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Research Paper

Assessing readiness for research: a pilot study of Indonesian pharmacists

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Abstract

Objectives Readiness is a key factor that influences pharmacists' willingness to get involved in research, thus promoting evidence-based pharmacy practice. While the data are lacking, this study aimed to assess readiness for research, as well as the associated demographic and attitudinal characteristics of pharmacists in a range of healthcare settings in East Java Province, Indonesia.

Methods A questionnaire was administered to all pharmacists in a public hospital in Malang (n = 55), pharmacists from primary health centre (PHCs) (n = 63) and community pharmacies (n = 100) in Surabaya in 2017. The questionnaire consisted of three sections: (1) demographic characteristics, (2) attitudinal aspects and (3) readiness for research. Descriptive analysis was used to summarise the data. Spearman correlation tests determined the correlations between 'demographic characteristics' or 'attitudinal aspects' versus 'readiness'.

Key findings A total of 142 pharmacists responded which comprised hospital pharmacists (n = 46), community pharmacists (n = 51) and PHC pharmacists (n = 45), giving response rates ranged from 51.0% to 83.6%. Approximately half of the participating pharmacists demonstrated adequate 'readiness' to research [mean 2.53 ± 0.7 (range 0–4)]. Compared with hospital or PHC pharmacists, community pharmacists showed lower 'readiness' to research (mean 2.76 ± 0.71 versus 2.53 ± 0.66 versus 2.31 ± 0.68, respectively; P = 0.005). Two demographic characteristics positively correlated with 'readiness', that is, prior research training (r_s = 0.217; P = 0.010) and prior research experience (r_s = 0.221; P = 0.008). Meanwhile, all 'attitudinal aspects' were found to be positively correlated with research 'readiness' (all P-values <0.001).

Conclusions Findings from this study provide baseline data to develop strategies to optimise the involvement of pharmacist practitioners in research, thus enhancing evidence-based pharmacy practice and quality use of medications in Indonesia.

Keywords: Indonesia; pharmacists; research readiness; attitudinal factors; demographic characteristics

Introduction

Indonesia is a middle-income country with a population greater than 265 million, spread over 17.500 islands.[1] The Indonesian economy is among the largest in the Asia Pacific region, thus enabling its fast development in various sectors, including health.[2] A goal of the national health development program in Indonesia is to provide effective, safe and quality health care for the population.[3] To achieve the goal, there is a need for translation of research findings into daily patient care practices or decision making (evidence-based practices). Hence, the performance of well-designed research to interpret needs in the local context, including in the overall Indonesian context, plays an important role.

Based on the database SCImago in 2016; Indonesia produced a lower research output when compared with Malaysia, Singapore and Thailand. When citations are considered, Indonesia also ranked lower than Vietnam.[4] Hence since 2017, The Ministry of Research and Technology has launched a number of structured programs and incentives to encourage Indonesian academics to be more involved in research and thus increase publications. Collaboration with practitioners is of importance to ensure research findings address the needs in the context of current practice. Thus, pharmacist practitioners, as the primary providers of evidence-based pharmaceutical care, have a crucial role in research. In Indonesia, pharmacists could provide pharmaceutical care in various settings, including hospitals, primary health centres (PHC or *Pusat Kesehatan Masyarakat*, *Puskesmas*) and community pharmacies.[5–7]

The implementation of evidence-based pharmaceutical care has been reported to provide positive outcomes for patients. Employing clinical guidelines enables pharmacists to recommend optimum therapy for a specific patient, and it is often necessary to justify financial rewards or incentives for pharmacists as a profession.[8] Considering the importance of research, the International Pharmaceutical Federation (FIP) and the World Health Organisation (WHO) through the concept of 'Seven Star Pharmacist', have clearly stated that it is expected pharmacists have skills in conducting research.[9] In Indonesia, pharmacists' involvement in research has been supported by the National Committee of Pharmacy [*Komite Farmasi Nasional* (*KFN*)] by giving 10 credit points for pharmacists who are involved in either individual or joint research projects.[9]

Pharmacist practitioners' involvement in research is related to their level of readiness. Based on the transtheoretical (stage of change) model, readiness ('preparation') is the final step for implementing change ('action').[10, 11] Previous studies have suggested that readiness to research among pharmacists could be influenced by many factors. Stewart et al. reported that attitude towards research has been a key factor influencing readiness.[12] In addition, it is known that readiness to research is affected by a pharmacist's demographic characteristics, including gender,[13, 14] age,[15, 16] qualifications,[13, 15–20] work experience in the area of pharmacy,[15] prior research training,[17, 21] and prior research experience.[15–17]

While collaboration with pharmacist practitioners is paramount to produce quality research and to practice evidence-based medicines, to date, available data on Indonesian pharmacists' involvement in research is lacking. A systematic review on the involvement and attitudes of pharmacists in conducting research included articles from six countries: UK (5), Australia (3), Canada (3), Qatar (2), Thailand (1) and USA (1).[17] In addition to the studies included in the review, there were four related research articles, each conducted in Saudi Arabia,[22] Qatar,[12] Pakistan,[23] and Malaysia.[24] As there are limited data available for Indonesia, this study aimed to assess readiness for research, as well as the associated demographic and attitudinal characteristics of pharmacists in a range of healthcare settings in East Java Province, Indonesia.

