

## Original Research

# Hospital and community pharmacists' perception of the scope, barriers and challenges of pharmacy practice-based research in Nigeria

Titilayo O. FAKEYE , Rasaq ADISA , Rashidat T. OLUKOTUN , Paul K. MORAWO .

Received (first version): 3-Nov-2016

Accepted: 27-Feb-2017

### Abstract

**Objectives:** To evaluate perception, extent of involvement and barriers to pharmacy practice-based research among community and hospital pharmacists in Ibadan, Oyo state, southwestern Nigeria.

**Methods:** A prospective cross-sectional study was carried out among 65 hospital and 86 community pharmacists with at least five-year post-qualification experience, using pre-tested questionnaire. Socio-demographic information, extent of involvement, relevance and scope, as well as barriers to pharmacy practice-based research were explored. Data were summarised using descriptive statistics. Kruskal-Wallis and Mann-Whitney-U tests were used for evaluating ranked variables at  $p < 0.05$ .

**Results:** Nearly all participants (>95.0%) in each practice category agreed that pharmacy practice-based research is essential to pharmacy profession. Greater than 90.0% agreed that pharmacy practice-based research may help in identifying gaps to improve practice. Thirty-five (40.7%) community and 36(55.4%) hospital pharmacist participants had previously involved in practice-based research. Seventy-seven (89.5%) community and 55(84.3%) hospital pharmacists agreed that acquisition of additional research-oriented training is essential for effective conduct of pharmacy practice-based research. More than one-half in each category agreed that inadequate financial commitment and lack of access to patient's data are major barriers to pharmacy practice-based research.

**Conclusions:** Community and hospital pharmacists agreed that pharmacy practice based research is essential to pharmacy profession, especially in identifying areas of focus to improve practice. Necessity for acquiring additional training in research, financial constraints and lack of access to patient's data were identified as barriers to pharmacy practice-based research. Thus, there is a need to continually stimulate pharmacists' interest in research so as to enhance professional competence and promote healthcare development.

### Keywords

Community-Based Participatory Research; Pharmacies; Pharmacists; Surveys and Questionnaires; Nigeria

## INTRODUCTION

Worldwide, there is no harmonized policy on pharmacy practice. However, operational practice varies between countries.<sup>1,2</sup> Pharmacists often provide integrated, accessible, accountable healthcare services in a variety of practice settings. They are also capable of developing and sustaining partnership with patients and other providers with increased emphasis on collaborative and patient-centred care.<sup>2,3</sup> The International Pharmaceutical Federation (FIP) and World Health Organisation (WHO) developed the concept of "seven star pharmacist", which stated that a well-rounded pharmacist should be a compassionate care giver, decision maker, active communicator, lifelong learner and good manager, possess

good leadership qualities and have the ability to be a teacher and researcher.<sup>1-4</sup> Pharmacists' roles have therefore evolved greatly with pharmacists having more important responsibilities in meeting the needs of their patients as medication management experts.<sup>2,3</sup>

The mission of pharmacy practice is to provide medication and other healthcare products and services to the general public with particular emphasis on patient-centred care. However, optimal outcome with prescribed medicine requires collaboration with other healthcare practitioners especially physician.<sup>2,3</sup> Recently in developed countries like Australia, United States of America and the United Kingdom, the new role of pharmacist, especially as a health adviser, is highly esteemed and acknowledged by general practice physicians.<sup>5</sup> Pharmacist-provided interventions in community pharmacy and managed care organisation have largely focused on responding to new concerns about the quality of patient care<sup>6</sup>, which encompasses patient's satisfaction, medication appropriateness, adverse drug events and adverse drug reaction, as well as economic and health-related quality of life.<sup>6,7</sup> Possible errors about the medication can be detected and resolved during pharmacists' interventions.<sup>1,7-11</sup> These interventions could be effectively enhanced through ongoing pharmacy practice-based research in different practice settings.

Pharmacy practice-based research (PPBR) has been described as "research which attempts to inform and enhance pharmacist's understanding of the way practice should focus to ensure informed medicine information, as

**Titilayo O. FAKEYE.** PhD. Professor. Department of Clinical Pharmacy & Pharmacy Administration, Faculty of Pharmacy, University of Ibadan. Ibadan, (Nigeria).  
titifakeye@gmail.com

**Rasaq ADISA.** PhD, Senior Lecturer. Department of Clinical Pharmacy & Pharmacy Administration, Faculty of Pharmacy, University of Ibadan. Ibadan, (Nigeria).  
adisarar73@yahoo.co.uk

**Rashidat T. OLUKOTUN.** BPharm. Department of Clinical Pharmacy & Pharmacy Administration, Faculty of Pharmacy, University of Ibadan. Ibadan, (Nigeria).  
toyinrashidat@gmail.com

**Paul K. MORAWO.** BPharm. Department of Clinical Pharmacy & Pharmacy Administration, Faculty of Pharmacy, University of Ibadan. Ibadan, (Nigeria).  
morawo.paul@yahoo.com



well as guarantee evidence-based practice<sup>12</sup> which will not only improve the quality of pharmaceutical care delivered by the pharmacist but will also broaden the scope of pharmacy practice.<sup>13,14</sup> Traditionally, pharmacy has been slower than medicine and nursing in participating in practice-based research.<sup>15</sup> However, this trend has steadily improved over the last few decades with more pharmacists especially in developed countries getting involved in PPBR.<sup>15-19</sup> Notwithstanding the increasing involvement of pharmacists in PPBR, a number of barriers limiting greater pharmacists' participation in practice-based research have been identified. This includes lack of support, lack of time, unawareness of the opportunity and never been asked to partake in research.<sup>14,17,20</sup>

According to the World Health Organisation (WHO) Health Statistics Report (2010), Nigeria has one pharmacist per 10,000 of the population<sup>21,22</sup> indicating that only 10 pharmacists are available for 100,000 people compared to minimum of 50 pharmacists per 100,000 recommended due to increasing demand for pharmacist-provided value-added services in public health.<sup>22,23</sup> In addition, effective pharmaceutical care requires improved pharmacist's knowledge and skills in solving health-related problems and meeting the health needs of the population.<sup>12,17,24</sup> This can be largely accomplished through small-scale research projects or large-scale, multi-site projects undertaken to advance understanding of local or practice-specific issues.<sup>3,12,17,24</sup> In Nigeria and some other developing countries, in spite of the fact that research is needed irrespective of the practice area to enhance professional development, education and practice<sup>25</sup>, patient-oriented pharmacy practice research in community and hospital settings is scarce. This study was therefore carried out to assess perception, extent of involvement and barriers to pharmacy practice-based research among community and hospital pharmacists in Ibadan, Oyo state, southwestern Nigeria, with a view to identify specific areas of focus for future interventions.

