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Perceptions and Challenges of Conducting Research among Undergraduate Pharmacy Students in University of Ilorin

Rashidat Oluwafunke Ayanniyi[1*] Aishat Jumoke Alaran[1]

[1]Department of Pharmacology and Toxicology, Faculty of Pharmaceutical Sciences, University of Ilorin, Kwara State, Nigeria.

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* *Corresponding Author:*
ayanniyi.ro@unilorin.edu.ng
https://orcid.org/0000-0002-3484-7627
+234-8033908610

ABSTRACT

Background: Active participation of students in research projects will enhance acquisition of critical thinking and problem-solving skills. The aim of the study was to assess the perception of and identify challenges in conducting research among pharmacy students at University of Ilorin, Nigeria.
Methods: The study was a cross-sectional survey of fourth- and fifth-year pharmacy students aged between 16 and 30 years, selected by non-random purposive sampling technique. Bachelor of pharmacy students who have been exposed to research activities and spent 4-5 years of continuous study were included while postgraduate students were excluded from the study. Information on their perceptions of and challenges in conducting research were obtained using a structured, self-administered questionnaire. Data was collated and analyzed using SPSS version 25. Descriptive statistics (mean, percentages and frequencies) were used for presentation of data.
Results: The sample size for the study was 114 and a total of 100 students answered the questionnaire with a response rate of 87.72%. A total of 46 and 54 students in fourth- and fifth- year respectively participated in the study. Majority of the respondents were females (57%). The mean age of the respondents was 22.24±3.48 years. Most of the students (87%) had interest in research while (13%) revealed they had no interest in research. In addition, 78% of the respondents acknowledged research made students to be active learners and critical thinkers, (73%) agreed research work encouraged them to be problem solvers and innovators. Majority of the respondents (96%) revealed that there was inadequate preparatory courses/scientific training and facilities to carry out research projects. More than half of the respondent (61%) were of the opinion that the time allotted for research work/projects was grossly insufficient.
Conclusion: Pharmacy student's perception of research was positive and they also recognized challenges that hindered effective conduct of research projects. Addressing these challenges could potentially enhance the acquisition of research and problem-solving skills by pharmacy students.

1. Introduction

The Bachelor of pharmacy (B. Pharm) programme was designed to produce pharmacists with sound knowledge of pharmacy (Pharmacist Council of Nigeria (PCN) Act 92 of 1991 Cap. P17, LFN 2004)[1]. They apply the core knowledge and problem-solving skills for effective delivery of pharmaceutical and related healthcare services. Research is an important aspect of the Bachelor of pharmacy curriculum and includes inquiry-based activities like laboratory experiments and projects[2]. Research activity is one of the strategies for implementing active learning and problem-solving skills in the undergraduate pharmacy curricula. This strategy facilitates student engagement, enhance relevance and improve motivation by actively involving students within their classroom and experiential learning environments[3].

Research is the only method, with proven record, that enables us to improve the human condition both in our immediate communities and countries[4]. It involves the collation and analysis of information to improve human understanding of phenomena under study[5]. It also entails data collection, analysis, interpretation and assessment procedures conducted in an organized manner in a bid to find solutions to problems[6]. No nation can develop without partaking and investing in research activities[7]. In Nigeria, the Pharmacist Council of Nigerian has a requirement for every undergraduate student to carry out a research project (PCN Act 92 of 1991 Cap. P17, LFN 2004)[1]. In University of Auckland, New Zealand, the requirement is different with students undertaking research projects as members of a group of 4-6 students under the supervision of an academic staff[8]. The benefits of research activities are enormous to both the researchers and their immediate community. Some benefits of research to students include; personal gains (confidence), intellectual gains (critical thinking), communication skills, and career benefits (increasing skills and aspirations for postgraduate studies)[9,10,11]. Undergraduate research activity has been reported to increase the rate of student retention and engagement thus resulting in improved learning outcomes, skills and attitudes[12,13,14]. There are very few published reports on undergraduate pharmacy students' perception of research in Nigeria. This study aims to assess the perception of and identify challenges in conducting

research among fourth- and fifth-year pharmacy students in University of Ilorin.