Methods

Research design and participant recruitment

This cross-sectional study used a questionnaire to collect the data. Ethics approval for this study was obtained from the Medical and Health Research Ethical Committee in the Faculty of Medicine, Universitas Islam Indonesia (No. 57/Ka.Kom.Et/70/KE/XI/2018). East Java Province was chosen as the study setting since the province has the greatest spread of pharmacists in Indonesia, across 38 regions/cities. Participants included pharmacists working in a range of healthcare settings, that is, hospital, PHC and community pharmacy. Hospital pharmacists were recruited from one of the public hospitals in Malang, taking into consideration that the hospital has the highest number of pharmacists in East Java Province and also in Indonesia (n = 55); while PHC and community pharmacists were recruited from Surabaya since Surabaya has the highest number of PHCs (n = 63) and community pharmacies (n = 791) across East Java. Involvement in this study was voluntary and no rewards were given, in any form, for the participants.

Questionnaire development

A questionnaire was developed to collect data from participants. The questionnaire was drafted based on prior literature,[12–19] which is detailed as follows:

(1) 'Readiness' was determined using a question 'Are you ready to get involved in research?' with four possible answers in a 4-point Likert scale (i.e. 1 = 'not ready at all', 2 = 'not quite ready', 3 = 'ready' and 4 = 'very ready').
(2) Factors affecting 'readiness' included 'demographic characteristics' (age, gender, education level, work experience, prior research training and prior involvement in research) and 'attitudinal aspects' (general attitudes towards aspects of research; confidence, motivation and resources; research culture; and support from others). 'Attitudinal aspects' were assessed using 5-point Likert scale statements (ranging from 1 = 'strongly disagree' to 5 = 'strongly agree').

Subsequently, the questionnaire draft was forward translated (from English to Bahasa Indonesia) by one of the researchers (E.S.); and the Indonesian version was then compared with the original English version by a bilingual academic (Y.I.W.) to ensure that there were no contextual differences. Face validity was conducted with a panel of academics (n = 4), and the questionnaire was piloted to final year pharmacy students (n = 3) and pharmacist practitioners (n = 2); this resulted in minor changes to the questionnaire. The final questionnaire consisted of three sections: (1) 'demographic characteristics', (2) 'attitudinal aspects' and (3) 'readiness' for research. The final questionnaire was pretested with 30 pharmacists, and the internal consistency of the 'attitudinal aspects' was analysed using Cronbach's alpha. The Cronbach's alpha values for four attitudinal domains, that is, confidence, motivation and resources, research culture and support from others, were 0.89, 0.93, 0.94 and 0.90, respectively, which were considered as good reliability.

Data collection

Hospital pharmacists were recruited during a seminar in April 2017 in a public hospital in Malang, where all pharmacists in the hospital (n = 55) were invited. While the recruitment of PHC pharmacists and community pharmacists was conducted through a seminar in Universitas Surabaya in November 2017. The seminar aimed to promote the 'Smart Use of Medication Movement' (*Gerakan Masyarakat Cerdas Menggunakan Obat*, *GeMa CerMat*), thus the material was not related to the current research topic. While there are no records of pharmacists' addresses in East Java available, pharmacists in community pharmacies and PHCs were recruited according to their workplace settings. A sample of 100 community pharmacies were conveniently selected from a list of community pharmacies registered in the Surabaya Health Office to include 20 community pharmacies for each area, that is, West, East, Central, North and South Surabaya; while all 63 PHCs in Surabaya were included in this sample. An invitation was distributed to the sample of community pharmacies and each PHC inviting one pharmacist to attend a separate seminar held in Surabaya. At the beginning of each seminar, one of the researchers (A.P.S.) introduced the research questionnaire to pharmacists attending the seminar and asked for their participation. Written consent was obtained from those willing to participate, and they were given the paper-based questionnaire and information sheet. The pharmacists were provided some time to complete the questionnaire and submit it before the seminar began.