## METHODS

### Study Site

This study was carried out in secondary and tertiary healthcare facilities including Adeoyo Maternity Teaching Hospital, Adeoyo General Hospital, Jericho Specialist Hospital and the University College Hospital, all in Ibadan, Oyo state. Registered community pharmacies within Ibadan metropolis were also selected. Ethical clearance and approval of the study protocol was obtained from the Oyo State Ministry of Health Ethical Review Committee, while permission was subsequently obtained from managing director of each pharmacy outlet.

### Study design

A prospective cross-sectional study was carried out among hospital and community pharmacists using pre-tested and validated structured questionnaire between November 2014 and January 2015.

### Inclusion and exclusion criteria

Licensed hospital and community pharmacists with at least five years post-qualification experience were enrolled. This

is to ensure that participants were qualified as senior pharmacist who should be able to make independent therapeutic decision in the practice setting with minimal guidance. Eligible participants also gave voluntary informed consent to participate in the study. Pharmacists with less than five years' experience in practice and who declined participation were excluded. Where there were two community pharmacists in a pharmacy outlet, only one pharmacist was selected.

### Sample size calculation

A representative sample size was calculated based on estimated population of registered hospital and community pharmacists in the state during the study period, using a sample size calculator ([www.surveysystem.com/sscalc.html](http://www.surveysystem.com/sscalc.html)). The Pharmacists Council of Nigeria (PCN) record indicated that 98 community pharmacists registered in the year 2013, and a total of 70 hospital pharmacists in the rank of senior pharmacist and above was obtained from the list of hospital pharmacists in the Oyo State Ministry of Health Hospital Management Board. With the estimated population of 98 community and 70 hospital pharmacists, at 95% confidence level and 5% margin of error, a target sample size of 86 and 65 community and hospital pharmacists, respectively was calculated, making allowance for a 10% attrition or non-response rate.

### Instrument for data collection

The survey instrument, a pretested questionnaire comprised four sections. Section A clarified socio-demographic characteristics including years of experience in practice and possession of additional postgraduate qualification(s). Section B evaluated respondents' opinion and views on relevance and scope of pharmacy practice-based research (PPBR). Section C explored respondents' views on barriers and challenges to conduct of PPBR in their practice settings, using a 5-point Likert scale response option (strongly agree – 1, agree – 2, undecided – 3, disagree – 4 and strongly disagree - 5). Section D explored possible research areas to focus on, as well as probable research collaborator(s) for effective conduct of PPBR. Opinion and views on the likely research or scope of research that participants might have carried out in the past, as well as suggestions on way(s) to stimulate pharmacist's interest in PPBR were also evaluated. The item-statement in the questionnaire was developed following extensive review of literature<sup>14,16,26</sup>, as well as investigators' previous practice experience.

### Pre-test and validation of the questionnaire

The questionnaire was assessed for content validity and pre-tested among three pharmacists in academia, one hospital and one community pharmacist who were subsequently excluded from the main study. Slight modifications after the pre-test included rephrasing of some open-ended questions to ensure respondents' clarification of intention and to remove ambiguity. The construct criterion for assessing reliability of the item-statement in the questionnaire gave a Cronbach's alpha value of 0.60.

Table 1. Relevance, scope and barriers to pharmacy practice-based research among community pharmacists

Relevance and scope of PPBR	Response options N (%)			Median
	SA & A	UN	SD & D	
Pharmacy practice research is essential to pharmacy profession	86 (100.0)	0 (0.0)	0 (0.0)	1
Pharmacy practice research can be done in my area of practice	84 (97.6)	1 (1.2)	1 (1.2)	2
Pharmacy practice research can be done on routine patient care activities	82 (95.4)	4 (4.7)	0 (0.0)	2
Research in pharmacy practice help in identifying gaps to focus for improved practice	80 (93.0)	6 (7.0)	0 (0.0)	2
Research in a specific area of pharmacy practice contribute to health service development	81 (94.2)	4 (4.7)	1 (1.2)	2
Research in pharmacy practice is meant only for pharmacists in academia	6 (7.0)	3 (3.5)	77 (89.6)	4
Irrespective of the practice setting, pharmacist can carry out pharmacy practice research	84 (97.6)	1 (1.2)	1 (1.2)	2
<b>Barrier and challenges to pharmacy practice-based research</b>				
Lack of requisite skills to get involved in pharmacy practice research	11 (12.8)	7 (8.1)	68 (79.1)	4
Inability to provide the necessary financial commitment for pharmacy practice-based research	45 (52.3)	12 (14.0)	29 (33.7)	2
Time constraints in combining professional service with research	37 (43.0)	10 (11.6)	39 (45.3)	3
Additional staff required for conduct of pharmacy practice-based research is not available	43 (50.0)	11 (12.8)	32 (37.3)	2
The lay-out of practice setting do not encourage research	28 (32.5)	13 (15.1)	45 (52.3)	4
Lack of access to patient's data hinder pharmacy practice-based research	45 (52.3)	14 (16.3)	27 (31.4)	2
Acquisition of additional training in research is essential for effective pharmacy practice research	77 (89.5)	2 (2.3)	7 (8.1)	2

PPBR = Pharmacy practice-based research, N = number, SA = strongly agree (1), A = agree (2), UN = undecided (3), D = disagree (4), SD = strongly disagree (5)

#### Data collection and recruitment procedure

All eligible pharmacists were visited in their respective practice sites. Objectives of the study were clearly explained to every participant and then informed consent was individually obtained to signify intention to partake in the study. Participants were informed that participation is voluntary and that there was no incentive or compensation for their participation. However, they were assured of their anonymity and confidentiality of response. Only consented participants self-administered the questionnaire in their respective places of practice. The questionnaire took about 20 minutes to complete and was collected back immediately after completion. All administered questionnaire were completely returned within the study period and used for the analysis.

