

57/16



UNIVERSITY OF LAGOS, NIGERIA

Inaugural Lecture Series 2019

196
2019

TOPIC:

TAKE ONE, THREE
TIMES DAILY!
SIMPLE, RIGHT?

By

Professor (Mrs.) Bolajoko Ajoke Aina



PROFESSOR (MRS.) BOLAJOKO AJOKE AINA

*B.Sc. Pharm. (Ife), M.Sc. (Ife), Ph.D. (Lagos), M.Sc. Public Health (Lagos)
FPSN, FPCPharm, MAW, AMA*

Professor of Clinical Pharmacy

TAKE ONE, THREE TIMES DAILY! SIMPLE, RIGHT?

An Inaugural Lecture Delivered at the University of Lagos,
JF Ade Ajayi Auditorium on 13th March 2019.

By

PROFESSOR (MRS.) BOLAJOKO AJOKE AINA

*B.Pharm. (Ife), M.Sc. (Ife), Ph.D. (Lagos), M.Sc. Public Health (Lagos)
FPSN, FPCPharm, MAW, AMA*

Professor of Clinical Pharmacy
Dean, Faculty of Pharmacy

Department of Clinical Pharmacy and Biopharmacy,
Faculty of Pharmacy,
University of Lagos, CMUL Campus,
Idi Araba– Lagos

Copyright © 2019, Bolajoko Ajoke AINA

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without prior permission of the author

ISSN: 1119-4456

Published by

University of Lagos Press and Bookshop Limited
Works and Physical Planning Complex
UNILAG P.O. Box 132
University of Lagos
Akoka, Yaba
Lagos, Nigeria.
Email: press@unilag.edu.ng

CONTENTS

Dedication	vi
Protocol	1
Preamble	1
Introduction	3
Definitions/Basic Concepts in Pharmacy	3
History of Pharmacy/Pharmacy Education	4
Pharmacy Practice	11
Different Areas of Pharmacy Practice	11
Job opportunities in pharmacy	12
Clinical Pharmacy/Clinical Pharmacist	14
My Contributions to Knowledge	18
My Contributions to Human Resource Development	44
Conclusion	49
Recommendation	49
Acknowledgement	51
References	58

DEDICATION

This inaugural lecture is dedicated to God Almighty, the maker of heaven and earth, giver of life and divine healer. It is also dedicated to humanity.

PROTOCOL

Vice-Chancellor
Deputy Vice-Chancellor (Management Services)
Deputy Vice-Chancellor (Development Services)
Deputy Vice-Chancellor (Academic and Research)
The Registrar
The Bursar
The University Librarian
The Provost, College of Medicine
Acting Dean of Faculty of Pharmacy
Director, Directorate of Academic Affairs
Deans of other Faculties
Other Principal Officers of the University
Members of Council
Members of the University Senate
Heads of Departments
Directors
Academic and Non-Teaching members of staff,
Professional colleagues (PSN Men of Honour)
Your Lordship (Spiritual and Temporal)
Your Royal Majesties
Students (Past and Present)
Family members, Church members and Friends
Gentlemen of the Press
Distinguished Guests, Ladies and Gentlemen

PREAMBLE

I give glory to God for making today a reality. It is the day that the Lord has made and we will all rejoice and be glad in it. It is with great pleasure that I welcome you all to my inaugural lecture. It is indeed a great honour to deliver today the **328th** Inaugural lecture in this University. This inaugural lecture is the **1st** for the 2018/2019 Session, the **6th** in the Faculty of Pharmacy, the **5th** in Clinical Pharmacy in Nigeria and the **1st** in the Department of Clinical Pharmacy and Biopharmacy, University of Lagos. Mr Vice-Chancellor Sir, I thank you for giving me the approval to deliver this inaugural lecture.

As an undergraduate in the Faculty of Pharmacy at the University of Ife (now Obafemi Awolowo University), I made up my mind to be in academia hence I opted to do my internship in the same Faculty to harness the opportunity to start my Masters in Pharmaceutics (1982/83), as Clinical Pharmacy was not available then. So my journey to become an academic started.

My interest in academia was based on the serenity of the academic environment, the simplicity of the academics, peaceful and orderly lifestyle of lecturers on Unife campus which was different from the hustle and bustle of Lagos where I was born and bred. This lifestyle suits my personality as an introvert.

My strong love for academia, made me opt for a job at the University of Ibadan (Department of Pharmaceutics) rather than in an oil company where I also had an offer. After 2 years, for marital reasons, I left the University of Ibadan for a 4- year detour in two hospitals {2 years with Lagos State Hospital Management Board (LSHMB) now Lagos State Health Service Commission and another 2 years with Lagos University Teaching Hospital (LUTH)}. I finally joined the Department of Clinical Pharmacy and Biopharmacy in 1992. I therefore, thank God for bringing me to this height in my career. At this point, I wish to express my appreciation to my mentor Prof FolaTayo, who believed in me, supervised my PhD and is still mentoring me till now. I met him first at Ibadan. He was instrumental to my employment in the Department of Clinical Pharmacy and Biopharmacy of the University of Lagos.

INTRODUCTION

What is Pharmacy?

Pharmacy may be defined as that profession concerned with the art and science of preparing from natural (plants, animals, minerals, microorganisms etc.) and synthetic sources, suitable materials and medicaments for use in the treatment and prevention of diseases. A thorough knowledge of the formulation procedures, storage, distribution and safe use of these medicinal preparations is subsumed in the above definition. Pharmacy is therefore, a science-based profession which is strongly predicated on studies in the areas of the pure and applied physical, chemical, biological and technological sciences.

Pharmacy may also be defined as the health profession that links the health sciences with the chemical sciences, and it is charged with ensuring the safe and effective use of medication.

Who is a Pharmacist?

The pharmacist is the expert with an all-embracing knowledge of drugs and with the legal responsibility to handle all drugs.

He/she is expected to know "everything" about drugs: their sources, nature of their active ingredients, uses in the body, side effects, breakdown products and their various dosage forms.

The pharmacist is an artist, scientist, technologist and a licensed healthcare provider.

i. Historical Perspective of Pharmacy

The first pharmacy in Europe (still operational) was opened in 1241 in Trier, Germany.

The earliest known compilation of medicinal substances was the Sushruta Samhita, an Indian Ayurvedic treatise attributed to Sushruta in the 6th century BC. However, the earliest text as preserved, dates to the 3rd or 4th century AD.

Ancient Egyptian pharmacological knowledge was recorded in various papyri such as the Ebers Papyrus of 1550 BC, and the Edwin Smith Papyrus of the 16th century BC.

The earliest known Chinese manual on Materia medica is the Shennong Bencao Jing (The Divine Farmer's Herb-Root Classic), dating back to the 1st century AD. It was compiled during the Han dynasty and was attributed to the mythical Shennong. Earlier literature included lists of prescriptions for specific ailments, exemplified by a manuscript "Recipes for 52 Ailments", found in the Mawangdui tomb, sealed in 168 BC.

In Europe, pharmacy-like shops began to appear during the 12th century. In 1240, Emperor Frederic II issued a decree by which the physician's and the apothecary's professions were separated.

The most essential points in Frederick II's edict regarding pharmacy included:

1. complete separation of the pharmaceutical profession from the medical profession and forbidding any business relationship;

2. official supervision of pharmaceutical practice with rigid penalties in cases of violations of pharmacists duties to his/her customers;
3. compulsory use of a prescribed formulary (a form of pharmacopoeia) to guarantee reliability and uniformity of compounded drugs;
4. limitation on the number of pharmacies (pharmacy shops) to be licensed; and
5. governmentally fixed prices for drugs.

ii. History of Pharmacy and Pharmacy Education in Nigeria (Egboh, 1982)

Before pharmacy profession came to Nigeria, Nigerians have been known to use nature just like their foreign counterparts in treating diseases. However, a European operated the first pharmacy shop in Nigeria, by the name Mr Richard Zacheus Bailey (1829 – 1911) in the year 1887. The shop was at Balogun Street, Lagos State. The store was licenced by the then governor-in-council. This showed that licencing has always been with us right from the very beginning.

Pharmacy Education in Nigeria

Pharmacy education in Nigeria passed through five developmental stages viz:

1. Training of dispensers through apprenticeship (1899 – 1923).
2. Training of dispensers through formal schools of pharmacy e.g., School of Pharmacy Yaba (1927) and School of Pharmacy, Zaria (1930).
3. Training of Chemists and Druggists (1927 – 1972) in School of Pharmacy, Yaba and Zaria and Nigerian College of Arts, Science and Technology, Ibadan (1957).
4. Training of pharmacists at Bachelor Degree level (1963 to date).

5. Training of pharmacists at Doctor of Pharmacy Degree level (2002 by PCN and 2016 by NUC to date).

Early Dispensers (No formal Education, 1899-1923)

The European Medical doctors that reside in Nigeria started training dispensers in 1899. There was no formal school hence the apprentice method became predominant. In this method, a student can decide the Medical Doctor (MD) to serve under as a master. The student goes to the house or the shop of the MD every morning. In other cases, the student may live with the master for some years.

Dispensers that graduated were later employed to work in the government hospitals. Obviously, the hospital could not absorb them all hence they started selling drugs from the 1920s.

Early Student Dispensers (Formal Education)

The first School of Pharmacy, Yaba, Lagos was established in 1927 while another school of pharmacy for training Dispensers/Chemists and Druggist was established at Zaria in 1930. The training for Chemists and Druggists Diploma started in 1946 with the abolition of the old Dispenser Certificate and regulation was done by the Nigerian Medical Board of Examiners. Entry requirement were relevant science subjects in Senior Oxford or Cambridge School Certificate Examination or the London Matriculation examination level for its three years course.

Early Pharmacy Students

The school of pharmacy moved from Yaba to Ibadan in 1957 as a department under the former Nigerian College of Arts, Science and Technology (NCAST), Ibadan. Qualification for the admission to the College was the

Ordinary Level GCE Certificate. They were awarded Chemists and Druggists Diploma which was a three-year programme. In 1962, the University of Ife, Ile Ife (now Obafemi Awolowo University, OAU) took over the programme and started the diploma in pharmacy in 1963 until 1965. It was not until 1966 that the first pharmacy students graduated with a B. Pharm classified degree. It took, however, Ahmadu Bello University (A.B.U) seven years to produce their first pharmacy graduate with B.Sc. Pharm. A point to note is that ABU came from the school of pharmacy, Zaria in 1968. The degree was for three years, which started in 1968.

