The knowledge and interest of Iraqi pharmacists in pharmaceutical research: A cross-sectional study

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Abstract

Background: High interest and good knowledge in pharmaceutical research are crucial for pharmacists to improve the quality of care to their patients. Most pharmacists in developing countries have poor knowledge in the basics of conducting scientific research and are less likely to be interested in participating in research activities. Therefore, the current study aimed to assess Iraqi pharmacists' knowledge and interest in pharmaceutical research.

Methods: A cross-sectional study was conducted using a newly developed and validated questionnaire. The questionnaire was distributed to Iraqi pharmacists through social media in March 2023. Only pharmacists who work in community pharmacies were eligible to participate in the study.

Results: The questionnaire was filled by 230 pharmacists; however, only 149 responses were complete and submitted by community pharmacists and thus included in this study. Most of the participating community pharmacists have an intermediate interest in research activities. Meantime, this research interest was positively and significantly influenced by the history of publishing research ($P<0.05$). Less than 1/3 of the participating pharmacists were confident in their knowledge about pharmaceutical research.

Conclusion: The participating Iraqi community pharmacists have a moderate interest but poor knowledge in pharmaceutical research.

Keywords: Community pharmacists; research; knowledge; interest; Iraq

Introduction

In the last 3 decades, the services of pharmacists have shifted from being drug-oriented to patient-oriented by providing patients with pharmaceutical care services.[1,2] To provide patients with optimum pharmaceutical care, community pharmacists are in need to adopt and practice an evidence-based approach[3] such an approach can be defined as" the conscientious, explicit and judicious use of current best evidence in making decisions about the care of current individual patients".[4]

This means that implementing evidence-based pharmacy practice (EBPP) requires pharmacists to keep themselves with up-to-date information by reviewing of literature.[5] In addition, pharmacists must be competent in research tricks to be able to understand the literature, then find, and implement the most evidenced information in the literature in their pharmacy practice.[5]

Furthermore, pharmacists must engage in pharmacy practice research to enhance pharmaceutical care services[6] by such type of research, the efficacy and safety of different pharmaceutical products can be detected.[7] Therefore, high interest and good knowledge in pharmaceutical research are crucial for pharmacists to improve the quality of care to their patients.[8,9] Studies conducted in both developed and developing countries reveal a significant disconnect between pharmacists' positive attitudes toward research and their actual

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participation in research activities. Specifically, while most pharmacists recognize the importance of research, many express a lack of interest in engaging with it. This issue is particularly pronounced in developing countries, where significant gaps in knowledge regarding basic research methodologies exist.[10-13] Furthermore, many pharmacists in these regions lack sufficient insights into the factors affecting the quality of evidence derived from research. Consequently, this leads to a cycle of limited research output, which adversely impacts the evidence base that informs pharmacy practice.[14]

To the best of our knowledge, no studies has been conducted to assess research interest and knowledge among Iraqi pharmacists. Therefore, the current study aimed to assess Iraqi pharmacists' knowledge of pharmaceutical research, their interest in participating in it, and the factors that influence both.

Methods
Study design
A cross sectional study was conducted among Iraqi pharmacists using an online, newly developed and validated structured questionnaire. All pharmacists working in community pharmacies, regardless of their geographical location within Iraq were eligible to participate in this study. Pharmacists with very short (less than 3 months) working experience in a community pharmacy were excluded from this study. The study was ethically approved by the ethical committee at the College of Pharmacy/ University of Baghdad (approval no. RECAUBCP392023R).

Development and validation of the questionnaire
The questionnaire (appendix 1) was developed based on previous literature.[14,15] It consisted of 3 parts: the first part involved questions about pharmacists' demographics; the second part involved questions assessing pharmacists' knowledge in research, and the last part involved questions to assess pharmacists' interest in research. Responses for both the knowledge and interest sections were measured on a five-point Likert scale. For face validity, the questionnaire was sent to two experts in pharmaceutical research. Both experts agreed on the essentiality, clarity, and importance of questionnaire items.

The reliability of the validated questionnaire was tested through a pilot study on 25 pharmacists. The obtained results were statistically analyzed and Cronbach's alpha of 0.71 was obtained. This value confirmed the reliability of the developed questionnaire.[16]

Data collection
Considering the nature of online surveys and the challenges in obtaining a large sample, along with difficulties in controlling participant responses, a sample size of 150 participants was aimed to be achieved for this study based on a commonly used rule of thumb.[17]

The validated questionnaire was written using a Google form. Then, a link to this form was shared online by one of the study authors with pharmacists through social media using three Facebook pages for pharmacists. The link was kept open to receive responses for one month (March 2023). At the end of the study, an Excel sheet of the data was obtained from Google. The obtained data was checked manually for eligibility of the participant, and to exclude any duplicates or responses with missing data.

