



Survey of Opinions of Medical Students on Pharmacology Education in a Nigerian Medical School

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Abstract

Pharmacology education aimed at equipping learners with the knowledge and skills for safe and effective use of medications through rational prescribing. This study was carried out among fourth year medical students of a Nigerian medical school at the end of pharmacology postings to understand their opinion about the pharmacology education received with the goal of improving. A cross sectional survey of the opinions of the medical students obtained through a self-administered questionnaire that sought information was obtained on various aspects of the pharmacology education received. Results were summarized with descriptive statistics using SPSS version 17.0. Continuous variables were expressed as means (standard deviation), categorical variables as proportions. A total of 40 students completed the survey in a class of 67 students (60% response rate) with mean age of 23.2 ± 2.6 years and 49% females. Pharmacology was found difficult by 47.5% while only 32.4% felt prepared for rationale prescribing after the course.

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Aspects of pharmacology found most interesting were: None (17%), Antihypertensive drugs (17%), Other Cardiovascular (CVS) pharmacology topics (12%) and Practical sessions (12%) while aspects found most challenging and difficult were: Cancer chemotherapy (27.5%), drug names (12.5%), All aspects (10%) and 5% each for Central Nervous System, CVS, Antiretroviral drugs and None. Suggestions from respondents included preference for integrated and problem-solving approach to learning with clinical applications, more practical sessions, seminars and tutorials, teaching of drug doses, indications and trade names of commonly used drugs and better approach to teaching especially for the perceived challenging topics. The findings suggest a need for critical review of pharmacology education being received by the medical students towards improved outcomes.

Keywords: Pharmacology Education; Medical students; Nigeria.

1. Introduction

The discipline of Pharmacology is one of the most fundamental subjects in the field of medicine and it entails the knowledge of the sources of drugs, their physical and chemical properties, methods of compounding, physiological actions, pharmacokinetic and pharmacodynamics properties and their therapeutic uses [1]. Pharmacology is taught in medical schools across the world at different stages of the medical education using different approaches. In a medical college in Nepal for example, it is taught in an integrated manner alongside other basic medical sciences subjects like anatomy, physiology, biochemistry, pathology in the first four semesters of study through didactic lectures and problem-stimulated learning (PSL) sessions [2]. The medical curriculum in India teaches pharmacology over a period of one and half years along with pathology, microbiology and forensic medicine [3]. This is similar to what obtains in most medical schools in Nigeria where the subject is taught in the fourth year of the medical program alongside the pathology sub-specialties over a period of about a year or a year and half through lectures, practical sessions and in some settings tutorials and student seminars.

Pharmacology education among medical students is expected to equip the learners with pharmacological principles and prepare them for safe and effective use of medications through rational prescribing [4,5]. However, the traditional pharmacology teachings in medical schools have placed emphasis majorly on acquisition of factual knowledge about drugs and has not trained the students adequately for therapeutics [6-9]. A survey carried out among Italian doctors revealed they considered their pharmacology education to be theoretical and would prefer more attention given to clinical practice related issues in the teaching [10]. Nazar and his colleagues in a review of perspectives on teaching safe prescribing to medical students in the United Kingdom documented that reported prescribing errors were made by practically all grades of doctors, less commonly by consultants but notably among doctors in their foundational years, a consequence of inadequate training in practical prescribing, rational use of medicines and failure to link theory and practice [11]. The fact that about 75% of all inpatient's prescriptions are written by these recent graduates further compounded the problem [12]. Similarly, a study carried out by Oshikoya and his colleagues in Nigeria on medical interns' knowledge of clinical pharmacology and therapeutics after undergraduate and on-going internship training also revealed deficiencies and training gaps in prescribing skills among these young graduates [13].

In the past two to three decades, medical educators globally have been embarking on reforms and reviews of undergraduate pharmacology education focusing on methodologies and curricula at regular intervals which have resulted in the development and introduction of a number of educational programs and initiatives to improve the teaching and learning of pharmacology and therapeutics [14–20]. Such includes but not limited to Problem Based Learning (PBL) approach, deployment of technological tools in teaching, reviews of methods of assessments to include both formative and summative, integration of teaching of pharmacology with internal medicine, clinical pharmacology and therapeutics taught in clinical years, inclusion of drug use indicator study, assessments of drug promotional materials, communication skills training using simulated patients in the curriculum and overall emphasis on rational prescribing using the World Health Organization (WHO) Guide to Good Prescribing as reference standard [5, 21].