The next school that started pharmacy was the University of Nigeria, Nsuka, (U.N.N). Other schools followed years later.

Current Pharmacy Education

Subject areas in Pharmacy include:

- **Pharmaceutical Chemistry:** Pharmaceutical Chemistry is that branch of applied chemistry, which embraces: Organic, inorganic, physical, medicinal and analytical chemistry; and the applications of these disciplines in the preparation, synthesis, standardisation, interpretation of drug actions, drug interactions and analysis of chemical substances for medicinal use.

- **Pharmacognosy:** The study of the biology, biochemistry, purification, analysis, and commerce of natural (plant and animal) drugs.

- **Pharmaceutics and Pharmaceutical Technology:** The study and application of physical and physicochemical properties of substances used in medicine to the formulation and production of medicinal products. It includes the study of pharmaceutical

formulations and dispensing, technology, pharmaceutical microbiology, physical and forensic pharmacy and introduction to the nanosciences.

- **Pharmaceutical Microbiology and Biotechnology:** This involves the study of the interactions between microorganisms and drugs in the classifications, synthesis, production, genetic manipulation, quality controls and assurance; contamination controls and others. It is a science that harvests microbes and their metabolites for drug productions as well as their nuisance values for quality controls.

- **Clinical Pharmacy:** This is the area of pharmacy training with emphasis on drug administration, drug performance and interactions, and drug supplies to the users. In practice, it is patient-oriented and includes not only the dispensing of required medication but also advising the patient on the proper use of all medications. It also prepares the future pharmacist to play the proper role as an information source and adviser to the other health professionals on all matters related to drugs and their dosage forms and toxicity. Biopharmacy is the aspect which deals with the properties of the drug dosage forms in the body as they affect the bioavailability and hence therapeutic effectiveness.

- **Pharmacy Practice and Management;** is taught in the Department of Clinical Pharmacy. It involves instructions in general administration and management principles, pharmacy business administrations and the principles and practices of business and law, as they apply to pharmacy practices in Nigeria.

Apart from these core courses situated in the Faculty of Pharmacy, the students also take courses in Pharmacology, Anatomy, Physiology and Biochemistry.

Pharmacology: The study of the biological action and use of drugs. It includes the study of human diseases and their chemotherapy, the uses, side effects and the biotransformation of drugs in the human body including the interaction between drug molecules and receptors.

Traditional Pharmacy education has focused on drug products. In recent times, the focus has changed to patients with pharmaceutical care at the forefront.

Pharmacists are highly trained and skilled healthcare professionals who perform various roles to ensure optimal health outcomes for their patients. They are therefore the primary health professionals who optimise medication use to provide patients with positive health outcomes.

While legally authorised drug prescribers such as physicians, dentists and veterinary surgeons are primarily interested in the effect of drugs on their patients (their therapeutic value, pharmacological actions and toxicity) and nurses are concerned with the administration (dosage form, dosage & route) of the drugs. The pharmacist is the only expert with an all-embracing knowledge of drugs and with the legal responsibility to handle all drugs.

Many pharmacists are also small business owners, owning the pharmacy in which they practice (community pharmacists). For these ones, to their patients, pharmacists are many things: medication experts, immunizers, educators, and perhaps even friends. Within

their communities, they may also be public health servants and emergency respondents. The results of a recently published study indicated that pharmacists could be instrumental in preparing for public health emergencies and addressing problems, such as the opioid abuse epidemic etc. (John Hopkins, 2017).

The theme for last year **World Pharmacists Day (Sept 25, 2018)** was "Pharmacists: Your Medicines Experts", this buttresses whom a pharmacist is.

The pharmacist, as a medicine expert, is also by such expertise a lifelong learner, caregiver, decision maker, teacher, communicator, manager, entrepreneur, leader and researcher. As the most accessible healthcare professional in the world, the pharmacist is appropriately placed and suitably trained to strengthen the health outcomes in Nigeria, and in all developing countries (WHO, 1994).

The evolution of the pharmacists' training to a more intensely clinical programme (PharmD) will also see greater involvement of pharmacists participation in the bedside care of patients, where pharmacists will be able to collaborate more with patients, physicians, nurses and other members of the healthcare team to improve the health of the patient.

The pharmacist in Nigeria and around the world is trained in an extensive (theoretical and clinical) curriculum that imparts the appropriate skills and competencies required to excel in solving patients' pharmaceutical needs, and in the clinical care of patients.

The pharmacist uses his/her skills to:

- Provide medicine use counselling and medication therapy problem resolution to patients,
- Disseminate medicine information for public health education, and as a form of socio-behavioural change communication tool,
- Provide clinical evidence for the use of medicines to healthcare providers,
- Make new, innovative formulations or improve the availability of old ones as patients require them,
- Build, manage and operate pharmaceutical practices that promote patient's access to medicines,
- Educate and train the next generation of pharmacists and other healthcare workers, and
- Support evidence-based policymaking through research backed advocacy.

Most significantly, for every patient, the pharmacist represents a trusted ally (FIP 2018 World Pharmacists Day).

Pharmacy Practice

Pharmacy practice is the discipline of pharmacy which involves developing the professional roles of pharmacists.

The scope of pharmacy practice includes the traditional roles such as; compounding and dispensing medications, more modern services related to patient care including clinical services, reviewing medications for safety and efficacy, as well as providing drug information.

Areas and services of pharmacy practice include:

- Disease-state management.
- Clinical interventions (refusal to dispense a drug, recommendation to change and/or add a drug to a

patient's pharmacotherapy, dosage adjustments, etc.).

- Professional development.
- Pharmaceutical care.
- Extemporaneous pharmaceutical compounding.
- Communication skills.
- Health psychology.
- Patient care.
- Drug abuse prevention.
- Prevention of drug interactions, including drug-drug interactions or drug-food interactions.
- Prevention (or minimisation) of adverse events.
- Incompatibility.
- Drug discovery and evaluation.

Job opportunities or areas of practice in pharmacy include:

- Community pharmacy.
- Hospital pharmacy (Government or Private).
- Academic pharmacy.
- Industrial pharmacy.
- Public Health or Consultant pharmacy (e.g. WHO, UNICEF, USAID, JSI etc).
- Internet pharmacy or pharmacy informatics.
- Veterinary pharmacy.
- Nuclear pharmacy.
- Military pharmacy.
- Pharmaceutical journalism.

Pharmaceutical Services

Pharmaceutical services is defined as the administration of drugs/poisons, therapy management, regulation of drugs, development of drugs, development of policies and guidelines for administration of drugs and patient care to achieve definite outcome and to improve the patient's quality of life.

The Objectives of Pharmaceutical Services

1. To ensure that medicines are appropriately available to the public and are stored, distributed, prescribed and supplied in accordance with legislative requirements.
2. To ensure that poisons (and other products that are potentially hazardous) are appropriately available to the public and are packed, labelled, stored, distributed and used in accordance with legislative requirements.
3. To minimise harm from the use of medicines and poisons in the community through the development and implementation of appropriate policy, regulatory and educational initiatives.
4. To promote the quality use of medicines in the community and healthcare facilities.
5. To adopt best practice in the regulation of medicines and poisons.

Pharmacists have the adequate professional competence to perform various pharmaceutical services which include:

- ❖ procurement, storage, dispensing of drugs, preparation, compounding, packaging of drugs and medicaments as well as monitoring drug utilisation by patients;
- ❖ educating patients concerning the appropriate use of their prescription and non-prescription medication;
- ❖ providing drug information to other health professionals e.g. veterinarians and physicians;
- ❖ collecting and evaluating data from the patients, other healthcare professionals, the literature and past experience as an aid to drug therapy judgment;
- ❖ reviewing scientific publications in order to maintain and add to acquired professional knowledge;

- ❖ participating productively during clinical ward rounds and seminars in hospital based practice and settings;
- ❖ participating in drug and pharmaceutical production and quality assurance in the industries; and
- ❖ participating in Good Clinical Practice, Public Health Pharmacy Management and Pharmacy Administration.

Pharmacists in hospitals and community pharmacies have a major role in making pharmaceutical services available and ensuring that those services are rendered to patients to give them maximal satisfaction and to improve their quality of life.

Series of stages have characterised the evolution of pharmacy practice. The stages have been from compounding, manufacturing, distribution, clinical pharmacy to pharmaceutical care. It is a collaborative process that aims to prevent or identify and solve medicinal product and health related problems.

What is Clinical Pharmacy?

American College of Clinical Pharmacy (ACCP), in an abridged definition, describes clinical pharmacy as that area of pharmacy concerned with the science and practice of rational medication use. Another definition is "a health science specialty that embodies the application, by pharmacists, of the scientific principles of pharmacology, toxicology, pharmacokinetics and therapeutics to the care of patients." (ACCP 2008)

The European Society of Clinical Pharmacy defines clinical pharmacy as, "a health speciality, which describes the activities and services of the clinical pharmacist to develop and promote the rational and

appropriate use of medicinal products and devices" (ESCP).

The practice of clinical pharmacy embraces the philosophy of pharmaceutical care; it blends a caring orientation with specialised therapeutic knowledge, experience, and judgment for the purpose of ensuring optimal patient outcomes.

Pharmaceutical care is defined as "responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life" (Hepler and Strand, 1989).

Both clinical pharmacy and pharmaceutical care are ideas about safety and effectiveness of drug therapy. They are closely related concepts. The comparisons show that clinical pharmacy and pharmaceutical care are compatible, mutually complementary ideas (Hepler 2004).

Who is a Clinical Pharmacist?

The clinical pharmacist apart from the traditional roles of drug manufacture and distribution has extra training which gives him/her a comprehensive knowledge of disease processes, patient and drug monitoring techniques and other abilities to ensure that the right drug is given to the right personnel through the right route.

The term "clinical" does not necessarily imply an activity implemented in a hospital setting. A community pharmacist may perform clinical activities as well as a hospital practitioner.

A United States Department of Health and Human Services draft report on the clinical role for community pharmacy defined clinical pharmacy as, "functions performed by pharmacists on behalf of the patient to identify, resolve and prevent drug-related problems." (US Dept of and Human Services 1990).

