

# A Cross-Sectional Survey of Attitude, Perception and Interest in Conducting Pharmacy Practice Research among the Northern States Enforcement Pharmacists in Malaysia

Vinoedh Naidu Raja Gopal<sup>1</sup>, Lee Boon Sin<sup>1</sup>, A. Thanalekshumi Appadorai<sup>1</sup>, Dali Ismail<sup>1</sup>, Rohaya Mahmud<sup>1</sup>, Mokhtar Abdullah<sup>1</sup>

<sup>1</sup> Kedah Pharmacy Enforcement Branch, Kedah State Health Department, Ministry of Health Malaysia

## Abstract

**Introduction:** Pharmacy practice research becomes an essential element in Malaysian pharmacy practice. An increasing number of pharmacy practice research findings proved its importance in policy decision making and improving health services.

**Objectives:** This study aimed to determine the attitude, perception and interest among the enforcement pharmacists in conducting research and to compare with their demographic factors.

**Methods:** A cross-sectional survey was conducted using a validated self-administered questionnaire that assess the attitude, perception and interest to conduct pharmacy practice research among the enforcement pharmacists in four northern states in Malaysia namely Kedah, Perlis, Penang and Perak. Descriptive analysis was used to analyse the attitude, perception and interest responses. Independent samples t-test and one-way ANOVA and were used to compare the attitude, perception and interest based on demographic factors.

**Results:** A total of 120 enforcement pharmacists responded to the questionnaire (response rate: 94.5%). The attitudes, perception and interest were moderate. The mean scores [ $\pm$  standard deviation (SD)] of attitudes, perception and interest were  $3.05 \pm 0.56$ ,  $3.26 \pm 0.51$  and  $2.94 \pm 0.77$  respectively. The main barrier to research was not having enough time to conduct research (73.3%) and the least reported barrier was other reason – forced to do (0.8%). There was no significant association between the age, gender and working experience with the attitude, perception and interest. No significant association was also observed in the perception and interest among the enforcement pharmacists with their prior research experience. However, there was a statistically significant association between the attitude and prior research experience ( $p=0.045$ ).

**Conclusion:** The enforcement pharmacists in Northern Malaysia had moderate attitude, perception and interest in conducting pharmacy practice research and those with prior research experience had more positive attitude to conduct research.

**Keywords:** attitude, perception, interest, enforcement pharmacists, pharmacy practice, Malaysia

**NMRR ID:** NMRR-20-677-53214

**Corresponding Author:** Vinoedh Naidu Raja Gopal

Kedah Pharmacy Enforcement Branch, Kedah State Health Department, Jalan Kuala Kedah, 05400 Alor Setar, Kedah.

Email: vinoedh@moh.gov.my

## Introduction

Research is an important aspect of pharmaceutical services and health care delivery by providing innovative ideas, valuable information, transformation and evidence to support policy decision making and improve health services. Pharmacy practice in Malaysia compromises pharmaceutical care to patients at the primary and secondary care levels as well as enforcement of relevant acts and regulations pertaining to pharmaceutical products and cosmetics. There is a strong commitment by the Pharmacy Services Programme of Ministry of Health Malaysia (MOH) to encourage all pharmacists to conduct research in addition to their routine job, in line with the changing demands of the population and the advancement of digital technology. Globally, health systems face challenges in terms of access to needed medicines,

optimising medicines use and reducing unwanted risk. Thus, useful research outcomes will improve population health and economic well-being besides facilitating health policies.

The increasing trend of conducting research among the pharmacists are seen lately. There were only about 50% pharmacy facilities within MOH conducting research in year 2015, but this had increased to 95% in 2020 (1). Meanwhile, the first Pharmacy Research Reports was published in 2018 by the Pharmaceutical Services Programme, marking a milestone to collect and publish the research findings by the pharmacists in MOH, which also proved the significance of pharmacy practice research in Malaysia (2). This encourages and intensifies knowledge sharing via publishing research findings.

A large number of small-scaled research are being conducted at the hospitals and health facilities by a mixture of trained and inexperienced pharmacy researchers (3), who sometimes repeat similar researches in different facilities. However, overcoming this is not easy because pharmacists must have adequate research skills and understanding of research gaps. Furthermore, there are limited researches in the field of pharmacy enforcement to serve as references to improve pharmacy enforcement practices. Good researches are important to address critical concerns.