#### Data Analysis

The data obtained were sorted, coded and entered into SPSS Version 20.0 for analysis and management. Descriptive statistics including frequency and percentage were used to summarise the data. Ranked variables were summarily described with 50<sup>th</sup> percentile. Associations between years of experience in practice and respondents' opinion on relevance and scope, as well as barriers to PPBR were evaluated using Kruskal-Wallis test. Mann Whitney U test was used to compare opinion of respondents with or without additional postgraduate qualification(s) at  $p < 0.05$  considered significant.

## RESULTS

A total of 86 community pharmacists (CP), and 65 hospital pharmacists (50 from the University College Hospital, 11 from Adeoyo Maternity and Adeoyo General Hospital, and four from Jericho Specialist Hospital) participated in the study with a response rate of 100% in each practice category. The mean ages were 43.3 (SD=12.3) and 41.0 (SD=6.3) years for CP and hospital pharmacist (HP) participants, respectively. Forty-nine (57.0%) CP and 28

(43.1%) HP participants had 5-10 years practice experience, 12 (14.0%) CP and 18 (27.7%) HP had 11-15 years' experience in practice, 8 (9.3%) CP and 6 (9.2%) HP had 16 – 20 years, while 17 (19.8%) CP and 13 (20.0%) HP had greater than 20 years' experience in practice. Forty-seven (54.7%) CP and 56 (86.2%) HP participants had additional academic (M.Sc./M.Pharm.) or professional postgraduate qualification(s) (Fellowship of West Africa Postgraduate College of Pharmacists), while 39 (45.3%) CP and 9 (13.8%) HP participants had no additional postgraduate qualification.

Nearly all participants (>95.0%) in each practice area agreed that pharmacy practice-based research (PPBR) is essential to pharmacy profession. More than 95.0% also agreed that PPBR can be carried out in their respective practice setting, while greater than 90.0% supported the fact that conduct of PPBR may help in identifying gaps on which practice may need to be improved. Majority of the participants disagreed that PPBR is meant only for pharmacists in academia. Details of responses of CP and HP participants on relevance and scope of PPBR are shown in Tables 1 and 2, respectively.

A large number of participants, 77 (89.5%) CP and 55 (84.3%) HP agreed that acquiring additional research-oriented training by pharmacists is essential for effective conduct of PPBR. Also, more than one-half agreed that inadequate financial commitment [(45; 2.3%) CP, (38; 58.5%) HP], and lack of access to patient's data [(45; 52.3%) CP and (33; 50.8%) HP] constitute barriers to pharmacy practice-based research. More than three-quarters of community (79.1%) and hospital pharmacists (87.7%) disagreed with the fact that lack of requisite skills could be a factor hindering pharmacists' involvement in pharmacy practice research. There were mixed reactions of agreement and disagreement on respondents' views of probable challenges and barriers to conduct of PPBR (Tables 1 and 2).

Table 2. Relevance, scope and barriers to pharmacy practice-based research among hospital pharmacists

Relevance and scope of PPBR	Response options N (%)			Median
	SA & A	UN	SD & D	
Pharmacy practice research is essential to pharmacy profession	64 (98.5)	0 (0.0)	1 (1.5)	1
Pharmacy practice research can be done in my area of practice	64 (98.5)	1 (1.5)	0 (0.0)	1
Pharmacy practice research can be done on routine patient care activities	64 (98.5)	1 (1.5)	0 (0.0)	1
Research in pharmacy practice help in identifying gaps to focus for improved practice	62 (95.3)	3 (4.6)	0 (0.0)	1
Research in a specific area of pharmacy practice contribute to health service development	63 (97.0)	1 (1.5)	1 (1.5)	1
Research in pharmacy practice is meant only for pharmacists in academia	3 (4.6)	3 (4.6)	59 (90.7)	5
Irrespective of the practice setting, pharmacist can carry out pharmacy practice research	63 (96.9)	0 (0.0)	2 (3.1)	1
<b>Barrier and challenges to pharmacy practice-based research</b>				
Lack of requisite skills to get involved in pharmacy practice research	7 (10.8)	1 (1.5)	57 (87.7)	4
Inability to provide the necessary financial commitment for pharmacy practice-based research	38 (58.5)	1 (1.5)	26 (40.0)	2
Time constraints in combining professional service with research	17 (26.2)	12 (18.5)	36 (55.4)	4
Additional staff required for conduct of pharmacy practice-based research is not available	33 (50.8)	6 (9.2)	26 (40.0)	2
The lay-out of practice setting do not encourage research	13 (20.0)	5 (7.7)	47 (72.3)	4
Lack of access to patient's data hinder pharmacy practice-based research	33 (50.8)	8 (12.3)	24 (36.9)	2
Acquisition of additional training in research is essential for effective pharmacy practice research	55 (84.3)	8 (12.3)	2 (3.0)	2

PPBR = Pharmacy practice-based research, N = number, SA = strongly agree (1), A = agree (2), UN = undecided (3), D = disagree (4), SD = strongly disagree (5)

There was a significant difference among HP participants with different years of experience in practice and their opinion on feasibility of conducting PPBR on routine patient's care activities [Kruskal-Wallis (K-W)=9.10, p=0.03]. The HP participants with >20 years' experience in practice had the lowest mean rank (MR) of 24.4 suggesting those

who mostly supported PPBR to be carried out on routine patient's care activities compared to MR of 31.4 among HPs with 5-10 years' experience in practice, 37.3 for 11-15 years, and 48.2 for participants with 16-20 years of practice experience. Though the mean rank differs, no significant difference was observed between the HP years of

Table 3. Relationship between years of practice experience of hospital pharmacists and opinion on relevance and scope of pharmacy practice-based research.