1. Method

2.1 Setting

This cross-sectional study was conducted at the Faculty of Pharmaceutical Sciences, University of Ilorin, Ilorin, Kwara State, Nigeria. Non-random purposive sampling (total population sampling) technique was used to select subjects for the study. A total of 100 pharmacy students in their fourth- and fifth-year participated in the study and confidentiality was maintained during the study.

Ethical approval with number UERC/ASN/2019/1862 was obtained from the University of Ilorin Ethical Review Committee.

A structured self-administered questionnaire was used to obtain data for the study. The study instrument developed by the researchers was subdivided into three sections. The first section contained questions related to the students' demographic data. The second section assessed pharmacy students' area of research interest. The third section was subdivided into three parts and all items were scored on a 4-point Likert scale. Part A assessed pharmacy students' perceptions of research, importance of research projects and perception on impact of research on the society. These were scored on an agreement scale ranging from strongly agree to strongly disagree. Part B assessed knowledge of basic research while part C assessed the challenges encountered during conduct of research and was scored on an experience scale ranging from not familiar to very familiar).

Variables were assigned scores ranging from 1-4. The highest score of 4 was assigned to the variable that represents a positive perception while the lowest score of 1 was assigned to the variable that best represents a negative perception. Perception score was calculated by subtracting the percentage of negative from positive perception. The scores obtained were computed and the resulting data was analysed for measures of central tendency.

The validity of the research instrument was verified by experts in the Department of Clinical Pharmacy and Pharmacy Practice who reviewed the questionnaire for face and content validation before the pilot study was carried out[15].

In order to test the reliability of the tool, a pilot study was conducted among students in third year at the Faculty of Pharmaceutical Sciences using a sample size representing 10% (n=10) of the study sample size. Reliability of the research instrument was determined by the Cronbach Alpha reliability analysis method using data obtained from the pilot study. A Cronbach alpha score of 0.57 (35-item) was obtained.

The questionnaire was administered to eligible pharmacy students selected through non-random purposive sampling (total population sampling). The entire population who share common characteristics was studied. A total of 100 students in their fourth- and fifth-year in the Faculty of Pharmaceutical Sciences participated in this study after obtaining verbal consent from them. Confidentiality was maintained by concealing the identity of all research subjects.

Data was collected for a period of seven days, collated and analyzed using Statistical Package for Social Sciences (SPSS) version 25.0. Descriptive statistics was used in presenting data as percentages, frequencies, mean and standard error of mean.

2. Results

2.1 Demographic characteristics of respondents

A total of (100) pharmacy students participated in the study; fifty-four (54%) students in fifth-year and forty-six (46%) students in fourth-year. Majority of the students were females 57 (57%) while 43 (43%) were males. The mean age of the participants was 22.24 ± 3.48 years (Table 1).

Table 1: *Demographic characteristics of the respondents (n=100)*

Demographic variables	Indices	Frequency (%)
Gender	Male	43
	Female	57
Age	16-20	25
	21-25	63
	26-30	10
	>30	2
Fourth year		46
Fifth year		54

3.2 Area of research interest

A total of 87% of the respondents indicated they had interest in research while 13% revealed that they do not have interest in research. Clinical Pharmacy and Pharmacy Practice was the most preferred students' area of research (21%) while Pharmaceutical and Medicinal Chemistry was the least preferred (Figure 1).

