the community-based training among local communities, thus providing a comprehensive needs assessment for a basis to develop strategies to make the training programme successful when implemented in the general population. While the training focused on improving knowledge on medication use, further research is required to evaluate its subsequent impact on the behaviours of responsible self-medication.

## Declarations

### Conflicts of interest

The Author(s) declare(s) that they have no conflicts of interest to disclose.

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## Authors' contributions

AP made contributions to the design, supervised data collection and analysis and approved the final version for

submission. YW analysed the data and wrote the first draft of the report and data analysis. YW, ES, BOB, IM, ASW participated in module development and data collection. BS contributed to the conception and design of

the study, interpretation of data, revisions to the manuscript and final approval of the version to be published. All authors had complete access to the study data that support the publication.

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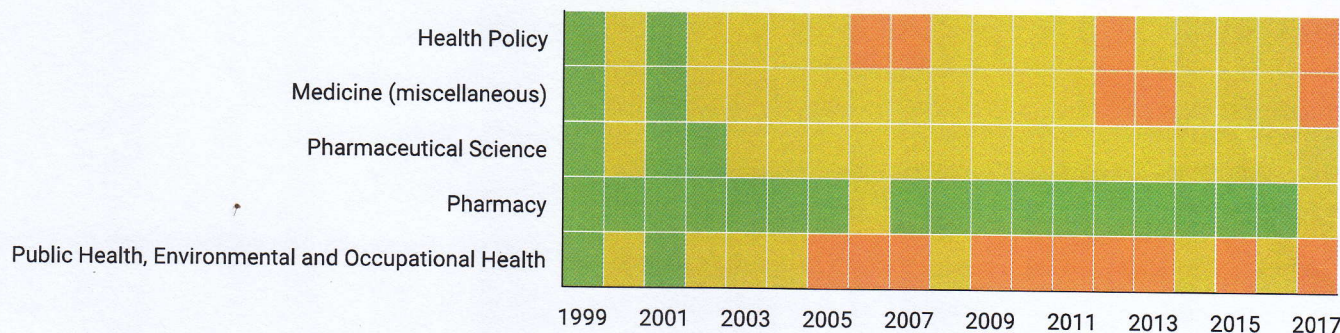