In identifying the most appropriate educational reforms applicable to each setting, studies have shown that the understanding of student's perspectives and expectations through feedbacks and opinion surveys have proven to be beneficial [2,3,22–27] . While this approach has been extensively applied in other parts of the world, documented evidence of its application in evaluating pharmacology education in Nigerian medical schools remains few. A similar study in this institution about a decade earlier that assessed medical students' view on the methods of teaching pharmacology revealed the need for curriculum reviews and introduction of other methods to make the learning of pharmacology more relevant to clinical practice in line with global trends [28]. However, the impacts of these earlier findings on pharmacology education in this institution remains uncertain. This study was therefore carried out among fourth year medical students of Lagos State University College of Medicine, Lagos, Nigeria at the end of their pharmacology postings and examinations to understand their opinion about the pharmacology education they received with the hope of identifying appropriate measures to improve on pharmacology education in the institution and the nation as a whole.

2. Methodology

Cross sectional survey of the opinions of medical students at Lagos State University College of Medicine, Lagos, Nigeria who completed pharmacology postings and examinations in year 2019. The institution is a state government owned medical school in southwestern Nigeria. The medical school was created in 1999 and currently has four faculties namely: Basic Medical Sciences, Basic Clinical Sciences, Clinical Sciences and Dentistry. With an overall current student population of about 500, it offers undergraduate programs in Medicine and Surgery, Dentistry, Nursing Sciences, Pharmacology and Physiology and some Postgraduate Programs. Medical and Dental Students are taught pharmacology in the fourth year for a total duration of about 52 weeks through lectures, practical, seminars and tutorials and are assessed through in-course examinations and a summative examination comprising of essays, multiple choice questions, objective structured practical examination and viva voci.

At the end of the pharmacology training and examinations, students who were willing to give feedback on the pharmacology education they received were requested to complete a self-administered questionnaire which obtained information on the demography of the students and their opinion on various aspects of the pharmacology education received. Participation was voluntary and responses were anonymous. The

questionnaire obtained information on the general opinion of the students on the subject of pharmacology, the method of teaching and the approach (problem based learning or system based learning), the aspects of pharmacology found most interesting and most difficult or challenging and the reasons respectively, how well prepared the students felt for rationale prescribing following the education received, what is considered to be the strengths and weaknesses of pharmacology education in the institution and suggestions for improvements.

Results were summarized with descriptive statistics using SPSS version 17.0. Continuous variables were expressed as means (standard deviation), categorical variables as proportions.

Ethics approval for the study was granted by the Institutional Review Board of the Lagos State University Teaching Hospital.

3. Results

A total of 40 students completed the survey in a class of 67 students (60% response rate), 51% males with mean age of 23.2 ± 2.6 years. It was the general opinion of 48% of the class that the subject of pharmacology was difficult, while 10% were undecided (See Figure 1). Only 23% of the students felt they were well prepared for rationale prescribing of drugs, the majority (42%) were unable to decide. See Figure 2.

Aspects of pharmacology found most interesting by the students were summarized in Figure 3. 17% found none of the aspects interesting while another 17% found the antihypertensive drugs interesting and another 12% each found other aspects of Cardiovascular Pharmacology (other than antihypertensive drugs) and the practical sessions most interesting. The prominent reasons for finding these aspects most interesting were summarized in Table 1 with the topics being found simple and easily understood (37.5%), clinical applications in teaching (17.5%) and knowledgeable lecturers and good method of teaching (10%) being the most reasons given.

The topics and areas found challenging and difficult were: cancer chemotherapy (27.5%), drug names (12.5%) antiretroviral and central nervous system pharmacology (5% each). The reasons for finding these topics or areas challenging were summarized in Table 2 with the topics or aspects found to be complex, hard to understand and requiring lots of cramming (42.5%), topics poorly taught (17.5%) and lack of clinical application (12.5%) being the most reasons. Worthy of note is the fact that 17% of the students surveyed found all aspects interesting while 10% found none interesting.

Tables 3 and 4 summarized the perceived strengths and weakness of pharmacology education in the institution by the students while the suggestions by students on how to improve pharmacology education in the institutions are listed in Table 5 with 35% of the students advocating clinical application and problem based approach to learning pharmacology while 27.5% would prefer simpler approach to teaching with reduced number of power point slides and less bulky notes provided by the lecturers among other suggestions.