Relevance and scope of PPBR	Years of practice experience	Frequency (%)	Mean rank	K-W p-value <sup>a</sup>
Pharmacy practice research is essential to pharmacy profession	5-10	28 (43.1)	35.09	0.64
	11-15	18 (27.7)	31.61	
	16-20	6 (9.2)	35.17**	
	>20	13 (20.0)	29.42*	
Pharmacy practice research can be done in my area of practice	5-10	28 (43.1)	33.04	0.05
	11-15	18 (27.7)	34.22	
	16-20	6 (9.2)	46.67**	
	>20	13 (20.0)	24.92*	
Pharmacy practice research can be done on routine patient care activities	5-10	28 (43.1)	31.41	0.03
	11-15	18 (27.7)	37.28	
	16-20	6 (9.2)	48.17**	
	>20	13 (20.0)	24.42*	
Research in pharmacy practice help in identifying gaps to focus for improved practice	5-10	28 (43.1)	31.82	0.18
	11-15	18 (27.7)	33.50	
	16-20	6 (9.2)	46.33**	
	>20	13 (20.0)	28.69*	
Research in a specific area of pharmacy practice contribute to health service development	5-10	28 (43.1)	32.50	0.40
	11-15	18 (27.7)	37.75**	
	16-20	6 (9.2)	27.25*	
	>20	13 (20.0)	30.15	
Research in pharmacy practice is meant only for pharmacists in academia	5-10	28 (43.1)	30.68	0.39
	11-15	18 (27.7)	36.03	
	16-20	6 (9.2)	25.67*	
	>20	13 (20.0)	37.19**	
Irrespective of the practice setting, pharmacist can carry out pharmacy practice research	5-10	28 (43.1)	35.63**	0.66
	11-15	18 (27.7)	31.25	
	16-20	6 (9.2)	33.00	
	>20	13 (20.0)	29.77*	

PPBR = Pharmacy practice-based research,  
<sup>a</sup> Kruskal Wallis test; \*Lowest mean rank indicates those who mostly agreed with corresponding statement; \*\* Highest mean rank suggests those who least agreed with corresponding statement

Table 4. Relationship between years of practice experience of hospital pharmacists and opinion on barriers to pharmacy practice-based research

Barriers to pharmacy practice-based research	Years of practice experience	Frequency (%)	Mean rank	p-value <sup>a</sup>
Lack of requisite skills to get involved in pharmacy practice research	5-10	28 (43.1)	29.91*	0.52
	11-15	18 (27.7)	33.28	
	16-20	6 (9.2)	34.83	
	>20	13 (20.0)	38.42**	
Inability to provide the necessary financial commitment for pharmacy practice-based research	5-10	28 (43.1)	32.52	0.59
	11-15	18 (27.7)	30.56*	
	16-20	6 (9.2)	41.83**	
	>20	13 (20.0)	33.35	
Time constraints in combining professional service with research	5-10	28 (43.1)	28.14*	0.06
	11-15	18 (27.7)	30.89	
	16-20	6 (9.2)	44.50**	
	>20	13 (20.0)	41.08	
Additional staff required for conduct of pharmacy practice-based research is not available	5-10	28 (43.1)	29.20	0.25
	11-15	18 (27.7)	38.00**	
	16-20	6 (9.2)	26.75*	
	>20	13 (20.0)	37.15	
The lay-out of practice setting do not encourage research	5-10	28 (43.1)	28.72*	0.24
	11-15	18 (27.7)	33.28	
	16-20	6 (9.2)	29.58	
	>20	13 (20.0)	40.62**	
Lack of access to patient's data hinder pharmacy practice-based research	5-10	28 (43.1)	32.35	0.61
	11-15	18 (27.7)	29.47*	
	16-20	6 (9.2)	30.25	
	>20	13 (20.0)	38.04**	
Acquisition of additional training in research is essential for effective pharmacy practice research	5-10	28 (43.1)	38.72**	0.06
	11-15	18 (27.7)	32.11	
	16-20	6 (9.2)	20.67*	
	>20	13 (20.0)	27.58	

<sup>a</sup> Kruskal Wallis test; \*Lowest mean rank indicates those who mostly agreed with corresponding statement; \*\* Highest mean rank suggests those who least agreed with corresponding statement

experience in practice and other opinion on relevance, scope and barriers to PPBR (Tables 3 and 4).

Also, there were significant differences in the opinion of HP participants with or without additional postgraduate qualification(s) on the need for sufficient number of additional staff to carry out PPBR [Mann-Whitney-U (MWU)=497.500, z-score=2.751, p=0.006], and necessity for acquiring additional research-oriented training for effective conduct of PPBR (MWU=489.500, z-score=2.729, p=0.006). The HP participants with additional postgraduate qualification(s) had the lowest mean rank (MR) of 29.9 suggesting those who largely agreed that insufficient number of staff constitute a barrier to PPBR in their practice area, compared to MR of 45.3 for HP participants without additional postgraduate qualification. Also, HP participants with additional postgraduate qualification had the lowest mean rank of 30.1 indicating those who mostly supported the necessity for acquiring additional research-oriented training for conduct of PPBR compared to MR of 44.9 for HP participants without additional postgraduate qualification(s).

There was no significant difference among CP participants with different years of experience in practice and their opinion on relevance, scope and barriers to PPBR (p>0.05) Tables 5 and 6. The CP participants with additional postgraduate qualification(s) had the lowest mean rank of 39.7 suggesting those who mostly agreed that PPBR is essential to pharmacy profession, compared to their counterparts without additional postgraduate qualification(s) with MR of 48.1 (MWU=1097.500, z-

score=1.974, p=0.048). No significant difference was observed among CP participants with or without postgraduate qualification(s) in respect of other opinion.

Summarily, 81 (32.7%) CP and 65 (33.2%) HP participants suggested in different combinations pharmaceutical care, while 82 (33.1%) CP and 60 (30.6%) HP mentioned medication therapy management as top research areas to focus on for PPBR. Other research areas suggested are shown in Table 7. The preferred research collaborators for PPBR were cited by participants in each category in the order of magnitude as academic pharmacist > physician in the practice locality > regulatory pharmacist > other members of the healthcare team including nurses and laboratory scientists > non-governmental organisation > medical representative. Details of preferred collaborators for PPBR are shown in Table 7.

Thirty-five (40.7%) CP and 36 (55.4%) HP participants claimed to have carried out some forms of research in their practice settings. Top on the list of research conducted include those involving data collection on patients' previous medications, and data gathering using questionnaire among others (Table 8). Thirty (85.7%) community and 28 (77.8%) hospital pharmacists reported to have utilized data generated from the research in various ways as shown in Table 8. Suggestions on measures to stimulate interest in pharmacy practice-based research were mentioned to include assurance on implementation of research results in practice [(72; 53.6%) CP, (53; 49.1%) HP], and reimbursement for pharmacists who conduct PPBR [(60; 43.8%) CP, (38; 35.2%) HP] (Table 8).