Difference between Clinical Pharmacy and Pharmacy

- The discipline of pharmacy embraces the knowledge of synthesis, chemistry and preparation of drugs.
- Clinical pharmacy is more oriented to the analysis of population needs with regards to medicines, ways of administration, patterns of use, and drug effects on the patients.

The focus of attention moves from the drug to the single patient or population receiving drugs.

Clinical Pharmacists are involved in direct interactions with the patient.

Clinical Pharmacists are also researchers thus they are involved in generating and disseminating new knowledge that contributes to improved health and quality of life of the patient. They are a primary source of scientifically valid information and advice regarding the safe and cost-effective use of medications.

The principal activities of a clinical pharmacist include:

1. **Consulting:** Analysing therapies, advising healthcare practitioners on the correctness of drug therapy and providing pharmaceutical care to patients both at the hospital and community level.

2. **Selection of drugs:** Defining "drug formularies" or "limited lists of drugs" in collaboration with hospital doctors, general practitioners and decision makers.
3. **Drug information:** Seeking information and critically evaluating scientific literature; organising information services for both the healthcare practitioners and patients.
4. **Formulation and preparation:** Formulation and preparation of medicinal products and devices according to acceptable standards to meet specific patients' needs.
5. **Drug use studies and research:** Drug use studies/ Pharmacoepidemiology/ outcome research/ pharmacovigilance and vigilance in medicinal devices: collecting data on drug therapies, their costs and patient outcome through structured and scientific methods.
6. **Pharmacokinetics / therapeutic drug monitoring:** Studying the kinetics of drugs and optimising the dosage.
7. **Clinical Trials:** Planning, evaluating and participating in clinical trials.
8. **Pharmacoeconomy:** Using the results of clinical trials and outcome studies to determine cost-effectiveness evaluations.
9. **Dispensing & Administration:** Dispensing and administration of medicinal products and devices; studying and developing systems for the dispensing and administration of medicinal products and devices that can guarantee a higher security in administration, a reduction of expenditure and a reduction in medication errors.

10. **Teaching & Training:** Pre and postgraduate teaching and activities to provide training and education programmes for pharmacists and other healthcare practitioners.

MY CONTRIBUTIONS TO KNOWLEDGE

Mr Vice-Chancellor Sir, I will now address the topic for the inaugural lecture of today

"Take one, three times daily! Simple, Right?"

Mr Vice-Chancellor Sir, as mentioned earlier the different job opportunities of a pharmacist include Community, Hospital, Industry and Academic but the uniting area is the academia, which propels the future of pharmacy and healthcare systems. Undoubtedly, there is no healthcare without drugs.

'Take one three times daily' is, perhaps, the mantra of pharmacy practice but it oversimplifies the roles of a pharmacist and an indication that the pharmacists are often underutilised.

Lay people and even some healthcare professionals often wonder – What about pharmacy practice? Is it not just to give medicinal products out and say take one three times daily or something similar? Yes, that is what it is all about – product + information. But like Salvation, simple things often confound the wisest among us. Such a simple statement is often misinterpreted e.g. a patient swallowing a product meant to be inserted into the vagina because the information given is not clear or well understood by the patient. Hence, the field of operational research in Clinical Pharmacy.

The gaps in the medicine use process and medicine information brings to fore the need for Operational

research (OR) in pharmacy. Operational research (OR) in pharmacy provides background data and experimental evidence from which policymakers or healthcare providers can make informed decisions. There are at least three reasons operation research is relevant to health.

- To improve programme outcomes in relation to medical care or prevention,
- To assess the feasibility of new strategies or interventions in specific settings or populations, and
- To advocate policy change (Zacharia *et al.*, 2009).

To get pharmacotherapy right, there is the need to combine the right pharmaceutical product with adequate and usable information.

Appropriate Pharmaceutical Product + Appropriate Drug Information = Appropriate Pharmacotherapy

One component without the other often results in the irrational use of medicine and a failure of the product to deliver its therapeutic promise.

My Research Coverage in Pharmacy operational research

Over the years, my operational research in clinical pharmacy covers these areas

- Rational Use of Medicines.
- Communication.
- Public Health/ Health Promotion.
- Practice Researches.

1. Rational Use of Medicines (Pharmacoepidemiology/Drug Use Studies)

A drug product starts in the laboratory either by isolation from a natural source (Pharmacognosy) or through

synthesis (Pharmaceutical Chemistry) then goes through formulation (Pharmaceutics) and finally to the bedside (Clinical Pharmacy). The whole process will fail and resources wasted if the product is not used rationally (Fig. 1).

The abridged definition of Clinical Pharmacy describes clinical pharmacy as that area of pharmacy concerned with the science and practice of rational medication use, core to clinical pharmacy therefore, is the rational use of medicines.

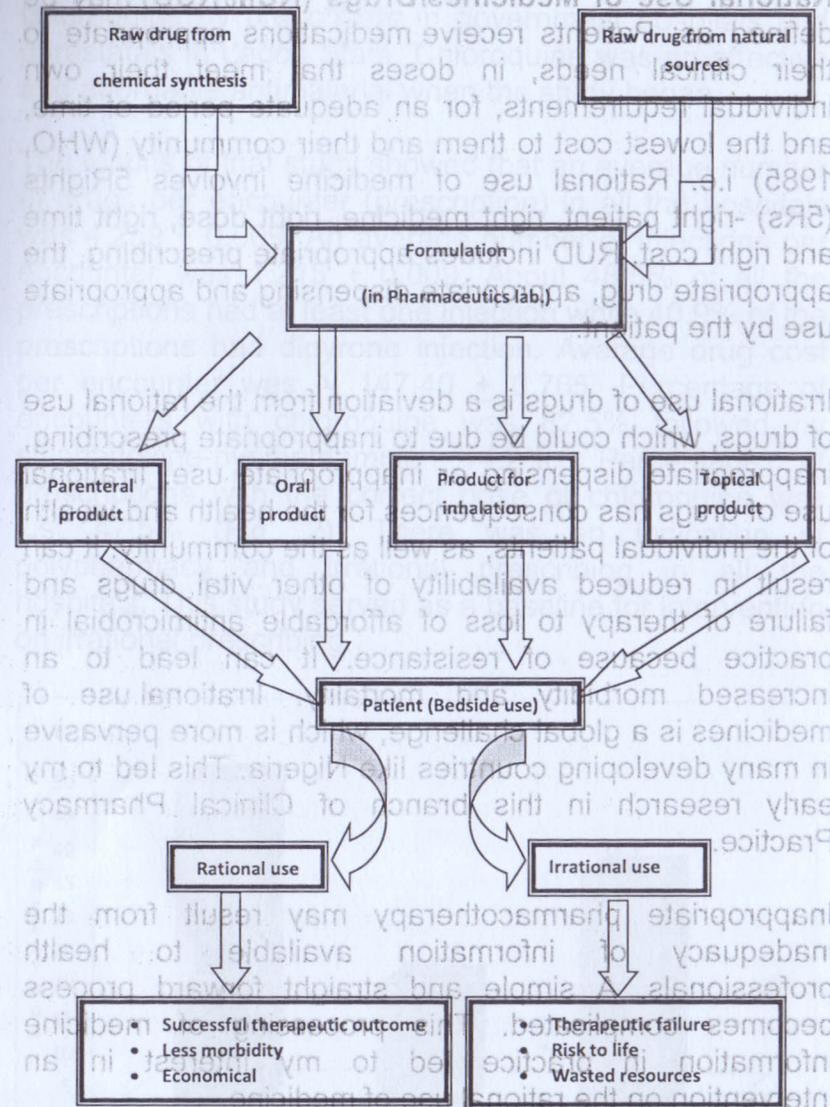


Figure 1: Flow chart from isolation or synthesis to use of drugs and outcomes

Rational Use of Medicines/Drugs (RUM/RUD) may be defined as: Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and the lowest cost to them and their community (WHO, 1985) i.e. Rational use of medicine involves 5Rights (5Rs) -right patient, right medicine, right dose, right time and right cost. RUD includes appropriate prescribing, the appropriate drug, appropriate dispensing and appropriate use by the patient.

Irrational use of drugs is a deviation from the rational use of drugs, which could be due to inappropriate prescribing, inappropriate dispensing or inappropriate use. Irrational use of drugs has consequences for the health and wealth of the individual patients, as well as the community. It can result in reduced availability of other vital drugs and failure of therapy to loss of affordable antimicrobial in practice because of resistance. It can lead to an increased morbidity and mortality. Irrational use of medicines is a global challenge, which is more pervasive in many developing countries like Nigeria. This led to my early research in this branch of Clinical Pharmacy Practice.

Inappropriate pharmacotherapy may result from the inadequacy of information available to health professionals. A simple and straight forward process becomes complicated. This processing of medicine information in practice led to my interest in an intervention on the rational use of medicine.

1.1 Prescribing Pattern of Antimalarial (Aina *et al.*, 2009a)

The objective was to determine the antimalarial prescribing pattern and to assess rational prescribing of

chloroquine by prescribers in government hospitals and parastatals in Lagos State. Chloroquine was an effective and affordable antimalarial when the study began.

The results of that study showed that an average number of drugs per encounter (prescription) in all the hospitals was 4.259 ± 0.009 . An average number of injections per encounter was 1.215 ± 0.009 . About 48.5% of all the prescriptions had at least one injection while 40.9% of the prescriptions had dipyrone injection. Average drug cost per encounter was ₦ 147.40 ± 0.765 . Percentage of encounters with chloroquine was 82.5% followed by sulphadoxine-pyrimethamine 14.2%. Percentage of prescriptions with the correct dose of chloroquine was just 47.5% (Fig. 2). There was an indication of polypharmacy and irrational prescribing in all the hospitals. This study served as a baseline for intervention on irrational prescribing.