Several studies from the other countries showed that although the pharmacists were aware of research, they were less likely to get involved in research activities (4,5). This situation is expected to be worse among the enforcement pharmacists as their job scopes are different from other pharmacists. The enforcement pharmacists are mainly involved in enforcement and prevention activities, control of licensing, monitoring activities, and consumer awareness activities to reduce the demand for unsafe or hazardous products (6). So far, no studies have addressed the need of pharmacy research among the pharmacy enforcement officers worldwide. This study's aim was to assess the attitude, perception and interest of enforcement pharmacists in conducting pharmacy practice researches. The results of this research will be useful for the enforcement pharmacists and policy makers to improve their involvement in pharmacy research.

## Methods

This cross-sectional study was carried out from August to October 2020 in four northern states in Malaysia namely Kedah, Perlis, Penang and Perak. The questionnaire for this study was adapted from similar studies that was done in Saudi Arabia and Ethiopia (4,7). The permissions from the authors were obtained to use and modify the questionnaires as the original questionnaires were conducted in different settings in Saudi Arabia and Ethiopia. This newly developed questionnaire was validated through content validation by three subject matter experts (SME). A pilot study was conducted among 20 selected enforcement pharmacists from Kedah. The internal consistency by Cronbach's alpha of attitude, perception and interest in conducting research were 0.775, 0.758 and 0.954 respectively in this study. Therefore, all Cronbach's alpha scores were acceptable for modified instruments. The pilot study results were also included in the final analysis.

This questionnaire consists of five sections where section A collected the demographic factors such as age, gender, academic qualification, working experience in years and prior research experience. Section B, C and D contained ten questions each to collect responses on the attitude, perception and interest in conducting pharmacy practice research using 5-point Likert's scale. Scores were assigned to the answers, in which 1=strongly disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree. There were some negative statements and these were reversely coded before the analysis. The mean ( $\pm$  standard deviation (SD)) scores were calculated, with the highest possible mean score being 5.00 and lowest possible mean score was 1.00. The scores were classified into low, moderate and high by dividing the difference between the highest and lowest possible mean score by 3 to give an interval of 1.33. Mean score of 1.00-2.33, 2.34-3.67 and 3.68-5.00 was interpreted as low, moderate and high level of attitude, perception and interest in conducting research (8). In section E, the barriers to conducting research was investigated.

This study was approved by the MOH Medical Research and Ethics Committee (MREC) with the National Medical Research Registry (NMRR) registration number of NMRR-20-677-53214. All 127 practising enforcement pharmacists from the selected Malaysian northern states were included. The questionnaires were sent out by registered mail to the respective offices and follow-up with the states' representatives was done every week.

Data was analysed using Statistical Package for Social Science (SPSS) version 23.0. Descriptive analysis focused on frequencies and percentages while independent samples t-tests and one-way analysis of variance (ANOVA) were utilised to determine the differences between the selected demographic variables. The statistical significance level was set at  $p < 0.05$ . Academic qualification was not analysed and discussed as 90% of the respondents were having bachelor academic qualification.

## Results

A total of 120 responses were received (response rate 94.5%) and analysed. The demographic characteristics of the study population were reported in Table 1. Majority of the respondents were between 31-35 years old (47.5%), male (53.3%), have bachelor academic qualification (90%), working experience of 4-6 years (28.3%) and with prior research experience (65.8%).

Most of the responses to the attitude, perception and interest to conduct pharmacy practice research were in the moderate level, with only seven out of 30 attitude, perception and interest statements were positively or negatively responded (levels: low = 1.00–2.33, moderate = 2.34–3.66, high = 3.67–5.00).

The attitude of the respondents to conduct pharmacy practice research was moderate with the mean score of 3.05 (SD 0.558, range 2.56–3.64). The statement with the highest mean score was '*Research is of little importance in Malaysia*' and this was a negative statement. The lowest mean score statement was '*I am confident to conduct research*'.

The perception of the respondents to conduct pharmacy practice research was moderate with the mean score of 3.26 (SD 0.507, range 2.45–4.13). The highest mean score statement was '*Research is important to improve health service delivery*'. The lowest mean score statement was '*My daily activities prevent me from doing research*' and this was a negative statement.