Statistical analysis
Categorical data was presented as number and frequency. Continuous data was presented as mean ± standard deviation. For statistical analysis of research knowledge, participants' responses were evaluated using a 5-point Likert scale, where a score of 5 represented excellent knowledge and a score of 1 represented poor knowledge. The scores for each question were summed to obtain a total score. This total score was then divided by 75 (maximum possible score for excellent knowledge). The resulting value was then multiplied by 100 to convert it into a percentage. Participants who achieved a percentage score of 80% or higher were classified as having good knowledge.[18]

The chi-square test was used to evaluate the association between different demographic factors (categorical variables) on research knowledge and interest. The chi-square test was measured using an online calculator http://www.quantpsy.org/chisq/chisq.htm. P values less than 0.05 were considered significant.

Results

The questionnaire was submitted by 230 participants; however, only 209 responses were complete (completion rate 91%). An additional 60 responses were excluded because they were filled and submitted by pharmacy college students (n=35) and by pharmacists not working in community pharmacies (n=25). Therefore, the final study sample included only 149 pharmacists. The average age of participating pharmacists was 25.35 years; most of them were females with Bsc. degree in pharmacy and less than 5 years of working experience (Table 1).

Table 2 shows that most pharmacists have an intermediate interest in research activities. Meanwhile, the highest interest of participating community pharmacists was concerning the oral presentation of a research study, followed by reading the research advances in the pharmaceutical field. On the other hand, the lowest interest of pharmacists was about writing a research proposal. The interests of pharmacists in writing a research proposal, writing medical research, and publishing research were positively influenced by the history of publishing previous research by the participating pharmacists. Young pharmacists had the highest interest in publishing researches, whereas all other demographic data (i.e.,gender, and working experience) were not likely to influence the interest of pharmacists in research activities (table 3).

Regarding pharmacists' knowledge in scientific research, nearly half of the participating pharmacists agreed to have fair knowledge while excellent research knowledge was detected in less than 1/5 of participating pharmacists. Further details are given in Table 4.

Research knowledge was not affected by pharmacists' age, gender, working experience, academic degree, and even by the history of publishing research (Table 5).

Discussion

The present study showed that most participating

Table 3: Factors affecting the pharmacists' interest in pharmaceutical research

Parameter		Interest in Writing proposal			P value	Interest in Writing a research			P value	Interest in Publishing a research			P value
		High* n(%)	Moderate n(%)	Low^ n(%)		High* n(%)	Moderate n(%)	Low^ n(%)		High* n(%)	Moderate n(%)	Low^ n(%)	
Gender	Male	12 (38.7)	10 (32.3)	9 (29.0)	0.817	10 (32.3)	13 (41.9)	8 (25.8)	0.699	7 (22.6)	14 (45.2)	10 (32.3)	0.509
	Female	39 (33.1)	44 (37.3)	35 (29.7)		45 (38.1)	40 (33.9)	33 (28.0)		38 (32.2)	42 (35.6)	38 (32.2)	
Age	<25 years	25 (36.2)	28 (40.6)	16 (23.2)	0.277	30 (43.5)	24 (34.8)	15 (21.7)	0.214	29 (42.0)	23 (33.3)	17 (24.6)	0.012
	≥25 years	26 (32.5)	26 (32.5)	28 (35.0)		25 (31.3)	29 (36.3)	26 (32.5)		16 (20.0)	33 (41.3)	31 (38.8)	
Experience	Less than 5 years	44 (34.1)	45 (34.9)	40 (31.0)	0.548	47 (36.4)	44 (34.1)	38 (29.5)	0.377	37 (28.7)	48 (37.2)	44 (34.1)	0.399
	5 years or more	7 (35.0)	9 (45.0)	4 (20.0)		8 (40.0)	9 (45.0)	3 (15.0)		8 (40.0)	8 (40.0)	4 (20.0)	
Degree	BSc	43 (32.8)	48 (36.6)	40 (30.5)	0.243	45 (34.4)	49 (37.4)	37 (28.2)	0.353	39 (29.8)	49 (37.4)	43 (32.8)	0.366
	MSc	3 (27.3)	4 (36.4)	4 (36.4)		5 (45.5)	3 (27.3)	3 (27.3)		3 (27.3)	3 (27.3)	5 (45.5)	
	PhD	5 (71.4)	2 (28.6)	0 (0.0)		5 (71.4)	1 (14.3)	1 (14.3)		3 (42.9)	4 (57.1)	0 (0.0)	
College	Public	37 (31.9)	43 (37.1)	36 (31.0)	0.514	41 (35.3)	44 (37.9)	31 (26.7)	0.179	37 (31.9)	44 (37.9)	35 (30.2)	0.663
	Private	9 (36)	9 (36.0)	7 (28.0)		9 (36)	6 (24.0)	10 (40.0)		6 (24.0)	8 (32.0)	11 (44)	
	International	5 (62.5)	2 (25.0)	1 (12.5)		5 (62.5)	3 (37.5)	0 (0.0)		2(25.0)	4 (50.0)	2 (25)	
Already Published a research	Yes	19 (61.3)	7 (22.6)	5 (16.1)	0.002	22 (71.0)	5 (16.1)	4 (12.9)	0.000	15 (48.4)	9 (29.0)	7 (22.6)	0.046
	No	32 (27.1)	47 (39.8)	39 (33.1)		33 (28.0)	48 (40.7)	37 (31.4)		30 (25.4)	47 (39.8)	41 (34.7)	