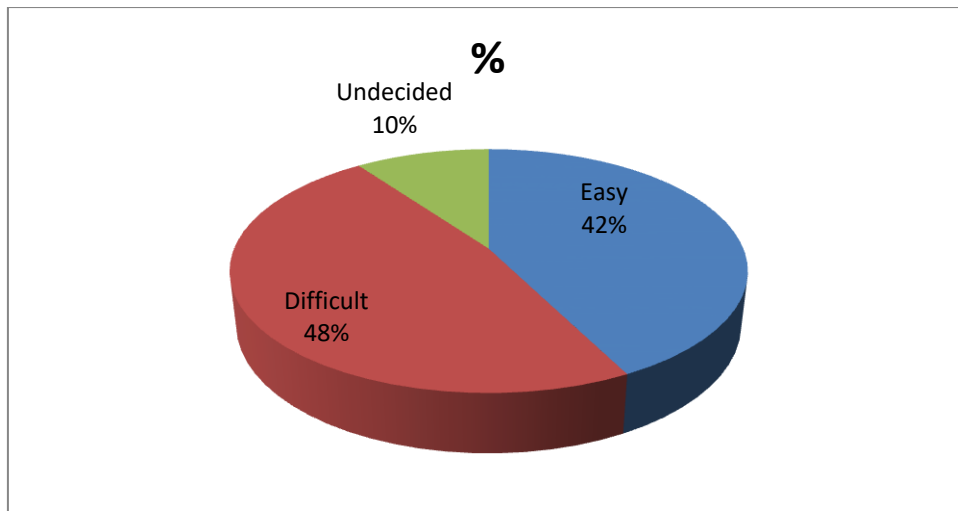


Figure 1: Frequency of the Student’s General Opinion About the subject of Pharmacology