Data analysis

For each setting (i.e. hospital, community pharmacy or PHC), pharmacists' responses were summarised using descriptive analysis and presented as percentages for categorical data or mean ± standard deviation (SD) for continuous data (interval or ratio). With regard to the 'readiness' section, responses for the 4-point Likert scale were scored: '1' for 'not ready at all', '2' for 'not quite ready', '3' for 'ready' and '4' for 'very ready' for each participant; subsequently, a mean score ± SD was calculated for all participants and participant groups. Responses from the 5-point Likert scale statements on 'attitudinal aspects' were scored from '1' for 'strongly disagree' to '5' for 'strongly agree' for each participant; the scores were reversed for negative statements. Mean score ± SD was then calculated for all participants both for each statement as well as for each group of 'attitudinal aspects' (i.e. general attitudes towards aspects of research; confidence, motivation and resources; research culture; and support from others). Differences with regard to 'readiness', 'attitudinal aspects' and 'demographic characteristics' across settings were analysed using Kruskal–Wallis tests, with a P-value of <0.05 considered as statistically significant. Spearman Rho correlation tests were used to determined 'demographic characteristics' and 'attitudinal aspects' contributing to research 'readiness'. The analysis was conducted using SPSS version 23 (IBM Corp., Armonk, NY, USA).

Results

A total of 142/218 (65.1%) pharmacists consented to participate in this study, which consisted of: pharmacists in the hospital setting (n = 46/55), pharmacists in community pharmacies (n = 51/100) and pharmacists in PHCs (n = 45/63); thus, the response rates achieved were 83.6, 51.0 and 71.4%, respectively. The detailed characteristics of the participants can be seen in Table 1. In the hospital setting, the majority of the pharmacists was male (80.9%); while in community pharmacies and PHCs, the majority was female (94.1 and 84.4%, respectively). In addition, more than 50% of pharmacists in the hospital setting had postgraduate education, compared with only <15% among community or PHC pharmacists. The majority of pharmacists in this study had prior research training (68.3%) and/or had been involved in research (67.6%).

Detailed responses with regard to the 'attitudinal aspects' can be seen in Table 2. The mean scores for all participants for each 'attitudinal aspect' were: general attitudes towards aspects of research (3.69/5); confidence, motivation and resources (3.40/5); research culture (3.17/5); and support from others (3.28/5). Hospital pharmacists had higher mean values than those working in community pharmacies and PHCs for three groups of 'attitudinal aspects', that is, confidence motivation and resources (3.52 versus 3.26 and 3.44, respectively; $P < 0.05$); research culture (3.57 versus 2.80 and 3.17, respectively; $P < 0.001$); and support from others (3.70 versus 2.95 and 3.22, respectively; $P < 0.001$).

Further, responses regarding 'readiness' to research can be seen in Table 3. Pharmacists working in the hospital setting perceived higher 'readiness' for research compared with those in community pharmacies or PHCs. This was indicated by the mean value of 'readiness' among hospital pharmacists being significantly higher than those for community or PHC pharmacists (2.76 ± 0.71 versus 2.31 ± 0.68 and 2.53 ± 0.66, respectively; P = 0.005). The results of the correlation tests between 'demographic characteristics' or 'attitudinal aspects' versus 'readiness' can be seen in Table 4. Two participants' characteristics showed significant positive correlations with 'readiness', that is, prior research training (r_s = 0.217, P = 0.010) and prior research involvement (r_s = 0.221; P = 0.008). While all of the four 'attitudinal aspects' significantly affected 'readiness' to research, that is, general attitudes towards aspects of research (r_s = 0.537; $P < 0.001$); confidence, motivation and resources (r_s = 0.470; $P < 0.001$); research culture (r_s = 0.381; $P < 0.001$); and support from others (r_s = 0.470; $P < 0.001$).

Discussion

This study provides preliminary data on readiness to research and the associated factors among pharmacists in varied healthcare settings in Indonesia. In general, pharmacists participating in this study demonstrated a reasonable level of research 'readiness' (mean score 2.5 ± 0.7; range 0–4). According to the transtheoretical (stage of change) model, a perception of 'readiness' can be considered as a key step before taking 'action', providing what could be considered a promising basis for pharmacists' to be involved in research.

Participating pharmacists in the hospital setting reported a significantly higher readiness score compared with those in community pharmacies or PHCs. This could have occurred since more hospital pharmacists had prior involvement in research than those in the other settings. Research experience was also found to be a significant predictor of readiness for research, supporting the previous finding. Similar findings have been reported from several studies conducted in other countries.[15–17,22] In addition to research experience, hospital pharmacists showed more positive attitudes toward research compared with those in the other settings, particularly with regard to the aspects of 'confidence, motivation and resources', 'research culture' and 'support from others'. It should be noted that the hospital used for this study is a teaching hospital with a high number of pharmacists (n = 55) where almost half held postgraduate qualifications; all of which potentially contributed to the more positive attitudes and thus impacted on the readiness for research involvement.