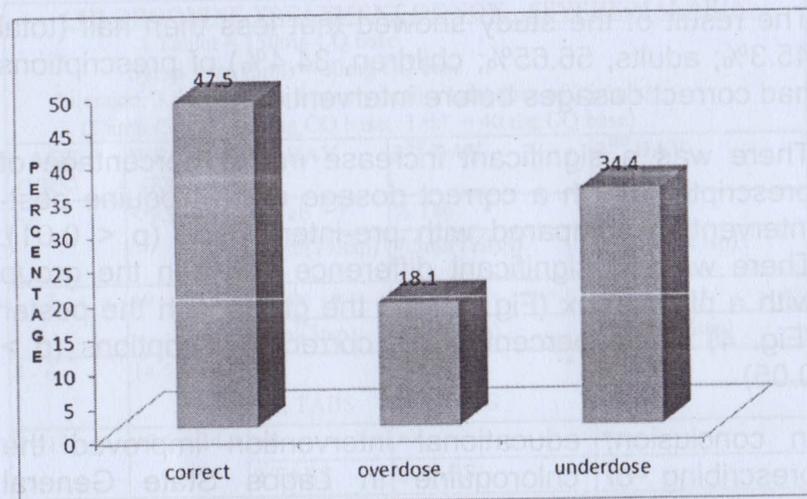


Figure 2: Correctness of chloroquine dosage in all the hospitals

1.2 Intervention Studies on Rational Prescribing of Chloroquine in Lagos State General Hospitals (Aina et al., 2009b)

The objective of the study was to determine the impact of two modes of an educational intervention on the chloroquine prescribing pattern of prescribers in Lagos State General Hospitals.

Educational seminars were presented at 8 of the 10 general hospitals. Two hospitals served as controls. Among the 8 hospitals that had the seminars, 4 hospitals had a plastic board (Fig. 3) describing correct doses of chloroquine left behind, whereas the other 4 had educational posters (Fig. 4) with the correct doses.

Percentage of prescriptions with correct doses of chloroquine prescribed was determined before and after the intervention over a time-series (1 month, 3 months, 6 months and 12 months post intervention).

The result of the study showed that less than half (total 45.3%; adults, 56.65%; children, 34.4%) of prescriptions had correct dosages before intervention.

There was a significant increase in the percentage of prescriptions with a correct dosage of chloroquine post-intervention compared with pre-intervention ($p < 0.01$). There was no significant difference between the group with a plastic box (Fig. 3) and the group with the poster (Fig. 4) in the percentage of correct prescriptions ($p > 0.05$).

In conclusion, educational intervention improved the prescribing of chloroquine in Lagos State General Hospitals. From the results of this study, it can be concluded that the intervention had a significant effect on the correct dosage of chloroquine prescribed. The effect was more at 1 month post-intervention than other study

times post-intervention. Correct dosage was obtained more when chloroquine tablet only, was prescribed than any other dosage form. Under dosage was obtained more when injection chloroquine only, was prescribed than any other dosage form. The other dosage forms or combination of dosage forms were in between. There should be a reminder of the appropriate dosage of chloroquine especially for the different age groups among the children.

There was no statistically significant difference in percentage of correct prescriptions between 1 month, 3 months, 6 months and 12 months post intervention, hence it is hereby implied that the intervention was sustained.

Table 1: Treatment of non-severe malaria with Chloroquine
(Extracted from FMOH 2001 recommendation)

CHLOROQUINE TREATMENT OF NON – SEVERE MALARIA				
1 Tablet = 150mg CQ base				
Syrup 1 tsp (5ml) = 50mg CQ base				
Injection: 3.5mg/kg 6 or 8 hourly until a total dose of 25mg/kg				
(1 amp (5ml) = 200mg CQ base; 1 ml = 40 mg CQ base)				
AGE (YRS)	WEIGHT (KG)	1 ST DAY	2 ND DAY	3 RD DAY
<1	< 9.9	½ Tab	½ Tab	¼ Tab
		7.5ml(1½tsp)	7.5ml(1½tsp)	3.75 ml(¾ tsp)
1 - 3	10 – 14.4	1 Tab	1 Tab	½ Tab
		15ml(3tsp)	15ml(3tsp)	7.5 ml(1½tsp)
4 - 6	14.5 – 18.4	••	••	•
		1 ½ TABS	1 ½ TABS	1 TAB
7 - 11	18.5 – 34.9	••	••	•
		2 TABS	2 TABS	TAB
>12	>35	••••	••••	••
		4 TABS	4 TABS	2 TABS

CQ TREATMENT OF NON - SEVERE MALARIA

1 Tablet = 150mg CQ base
 Syrup 1 tsp (5ml) = 40 mg CQ base
 Injection: 1.5mg/kg 6 or 8 hourly until a total dose of 25mg/kg
 (1 amp (5ml) = 200mg CQ base; 1 ml = 40 mg CQ base)

AGE (YRS)	WEIGHT (KG)	1ST DAY	2ND DAY	3RD DAY
<1	<9.9	½ Tab 2.5 ml (1 ¼ tsp)	½ Tab 2.5 ml (1 ¼ tsp)	¾ Tab 3.75 ml (¾ tsp)
1 - 3	10 - 18.4	1 Tab 15 ml (3 tsp)	1 Tab 15 ml (3 tsp)	½ Tab 7.5 ml (1 ½ tsp)
4 - 8	18.5 - 28.4	•• 1 ½ TABS	•• 1 ½ TABS	• 1 TAB
9 - 11	28.5 - 34.9	•• 2 TABS	•• 2 TABS	• 1 TAB
> 12	> 35	•••• 4 TABS	•••• 4 TABS	•• 2 TABS

Fig 3: Correct dosage on plastic box used for intervention

CQ TREATMENT OF NON - SEVERE MALARIA

1 TABLET = 150MG CQ BASE
 SYRUP 1 TEASPOON FULL (5ML) = 40 MG CQ BASE
 INJECTION: 1.5MG/KG 6 OR 8 HOURS UNTIL A TOTAL DOSE OF 25MG/KG
 (1 AMP (5ML) = 200MG CQ BASE; 1 ML = 40 MG CQ BASE)

AGE	WEIGHT	1ST DAY	2ND DAY	3RD DAY
LESS THAN ONE YEAR	UNDER 9.9 KG	75 MG ½ TABLET	75 MG ½ TABLET	37.5 MG ¼ TABLET
1-3 YEARS	10.0 - 18.4 KG	150 MG 1 TABLET	150 MG 1 TABLET	75 MG ½ TABLET
4-8 YEARS	18.5 - 28.4 KG	225 MG 1 ½ TABLETS	225 MG 1 ½ TABLETS	112.5 MG ¾ TABLET
9-11 YEARS	28.5 - 34.9 KG	300 MG 2 TABLETS	300 MG 2 TABLETS	150 MG 1 TABLET
12 YEARS AND ABOVE	OVER 35 KG	600 MG 4 TABLETS	600 MG 4 TABLETS	300 MG 2 TABLETS

Fig 4: Correct dosage on poster used for intervention

Total percentage of prescriptions with correct dosage of chloroquine increased from 45.3% at pre intervention to 72.4% at 1 month post intervention but reduced to 70.4%, 65.3% and 68.6% at 3, 6 and 12 months post intervention respectively (Fig. 5). There was no significant difference between the post intervention periods in percentage of correct prescriptions ($p > 0.05$).

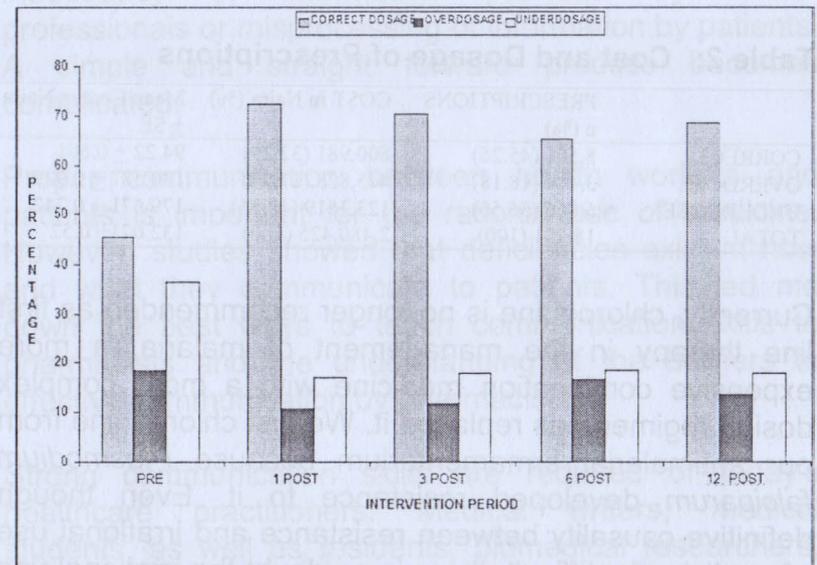


Fig 5: Dosage of Chloroquine prescribed at pre, 1, 3, 6 And 12 months post-intervention

1.3 Cost Implication of Irrational Use of Medicine (Chloroquine) Aina *et al.*, 2008

The objective of this study was to determine the subsequent cost implications of irrational use of chloroquine in Lagos State general hospitals. Irrational use of these drugs is a waste of financial and human resources that could have been deployed for another use within the hospital setting especially in cases where such drugs are provided free to patients (Aina *et al.*, 2008).

About 68% {(N1, 679, 444.00) (\$13,100.19)} of the total cost was lost to irrational prescribing (Table 2). This is a waste of scarce resources. Particularly, prescriptions of intramuscular injections only accounted for over 90% of the cost lost to irrational prescribing. Meanwhile, the chloroquine tablet was more cost-effective than injection chloroquine (intramuscular).

Table 2: Cost and Dosage of Prescriptions

	PRESCRIPTIONS n (%)	COST in Naira (%)	Mean Cost in Naira ± SE
CORRECT	8,501 (45.26)	800,981 (32.29)	94.22 ± 0.661
OVERDOSE	3,414 (18.18)	445,825 (17.97)	130.587 ± 0.929
UNDERDOSE	6,866 (36.56)	123,3619 (49.76)	179.671 ± 0.742
TOTAL	18,781 (100)	2,480,425 (100)	132.071 ± 0.52

Currently, chloroquine is no longer recommended as first line therapy in the management of malaria, a more expensive combination medicine with a more complex dosing regimen has replaced it. We lost chloroquine from our antimalarial armamentarium because *Plasmodium falciparum* developed resistance to it. Even though definitive causality between resistance and irrational use of medicine is difficult, there is no doubt the irrational use of chloroquine contributed in many ways to chloroquine resistance and failure in practice.