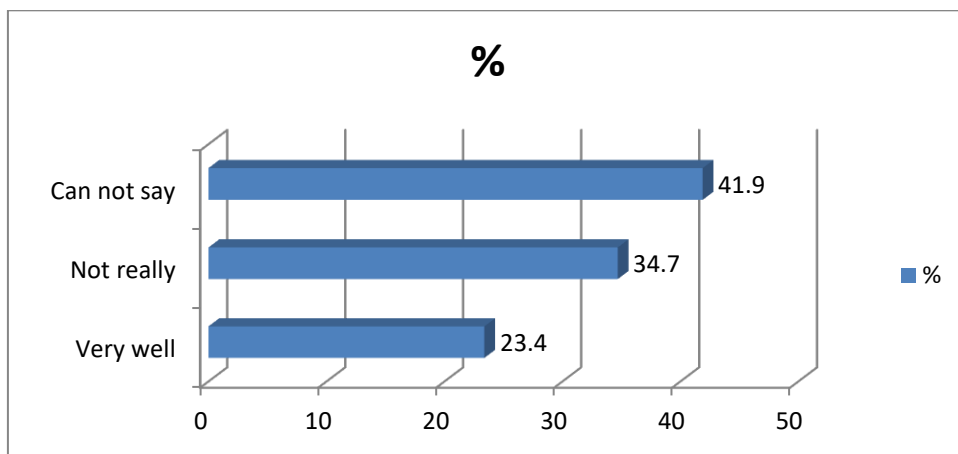


Figure 2: How well Prepared for Rationale Prescribing Following the Training

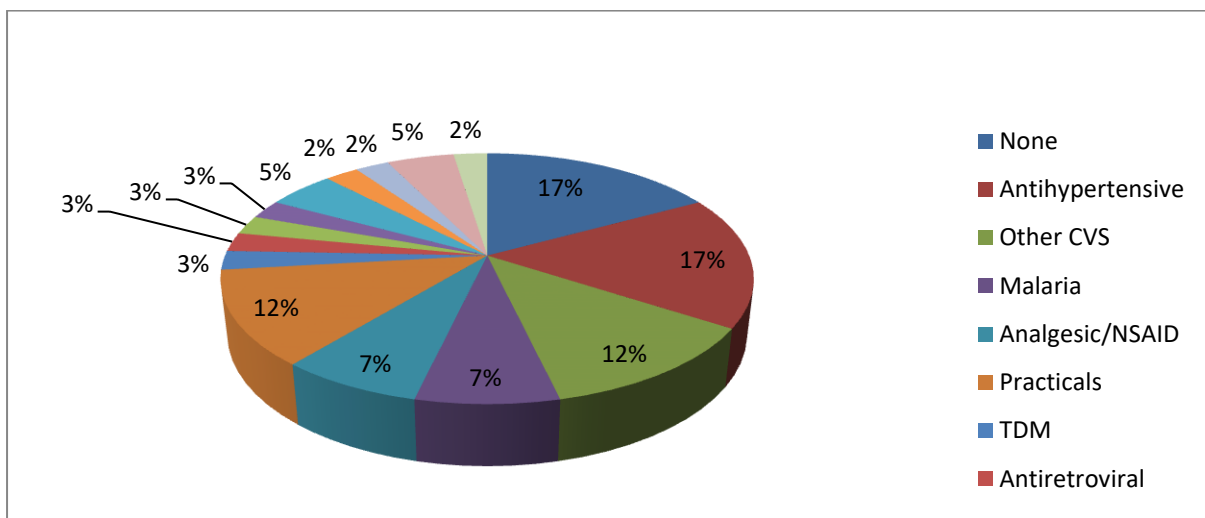


Figure 3: Aspects of Pharmacology found Most Interesting

Table 1: Reasons why the topics were found interesting

Reasons Given	Frequency	%
Topics were simple and easily understood	15	37.5
Clinical Applications in Teaching	7	17.5
Lecturers were knowledgeable with Good Method of Teaching	4	10.0
Students had Hand on Experience in Practical Sessions	3	7.5
Learnt new things	1	2.5

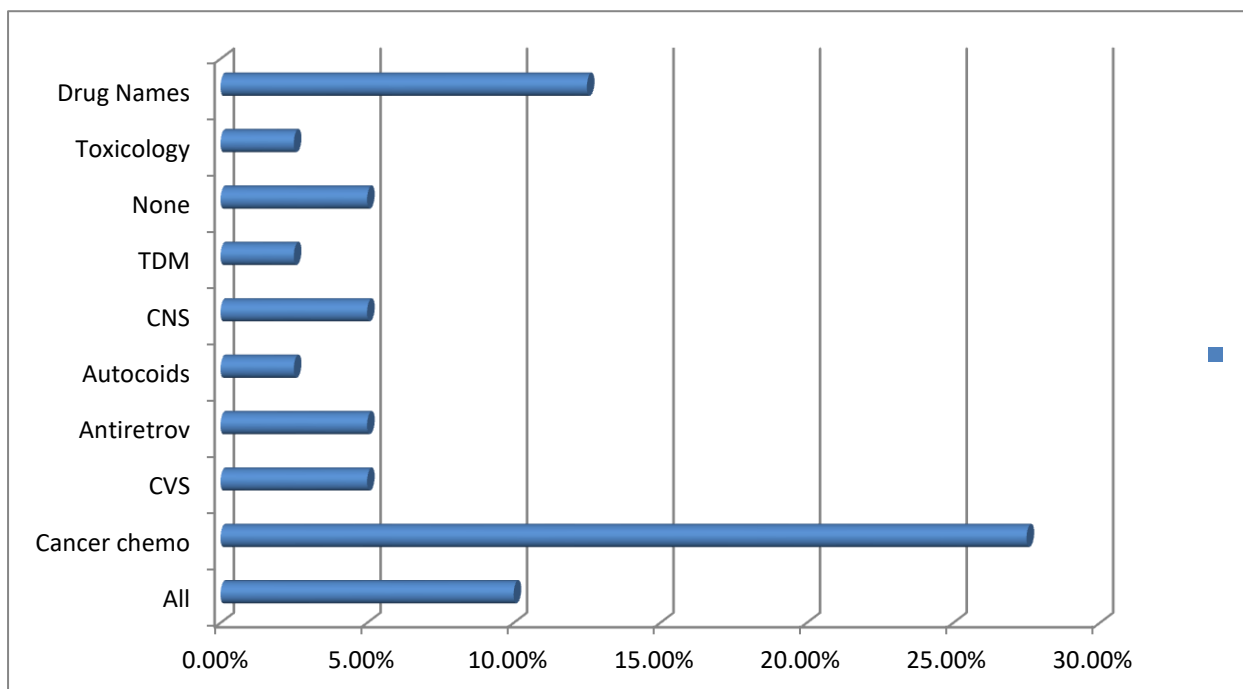


Figure 4: Aspects of Pharmacology found Most Challenging/Difficult

Table 2: Reasons why the aspects or topics were found challenging/difficult

Reasons Given	Frequency	%
Topics were complex, hard to understand, involves lots of cramming	17	42.5
Topics were poorly taught	7	17.5
Lack of Clinical Application in Teaching	5	12.5
Lecture notes were bulky and difficult to understand	1	2.5

Table 3: Perceived Strength of Pharmacology Education in the institution by the students