The interest of the respondents to conduct pharmacy practice research was also moderate with the mean score of 2.94 (Std.Deviation = 0.769, range 2.78 – 3.12). The highest mean score statement was '*Generating research ideas*'. The lowest mean score statement was '*Giving an oral presentation*'.

When examining the barriers in conducting research, it was found that the main barrier reported was no enough time (73.3%), followed by no personal interest and lack of knowledge (62.5%) (Table 5). In terms of association between the characteristics of the enforcement pharmacist with the attitude to conduct pharmacy practice research, it was found that there was a significant association between prior research experience ( $p=0.045$ ) and attitude. There was no significant association between the demographic characteristics of the enforcement pharmacist with their perception and interest to conduct pharmacy practice research (Table 6).

Table 1: Respondents' demographic characteristics (n=120)

Demographic variables	n	(%)
Age group		
25 - 30 years	33	(27.5)
31 - 35 years	57	(47.5)
36 years and above	30	(25.0)
Gender		
Male	64	(53.3)
Female	56	(46.7)
Current academic qualification		
Bachelor	108	(90.0)
Master	12	(10.0)
Experience as enforcement pharmacist		
1 - 3 years	31	(25.8)
4 - 6 years	34	(28.3)
7 - 9 years	28	(23.3)
10 years and above	27	(22.5)
Prior research experience		
Yes	79	(65.8)
No	41	(34.2)

Table 2: Attitude towards pharmacy practice research (n=120)

No.	Statement	n (%)					Mean	SD
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
B1	Being involved in research is important to my career	2 (1.7)	12 (10.0)	56 (46.7)	43 (35.8)	7 (5.8)	3.34	0.804
*B2	Research is of little importance to me	5 (4.2)	29 (24.2)	60 (50.0)	20 (16.7)	6 (5.0)	3.06	0.882
B3	I feel that it is my professional duty to be involved in research	3 (2.5)	17 (14.2)	58 (48.3)	33 (27.5)	9 (7.5)	3.23	0.877
*B4	Research is of little relevance to enforcement pharmacists'	9 (7.5)	34 (28.3)	51 (42.5)	23 (19.2)	3 (2.5)	3.19	0.919
*B5	Research is of little importance in Malaysia	26 (21.7)	49 (40.8)	23 (19.2)	20 (16.7)	2 (1.7)	3.64	1.052
*B6	Research is more suited to academics rather than enforcement pharmacists'	6 (5.0)	26 (21.7)	32 (26.7)	34 (28.3)	22 (18.3)	2.67	1.155
B7	I already underwent research training courses	9 (7.5)	20 (16.7)	46 (38.3)	39 (32.5)	6 (5.0)	3.11	0.994
B8	Involving in research is a part of my practice	6 (5.0)	26 (21.7)	62 (51.7)	20 (16.7)	6 (5.0)	2.95	0.887
*B9	I don't have time to think about research	7 (5.8)	20 (16.7)	45 (37.5)	30 (25.0)	18 (15.0)	2.73	1.090
B10	I am confident to conduct research	14 (11.7)	47 (39.2)	43 (35.8)	10 (8.3)	6 (5.0)	2.56	0.977
Overall						3.05	0.558	

Abbreviation: SD – standard deviation.

\* Negative statements.

Table 3: Perception towards pharmacy practice research (n=120)