In Nigeria the first line drug has been changed to Artemisinin-based Combination Therapy but there is the possibility that chloroquine may still come back on the scene in the future as is the case in Malawi where chloroquine is again an efficacious treatment of malaria 12 years after it was withdrawn from use (Laufer *et al.*, 2006).

2. When Communication Fails between Pharmacists and Patients (Communication/Counselling)

Mr Vice-Chancellor Sir,

Inappropriate pharmacotherapy may result from the inadequacy of information provided by health professionals or misprocessing of information by patients. A simple and straight forward process becomes complicated.

Proper communication between health workers and patients is important for the rational use of medicine. However, studies showed that deficiencies exist in how and what they communicate to patients. This led me down the best ways to teach communication skills to pharmacists and the understanding of the barriers to effective communication by pharmacists.

Strong communication skills are required of today's healthcare practitioners. Medical writers, medical students, as well as residents, biomedical researchers, Pharmacists, nurses and other health professionals must continue to improve their communication skills. Effective communication may increase patient understanding of treatment, improve compliance and, in some cases, lead to improved health. It can also reduce dispensing error.

We investigated communication skill and communication apprehension among pharmacy students (Aina and Ogunbiyi, 2012; Aina and Igbigbi, 2016).

In the study by Aina and Ogunbiyi (2012) which was conducted at the University of Lagos to assess the communication skills of Pharmacy students, it was

concluded from the results of this study that the majority of Pharmacy Students at the University of Lagos had good communication skills and they will be able to discharge their duties as pharmacists when they eventually graduate.

The study by Aina and Igbigbi (2016) was to determine the level of communication apprehension (CA) among pharmacy students. Communication apprehension (CA) is an individual level of fear or anxiety associated with either real or anticipated communication with another person(s). The pharmacist with high communication apprehension would be expected to talk less with patients than other pharmacists do, and also talk less about professional concerns and would not likely be perceived as a credible source of drug information or an intelligent person. According to Baldwin *et al.*, (1979) communication apprehension can be a possible fear factor for a pharmacist that results in avoiding patient communication or counseling and discussion forums with professional peers.

Majority of the students (76%) had average communication apprehensive while only about 4% had high communication apprehension. The overall mean score was 60.87 ± 13.34 . There was no statistically significant difference between the mean scores for all the levels of study as determined by one-way ANOVA. This implies that all the students at the different levels of the study had similar communication apprehension and when these students eventually become practising pharmacists, the majority will be able to communicate with the patients and other health practitioners.

In my work with Ajiboye and others, we looked at barriers among community pharmacists to effective medication

counselling. The main finding was that pharmacist workload and lack of appropriate medication counselling aids were the main barriers (Ajiboye *et al.*, 2014). Medication counselling is an avenue through which the pharmacist can help the patient maximise benefits of medication by improving adherence and reducing drug related problems. The World Health Organization (WHO) recognises the key role of community pharmacists in the use of medicines and public health. It emphasises their responsibility to provide informed and objective advice on medicines and their use (FIP, 1998).

In another study with Oyetunde and others on generic substitution, it was noticed that inadequate information on generic substitution resulted in confusion and subsequent nonadherence to medication by patients (Oyetunde *et al.*, 2014).

All these studies suggest gaps in pharmacists' communication abilities over the years. This prompted me to help improve communication skills and reduce communication apprehension among pharmacy students when training them so that they will become effective communicators with the patients and other healthcare providers in future.

3. Public Health/Health Promotion

Mr Vice-Chancellor Sir,

The community pharmacy is often a local asset with a trusted health professional, the pharmacist, who is able to give adequate information about medicines as well as lifestyle advice to improve people's health. The community pharmacists are the most accessible health professional in most developing nations (Goel *et*

1996). They open early and close late. Average closing time of a community pharmacy (CP) in Lagos is 9 pm and many now run 24/7 services. There are over 3000 registered CPs in Nigeria and a vast majority are located in Lagos. They are often the first contact of our people with the healthcare system and for some the only contact. Community pharmacies are visited by a wide range of clientele – healthy, ill, sometimes young and sometimes old.

A sociologist described the Nigerian perception of a community pharmacist and pharmacy practice as "...in the eyes of the public, pharmacy practice is a variant of clinical practice and the pharmacist, a primary healthcare provider...pharmacies play the role of outpatient clinics and are so recognised by the public, even though the legal position may not allow it. In most of these countries, retail pharmacies are usually the first point of contact between patients and the modern medical system" (Igun, 1994).

Yet as a group, pharmacists have not engaged fully in public health nor has the country tried to deploy them for public health activities. This lack of engagement in public health piqued my investigations in pharmacy practice in relation to public health.

What is pharmaceutical public health?

Pharmaceutical Public Health was defined by Walker (2000) as: "*The application of pharmaceutical knowledge, skills and resources to the science and art of preventing disease, prolonging life, promoting, protecting and improving health for all through organised efforts of society*".

Pharmacists are involved in Public health because the pharmacies are uniquely placed to deliver public health services due to their access, location and informal environment. They probably have the highest level of healthy people visiting a health facility.

The following are the possible pharmaceutical public health roles that can be performed by pharmacists.

- Provide health advice on self-care.
- Provide health advice to young mothers.
- Provide support to develop effective parenting skills.
- Participate in health promotion campaigns.
- Participate in healthy living centres.
- Promote drug misuse awareness.
- Participate in needle and syringe exchange schemes.
- Provide immunisation services.
- Promote healthy schools.
- Improve AIDS awareness.
- Provide sexual health support.
- Provide unplanned teenage pregnancy support.
- Support patients with chronic illness.
- Provide advice on how medicines work.
- Advise on complementary medicine.
- Maintain patient medication records.
- Provide monitored dosage systems.
- Promote patient medication adherence.
- Provide out-of-hours services.
- Provide collection and delivery services.
- Undertake domiciliary visits.
- Deal with pharmaceutical hazard alerts.

Examples of public health activities provided in community pharmacies are:

- *Healthy lifestyle* (healthy eating, nutrition, exercise, alcohol, family planning, passive smoking, smoking cessation)
- *Asthma/respiratory diseases* (chronic bronchitis, allergies, inhaler devices, medicines for asthma in children and adults)
- *Healthy heart* (healthy eating, exercise, high blood pressure, angina, use of aspirin)
- *Sexual health* (HIV/AIDS, safe sex, infertility, emergency contraception, emotional support, sexually transmitted disease, contraception)
- *Safety/prevention* (Safe use of medicines, drug campaigns, travel abroad, first aid, accident prevention, sports injuries)
- *Substance abuse* (solvents, alcohol, drugs [illicit or prescription drugs], needle exchange)
- *Elderly* (advice for carers, compliance devices, mobility aids, incontinence, stoma care, influenza, foot care)
- *Parents and babies* (breastfeeding, milk substitutes, folic acid, immunisation, nappy rash, teething)
- *Children* (head lice, parasites, meningitis, immunisation, vitamins, sugar and salt in food)
- *Women's health* (breast cancer, cervical cancer, migraine, stress incontinence, thrush, cystitis, menopause, osteoporosis)
- *Men's health* (prostate problems, heart attacks, lung cancer, stress, indigestion/ heartburn)
- *Oral health* (cancer of the mouth, mouth ulcers, babies' teeth, dentures, dental care, cold sores, sugarfree medicines)
- *Skincare* (cancer, eczema, psoriasis, acne, sunscreens, scabies)

According to a review by Agomo *et al.*, (2018) the effectiveness of community pharmacy based public

health interventions were shown in smoking cessation, health promotion, disease screening and preventive activities, provision of emergency hormonal contraceptive, and vaccination services.

3.1 Tobacco and Economic/Health implication

Mr Vice-Chancellor Sir,

Tobacco use is the single largest cause of preventable death in the world today. The *WHO report on the global tobacco epidemic, 2008*, provides a comprehensive analysis, based on data from 135 countries, of patterns of tobacco use, the deaths that result and the measures to reduce deaths.

Tobacco kills up to half of its users. The tobacco epidemic is one of the biggest public health threats the world has ever faced, killing more than 7 million people a year. More than 6 million of those deaths are the result of direct tobacco use while around 890 000 are the result of non-smokers being exposed to second-hand smoke (WHO, 2018a).

The theme for **World No Tobacco Day 2018 (May 31st 2018)** is – **'Tobacco Breaks Hearts'** (Fig 6). In this theme WHO has joined with the World Heart Federation to highlight the link between tobacco and cardiovascular diseases (CVD e.g. Ischaemic heart diseases, Stroke) - the world's leading causes of death, responsible for 44% of all Non Communicable Diseases (NCD) deaths, or 17.9 million deaths annually (WHO, 2018b).



Fig 6: World No Tobacco Day, 31st May 2018

The World Health Organization Framework Convention on Tobacco Control (WHO FCTC) is a global public health treaty aimed at reducing the burden of disease and death caused by tobacco consumption. The global tobacco treaty bans tobacco advertising, promotion and sponsorship, and insulates public health policy from interference by tobacco corporations (WHO, 2003).

WHO recommends five policies for controlling tobacco use. They include:

- Smoke-free environments.
- Support programmes for tobacco users who wish to quit.
- Health warnings on tobacco packs.
- Bans on the advertising, promotion and sponsorship of tobacco.
- Higher taxation of tobacco.

Furthermore, the preamble of the WHO FCTC emphasises the role of health professional bodies in efforts to include tobacco control in the public health agenda and contribute actively to the reduction of

tobacco consumption. These activities are also described in the Code of Practice for Health Professionals which has been officially adopted now by several Health Professional Associations worldwide (WHO,2004).

A study by Aina and Azimoh (2008), determined the knowledge and attitude towards smoking cessation among pharmacists in Lagos State. We observed that pharmacists were willing to be involved in smoking cessation programme despite their low knowledge on it.

In a study by Aina *et al.* (2009a), among the University of Lagos pharmacy students, it was found that the students were willing to promote tobacco cessation in spite of their low awareness of global policy on tobacco.

Another study by Aina *et al.* (2009b) among healthcare professional students at the College of Medicine University of Lagos (CMUL) and Lagos University Teaching Hospital (LUTH) revealed low smoking prevalence among the students but it is important that the school authorities set up counselling units to help the few smokers among them.