Table 1 Demographic characteristics of participating pharmacists

Characteristics	Total (142), *N* (%)	Pharmacists' practice setting, *n* (%)			*P*-value[1]
		Hospital (46)	Community pharmacy (51)	PHC (45)	
Gender					
Male	47 (33.1)	37 (80.9)	3 (5.9)	7 (15.6)	0.001*
Female	95 (66.9)	9 (19.6)	48 (94.1)	38 (84.4)	
Age (mean ± SD, in years)		31.5 ± 7.0	36.1 ± 9.5	33.3 ± 4.1	0.005*
Level of education					
Registered pharmacist	108 (76.1)	20 (43.5)	44 (86.3)	44 (97.8)	0.001*
Postgraduate (master's/doctorate degree)	34 (23.9)	26 (56.5)	7 (13.7)	1 (2.2)	
Work experience related to pharmacy[2]					
≤5 years	26 (18.3)	5 (10.9)	15 (29.4)	6 (13.3)	0.075
6–10 years	79 (55.6)	31 (67.4)	21 (41.2)	27 (60.0)	
>10 years	31 (21.8)	4 (8.7)	15 (29.4)	12 (26.7)	
Prior research training[3]					
No	44 (31.0)	12 (26.1)	19 (37.3)	13 (28.9)	0.600
Yes[4],[5]	97 (68.3)	33 (71.7)	32 (62.7)	32 (71.1)	
In school (bachelor's degree)	79 (81.4)	28 (84.9)	27 (84.4)	24 (75.0)	
Workshop	25 (25.8)	6 (18.2)	8 (25.0)	11 (34.4)	
Seminar	19 (19.6)	3 (9.1)	6 (18.8)	10 (31.3)	
Others	5 (5.2)	5 (15.2)	0 (0.0)	0 (0.0)	
Prior involvement in research[6]					
Never	45 (31.7)	7 (15.2)	26 (51.0)	12 (26.7)	0.001*
Sometimes	82 (57.7)	36 (78.3)	24 (47.1)	22 (48.9)	
Often	14 (9.9)	3 (6.5)	0 (0.0)	11 (24.4)	

Abbreviations: PHC, primary health centre (*Puskesmas*); SD, standard deviation.
[1]Results from Kruskal–Wallis tests.
[2]Six missing responses (13.0%).
[3]One missing response (2.2%).
[4]Respondents can choose more than one answer.
[5]The calculation was done by dividing the number of participants with a type of research training with the total number of participants with prior training.
[6]One missing response (2.0%).
*Statistically significant difference ($P < 0.05$).

Among 'demographic characteristics', research experience and prior research training showed positive correlations with 'readiness'. These positive correlations could be explained with an *a priori* hypothesis that prior training and research experience might improve research knowledge and skills; while other studies have suggested that research knowledge and skills have been key factors that determine interest and an active involvement in research.[15, 17, 19, 21] Most pharmacists involved in this research study reported that they had received research training as part of their final project in their bachelor's degrees. Considering research activity has not been integrated into pharmacists' daily practice in most settings, continued training would be of importance for practitioner pharmacists to improve their perceived readiness for research. Fakeye *et al.* reported that 89.5% of practitioner pharmacists agreed that additional research-oriented training was essential for conducting research effectively.[25] Hence, establishing regular Continuing Professional Development (CPD) programs related to the fundamentals of conducting research warrants further consideration.

Previous studies have suggested that educational level and work experience were significant predictors of pharmacists' readiness to research.[13, 15–20] This study has found positive correlations between these two factors with 'readiness', however, the correlations were not significant. This might relate to the external factors, such as in the organisational level. It was acknowledged that organisational commitment to support research has played an essential role in nurturing the research environment.[19, 24] When pharmacists' workplaces showed inadequate commitment to research, resources made available would also tend to be limited. Further research would be required to understand research commitment among leaders or policymakers in pharmacists' workplaces; this is particularly important in settings with limited healthcare resources, such as in Indonesia. Moreover, organisational commitment in allocating specific time for pharmacists for involvement in research warrants further consideration, especially in the era of Universal Health Coverage [*Jaminan Kesehatan Nasional* (*JKN*)] where demand for patient care has significantly increased.[26] Previous studies have suggested that Indonesian pharmacists generally have had high workloads;[27–29] hence, without a commitment to allocate specific time for research, pharmacists would tend to choose urgent tasks to ensure continuity in providing daily care for patients rather than get involved research.