No.	Statement	n (%)					Mean	SD
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
C1	Research should be a high priority for pharmacist	3 (2.5)	19 (15.8)	48 (40.0)	44 (36.7)	6 (5.0)	3.26	0.874
C2	It is important to be kept informed of the research relevant to the practice of pharmacy	1 (0.8)	2 (1.7)	37 (30.8)	62 (51.7)	18 (15.0)	3.78	0.747
C3	My daily practice is influenced by evidence based pharmacy practice research	10 (8.3)	24 (20.0)	49 (40.8)	29 (24.2)	8 (6.7)	3.01	1.025
*C4	Pharmacy research findings are irrelevant to me as an enforcement pharmacist	7 (5.8)	46 (38.3)	44 (36.7)	14 (11.7)	9 (7.5)	3.23	0.994
C5	Research is important to improve health service delivery	1 (0.8)	0 (0.0)	17 (14.2)	66 (55.0)	36 (30.0)	4.13	0.709
C6	Research is important for my recognition	7 (5.8)	12 (10.0)	67 (55.8)	26 (21.7)	8 (6.7)	3.13	0.898
C7	Research is important for my self-satisfaction	13 (10.8)	21 (17.5)	57 (47.5)	27 (22.5)	2 (1.7)	2.87	0.943
*C8	My daily activities prevent me from doing research	3 (2.5)	14 (11.7)	40 (33.3)	40 (33.3)	23 (19.2)	2.45	1.011
C9	I would require supervision to do research	1 (0.8)	3 (2.5)	26 (21.7)	66 (55.0)	24 (20.0)	3.91	0.767
C10	I am prepared to make time to do research during working hours	13 (10.8)	26 (21.7)	49 (40.8)	28 (23.3)	4 (3.3)	2.87	1.004
Overall						3.26	0.507	

Abbreviation: SD – standard deviation.

\* Negative statements.

Table 4: Interest to conduct pharmacy practice research (n=120)

No.	Statement	n (%)					Mean	SD
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
D1	Generating research ideas	4 (3.3)	22 (18.3)	57 (47.5)	30 (25.0)	7 (5.8)	3.12	0.891
D2	Finding relevant literature	8 (6.7)	24 (20.0)	57 (47.5)	28 (23.3)	3 (2.5)	2.95	0.897
D3	Writing a research proposal	9 (7.5)	26 (21.7)	62 (51.7)	20 (16.7)	3 (2.5)	2.85	0.876
D4	Using quantitative research methods (e.g. RCTs, cohort studies, surveys, questionnaires)	10 (8.3)	19 (15.8)	59 (49.2)	27 (22.5)	5 (4.2)	2.98	0.944
D5	Using qualitative research methods (e.g. focus groups, interviews)	11 (9.2)	20 (16.7)	60 (50.0)	26 (21.7)	3 (2.5)	2.92	0.922
D6	Analysing results	8 (6.7)	19 (15.8)	59 (49.2)	31 (25.8)	3 (2.5)	3.02	0.889
D7	Interpreting results	8 (6.7)	15 (12.5)	59 (49.2)	35 (29.2)	3 (2.5)	3.08	0.885
D8	Giving an oral presentation (e.g. national or international conference)	14 (11.7)	30 (25.0)	49 (40.8)	22 (18.3)	5 (4.2)	2.78	1.014
D9	Writing final research thesis	11 (9.2)	28 (23.3)	57 (47.5)	20 (16.7)	4 (3.3)	2.82	0.935
D10	Publishing research in academic journals	9 (7.5)	26 (21.7)	59 (49.2)	24 (20.0)	2 (1.7)	2.87	0.879
Overall							2.94	0.769

Abbreviation: SD – standard deviation.

Table 5: Barriers in conducting pharmacy practice research (n=120)

	n (%)
No personal interest	75 (62.5)
Not enough staff	38 (31.7)
Not aware of opportunity	17 (14.2)
Not enough time	88 (73.3)
Never been asked to	3 (2.5)
Lack of incentives	41 (34.2)
Lack of knowledge	75 (62.5)
Lack of support	47 (39.2)
Lack of research facilities	41 (34.2)
Others	1 (0.8)

Note: Respondents were allowed to choose more than one response.

Table 6: Association between demographic characteristics and attitude, perception and interest scores (n=120)