* Participants who indicated a 'high' or 'very high' interest in research were classified as having 'high interest; ^ Participants who indicated a low or very low interest in research were classified as having low interest.

Table 1: Demographic data of study participants

Parameter		Value
Age in years	mean±SD	25.35±3.13
	<25 years	69 (46.31)
	≥25 years	80 (53.69)
Gender	Male n(%)	31 (20.8)
	Female n(%)	118 (79.2)
Working experience	Less than 5 years n(%)	129 (86.6)
	5 years or more n(%)	20 (13.4)
Academic degree	BSc n(%)	131 (88)
	MSc n(%)	11 (7.3)
	PhD n(%)	7 (4.7)
University that the pharmacists graduated from	Public Iraqi University n(%)	116(77.8)
	Private Iraqi University n(%)	25 (16.8)
	Non-Iraqi University n(%)	8 (5.4)
Residency of the participating pharmacist	Baghdad n(%)	105 (70.5)
	Diayla n(%)	16 (10.7)
	Najaf n(%)	5 (3.4)
	Babil n(%)	5 (3.4)
	Wassit n(%)	4 (2.7)
	Other governorates n(%)	14 (9.4)

Table 2: The interest of community pharmacists toward research activities

Having an interest in	Very high n(%)	High n(%)	Medium n(%)	Low n(%)	Very low n(%)
Looking for research advances in my field	26 (17.4)	41 (27.5)	55 (37.0)	19 (12.7)	8 (5.4)
Generating research ideas	16 (10.7)	37 (24.8)	63 (42.3)	25 (16.8)	8 (5.4)
Writing a research proposal	16 (10.7)	35 (23.6)	54 (36.2)	30 (20.1)	14 (9.4)
Collecting data	23 (15.4)	49 (32.9)	48 (32.2)	20 (13.4)	9 (6.1)
Analyzing and interpreting research results	19 (12.7)	40 (26.8)	60 (40.3)	18 (12.1)	12 (8.1)
Writing research	21 (14.1)	34 (22.8)	53 (35.6)	25 (16.8)	16 (10.7)
Giving an oral presentation about a research study (e.g.in national or international conference)	30 (20.1)	39 (26.2)	45 (30.2)	25 (16.8)	10 (6.7)
Publishing research in academic journals	25 (16.8)	20 (13.4)	56 (37.6)	31 (29.8)	17 (11.4)

Table 4: Community pharmacists' knowledge in scientific research

Knowledge	Excellent n(%)	Good n(%)	Fair n(%)	Limited n(%)	Very limited n(%)
Reviewing the literature systematically	13(8.7)	25(16.8)	75(50.3)	24(16.1)	12(8.1)
Development of a research question	9(6.0)	31(20.8)	69(46.3)	27(18.1)	13(8.7)
Developing a theoretical framework for the research	9(6.0)	19(12.8)	75(50.3)	28(18.8)	18(12.1)
Formulating hypothesis	10(6.7)	23(15.4)	66(44.3)	29(19.5)	21(14.1)
Selecting a suitable research design (e.g., clinical trial, cross sectional, cohort, qualitative, case-control, etc..)	9(6.0)	31(20.8)	65(43.6)	29(19.5)	15(10.1)
Identifying the population and sample to be studied	14(9.3)	29(19.5)	63(42.3)	28(18.8)	15(10.1)
Determining appropriate sample size	10(6.7)	27(18.1)	69(46.3)	30(20.1)	13(8.7)
Methods to obtain a random study sample (e.g., stratified, block, simple randomization)	17(11.4)	25(16.8)	65(43.6)	24(16.1)	18(12.1)
Determining outcome measures	13(8.7)	25(16.8)	74(49.7)	23(15.4)	14(9.4)
Designing the sampling plan (a detailed outline of which measurements will be taken at what times, on which material, in what manner, & by whom)	13(8.7)	34(22.8)	64(42.9)	25(16.8)	13(8.7)
Specifying an appropriate method to collect the research data (e.g. questionnaire, direct interview, lab tests, …)	19(12.8)	25(16.8)	67(44.9)	25(16.8)	13(8.7)
Designing a data collection form	15(10.1)	28(18.8)	71(47.7)	23(15.4)	12(8.0)
Preparing the data for analysis (e.g., transferring the data to excel or to SPSS)	20(13.4)	29(19.5)	64(42.9)	21(14.1)	15(10.1)
Analyzing the data	21(14.1)	27(18.1)	60(40.3)	27(18.1)	14(9.4)
Interpreting and discussing the result	24(16.1)	29(19.5)	62(41.6)	21(14.1)	13(8.7)