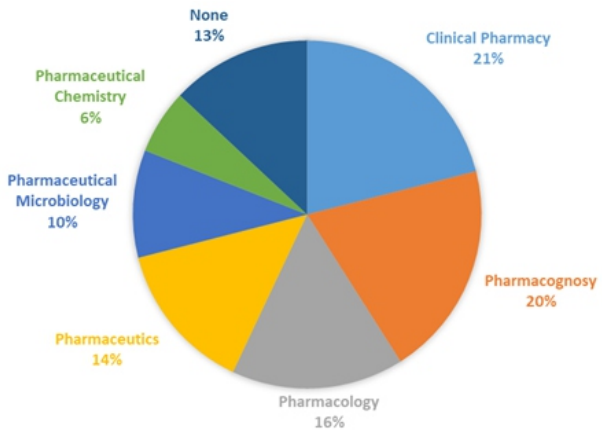

Figure 1: *Area of research interest (n=100)*

3.3 Students' perception of research

Most students (99%) agreed that research would enable them to be active learners and critical thinkers and also that research enables students to be problem solvers and innovators (98%). The minimum perception score obtained was 10 while the maximum score obtained was 20. The mean perception towards research was 17.59±2.08 (Table 2). This indicates pharmacy students had positive perception of research.

Table 2: *Student's perception of research (n=100)*

Items	SA	A	D	SD
Research encourages students to be active learners and critical thinkers	78.0	21.0	1.0	0.0
Research encourages students to be problem solvers and innovators	73.0	25.0	2.0	0.0
Research helps generate knowledge and skills needed in working life	56.0	39.0	5.0	0.0
Research supports individuals in educational growth	25.0	49.0	22.0	4.0
Research increases knowledge and confidence	66.0	33.0	1.0	0.0

Strongly Agree, SA; Agree, A; Disagree, D; Strongly Disagree, SD

3.4 Importance of research to pharmacy students

Most pharmacy students (97%) agreed that research was important in all areas of pharmacy practice (Table 3). The mean score obtained on the importance of research to students was 20.5±2.14. The minimum score obtained was 14 while the maximum perception score obtained was 24. The scores obtained range from 6-24 with a midpoint of 15.

Table 2: *Student's perception of research (n=100)*

Items	SA	A	D	SD
Important in all areas of professional practice	69.0	28.0	2.0	1.0
Important only in academic pharmacy	5.0	7.0	60.0	28.0
Prepares for future research activity and study	62.0	36.0	2.0	0.0
Opportunity to discover a new method or product	74.0	25.0	1.0	0.0
Opportunity to publish findings	56.0	41.0	3.0	0.0
A requirement for graduation	9.0	13.0	59.0	19.0

Strongly Agree, SA; Agree, A; Disagree, D; Strongly Disagree, SD

3.5 Perceived impact of research on society

Most of the students (93%) agreed that research influences a wide variety of phenomenon and trends in the society (Table 4). Majority also believed that it contributes to the development of societies (98%) and it creates economic and social value (97%). The mean score on the impact of research on society was 10.38±1.43. The minimum score obtained was 7 while the maximum score was 12. The scores obtained had a range of 3-12 with a midpoint of 7.5.

Table 4: *Impact of research on society*

Items	SA	A	D	SD
It influences a wide variety of phenomenon and trends in the society	45.0	48.0	7.0	0.0
It contributes to the development of societies	58.0	40.0	2.0	0.0
It creates economic and social value	47.0	50.0	3.0	0.0

Strongly Agree, SA; Agree, A; Disagree, D; Strongly Disagree, SD

Students' knowledge of basic research

About half of the respondents (55%) were familiar with ethical approval process and research ethics, less than half were familiar with handling and organizing research data (42%) while only (23%) were familiar with statistical analysis of research data (Table 5).

Table 5: *Students' knowledge of basic research (n=100)*

Items	Not familiar	Slightly familiar	Moderately familiar	Very familiar
Ethical Approval process and Research ethics	25.0	22.0	33.0	20.0
Safety Considerations and rules for Laboratory research	9.0	26.0	31.0	34.0
Handling and Organizing Research Data	21.0	37.0	30.0	12.0
Statistical analysis of research data using Software packages (SPSS, Graph pad)	43.0	34.0	12.0	11.0
Writing publications	17.0	35.0	24.0	24.0
Referencing styles	20.0	31.0	29.0	20.0
Plagiarism check	14.0	31.0	23.0	32.0

The scores obtained ranged from 7-28 with a midpoint of 17.5. The minimum score obtained was 7 and the maximum score

obtained was 28. The mean score towards research was 17.4±5.68. This indicates the students had a slightly moderate knowledge of research.