Table 5. Relationship between years of practice experience of community pharmacists and opinions on relevance and scope of pharmacy practice-based research.

Relevance and scope of PPBR	Years of practice experience	Frequency (%)	Mean rank	p-value <sup>a</sup>
Pharmacy practice research is essential to pharmacy profession	5-10	49 (57.0)	41.91*	0.74
	11-15	12 (14.0)	48.92**	
	16-20	8 (9.3)	46.63	
	>20	17 (19.8)	43.15	
Pharmacy practice research can be done in my area of practice	5-10	49 (57.0)	45.47	0.09
	11-15	12 (14.0)	37.71	
	16-20	8 (9.3)	29.06*	
	>20	17 (19.8)	48.71**	
Pharmacy practice research can be done on routine patient care activities	5-10	49 (57.0)	46.05	0.12
	11-15	12 (14.0)	30.17*	
	16-20	8 (9.3)	40.38	
	>20	17 (19.8)	47.03**	
Research in pharmacy practice help in identifying gaps to focus for improved practice	5-10	49 (57.0)	43.55	0.40
	11-15	12 (14.0)	36.00*	
	16-20	8 (9.3)	41.00	
	>20	17 (19.8)	49.82**	
Research in a specific area of pharmacy practice contribute to health service development	5-10	49 (57.0)	41.68*	0.79
	11-15	12 (14.0)	47.88**	
	16-20	8 (9.3)	42.56	
	>20	17 (19.8)	46.09	
Research in pharmacy practice is meant only for pharmacists in academia	5-10	49 (57.0)	44.98	0.56
	11-15	12 (14.0)	43.17	
	16-20	8 (9.3)	48.81**	
	>20	17 (19.8)	36.97*	
Irrespective of the practice setting, pharmacist can carry out pharmacy practice research	5-10	49 (57.0)	43.50	0.76
	11-15	12 (14.0)	40.46	
	16-20	8 (9.3)	39.75*	
	>20	17 (19.8)	47.41**	

PPBR = Pharmacy practice-based research,  
<sup>a</sup> Kruskal Wallis test; \*Lowest mean rank indicates those who mostly agreed with corresponding statement; \*\* Highest mean rank suggests those who least agreed with corresponding statement

## DISCUSSION

This study showed that pharmacists in their specific areas of practice are interested in pharmacy practice-based research (PPBR) and agreed that conduct of PPBR may help in identifying gaps on which to focus for improved practice. This is also confirmed by previous studies which report increased pharmacists' interest in practice-based research.<sup>12,14,27</sup> Ideally, the scope and nature of routine duties of hospital and community pharmacists put them at a vantage position of carrying out PPBR especially in the areas of collection and gathering of data on prescribing errors and drug-related problems during pharmacist-patient interaction encounters.<sup>28,29,30</sup> In the present study 40.7% CP and 55.4% HP participants had previously engaged in practice-based research, most of which were not written up for publication in peer-reviewed or professional journal. Studies have also reported increasing involvement of pharmacists in practice-based research with proportion of pharmacists with research experience ranges from 9 – 59%.<sup>14-19,31-33</sup> Concerted efforts to continually stimulate pharmacists' interest and involvement in pharmacy practice-based research is therefore essential to enhance professional competence and ensure evidence-based practice.<sup>12</sup> The key motivators for the pharmacist to participate in PPBR were reported to include the desire to improve profession, opportunity to learn more about disease management, provide enhanced service to patient care and personal satisfaction.<sup>14,17</sup> This is partly consistent with respondents' perception of relevance and scope of PPBR, especially in promoting health service development

as well as its usefulness in identifying gaps on which practice may need to be improved.

In the present study, a substantial proportion of participants suggested measures for stimulating pharmacists' interest in PPBR to include assurance that research results will be implemented in practice as well as reimbursement for the pharmacist who engage in PPBR. This is contrary to report from other studies where participants did not feel that financial incentive could be the reason for non-participation in research.<sup>34,35</sup>

It is observed that years of experience in practice and possession of additional postgraduate qualification(s) significantly influenced trends of opinion among HP participants, whereas there was no significant difference among CP participants' irrespective of the years of experience in practice. This perhaps imply that the extent of pharmacist's exposure and scope of patient care activities in different practice settings largely influence their perception and level of involvement in PPBR. Studies have reported that hospital pharmacists are increasingly becoming more engaged in research compared to their community pharmacists' counterparts.<sup>6,12,14,25</sup> This may be expected since involvement in research by hospital pharmacists is now being encouraged as part of their career development in keeping up to date with, and contributing to research and developments, often in collaboration with other healthcare providers.<sup>6,12,25,36</sup> The HP participants who had greater than 20 years' experience in practice mostly believed that conduct of PPBR should be focused on routine patient care activities of pharmacists

Table 6. Relationship between years of practice experience of community pharmacists and opinion on barriers to pharmacy practice-based research.

Barriers to pharmacy practice-based research	Years of practice experience	Frequency (%)	Mean rank	p-value <sup>a</sup>
Lack of requisite skills to get involved in pharmacy practice research	5-10	49 (57.0)	40.90	0.06
	11-15	12 (14.0)	40.17*	
	16-20	8 (9.3)	64.50**	
	>20	17 (19.8)	43.47	
Inability to provide the necessary financial commitment for pharmacy practice-based research	5-10	49 (57.0)	43.37	0.39
	11-15	12 (14.0)	39.88	
	16-20	8 (9.3)	34.69*	
	>20	17 (19.8)	50.59**	
Time constraints in combining professional service with research	5-10	49 (57.0)	44.15	0.20
	11-15	12 (14.0)	31.96*	
	16-20	8 (9.3)	54.44**	
	>20	17 (19.8)	44.62	
Additional staff required for conduct of pharmacy practice-based research is not available	5-10	49 (57.0)	43.10	0.61
	11-15	12 (14.0)	39.17*	
	16-20	8 (9.3)	53.31**	
	>20	17 (19.8)	43.09	
The lay-out of practice setting do not encourage research	5-10	49 (57.0)	46.00	0.38
	11-15	12 (14.0)	36.04*	
	16-20	8 (9.3)	50.19**	
	>20	17 (19.8)	38.41	
Lack of access to patient's data hinder pharmacy practice-based research	5-10	49 (57.0)	45.10**	0.71
	11-15	12 (14.0)	42.25	
	16-20	8 (9.3)	43.38	
	>20	17 (19.8)	38.09*	
Acquisition of additional training in research is essential for effective pharmacy practice research	5-10	49 (57.0)	44.71	0.62
	11-15	12 (14.0)	37.08*	
	16-20	8 (9.3)	39.63	
	>20	17 (19.8)	46.35**	

<sup>a</sup> Kruskal Wallis test; \*Lowest mean rank indicates those who mostly agreed with corresponding statement; \*\* Highest mean rank suggests those who least agreed with corresponding statement

such as prescription screening for errors, review of patients' previous medications to identify and resolve drug therapy problems as well as self-medication issues. Carrying out research in these areas will essentially require data collection at pharmacist's convenience without undue interference from other healthcare provider.