This study confirmed positive correlations between all 'attitudinal aspects' with pharmacists' readiness for research ($P < 0.001$). While participating pharmacists in all settings showed adequate 'attitude towards aspects of research' as well as 'confidence, motivation, and resources' (all mean values >3); they believed some improvements were necessary for the organisational level with regard to 'research culture' and 'support from others' (all mean values <3), particularly in community pharmacy settings. It should be noted that community pharmacies in Indonesia do not have to be owned by a pharmacist, some are even corporately owned or franchised. Community pharmacies often employ one or two pharmacists; hence, a range of tasks from planning to stock monitoring and counselling are often done by limited human resources. These all are challenges for community pharmacies in creating a research culture and providing adequate support for their pharmacist employees to be involved in research. On the other hand, as primary health providers for many

Table 2 Pharmacists' responses on 'attitudinal aspects' towards research

	Total (N = 142)	Pharmacists' practice setting Mean score (range)[1]			P-value[2]
		Hospital (n = 46)	Community pharmacy (n = 51)	PHC (n = 45)	
Attitudinal aspect 1: general attitudes towards aspects of research					
Being involved in research is important to my career	3.73 (2–5)	3.87 (2–5)	3.61 (2–5)	3.76 (2–5)	
Research is of little importance to me[3]	3.55 (1–5)	3.67 (2–5)	3.36 (2–5)[4]	3.62 (1–5)	
I feel that it is my professional duty to be involved in research	3.71 (1–5)	3.76 (1–5)	3.64 (2–5)[4]	3.73 (2–5)	
Research is of little relevance to practicing pharmacists[3]	3.76 (2–5)	3.87 (2–5)	3.66 (2–5)[4]	3.76 (2–5)	
Research is of little importance to my organisation[3]	3.85 (1–5)	3.98 (1–5)	3.76 (2–5)	3.82 (3–5)	
Research is more suited to academics rather than practicing pharmacists[3]	3.49 (1–5)	3.76 (2–5)	3.22 (1–5)	3.53 (1–5)	
Research is of little importance to me[3]	3.74 (2–5)	3.89 (2–5)	3.52 (2–5)[4]	3.82 (3–5)	
Mean score ± SD[5] (range)	3.69 ± 0.55 (2.33–5.00)	3.83 ± 0.44 (2.71–5.00)	3.53 ± 0.65 (2.33–4.86)	3.72 ± 0.51 (3.00–5.00)	0.066
Attitudinal aspect 2: confidence, motivation and resources					
I am motivated to be involved in research	3.62 (2–5)	3.82 (2–5)[6]	3.45 (2–5)	3.62 (2–5)	
I am entirely confident in my ability to be involved in research	3.72 (2–5)	3.91 (2–5)	3.53 (2–5)	3.76 (3–5)	
I am entirely confident in my ability to assess my own research training needs	3.71 (2–5)	3.69 (2–5)[6]	3.61 (2–5)	3.84 (3–5)	
I am entirely confident in my ability to lead research teams	3.39 (2–5)	3.50 (2–5)	3.24 (2–5)	3.44 (2–5)	
I already actively support others involved in research	3.46 (2–5)	3.54 (2–5)	3.22 (2–5)	3.64 (2–5)	
I have sufficient information technology support to be involved in research	3.28 (1–5)	3.39 (1–5)	3.14 (2–5)[4]	3.31 (2–5)	
I have sufficient administrative support to be involved in research	3.18 (1–5)	3.20 (1–5)	3.20 (2–5)	3.16 (1–5)	
I have sufficient opportunities to discuss my research ideas with others	3.30 (2–5)	3.50 (2–5)	3.14 (2–5)	3.29 (2–5)	
I already have access to statistical support for research data analysis	3.17 (2–5)	3.35 (2–5)	3.06 (2–5)	3.13 (2–5)	
I already have access to research training courses	3.53 (2–5)	3.67 (2–5)	3.35 (2–5)	3.58 (2–5)	
I already have access to all of the resources I need to be involved in research	3.04 (1–5)	3.15 (1–5)	2.88 (1–5)	3.09 (1–5)[7]	
Mean score ± SD[5] (range)	3.40 ± 0.56 (2.00–5.00)	3.52 ± 0.54 (2.00–4.64)	3.26 ± 0.60 (2.09–5.00)	3.44 ± 0.50 (2.73–5.00)	0.040*
Attitudinal aspect 3: research culture					
I work within a research active pharmacy team	2.99 (1–5)	3.50 (2–5)	2.62 (1–4)	2.87 (2–5)	
I work within a research active multidisciplinary team	2.97 (1–5)	3.43 (2–5)	2.58 (1–4)	2.93 (1–5)	
I work within a research active work environment	3.16 (1–5)	3.78 (2–5)	2.67 (2–5)	3.09 (1–5)	
I work within a supportive research environment	3.32 (2–5)	3.89 (2–5)	2.80 (2–5)	3.31 (2–5)	
Being involved in research is already part of my practice	3.11 (2–5)	3.43 (2–5)	2.69 (2–4)	3.24 (2–5)	
There are opportunities for me to attend research seminars and discussions	3.58 (2–5)	3.65 (2–5)	3.47 (2–5)	3.62 (2–5)	
Others often discuss their research ideas with me	3.04 (2–5)	3.28 (2–5)	2.75 (2–4)	3.14 (2–5)	
Mean score ± SD[5] (range)	3.17 ± 0.67 (2.00–5.00)	3.57 ± 0.49 (2.57–5.00)	2.80 ± 0.63 (2.00–4.00)	3.17 ± 0.65 (2.00–5.00)	<0.001*
Attitudinal aspect 4: support from others					
My fellow pharmacists are supportive of me being involved in research	3.33 (2–5)	3.66 (2–5)[8]	2.98 (2–4)	3.40 (2–5)	
My employing organisation is supportive of me being involved in research	3.31 (1–5)	3.83 (2–5)[9]	2.98 (2–5)	3.18 (1–5)	
My line manager (boss) is supportive of me being involved in research	3.35 (2–5)	3.87 (2–5)[6]	2.98 (2–4)	3.24 (2–5)	
Other healthcare professionals I work with are involved in research	3.23 (2–5)	3.74 (2–5)	2.80 (2–4)	3.18 (2–5)	
Other members of the wider healthcare team (non-pharmacists) are supportive of me being involved in research	3.19 (1–5)	3.48 (1–5)	3.00 (2–4)	3.11 (2–5)	
Mean score ± SD[5] (range)	3.28 ± 0.67 (2.00–5.00)	3.70 ± 0.57 (2.00–5.00)	2.95 ± 0.61 (2.00–4.00)	3.22 ± 0.60 (2.00–5.00)	<0.001*