3.6 Challenges of conducting research

Majority of the students (96%) agreed that training courses on conduct of research were inadequate. In addition, (96%) were of the opinion that facilities and relevant infrastructure for research studies were not available (Table 6).

Table 6: *Challenges of conducting research (n=100)*

Items	SA	A	D	SD
Lack of Adequate training courses on the responsible conduct of research	31.0	65.0	4.0	0.0
Inadequate Financial compensation for research studies	61.0	38.0	1.0	0.0
Research is esoteric, and meant for specially endowed people	1.0	20.0	60.0	19.0
Research is not tailored towards addressing specific issues of national importance	10.0	33.0	46.0	11.0
Facilities and relevant infrastructure for research studies are sparsely available	52.0	44.0	4.0	0.0
Lack of adequate motivation by research supervisors/mentors	23.0	51.0	23.0	3.0

4. Discussion

The curriculum of undergraduate pharmacy programs have courses that entail scholarly research and projects. Educational programs are linked to research by having academic staff involved in research teach courses and by engaging student in research projects[16]. The present study was conducted to assess the perceptions of and challenges of research amongst undergraduate pharmacy students in University of Ilorin, Nigeria.

Most of the students indicated they had interest in research and agreed it made them to be problem solvers and innovators. They also believed that it supports educational growth and were of the opinion that research increases knowledge and confidence. There are limited reports on undergraduate pharmacy students' perception of research and these findings indicate that pharmacy students in University of Ilorin have a positive perception of research. A study carried out in Asia and Africa on students' perception of research showed that students had a positive attitude to research[17]. The importance of research to the students was also assessed and majority of the students agreed that it contributes to the development of societies and creates economic and social value. This is similar to the findings of Kritikos et al., [18] carried out in the pharmacy school of the University of Sydney, Australia.

Sensitization of undergraduate students to research is important and should be done at all level of study to enhance student participation in scholarly research activities. This will equip them with practical research experience and nurture them as scientists[17].

The data from the study revealed the students did not have adequate knowledge of basic research. Most of them were not familiar with research ethics, they have inadequate practical knowledge on statistical analysis and referencing using software packages. In a research conducted by Amin et al, students' knowledge of research was reported to be poor. Some challenges encountered were lack of time, training courses, incentives and mentoring[19].

Pharmacy students in many developing countries do not have adequate knowledge and opportunity to carry out research[20]. In the current study, the students agreed there were challenges when doing research and these include; inadequate training courses on the responsible conduct of research, lack of motivation by lecturers, lack of facilities and relevant materials for research studies. Furthermore, the respondents also agreed that the time allotted for research projects is grossly insufficient. A study highlighted the importance of training and showed that attendance of a short course on research methodology had positive short-term effect on students' attitude to research[21]. Attaining research experience early and often has been associated with a greatly enriched undergraduate experience. Students who discover their passion for research eventually apply for graduate studies and faculty positions[22]. Inclusion of research courses is thus important and should be introduced in the second and third year of study so that interest can be stimulated.

Limitations of the study: This research was carried out in one institution and findings may not be representative of all pharmacy students in the country and thus a limitation of the study. A further research in a multi-center setting assessing the perceptions of and challenges of research among pharmacy students in Nigeria is advocated.

5. Conclusion

Pharmacy students in the fourth- and fifth-year in University of Ilorin demonstrated a positive perception towards scientific research. This study also revealed challenges that may prevent students from participating actively in research activities. Addressing these challenges will enhance research and problem solving skills in pharmacy students.

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