It is noted that necessity for acquiring additional research-oriented training by pharmacists was mostly cited as barrier to PPBR. This partly confirmed studies which indicated that pharmacists' previous research experience may have increased their willingness to engage in research, as well as

ensuring better appreciation of practice-based research.<sup>14,15,27</sup> The HP participants with additional postgraduate qualification largely agreed with the necessity for acquiring additional training in research for effective conduct of PPBR compared to their counterparts without additional postgraduate qualification.

In addition, more than one-half of participants in each practice category agreed that lack of additional staff constitute a barrier to effective conduct of PPBR. In Nigeria, inadequate number of pharmacists in many hospitals is evident with far-reaching implication on effective discharge

Table 7. Summary of participants' suggestion on research areas and preferred collaborator for pharmacy practice-based research.

Variables	Respondents' site of practice, N (%)	
	Community N = 248	Hospital N = 196
<b>Suggested research areas</b>		
Pharmaceutical care	81 (32.7)	65 (33.2)
Medication Therapy Management	82 (33.1)	60 (30.6)
Pharmacovigilance (adverse reaction documentation)	76 (30.6)	63 (32.1)
Pharmacy/operation management	4 (1.6)	3 (1.5)
Drug abuse	4 (1.6)	NM
Self-medication	1 (0.4)	NM
Drug compliance/adherence	NM	2 (1.0)
Rational prescription and drug use	NM	2 (1.0)
New drug development	NM	1 (0.5)
<b>Preferred collaborator(s) for research in the respective area of practice</b>	<b>N = 169</b>	<b>N = 159</b>
Academic pharmacist	66 (39.1)	57 (35.8)
Physician in the practice locality	54 (32.0)	42 (26.4)
Regulatory pharmacist	38 (22.5)	33 (20.8)
Other members of the healthcare team (nurses, laboratory scientists)	5 (3.0)	16 (10.1)
Non-governmental organisation, patients/caregivers and community	4 (2.4)	11 (6.9)
Medical representative	2 (1.2)	NM

Responses are giving in combinations in some cases; NM = not mention, N = number

Response	Respondents' site of practice, N (%)	
	Community	Hospital
Nature of research conducted	N = 35	N = 36
Data collection on patients' previous medications	11 (31.4)	15 (41.7)
Data collection using questionnaire	7 (20.0)	13 (36.1)
Evaluation of self-medication issues in the practice setting	8 (22.9)	4 (11.1)
Research on use and misuse of antibiotics	6 (17.1)	1 (2.8)
Adverse drug reaction profile	NM (0.0)	1 (2.8)
Radiopharmaceutical research among cancer patients	NM (0.0)	1 (2.8)
Information system	NM (0.0)	1 (2.8)
Use of antimalarial and contraceptives	1 (2.9)	NM (0.0)
Customer services	1 (2.9)	NM (0.0)
Pharmacy management	1 (2.9)	NM (0.0)
Utilisation of data generated from the research conducted was	N = 30	N = 28
Analysed and written up for publication	1(3.3)	12 (42.9)
Use only to guide routine practice	12 (40.0)	6 (21.4)
Use to identify gaps to focus on for improve pharmacy practice	11(36.7)	5 (17.9)
Not process, but research only done for satisfaction or documentation	6 (20.0)	4 (14.3)
Use for postgraduate work	NM (0.0)	1 (3.5)
Suggestions on measures to stimulate interest in pharmacy practice research	N = 137	N = 108
Assurance that research results will be implemented in practice	72 (52.6)	53 (49.1)
Reimbursement for conducting research in pharmacy practice	60 (43.8)	38 (35.2)
Improved/integrated interaction between pharmacist and other healthcare team	3 (2.2)	NM
Creating awareness about pharmacy practice-based research and benefit to practice	2 (1.5)	NM
Recognition by other members of healthcare team	NM	17 (15.7)

N = number and is based on respondents who had previously participated in research

of pharmacist's professional duties, as well as constituting a barrier to proactive engagement of hospital pharmacists in PPBR. On the other hand, many of the community pharmacists, on account of the commercial nature of their practice might be overwhelmed by other ancillary profitmaking duties which may not be directly linked to patient's care activities that will ensure data gathering for PPBR. Thus, to effectively combine professional service with evidence-based research in either hospital or community pharmacy practice setting, there may be a need for additional staff as rightly supported by a sizeable proportion of participants, while continuous stimulation of pharmacists' interest in research should be essentially pursued.

More than one-half of CP and HP participants also identified lack of access to patient's data as one of the major barriers to PPBR. This is consistent with previous studies by Dunlop and Shaw<sup>37</sup>, as well as Bezverhni (2010).<sup>38</sup> However, non-accessibility to patients' data can be overcome by proactive engagement of pharmacists in research areas such as medication review to identify drug therapy problems, prescription errors, drug abuse/misuse and self-medication. These largely constitute research areas in which data may be obtained during pharmacist-patient interaction in the pharmacy, rather than relying on documented data by physicians. In contrast, the aforementioned research areas were not cited as viable areas of PPBR by majority of the participants.

Inadequate financial commitment was also identified as a barrier to conduct of PPBR. This may be expected, since effective conduct and execution of research typically requires sufficient funds. However, research can be sponsored or funded through grants depending on the scope, relevance and impact of the research to the society as well as to the sponsoring/funding organisations. It is worthy of note to mention that in Nigeria, like in other developing countries, some non-governmental

organisations are coming up with grants to fund research in pharmacy practice. Recently, in 2013, the Association of Industrial Pharmacists (AIP) in Nigeria endowed fund to support pharmacy-based research in Nigerian Schools of Pharmacy. This is encouraging and will likely stimulate interest in PPBR in order to solve local practice-related problems.