Abbreviations: PHC, primary health centre (*Puskesmas*); SD, standard deviation.

[1]Mean score for each statement was calculated by dividing the total score for that statement from all participants with the total number of participants. The score for each statement was obtained from each participant's response on a 5-point Likert scale (1 = strongly disagree to 5 = strongly disagree).

[2]Results from Kruskal–Wallis tests.

[3]Negative statement, thus the scoring was reversed.

[4]One missing response (2.0%).

[5]Mean score for each group was calculated by dividing the total score for that group from all participants with the total number of participants.

[6]One missing response (2.2%).

[7]One missing response (2.2%).

[8]Two missing response (4.4%).

[9]Three missing response (6.6%).

*Statistically significant difference (P < 0.05).

Table 3 Pharmacists' responses to research 'readiness'

	Total (142), *N* (%)	Pharmacists' practice setting, *n* (%)			*P*-value[1]
		Hospital (46)	Community pharmacy (51)	PHC (45)	
Not ready at all	6 (4.2)	0 (0.0)[2]	5 (9.8)	1 (2.2)	
Not quite ready	60 (42.3)	12 (26.1)	26 (51.0)	22 (48.9)	
Ready	67 (47.2)	29 (63.0)	19 (37.3)	19 (42.2)	
Very ready	8 (5.6)	4 (8.7)	1 (2.0)	3 (6.7)	
Mean score ± SD (range)[3]	2.53 ± 0.70 (0–4)	2.76 ± 0.71 (0–4)	2.31 ± 0.68 (1–4)	2.53 ± 0.66 (1–4)	0.005*

Abbreviation: PHC, primary health centre (*Puskesmas*).

[1]Mean score of 'readiness' was calculated by dividing the total score of 'readiness' from all participants with the total number of participants. The 'readiness' score was obtained from each participant's response on a 4-point Likert scale (1 = not ready at all, 2 = not quite ready, 3 = ready, 4 = very ready).

[2]One missing response (2.2%).

[3]Results from Kruskal–Wallis tests.

*Statistically significant difference ($P < 0.05$).

Table 4 Correlation between 'demographic characteristics' and 'attitudinal aspects' versus 'readiness' for research

Factor	Correlation coefficient (r_s)[1]	*P*-value[1]
Demographic characteristics		
Gender	−0.150	0.075
Age	−0.052	0.539
Level of education	0.120	0.156
Work experience in pharmacy	0.019	0.818
Prior research-related training	0.217	0.010*
Prior involvement in research	0.221	0.008*
Attitude aspects		
Attitudes towards aspects of research	0.537	<0.001*
Confidence, motivation and resources	0.470	<0.001*
Research culture	0.381	<0.001*
Support from other	0.470	<0.001*

[1]Results from Spearman correlation test.