Demographic variables	n (%)	Attitude score, mean (SD)	t / F statistics	p-value	Perception score, mean (SD)	t / F statistics	p-value	Interest score, mean (SD)	t / F statistics	p-value
Age group ¶										
25 - 30 years	33 (27.5)	3.082 (0.517)	0.129	0.88	3.342 (0.462)	0.606	0.547	2.982 (0.718)	0.08	0.923
31 - 35 years	57 (47.5)	3.049 (0.576)			3.249 (0.539)			2.93 (0.846)		
36 years and above	30 (25.0)	3.01 (0.581)			3.01 (0.581)			2.907 (0.686)		
Gender §										
Male	64 (53.3)	3.083 (0.581)	0.723	0.471	3.298(0.494)	0.79	0.431	3.047 (0.675)	1.665	0.099
Female	56 (46.7)	3.009 (0.532)			3.225 (0.524)			2.814 (0.854)		
Experience as enforcement pharmacist ¶										
1 - 3 years	31 (25.8)	3.126 (0.461)	0.291	0.832	3.429 (0.449)	1.61	0.189	2.887 (0.662)	0.566	0.638
4 - 6 years	34 (28.3)	3.003 (0.595)			3.118 (0.573)			2.988 (0.913)		
7 - 9 years	28 (23.3)	3.021 (0.595)			3.182 (0.406)			2.814 (0.688)		
10 years and above	27 (22.5)	3.044 (0.592)			3.256 (0.557)			3.063 (0.783)		
Prior research experience §										
Yes	79 (65.8)	3.115 (0.602)	2.029	0.045	3.272 (0.519)	0.238	0.812	2.973 (0.848)	0.773	0.441
No	41 (34.2)	2.916 (0.44)			3.249 (0.49)			2.871 (0.592)		

Abbreviation: SD – standard deviation.

¶ One-way Anova; § Independent T test.

## Discussion

Research among the enforcement pharmacists are relatively limited. To date, there has been limited published data on the attitude, perception and interest of the enforcement pharmacists to conduct pharmacy practice research. It was therefore a timely study to improve the involvement of enforcement pharmacists in pharmacy researches.

In this study, majority of the enforcement pharmacists expressed a moderate attitude, perception and interest towards pharmacy practice research. There was no significant association between the demographic factors of enforcement pharmacist with attitude, perception and interest to do research among enforcement pharmacist. This clearly showed that most of the enforcement pharmacists were indifferent towards pharmacy practice research. This can be debatable as enforcement pharmacists' attitude, perception and interest towards pharmacy practice research might be different from others like hospital pharmacists, clinical pharmacists or community pharmacists even though they had the same background of education. Another underlying reason would be the different job scopes of enforcement pharmacists.

However, those with prior experience in research had more positive attitudes towards research. The percentage of enforcement pharmacists with prior research experience in this study was higher (65.8%) compared to the population in other studies where the rate ranged from 9% to 50% (9,10). This reflected that involvement in research activities was not a new thing among the pharmacy enforcement officers consequential to research activities done during their undergraduate years in the pharmacy school.

In terms of the attitude and perception, the respondents generally felt that research is important but they were less confident to do it. The daily activities of enforcement officers may not provide a conducive environment to conduct research. This was evident that majority of the respondent reported time as a barrier to conduct research. Most of the respondents were also interested in generating research ideas but had reservation about presenting the research orally.

Enforcement pharmacists who participated in this survey appeared to understand the importance, relevance and value of pharmacy practice research. However, since they were not directly involved with patient care and health services delivery, their attitude, perception and interest towards pharmacy practice research may be moderate. Nevertheless, the barriers related to time, knowledge, support, incentives, facilities and opportunities identified in this study were quite similar to other studies (9). When a research was conducted as a compulsory requirement or request by the management, this may limit the contribution (5).

This research is the first study of Malaysian enforcement pharmacists' attitude, perception and interest to research with excellent response rate of (94.5%). There were some in this study. Firstly, this study is only done in northern region and could not be generalised nationally as different region may have different response. Besides that, the the respondent of this survey was mainly between 31 to 35 years old who are upper young adult compared the general enforcement workforce whom age could range between 22 to 60 years old. Thus, the result of this study might not generalize the enforcement pharmacist population in Malaysia.

## Conclusion

Most of the enforcement pharmacists in the northern region of Malaysia had moderate attitude, perception and interest towards pharmacy practice research. Our result indicated that only those with prior research experience had better attitude towards research. The top three main barriers for enforcement pharmacists to conduct pharmacy practice research were no enough time, no personal interest and lack of knowledge. Therefore, there is need for the MOH and senior pharmacists to encourage pharmacists to conduct pharmacy practice research by addressing the barriers.