Perceived Strength	Frequency	%
Experienced Lecturers with Good Teaching Skills	11	27.5
Good Lecturer-Students Relationship	5	12.5
Adequate number of Teaching Staff	4	10.0
High Students success rate in examinations	4	10.0
Well-equipped laboratory	1	2.5
Good organization of the programme	1	2.5
Easy to understand notes	1	2.5

Table 4: Perceived Weaknesses of Pharmacology Education in the institution by the students

Perceived Weakness	Frequency	%
Lack of clinical exposure and problem-based approach during posting	5	12.5
Some Poorly Taught Topics	5	12.5
Inadequate seminars and Practical sessions	3	7.5
Bulky notes, poorly understood given by some lecturers	3	7.5
Long hours of lectures in a day with large curriculum	3	7.5
Inadequate infrastructure and small laboratory space	3	7.5
Do not know	1	2.5

Table 5: Suggestions given by students for Improving Pharmacology Education in the Institution

Suggestion	Frequency	%
Clinical Applications and Problem Based Approach to Learning	14	35.0
Simpler approach to teaching: lesser slides, less bulky notes	11	27.5
More Practical and Seminar sessions	4	10.0
Lecturers to pay attention to students' feedback on lectures given	3	7.5
Provision of more infrastructure	1	2.5
Provision of Up-to-date Notes and Study materials	1	2.5
Preferred One Topic taught per day	1	2.5

4. Discussion

This study surveyed the opinion of medical students about pharmacology education at the conclusion of their postings and examinations with 60% of the class responding. The reasons why the remaining 40% of the class abstained were unknown since the survey was voluntary and the responses were anonymous. Such feedbacks are not routinely done in the institution and therefore the students might not have developed the confidence to express their opinions about courses taught by their 'superior orders' without fears. This kind of exercise should be encouraged routinely in our educational institutions as it has the potential to help build a more functional and productive learning systems.

Close to half (48%) of the class perceived the subject of pharmacology to be difficult. This is not an uncommon finding. A similar study among a group of medical students in Indian recorded pharmacology to be interesting to only 24% of the group [27]. This finding coupled with the 10% that were undecided about the question are indications of the fact that the education received might not be meeting the desired objective of competence in use of drugs and rational prescribing and therefore would require a review. Such review should take into consideration the expressed opinions of the students as these have been found useful in previous studies [2,3,22–27]. A study conducted in a United States of America medical school revealed improved student attendance and participation following a curriculum review that accommodated the student's opinion [22].

Only 23% of the class felt prepared for rationale prescribing of drugs following the training received. This low level of preparedness is consistent with findings from previous studies among medical students who have had the traditional trainings largely characterized by theoretical knowledge without much emphasis on solving therapeutic problems [10–12]. It is also noteworthy that 17% of the class found no aspect of the course interesting. These findings further buttress the need for a review. Both the aspects and topics found interesting and challenging or difficult showed some similarities and differences from findings from previous studies [27]. However, the important things to note are the reasons given for these perceptions. The ability of the lecturer to simplify the topics taught, the prominence of clinical applications and problem-based learning approach with opportunity for ‘hands on’ experiences as obtained in the practical sessions are likely to enhance the learning experience of the students. This institution and other medical schools in Nigeria should learn from the global trends in pharmacology education to medical students which currently seeks to integrate therapeutics into internal medicine trainings and help students to develop skills to solve therapeutic problems, prescribe appropriate drugs for disease conditions and communicate adequately with patients through the combination of Problem-based learning (PBL) and lecture-based-learning (LBL) as found appropriate for the settings and aided by modern learning tools and infrastructure [17,29–33].

The perceived strengths of pharmacology education in this institution which includes among others highly experienced lecturers with good teaching skills and good relationship with the students should be reinforced through in service trainings and continuous professional education for staff while the perceived weaknesses expressed by the students should be objectively appraised by the stakeholders and improvements sought while incorporating as much as possible the suggestions offered by the students.

5. Conclusion

Findings from this survey suggest a need for critical review of pharmacology teaching methods and curriculum for medical students in the institution and perhaps in the country as a whole. The study should be extended to other medical schools in Nigeria to obtain a broader perspective

6. Study Limitations

The response rate of sixty percent leaves some gaps in the overall opinions obtained from the group of medical students surveyed..

7. Competing Interests

Authors declare there is no competing interests in the conduct and reporting of this study

8. Authors Contributions

OOO: Conceived of the study, designed the study, carried out data acquisition, data analysis and interpretation and drafted the manuscript. OJO contributed to data acquisition, data analysis and revised the manuscript. AF carried out data acquisition, contributed to data analysis and revised the manuscript, AA contributed to data

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