Table 5: Factors affecting community pharmacists' knowledge in medical research

Parameter		Good knowledge n(%)	Poor knowledge n(%)	P value
Gender	Male	4 (12.9)	27 (87.1)	0.874
	Female	14 (11.9)	104 (88.1)	
Age	<25 years	12 (17.4)	57 (82.6)	0.064
	≥25 years	6 (7.5)	74 (92.5)	
Working experience	Less than 5 years	14 (10.9)	115 (89.1)	0.243
	5 years or more	4 (20.0)	16 (80.0)	
Academic Degree	BSc	16 (12.2)	115 (87.8)	0.938
	MSc	1 (9.1)	10 (90.9)	
	PhD	1 (14.3)	6 (85.7)	
College graduated from	Public	14 (12.1)	102 (87.9)	0.999
	Private	3 (12.0)	22 (88.0)	
	International	1 (12.5)	7 (87.5)	
Publishing a research	Yes	6 (19.4)	25 (80.6)	0.163
	No	12 (10.2)	106 (89.8)	

Iraqi pharmacists have a moderate interest in research activities. In contrast to this finding, Ethiopian[15] and Qatari[12] pharmacists had a high interest in research activities. This low research interest by Iraqi pharmacists as compared to the interest seen among pharmacists in other developing countries (15, 12) may be attributed to the lack of knowledge about the importance of research in developing pharmaceutical services provided to the patients.[19]

The current study showed that the highest interest of participating community pharmacists was concerning the oral presentation of a research study, followed by reading the research advances in the pharmaceutical field. This finding was so close to that obtained among Ethiopian pharmacists[15] Meanwhile, the lowest interest of Iraqi pharmacists was about writing a research proposal. This finding was reasonable since only a few of the participating pharmacists were working in Academic institutions (Pharmacy colleges) besides their working in community pharmacies[20] The majority of participants were working in non-academic institutions; in these non-academic institutions submitting a research proposal is not mandatory before conducting the research, thus, the interest in writing a research proposal is low for most Iraqi pharmacists.

The results of this study showed that the interests of pharmacists in research activities were mainly influenced by the history of publishing previous research. Similarly, a study among postgraduate medical students showed that a history of conducting research is the most important factor that influences interest in research.[21]

Despite the high interest of most pharmacists in research activities, the results of the present study showed that less than 1/5 of the participants were confident in their good research knowledge. This percentage was slightly less than that reported by Blebil and colleagues in which 60% of pharmacists in Malaysian hospitals were confident in their competence to do research[22]. The lack of confidence in research competence among most of the current study participants may be attributed to the absence of previous research experience.[22] Meanwhile, statistical analysis of the current study results showed that the research knowledge was not affected by pharmacists' age, gender, working experience, academic degree, and even by the history of publishing research. Therefore, the absence of previous research experience might not

be sufficient to explain the limited confidence in self-competence with pharmaceutical research among Iraqi pharmacists; instead, limited education and training of pharmacists about scientific research[22,23] may be the main reason for this poor research knowledge. Hence, it is highly recommended to add a research methodology course to the curriculum of pharmacy colleges. Additionally, conducting workshops about scientific research and encouraging graduated pharmacists to join these workshops will help to enhance their knowledge and ability to perform scientific research.

The main limitations of the current study include: 1) the small size of the included sample; however, this problem is common to all studies with online surveys[21]; and 2) the young age of most study participants which does not exactly represent the pharmacists' community in Iraq. Yet, this problem is expected because of the online nature of this study[24], thus older adults, who are less familiar with electronic technology, are less likely to engage in such studies[25].

In conclusion, the pharmacists participating in this study have a moderate interest in pharmaceutical research. The interests of pharmacists in writing and publishing research can be positively influenced by the history of publishing previous research. Meanwhile, the knowledge of participating pharmacists in pharmaceutical research was poor and not affected by pharmacists' age, gender, working experience, academic degree, and even by the history of publishing research.

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