*Statistically significant difference ($P < 0.05$).

Indonesians;[20–34] community pharmacists play an important role in research and evidence-based practice.

Based on these study findings, some practical points could be suggested to improve pharmacists' readiness to research. Firstly, collaboration is needed between academic and practitioner pharmacists. Academic pharmacists could have roles in the conceptualisation of research, while the main role of practising pharmacists could relate to data collection in their workplace. Prior studies have reported that such research networks have been successfully established;[35–37] and this could also be considered for the Indonesian context. Secondly, the technical procedures for research should be integrated into the practitioner pharmacists' daily routine; this could help in reducing the additional burden related to research.

This study has some limitations. First, convenience sampling was applied to recruit the pharmacists, particularly those practising in community pharmacies; hence caution should be made when generalising data to East Javan or Indonesian context. However, this approach was considered a feasible option as there are no records of pharmacists' addresses in East Java available. In addition, an adequate response rate was achieved (>50.0%), so that the study is expected to provide valuable insights on pharmacists' research readiness in East Java, Indonesia. Secondly, this study used self-reported data and the data collection was conducted during seminars. This might be subjected to social desirability bias, in which participants tend to give their answers according to what they perceive to be socially desirable. However, pharmacists' involvement in research has not been regulated in the Indonesian standards of pharmacy practice; there were no right or wrong answers, and as such, it is expected that the participants could provide their honest responses. Thirdly, this study was conducted in two of the largest cities in East Java, in which many educational institutions in the area of pharmacy are located. The existence of these institutions provides opportunities for local pharmacists to be exposed to various research activities conducted by pharmacy academics, and as such it might not represent the views of those in more remote areas of Indonesia. However, this research provides baseline data on the readiness for research among Indonesian pharmacists; a large-scale study could be considered to confirm the findings.

Conclusion

This study provides preliminary data on the readiness for research among hospital, community and PHC pharmacists in East Java, Indonesia. In general, the participating pharmacists perceived adequate readiness to be involved in research, particularly those practising in the hospital setting. Past research training and involvement in prior research were a good basis for pharmacists to become involved in future research. Seminars on research training could assist in establishing further readiness. It is also necessary to improve the level of commitment from pharmacists' workplace, in terms of developing a research culture and cooperation among employees. While this study focused on the pharmacists-related factors, further study is required to understand more about the contributing external factors; all of which should provide a basis to develop appropriate strategies to enhance pharmacists' roles in research and thus further promote evidence-based care in Indonesia.

Author Contributions

Y.I.W. made contributions to the conception and design of the study. A.P.S., Y.I.W., E.S., and S.V.H facilitated the data collection; Y.I.W., E.S., S.V.H., R.P.U. participated in the data analysis, and S.V.H. and R.P.U. wrote the first draft of the manuscript. B.S. and A.P.S. contributed to the design of the study and interpretation of data. All authors were involved in the revisions to the manuscript and final approval of the version to be published.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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< Previous Next >

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View article

RESEARCH PAPERS

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View article

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Nisha Jha, Subish Palaian, Pathiyil Ravi Shankar, Santosh K. C., Pan Bahadur Kshetry

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View article Supplementary data

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Angela Uyen-Cateriano, Percy Herrera-Añazco, Benoit Mougenot, Jerry K Benites-Meza, Vicente A Benites-Zapata

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View article

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View article

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Rana Kamran Mahmood, Syed Wasif Gillani, Muhammad Waqas Saeed, Prasanna Vippadapu, Maryam Jaber Mohamed Abdulla Alzaabi

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View article Supplementary data

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View article Supplementary data

Front Matter Table of Contents

All issues

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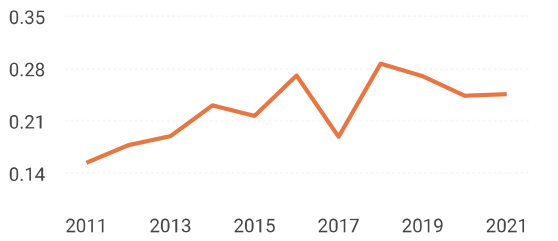

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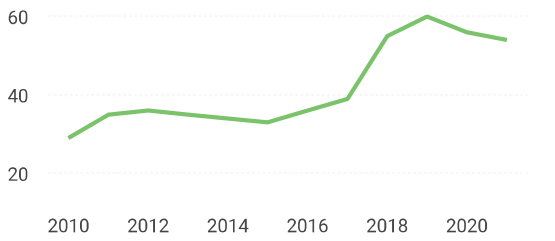