A study carried out on pharmacist-led smoking cessation services (Odukoya *et al.*, 2016) aimed to assess their attitudes, barriers and pattern and to explore the factors associated with the willingness to render these services. The results showed that approximately 92% of the community pharmacists encountered smokers in the course of their work. However, only 49.6% ever inquired about their smoking status, while 49.1% offered some form of cessation support. Only 44% had Nicotine Replacement Therapy (NRT) available on their pharmaceutical premises. The majority (68.5%) were willing to offer smoking cessation services on their

premises, but only 44.6% had any prior training on tobacco cessation. Qualitative findings also revealed that the majority felt they had a unique role to offer tobacco cessation services. Conclusively, the community pharmacists need specific training to effectively offer these services on their premises.

Another study by Poluyi *et al.* (2015) observed the tobacco-related knowledge of community pharmacists and assessed their support for smoke-free policies in Lagos State, Nigeria. The participating pharmacists expressed support for the smoke-free policies and they were mostly aware of the health risks associated with tobacco use. However, their awareness of the WHO FCTC and countrywide tobacco legislation was low. Meanwhile, current smokers among them were less likely to support smoke-free policies. This study also confirmed that the community pharmacists are well suited to promote smoke-free policies, but they need training on countrywide smoke-free laws.

3.2 Health Promotion

Community pharmacists have great opportunity to make significant contributions to health promotion activities because they have sufficient health knowledge, often uniquely sited, consultations are usually free and often with no prior appointment.

An investigation was carried out by Aina and Oyerinde (2014) to determine the level of importance attached to promoting health related behaviours among community pharmacists in Lagos State and their involvement in promoting those behaviours.

The result showed that the level of importance attached to promoting health related behaviours among community pharmacists in Lagos is high and there is a

strong positive relationship between the level of importance attached to a particular behaviour and the degree of involvement in promoting it (Table 3) ($r = .869, n = 22, p < .0005$). Though impatient clients and time constraints were the two major barriers to health promotion practices highlighted by over 60% of the respondents, lack of reimbursement for the services was also a barrier (Fig. 7). Almost all the respondents (99%) were willing to participate in health promotion training.

Community pharmacists in Lagos State should be encouraged to be involved in health promotion practices to boost health services in the State.

Table 3: Top 10 “Very Important” Health Related Behaviours Chosen by Community Pharmacists and Those Involved

HEALTH RELATED BEHAVIOURS	Very Important (%)	Very Involved (%)
Take prescription drugs as prescribed	91.3	65.3
Take OTC medications as directed	70.0	55.3
Always use condoms if one has multiple sex partners	66.7	34.7
Be knowledgeable about drug contents and side effects	62.0	54.7
Maintain normal blood pressure	59.1	49.3
Elimination of all tobacco products (cigarettes, pipe smoking etc.)	58.7	38.0
Always use seat belts when driving	57.3	32.7
Eat variety of foods i.e. balanced diet	56.7	30.7
Balance the food one eats with physical activity to maintain weight	55.3	29.3
Avoid undue stress	50.7	26.7

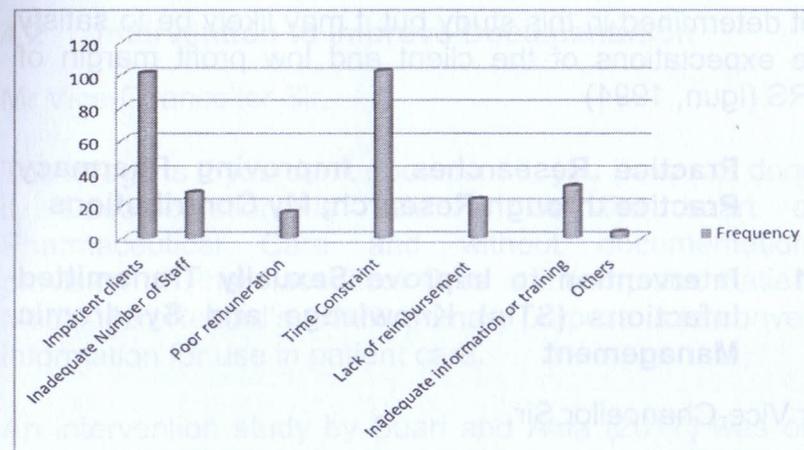


Fig. 7: Barriers to Health Promotion Practices/Services

In a study by Ogbo *et al.*, (2014) to compare the knowledge and attitude of community pharmacists in the management of acute diarrhoea in children with their observed practice, questionnaires and simulated patients were used. The study revealed that the knowledge and attitude of community pharmacists in the management of acute diarrhoea in children was different from their observed practice.

Questionnaire data revealed that 24% of pharmacists knew the correct instructions to give on food and fluid intake during diarrhoea, whereas 8% followed WHO guideline on food and fluid intake during the visits. Observed practice in managing acute diarrhoea in children was inappropriate and significantly different from their claims in the questionnaire ($p < 0.05$). The recommendation of ORT was scanty and advice on food and fluid intake was inadequate and sometimes inappropriate. This study shows that only 15% of community pharmacists managed acute diarrhoea in children according to the WHO guidelines. The reasons for the difference in knowledge and actual practice was

not determined in this study but it may likely be to satisfy the expectations of the client and low profit margin of ORS (Igun, 1994)

4. Practice Researches - Improving Pharmacy Practice through Research; My Contributions

4.1 Intervention to Improve Sexually Transmitted Infections (STIs) Knowledge and Syndromic Management

Mr Vice-Chancellor Sir,

STIs and their complications rank in the top five disease categories for which adults seek healthcare. Infection with STIs can lead to acute symptoms, chronic infection and serious delayed consequences such as infertility, ectopic pregnancy, cervical cancer, anogenital cancer, neonatal and infant infection and the untimely death of infants and adults if not promptly diagnosed and properly managed.

An intervention study by Aina and Adetuyi (2012) to improve the knowledge of sexually transmitted infections (STIs) and syndromic management among community pharmacists showed that the in house training improved knowledge of STIs and syndromic management.

After the training intervention, there was an improvement in their knowledge on STIs (16 to 54%) and syndromic management of STIs (53 to 70%). The assessment of the knowledge of community pharmacists on STIs and syndromic management showed that there is a need for continuous education in these areas, especially in the early detection and management of the condition.

4.2 Intervention to Improve Documentation

Mr Vice-Chancellor Sir,

The adage is if you don't document it, you have not done it. Documentation is said to be the heart of Pharmaceutical Care and without documentation, provision of Pharmaceutical Care is incomplete. Patient Medication Record's (PMR) primary purpose is to convey information for use in patient care.

An intervention study by Buari and Aina (2017) was on documentation of patient medication records (PMR) in community pharmacies in Ilorin. The objectives of the study were to assess the community pharmacists' knowledge of PMR, evaluate documentation of PMR and provide intervention to improve documentation of PMR. The intervention improved the documentation of patient medication record by Community Pharmacists in Ilorin and this was sustained over a period of 3 years (Fig. 8).

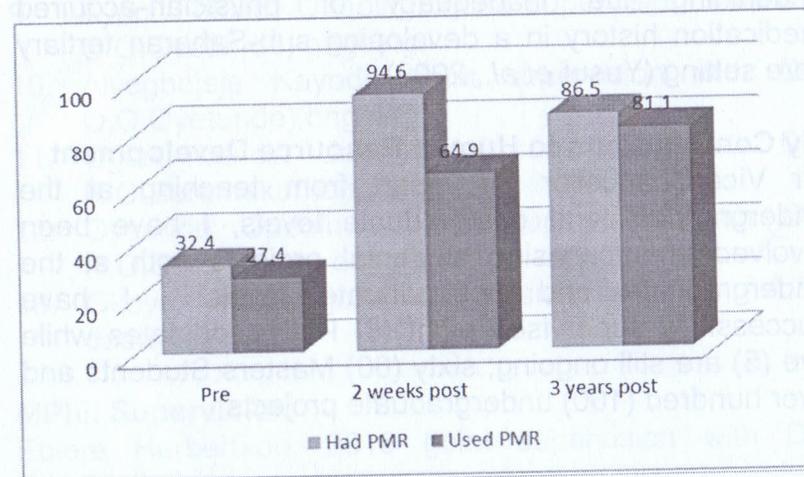


Fig 8: Having and using patient medication record pre and post intervention

A study of pharmacists' participation in the documentation of medication history by Yusuf *et al.* (2010) showed that pharmacists' participation resulted in an increase in the frequency and depth of medication history documentation than that of physicians. The depth of medication history information acquired and documented by pharmacists was significantly better for all the thirteen medication history components ($P < 0.0001$). The frequency of medication history information documented by pharmacists was significantly higher for twelve out of the thirteen medication history components ($P < 0.0001$) than for physicians. These include prescription medicines; over the counter medicines; source of medicines; adverse drug reactions; allergy to drugs, allergy to foods, allergy to chemicals; patient adherence; alcohol use; cigarette smoking; dietary restrictions and herbal medicine use. Physicians' heavy workload, due to a large number of patients, and their belief that medical history is more important than medication history, appear to be the probable factors underlining the inadequacy of physician-acquired medication history in a developing sub-Saharan tertiary care setting (Yusuf *et al.*, 2009).

My Contributions to Human Resource Development

Mr Vice-Chancellor Sir, apart from teaching at the undergraduate and postgraduate levels, I have been involved in supervising students' projects both at the undergraduate and postgraduate levels. I have successfully supervised eight (8) PhD candidates while five (5) are still ongoing; sixty (60) Masters Students and over hundred (100) undergraduate projects.