## Acknowledgement

We would like to thank the Director General of Health Malaysia for his permission to publish this article. We would also like to acknowledge the kindness of Akshaya Srikanth Bhagavathula and Khizra Sultana for providing and allowing us to use their questionnaire instruments. Lastly, we would like to thank the State Health Directors of Kedah, Perlis, Penang and Perak, our colleagues and respondents for supporting this study.

### Conflict of Interest Statement

The study was undertaken within the MOH and is not funded by any organisation. The authors declared no conflict of interest.

### References

1. Pharmaceutical Services Programme. Pharmacy Programme Strategic Plan 2017-2020 [online]; 2017 [cited Jan 28 2020]. Available from: <https://www.pharmacy.gov.my/v2/sites/default/files/document-upload/2017-2020-web.pdf>
2. Pharmaceutical Services Programme. Pharmacy Research Reports [online]; 2018 [cited Nov 28 2020]. Available from: <https://www.pharmacy.gov.my/v2/sites/default/files/document-upload/moh-pharmacy-researchreports-vol1-2018.pdf>.
3. Pharmaceutical Services Programme. Pharmacy Research Priorities in Malaysia [online]; 2018 [cited Jan 28 2020]. Available from: [https://www.pharmacy.gov.my/v2/sites/default/files/document-upload/pharmacy-research-priorities-malaysia-2018\\_0.pdf](https://www.pharmacy.gov.my/v2/sites/default/files/document-upload/pharmacy-research-priorities-malaysia-2018_0.pdf).
4. Sultana Khizra, Al Jeraisy Majed, Al Ammari Maha, Patel Rahul, Zaidi Syed Tabish R. Attitude, barriers and facilitators to practice-based research: cross-sectional survey of hospital pharmacists in Saudi Arabia. *J Pharm Policy Pract.* 2016;9(4):4. doi: 10.1186/s40545-016-0052-z, PMID 26877877.
5. Peterson GM, Jackson SL, Fitzmaurice KD, Gee PR. Attitudes of Australian pharmacists towards practice-based research. *J Clin Pharm Ther.* 2009;34(4):397-405. doi: 10.1111/j.1365-2710.2008.01020.x. PMID 19583672.
6. Pharmaceutical Services Programme 2020. Pharmacy Enforcement Division [online] [cited Dec 16 2020]. Available from: <https://www.pharmacy.gov.my/v2/en/content/pharmacy-enforcement-division.html>.
7. Bhagavathula AS, Gebreyohannes EA, Gebresillassie BM, Erku DA, Negesse CT, Belay YB. Community pharmacists' interest in and attitude to pharmacy practice research in Ethiopia: A cross-sectional study. *PLOS ONE.* 2017;12(6):e0178919. doi: 10.1371/journal.pone.0178919. PMID 28617834.
8. Polit D, et al. *Nursing research: principle and method.* 6th ed. Philadelphia: Lippincott Company, P.P; 1999. p. 416-417.
9. Elkassem W, Pallivalapila A, Al Hail M, McHattie L, Diack L, Stewart D. Advancing the pharmacy practice research agenda: views and experiences of pharmacists in Qatar. *Int J Clin Pharm.* 2013;35(5);Suppl 5:692-6. doi: 10.1007/s11096-013-9802-z. PMID 23743706.
10. Awaisu A, Alsalimy N. Pharmacist's involvement and attitudes towards pharmacy practice research: A systematic review of the literature. *Res Soc Admin Pharm.* 2015;11(6);Suppl 6:725-48. doi: 10.1016/j.sapharm.2014.12.008.
11. Rosenbloom K, Taylor K, Harding G. Community pharmacists' attitudes towards research. *Int J Pharm Pract.* 2011;8(2):103-10. doi: 10.1111/j.2042-7174.2000.tb00994.x.
12. Armour C, Brilliant M, Krass I. Pharmacists' views on involvement in pharmacy practice research: Strategies for facilitating participation. *Pharm Pract.* 2007;5(2):59-66. doi: 10.4321/s1886-36552007000200002, PMID 25214919.
13. Roberts R, et al. Pharmacy research has an impact on each and every pharmacist. *The Pharmaceutical Journal.* 2010;284:267-8.
14. Charan J, Biswas T. How to calculate sample size for different study designs in medical research? *Indian J Psychol Med.* 2013;35(2):121-6. doi: 10.4103/0253-7176.116232, PMID 24049221.