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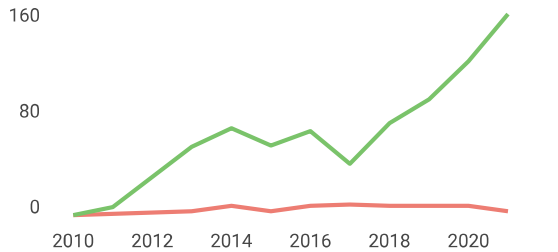

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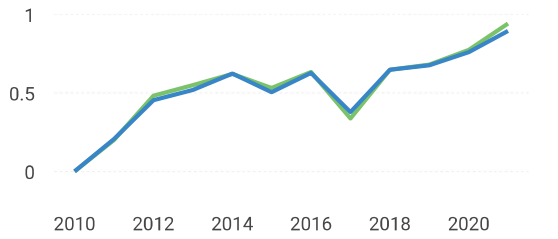

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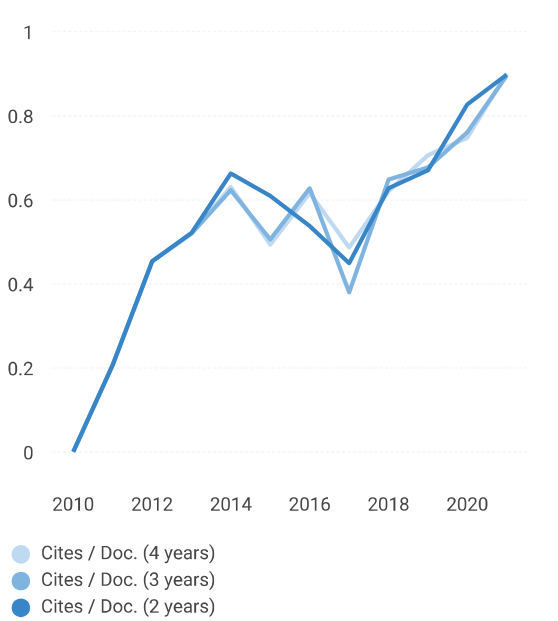

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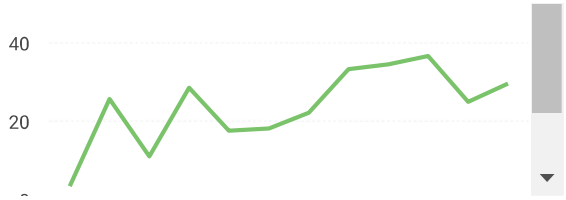

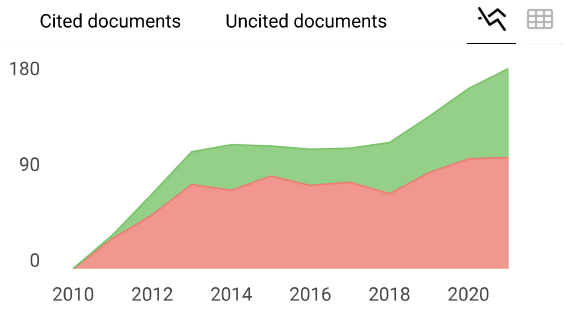

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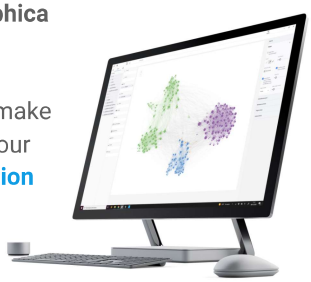

Metrics based on Scopus® data as of April 2022

A **Ayilya M** 2 years ago

I would like to know if Journal of Pharmaceutical Health Services Research is scopus indexed as of 2021. I would like to know about its impact factor also.

reply

SCImago Team

Melanie Ortiz 2 years ago

Dear Ayilya,
thank you very much for your comment. We suggest you consult the Scopus database

directly. Keep in mind that the SJR is a static image (the update is made one time per year) of a database (Scopus) which is changing every day.
Besides, as SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it above). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source.
Best Regards, SCImago Team

A **ASIM AHMED** 2 years ago

Please update the cite score of 2020 or at least 20219 for this Journal
Journal of Pharmaceutical Health Services research

reply

SCImago Team

Melanie Ortiz 2 years ago

Dear Asim, thank you very much for your comment. We suggest you consult the Scopus database to see the CiteScore.
Best Regards, SCImago Team

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Horatio (Satire 1,1,106)

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