Contrary to most studies which report lack of time as a major barrier to pharmacists' engagement in research<sup>14,17,20,39,40</sup>, CP and HP participants in the present study did not substantially agree with time constraints as a barrier to PPBR. This perhaps implies that once there is interest and willingness in research, lack of time should not be a hindrance to conduct of PPBR. This information needs to be continually emphasized and widely disseminated among pharmacists in different practice settings. In addition, majority did not perceive lack of requisite research skills as a barrier to PPBR. Pharmacists in academia were ranked by most participants as the preferred partner and collaborator in ensuring effective conduct of pharmacy practice-based research. Collaborating with pharmacists in academia may partly help in overcoming some of the financial challenges since pharmacists in academia, on account of the nature of their job may have access to grants or funds, some of which are domiciled in their institution, but can be accessed to conduct PPBR.

The top research areas of interest for PPBR as suggested by substantial number of participants include pharmaceutical care (PC), medication therapy management (MTM) and pharmacovigilance (PV). These are emerging professional research areas<sup>41</sup> that are currently receiving attention in pharmacy profession in the 21<sup>st</sup> century. Effective conduct of research in these emerging areas will not only require access to large volume of data on patients, but will also involve collaboration with other healthcare providers especially physician. In Nigeria and some other developing



countries, pharmacists do not have direct access to physician generated data and this may serve as hindrance to PPBR in PC, MTM and PV.

In the present study, the research areas with less emphasis by participants include drug adherence, rational drug use, drug abuse and self-medication which largely constitute areas in which research can be carried out easily by pharmacists in their places of practice. Therefore, encouraging community and hospital pharmacists to refocus their research efforts toward research areas where data collection will emanate from their day-to-day routine duties with patients will be a good starting point to stimulate interest and enhanced pharmacist's participation in PPBR.

This study is limited by the fact that only pharmacists in the rank of senior cadre were involved, whereas the junior pharmacists might also have different but important opinions on issues relating to PPBR in different practice settings in Nigeria. Also, this study was only carried out among community and hospital pharmacists in Ibadan metropolis, while opinion of pharmacists in other region might have been useful in making a far-reaching conclusion. Nonetheless, this study provides valuable information on current situation about pharmacy practice-based research among pharmacists with five-year post-qualification experience who should be proactively involved

on issues of policy decision concerning pharmacy profession in their respective practice sites.

## CONCLUSIONS

Community and hospital pharmacists are interested in pharmacy practice-based research essentially in identifying areas of focus to improve practice. A sizeable proportion had previously engaged in practice-based research. However, necessity for acquiring additional research-oriented training, need for additional staff, financial constraints and lack of access to patient's data were identified as major barriers. Pharmacists in academia were mostly preferred as partner and collaborator in ensuring effective conduct of pharmacy practice-based research. There is generally a need for concerted efforts to continually stimulate pharmacists' interest in pharmacy practice-based research so as to enhance professional competence and promote healthcare development.

## CONFLICT OF INTEREST

None to declare by the authors.

## FUNDING

The authors received no grant or fund from any agency in the conduct of this research.

## References

1. International Pharmaceutical Federation (FIP) Statement of Policy: Good pharmacy education and practice. The Hague, The Netherlands. International Pharmaceutical Federation, 2000. Available at <http://www.fip.org> (accessed 30 October, 2016).
2. Wiedenmayer K, Summers RS, Mackie CA, Gous AGS, Everaldo M, Tromp TFJ. Developing Pharmacy Practice – A Focus on Patient Care. World Health Organisation & International Pharmaceutical Federation 2006. Available at [http://whqlibdoc.who.int/hq/2006/WHO\\_PSM\\_PAR\\_2006.5\\_eng.pdf](http://whqlibdoc.who.int/hq/2006/WHO_PSM_PAR_2006.5_eng.pdf) (accessed 30 October, 2016).
3. Habeeb IAR, Jose D, Jegan RS. Pharmacists in the wider public health workforce – a review. *Arch Pharm Pract.* 2012;3(2):166-169.
4. Ryan K, Bissell P, Anderson C, Traulsen JM, Sleath B. Teaching social sciences to undergraduate pharmacy students: an international survey. *Pharm Educ.* 2007;7(1):1-9.
5. Adepu R, Nagavi B. General practitioners' perception about the extended roles of community pharmacists in the state of Karnataka: A study. *Indian J Pharm Sci.* 2006;68:36-40.
6. Kaboli PJ, Hoth AB, McClimon BJ, Schnipper JL. Clinical pharmacists and inpatient medical care: a systematic review. *Arch Intern Med.* 2006;166(9):955-964.
7. Akhtar MM, Waheed A, Sheikh D, Hussain A. Role of pharmacist in improving health related quality of life (HRQoL) in hypertensive patients in Pakistan. *Am J Pharmacol Sci.* 2014;2(5B):17-22. doi: [10.12691/ajps-2-5B-5](https://doi.org/10.12691/ajps-2-5B-5)
8. Chamba G, Bauguil G, Galiezot J. The role of French community pharmacist in drug dispensing. *Pharm World Sci.* 1999;21(3):142-143.
9. Westerlund T, Almarsdóttir AB, Melander A. Factors influencing the detection rate of drug related problems in community pharmacy. *Pharm World Sci.* 1999;21(6):245-250.
10. Frokier B, Bolvig T, Griese N, Herborg H, Rossing C. Prevalence of drug-related problems in self-medication in Danish community pharmacies. *Innovations in Pharmacy* 2012; 3(4):95.
11. Weinstein M, Herrings R, Leufkens H. Determinants of pharmacists' interventions linked to prescription processing. *Pharm World Sci.* 2001;23(3):98-101.
12. Mays N. A new age for pharmacy practice research: promoting evidence-based practice in pharmacy. London: Royal Pharmaceutical Society; 1997.
13. Al-Quteimat OM, Amer AM. Evidence-based pharmaceutical care: The next chapter in pharmacy practice. *Saudi Pharm J.* 2016;24(4):447-451. doi: [10.1016/j.jsps.2014.07.010](https://doi.org/10.1016/j.jsps.2014.07.010)
14. Sultana K, Jeraisy MA, Al Ammari M, Patel R, Zaidi STR. Attitude, barriers and facilitators to practice-based research: cross-sectional survey of hospital pharmacists in Saudi Arabia. *J Pharm Policy Pract.* 2016;9:4. doi: [10.1186/s40545-016-0052-z](https://doi.org/10.1186/s40545-016-0052-z)
15. Awaisu A, Alsalmiy N. Pharmacist's involvement and attitudes towards pharmacy practice research: A systematic review of the literature. *Res Social Adm Pharm.* 2015;11(6):725-748. doi: [10.1016/j.sapharm.2014.12.008](https://doi.org/10.1016/j.sapharm.2014.12.008)