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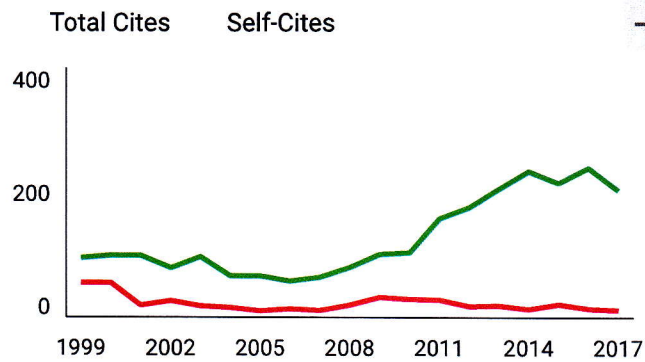
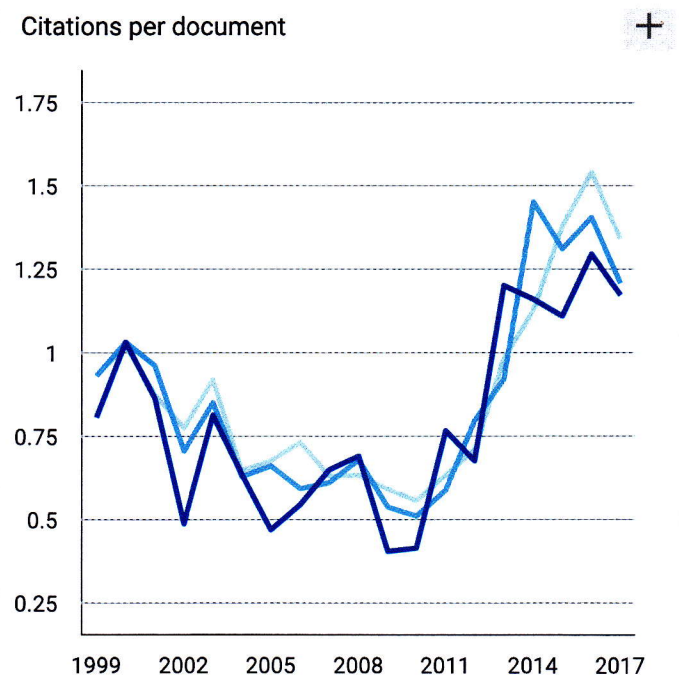
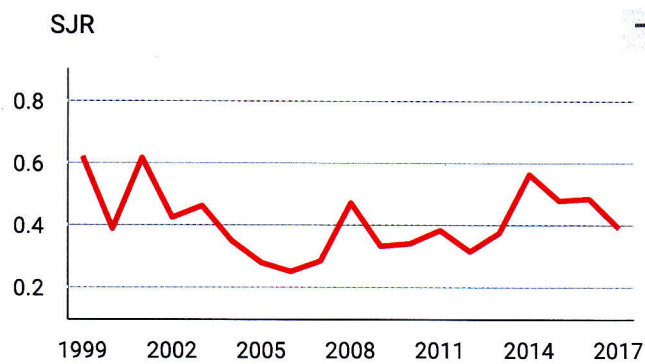
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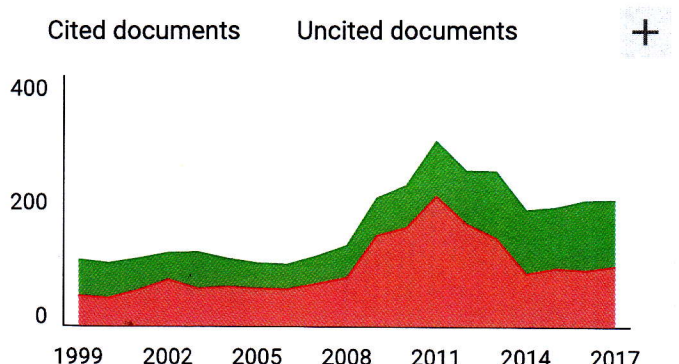
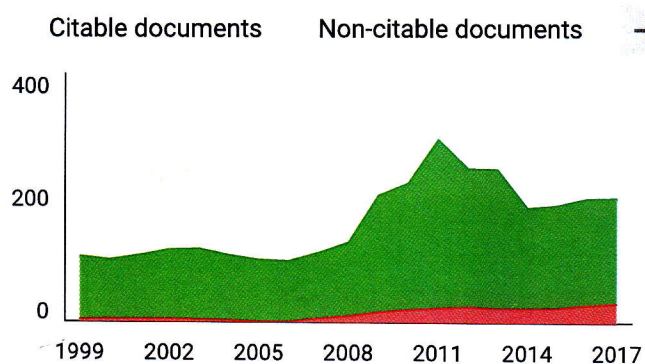
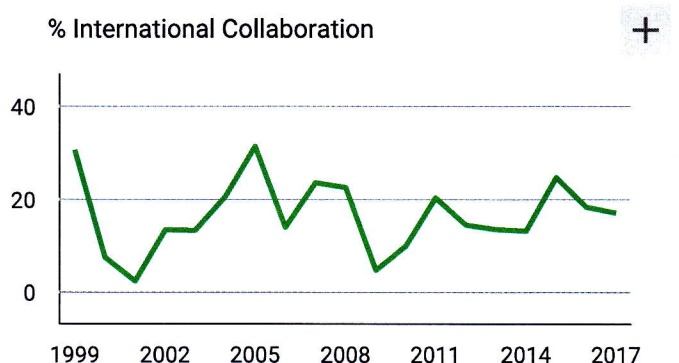
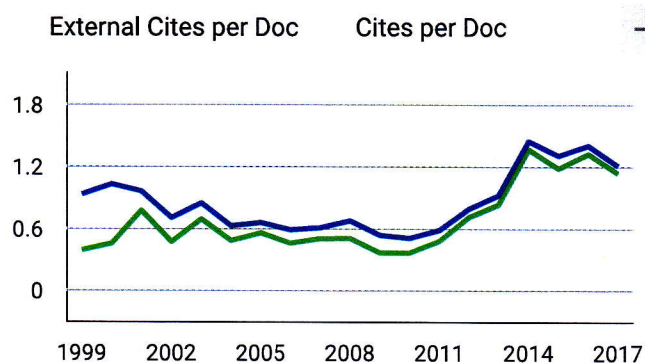
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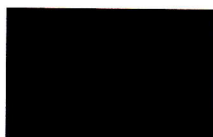
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