List of Students Supervised at the Postgraduate Level

Ph.D. Supervision

1. Yusuff Kazeem Babatunde 2008 (jointly supervised with Prof Fola Tayo).
2. Dada Olubukola 2010 (jointly supervised with Prof Fola Tayo).
3. Giwa Abdulganiyu. 2011(jointly supervised with Prof Fola Tayo).
4. Joda Arinola 2011/2012. (jointly supervised with Prof Fola Tayo).
5. Ajiboye Wale Timothy 2013. (jointly supervised with Prof Fola Tayo).
6. Olugbake Olubusola 2014 (joint supervision with Prof Fola Tayo& Prof Aba Sagoe).
7. Ailoje Kemi 2015 (joint supervision with Prof Fola Tayo& Prof Fagbenro-Beyioku).
8. Mgbahurike AugustinaAmaka 2016 (joint supervision with Prof Fola Tayo & Dr. E. N. Anyika).
9. Ayeni Foluke. Ongoing. (joint supervision with Dr. O.O.Oyetunde) ongoing.
10. Aiyegbajeje Kayode (joint supervision with Dr. O.O.Oyetunde) ongoing.
11. Ogbo Patricia Uche (joint supervision with Dr. R.O.Soremekun)ongoing.
12. Oyerinde Opeoluwa (joint supervision with Dr. R.O.Soremekun) ongoing.
13. Okoye Ngozi (joint supervision with Dr. A.E. Joda)ongoing.

MPhil Supervision

- Ebiere Herbertson. 2015 (joint supervision with Dr. E.N.Anyika).

Masters Degree Supervision

1. Folorunsho Oluwatoyin Bukola. 2006 (MPharm)
2. Buari Sikiru Bolaji. 2007 (MPharm)
3. Oguntade Olawunmi Adebukola. 2007 (MPharm)
4. Azimoh Joy. Feb 2008 (MPharm)
5. Aribeara Olubunmi Stella. Feb 2008 (MPharm)
6. Davies Saidi Omowamiwa. Feb 2008
7. Ogbo Patricia Uche. Feb 2008
8. Mamman Hafsat Avosuahi. 2008
9. Adefuye Oluwafunmilola. Feb 2008
10. Mgarhuke Amaka. Feb 2008
11. Osegbe Chioma Clare. Feb 2008
12. Akande taofiqat Oriyomi. Feb 2008
13. Sanusi Saidi Oluwasegun. July 2008
14. Emenike Chinwe Chikodi. July 2008
15. Roberts Irisoanga I. July 2008
16. Badmus-Orekan Kafilat. July 2008
17. Ikolaba Abdul Hakeem Abiodun. July 2008
18. Ayeni Foluke Adenike. July 2008
19. Aina-Alagbala Hakeem Olalekan. July 2008
20. Uwanoghor Kenyetta Bolokor. Sept 2009
21. Odunuga Patricia Titilola. Sept 2009
22. Ajose Olufunmilayo. Sept 2009
23. Oyawale Adetutu O. Sept 2009.
24. Giwa Halimat Bukola F. Sept 2009.
25. Kalejaye Folasade. Sept 2009.
26. Kolade Olusoji Olawuyi. Sept 2009.
27. Oyerinde Opeoluwa. 2011.
28. Elufiede Motolani. O 2011
29. Williams Aladi Charity. 2012
30. Ndem Ekpedieme Essien (joint supervision with Dr. G.O.Ajayi). 2012
31. Oyawole Rukayat Modupe. 2012
32. Balogun Adijat Kuburat. 2012
33. Bello-Bakare Medinat Adebukola. 2012.
34. Kotun Oluwajeda Afolasade. 2012

35. Anigioro Atinuke Afolabi (joint supervision with Dr. I. Oreagba). 2012
36. Bello Folasade. 2012
37. Nwokoma Omolola. 2012
38. Akinola Alexander. 2013
39. Ajoma Ehi Love. 2013
40. Aliyu Shuaibu. 2013
41. Umar Mohammed. 2013
42. Oyedara Omotoyosi. 2013
43. Sofoluwe Saeed Folorunso. 2013
44. Eleke Onyekachi Daniel. 2013
45. Yakubu Ikunaiye Nasiru. 2014
46. Ewedairo Olusola Oluseyi. 2014
47. Adedini Teju. 2014
48. Ata Ngozi Mary. 2014
49. Ayodele Tamilore Ekanade. 2014
50. Esther Adebimpe Olayemi. 2014
51. Alli Modupeore Sadia. 2015
52. Sani Gushiji Patience. 2015
53. Ayodele Kehinde Alice Unweyi. 2015
54. Onyeizugbe Amara Oluebube. 2015
55. Fowowe Oluwadamilola Toluwalase. 2015
56. Ogueri Dayo. 2016
57. MacDarius Godu. 2016
58. Adebayo Adenike. 2016
59. Udioh Michaela. 2017
60. Obiakonwa Gerald. 2017

Many of the students I have had the privilege of teaching and mentoring are doing well in pharmacy and other callings. They are distinguished men and women in different areas of practice in pharmacy, even in the diaspora. Many are in the pharmaceutical industry while some are business owners. Some are Managers in Pharmaceutical companies. Some are at the Professorial level in the academia.

Resource Person/Consultant

I am a resource person for West African Postgraduate College of Pharmacists, I am involved in training pharmacists for the West African Region.

I have also been a resource person for Pharmanews Limited Trainings and Workshops.

As a Consultant to World Health Organization (WHO, Nigeria Office), I was involved in reviewing the draft of Standard Treatment Guidelines for Nigeria by FMOH/WHO and Training of Trainers Workshop on Drug Supply Management in Health facilities.

Sabbatical

During my sabbatical leave at the Niger Delta University (NDU) in 2009/2010, I was involved in the design and development of the postgraduate programme for the Department of Clinical Pharmacy and Pharmacy Practice.

Professional Services

I was the Editor in Chief for the Nigerian Journal of Pharmacy 2014 to 2017. This is a journal of the Pharmaceutical Society of Nigeria (PSN). The journal became available online during my tenure with the assistance of the Editorial team. I am a PSN Council member 2014 till date.

I am a member of NUC and PCN accreditation teams to Faculties of Pharmacy in Nigeria.

Contribution to Community Services

I am a council member of Foursquare Gospel Church, Apata. I am a member of Welfare Committee of the church and even many times Head of the committee

contributing to the welfare of people within and around the church. I have been one time Secretary and President of Foursquare Women International (FWI) in the same church seeing to the development and empowerment of women in the church. I am a motivational speaker at FWI June Rally. I am a member of District Convocation Committee of FGC Alapere District

Head of Department

As acting Head of Department several times, I built a team that will continuously ensure the growth and development of the department. During my tenure, I ensured prompt processing of results at both undergraduate and postgraduate levels. The clerkship extension to external postings outside LUTH was initiated. The postgraduate programme of the department was reviewed to fall in line with the structures approved by the School of Postgraduate studies.

CONCLUSION

Mr Vice-Chancellor Sir, from what has been discussed so far, it is obvious pharmacists contribute to the health of the populace. However, they are underutilised and untapped assets that have immense capacity to impact public health in our society. 'Take One Tablet Three Times Daily' sounds simple but the medicine use process is quite complex. Where and when the pharmacists are underutilised like in our setting, irrational use of medicine will occur.

RECOMMENDATIONS

- ✓ A policy should be put in place to give pharmacists the legal backing in providing the services they are trained for.

- ✓ Health professionals should see themselves as partners in progress for the benefit of the patients.
- ✓ Pharmacists should be compensated for the public health services they provide.
- ✓ Pharmacists' communication skills need strengthening to improve patient care and teamwork with other health professionals.
- ✓ Pharmacists need to be properly motivated for public health activities.
- ✓ A policy should be put in place to give pharmacists the legal backing in becoming consultants in hospitals.

ACKNOWLEDGEMENTS

Mr. Vice-Chancellor Sir, I wish to express my appreciation to God for His love, mercy, goodness and divine intervention in every area of my life. He has been the sustainer of my life and family. He alone makes every blessing to abide in my life. Who is like unto the Lord who has made this day and many other good things possible in my life. Lord, I give you all the glory, honour and adoration in Jesus Name.

I appreciate all the members of Council and Management of this great University from the Pro-Chancellor and Chairman of Council, Dr. Wale Babalakin (SAN), the Vice-Chancellor Prof. Oluwatoyin Ogundipe, Prof. Ben Oghojafor (DVC, Management Services), Prof. (Mrs.) Folasade Ogunsola (DVC, Development Services, my big sister) and Prof Oluwole Familoni (DVC, A&R). I appreciate the Registrar and Secretary to Council, Mr. Oladejo Azeez Esq, University Librarian, Dr.(Mrs.) Olukemi Fadehan, the University Bursar, Mr. Lekan Lawal; Provost, College of Medicine, Prof. Afolabi Lesi (my amiable landlord), Director, Directorate of Academic Affairs.

Mr. Vice-Chancellor Sir, Prof. Oluwatoyin T. Ogundipe, I want to thank God for putting you at the helm of the affairs of the University of Lagos, the University of first choice and not just Nation's pride but Continent's pride. I thank you for the opportunities you gave me to serve. May God continue to bless you and your family on every side.

On this occasion, I want to appreciate our former Vice-Chancellors (VC) in particular the immediate past VC, Prof. Rahamon Adisa Bello (FNSE, FNSChE, FAEng), the 11th Vice-Chancellor under whom I became a full

Professor and Dean of Faculty of Pharmacy. I had the privilege of working under you as a Senate member and Dean. I learnt some administrative skills from you. Sir, I sincerely appreciate you and I am most grateful. Special appreciation goes to former VC, Prof. Tolu Odugbemi (OON, NNOM, FAS) under whose administration we started receiving our salaries before the end of the month.

I appreciate the immediate past Registrar, Dr. (Mrs.) Taiwo F. Ipaye, the change agent. I admire your administrative skills and human relations.

My appreciation goes to the former Deans, Subdeans and management of the Faculty of Pharmacy, Distinguished Prof. (Mrs.) C.I. Igwilo, Distinguished Prof. H.A.B. Coker (the Rabbi), Prof. U.E. Mendie, Prof. Olukemi Odukoya and Prof. B.O Silva. I thank you all for your support and making the work as Dean bearable for me.

I want to thank all my colleagues in the Faculty of Pharmacy, in particular, the Subdean Dr. C.P. Azubuiké, the immediate past Subdean Dr. A. Sowemimo and the Heads of Departments, you have all been good team players. I wish to express my appreciation to all the retired Professors in the Faculty, who in one way or the other made a great impact in my life, in particular, Prof. N.D. Ifudu and Prof. Fola Tayo. I am not leaving out our non-teaching staff in the Faculty of Pharmacy, you have been quite supportive. You are all wonderful. I want to thank the staff in the Dean's office, in particular, the Faculty officer Mrs. O.I. Kosoko-King, for their support in getting the work done in the Faculty.