16. Ellerby DA, Williams A, Winfield AJ. The level of interest in pharmacy practice research among community pharmacists. *Pharm J*. 1993;251:321-322.
17. Simpson SH, Johnson JA, Biggs C, Biggs RS, Kuntz A, Semchuk W, Taylor JG, Farris KB, Tsuyuki RT. Practice-based research: lessons from community pharmacist participants. *Pharmacotherapy*. 2001;21(6):731-739.
18. Saini B, Brilliant M, Filipovska J, Gelgor L, Mitchell B, Rose G, Smith L. Factors influencing Australian community pharmacists' willingness to participate in research projects - an exploratory study. *Int J Pharm Pract*. 2006;14(3):179-188.
19. Liddell H. Attitudes of community pharmacists regarding involvement in practice research. *Pharm J*. 1996;256:905-907.
20. Bakken S, Lantigua RA, Busacca LV, Bigger JT. Barriers, enablers and incentives for research participation: A report from the Ambulatory Care Research Network (ACRN). *J Am Board Fam Med*. 2009;22(4):436-445. doi: [10.3122/jabfm.2009.04.090017](https://doi.org/10.3122/jabfm.2009.04.090017)
21. World Health Organization. Global strategy for containment of antimicrobial resistance: World Health Organization, communicable diseases surveillance and response (CRS) WHO/CDS/CRS/DRS/2001.2. Geneva: World Health Organization; 2001.
22. Joda AE, Nwaokomah SO. Assessment of pharmacy students' willingness to practice after graduation. *West Afr J Pharm*. 2011;22(1):82-90.
23. Oparah AC, Eferakeya AE. Attitude of Nigerian pharmacists towards pharmaceutical care. *Pharm World Sci*. 2005;27(3):208-214.
24. Bakker A. Pharmacy-practice research: A challenge for academia and practicing pharmacists. *Pharm Acta Helvet*. 1996; 71: 373-379. doi: [10.1016/S0031-6865\(96\)00036-2](https://doi.org/10.1016/S0031-6865(96)00036-2)
25. Roberts R, Kennington E. Pharmacy Practice research has an impact on each and every pharmacist. *Pharm J*. 2010;284:267-271.
26. Perreault MM, Thiboutot Z, Burry LD, Rose L, Kanji S, Leblanc JM, Carr RR, Williamson DR. Canadian survey of critical care pharmacists' views and involvement in clinical research. *Ann Pharmacother*. 2012;46(9):1167-1173. doi: [10.1345/aph.1R180](https://doi.org/10.1345/aph.1R180)
27. 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](https://doi.org/10.1111/j.1365-2710.2008.01020.x)
28. Dickerson LM, Kraus CK, Kuo GM, Weber CA, Bazaldua OV, Tovar JM, Hume AL, Ives TJ, Gums JG, Carter BL. Formation of a primary care pharmacist practice-based research network. *Am J Health Syst Pharm*. 2007;64(19):2044-2049.
29. Chewning B, Schommer JC. Increasing clients' knowledge of community pharmacists' roles. *Pharm Res*. 1996;13(9):1299-1304.
30. Paulino EL, Bouvy ML, Gastellurrutia MA, Guerreiro M, Buurma H. Drug related problems identified by European community pharmacists in patients discharged from hospital. *Pharm World Sci*. 2004;26(6):353-360.
31. Elkasseem W, Pallivalapila A, Hail MA, 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):692-696. doi: [10.1007/s11096-013-9802-z](https://doi.org/10.1007/s11096-013-9802-z)
32. Awaisu A, Bakdach D, Elajez RH, Zaidan M. Hospital pharmacists' self-evaluation of their competence and confidence in conducting pharmacy practice research. *Saudi Pharm J*. 2015;23(3):257-265. doi: [10.1016/j.jsps.2014.10.002](https://doi.org/10.1016/j.jsps.2014.10.002)
33. Toulkidis V, Donnelly N, Ward J. Engaging Australian physicians in evidence-based medicine: a representative national survey. *Intern Med J*. 2005;35(1):9-17.
34. Rosenbloom K. Community pharmacists' attitudes towards research. *Int J Pharm Pract*. 2000;8:103-110.
35. Armour C, Brilliant M. Pharmacists' views on involvement in pharmacy practice research: Strategies for facilitating participation. *Pharm Pract (Granada)*. 2007;5(2):59-66.
36. Seston L, Hassell K. Pharmacy workforce census 2008: main findings. Available at <http://www.rpharms.com/about-pharmacy-pdfs/census08.pdf> (accessed 29 October, 2016).
37. Dunlop J, Shaw J. Community pharmacists' perspectives on pharmaceutical care implementation in New Zealand. *Pharm World Sci*. 2002;24(6):224-230
38. Bezverhni Z. Consumers' and Pharmacists' view on community pharmacy services in the Republic of Moldova. *Farmacia* 2010;58(3):378-390.
39. van Mil JWF, de Boer WO, Tromp ThFJ. European barriers to the implementation of pharmaceutical care. *Int J Pharm Pract*. 2001;9(3):163-168.
40. Cvijovic K, Boon H, Jaeger W, Vohra S. Pharmacists' participation in research: a case of trying to find the time. *Int J Pharm Pract*. 2010;18(6):377-383. doi: [10.1111/j.2042-7174.2010.00067.x](https://doi.org/10.1111/j.2042-7174.2010.00067.x)
41. Okonta JM, Okonta EO, Ofoegbu TC. Barriers to implementation of pharmaceutical care by pharmacists in Nsukka and Enugu metropolis of Enugu state. *J Basic Clin Pharm*. 2012;3(2):295-298.