I appreciate all my lecturers at the University of Ife in particular, my role model, big Auntie and mentor, Prof. (Mrs.) M.N. Femi-Oyewo, 'Sweet Sixteen', former Dean Faculty of Pharmacy, former Deputy Vice-Chancellor, Olabisi Onabanjo University and current Chairman, Board of Fellows of PSN. Thank you for accommodating me during my Master's degree programme at Unife.

Prof. Fola Tayo and Mummy Tayo I can't thank you enough for being our daddy and mummy in the Department of Clinical Pharmacy and Biopharmacy, I am saying thank you on behalf of your 'children' in the Department. Prof. Tayo, thank you, sir, for being patient with me, creating time for me despite your busy schedule as my PhD supervisor and not being tired of mentoring me even up to this moment.

I can't forget Dr. (Mrs.) Ogori Taylor my PhD co-supervisor who still made herself available for consultation even with her busy schedule then in World Health Organization (WHO), Nigeria office.

Prof. J.F. Eniojukan, thank you for being there as a mentor and boss both at Unilag and NDU.

I wish to acknowledge all my undergraduate and postgraduate students both past and present.

I also say a big thank you to my Inaugural Lecture team for the logistics, Drs. O.O. Oyetunde, A.E. Joda, C.P. Azubuiké, A.A. Adepoju-Bello, M. Iluomuanya, R.I. Aderemi-Williams and others not listed who have contributed in one way or the other to the successful planning of the inaugural lecture.

My Acting HOD, Dr. (Mrs.) O.O. Oyetunde, thanks for reviewing the manuscript within a short notice.

I wish to thank Profs. I.S. Agiobu-Kemmer, L.O. Chukwu, Ben Oghojafor, Ngozi Osarenren and Yomi Okanlawon for their contributions to my life towards the end of my Ph.D. Mr. Ademola Aliu and Pastor Gbenga Adefarakan, I can't forget your labour of love and contribution to my life and journey in this great University.

I want to thank Prof. Wale Okunuga (Director Academic Planning) and other officers in various units in the Senate Building - Bursary, Ceremonies, Academic Affairs, Information Unit, Examinations, Expenditure Control, Human Resources Management etc., for being quite supportive and giving me soft landing in my duties as the Dean of Faculty of Pharmacy.

I appreciate my parents, Late Mr. Emmanuel Gbadebo Sokale and Mrs. Mary Idowu Sokale for your sacrifices to give me a good education despite the fact that you were not lettered. I thank God for sparing the life of my mum (Mama 80) to witness this day despite all the turbulence between October and now.

My immense appreciation and gratitude go to my siblings, Mrs. Olufunke Oshosanya, Mrs. Modupe Ashaolu and Mr. Adebola Oluwasokale and their families. Thank you for your prayers and support all the time.

To all my extended families and in-laws, the Sokales, Oyejobis, Ainas, Onayemis, Oduwayes, Ogunsanyas, Baloguns, Oduekuns etc. I say a big thank you. My special 'baba oko', Prof. Leke Oduwaye (Urban and Regional Planning) and his wife Mrs. Olamide Oduwaye,

you have been a source of inspiration and encouragement to me when things were rough.

I thank the Ex-Mays that are here especially the 1973/78 Set, forty years plus is no joke to still be together.

I appreciate my Great Ife colleagues, especially Great Ife 1982 set and in particular my friend Pharm/Alhaja Sobalaje Abdul - retired Deputy Director of Pharmaceutical Services in Kwara State, you are wonderful people.

My deep appreciation goes to the Registrar of the Pharmacists Council of Nigeria (PCN), Pharm N.A.E. Mohammed and his team members that are here.

I thank the immediate past president of the Pharmaceutical Society of Nigeria (PSN), Pharm. Ahmed Ibrahim Yakasai, and other past presidents in particular Pharm. Olumide Akintayo, I had the privilege of serving as Editor in Chief under these 2 gentlemen. The new President, Mazi Sam Oluabunwa, Members of NEC and Council of PSN, the current and immediate past Chairman of PSN Lagos State, the National and Lagos State Chairman of the Association of Lady Pharmacists (ALPS), Fellows of PSN and other pharmacists here present, 'As Men of Honour we join Hands', I am grateful for your attendance today.

I thank Deans of other Faculties of Pharmacy and members of NAPA that have come to grace this occasion.

To my Foursquare Gospel Church (FGC) family in Nigeria, our General Overseer Rev and Rev (Mrs.) Felix Meduoye, our Alapere District Overseer (DO), Rev and

Prof. (Mrs.) Ajibola Jolaoso and other district council members, I say thank you all for your prayers and support. I am equally grateful to all the pastors under whom I have been blessed in FGC, Apata now Apata Missionary Zone- Rev and Rev (Mrs.) Albert Aina (DO of Sabo District); Rev and Rev (Mrs.) Kunle Muraina (DO of Somolu District), Rev and Pastor (Mrs.) Sunday Ashe (DO of Ogbe Missionary District, Benin), Rev and Pastor (Mrs.) Ezekiel Omoleye (Zonal Superintendent (ZS) of Pedro Missionary Zone), Pastor and Pastor (Mrs) Oluwayomi Akinwolemiwa, my ZS. I also appreciate my former Obanikoro ZS, Rev and Pastor (Mrs.) Segun Ajidagba, and other ZSs of Alapere District. All zonal officers and members of Apata Missionary Zone, thank you all for attending this inaugural lecture.

My appreciation goes to Daddy I.O. Ogunbomehin, the Senior Pastor of Mount of Joy and Grace Church, Oke Ayo, Saratu, Agege and the members of the church, you have been a wonderful family to belong to.

I appreciate our family friends, in particular, Mr. & Mrs. Seye Okunowo; Mr. & Mrs. Ola Ogunbowale and Dr. & Mrs. Segun Onajinrin, you are friends indeed. I can't forget Pharm Bayo Ogunbadejo (Bros Bayus), you are really our big brother.

Please pardon me if I omit your name. I equally thank everybody who has spared time to attend this inaugural lecture despite your busy schedule and Lagos traffic.

I thank God for the three gentlemen He has blessed me with, Okunola, Olanrewaju and Olaposi (Corper) Aina. I appreciate you. They are all alumni of the University of Lagos. My daughter in law, Dr. (Mrs.) Dolapo Aina, is

also an alumna of Unilag. My granddaughter, Oluwafifebomi Mopelola Aina is a potential alumna too!!

Last, but not the least, I want to appreciate my dear husband, Mr. Ayodeji Aina who has been with me all these years in prayers and encouraging me to move on. God will continue to bless you and our children and our home. Thanks for always being there for us.

Thank you all and God bless.

REFERENCES

- Agomo C, Udoh A, Kpokiri E, Osuku-Opio J (2018). Community pharmacists' contribution to public health: assessing the global evidence base. *Clinical Pharmacist*. April 2018, Vol. 10, No 4, online DOI: 10.1211/CP.2018.20204556
- Aina B.A.**, Igbigbi OS (2016). Communication Apprehension among pharmacy students at the University of Lagos, Lagos, Nigeria. *The Nigerian Journal of Pharmacy* 50(1), 50-54.
- AINA B.A.** and AZIMOH J. (2008): Knowledge and Attitude of Pharmacists to Tobacco/Smoking Cessation in Lagos State. *The Nigerian Journal of Pharmacy*, 41(3): 49-52.
- AINA B.A.**, Oyerinde O.O., Joda A.E. and Dada O.O. (2009)b: Cigarette Smoking among Healthcare Professional Students of University of Lagos and Lagos University Teaching Hospital (LUTH), Lagos, Nigeria. *Nigerian Quarterly Journal of Hospital Medicine*, 19(1): 42-46.
- AINA B.A.**, TAYO F. and TAYLOR O. (2008): Cost implication of irrational prescribing of chloroquine in Lagos State general hospitals. *Journal of Infection in Developing Countries*, 2(1):68-72. ICID 842399
- AINA B.A.**, TAYO F. and TAYLOR O. and ENIOJUKAN J.F (2009)a: Antimalarial Prescribing Patterns in State Hospitals and Selected Parastatal Hospitals in Lagos, Nigeria. *Nigerian Quarterly Journal of Hospital Medicine*, 19 (1): 20-26
- AINA B.A.**, TAYO F., TAYLOR O. AND ENIOJUKAN J.F. (2009)b: Intervention Studies on rational prescribing of Chloroquine in Lagos State General Hospitals. *Nigerian Journal of Pharmacy*, 42(2): 43-52. ISSN 0331-670X
- Aina B.A.** and Adetuyi C.C (2012). Intervention to improve the knowledge of sexually transmitted infections (STIs) and syndromic management among community pharmacists in Lagos State, Nigeria. *African Journal of Pharmacy and Pharmacology*, Vol. 6 (22) 1587-1593. DOI: 10.5897/AJPP12.035. ISSN 1996-0816. Available online www.academicjournals.org
- AINA B.A.** and Ogunbiyi O.O (2012). Assessment of communication skills among Pharmacy students of the University of Lagos, Lagos, Nigeria. *Journal of Basic and Clinical Pharmacy*, Vol 3 (1), 215-218. Available online www.jbclinpharm.org
- Aina B.A.** and Oyerinde O.O (2014). Health Promotion Practices Among Community Pharmacists in Lagos State, Nigeria: Perceived Importance and Involvement. *Book of proceedings, 9th University of Lagos Annual Research Conference and Fair 2014*, Vol. 2 (Medical Sciences) 300 – 308.
- American College of Clinical Pharmacy (2008). The definition of Clinical Pharmacy. *Pharmacotherapy*; 28(6):816–817.
- Andrew A. Egboh (1982). *History of Pharmacy in Nigeria: A Guide and Survey of the Past & Present, 1887-1980*
- Baldwin HJ, McCroskey JC, Knutson TJ (1979). Communication apprehension in the pharmacy student. *American Journal of Pharmaceutical Education*, 43: 91-93.
- Bolajoko A. Aina**, Adebayo T. Onajole, Babatunde M.O. Lawal and Opeoluwa O. Oyerinde. (2009a): Promoting cessation and a tobacco free future: willingness of pharmacy students at the University of Lagos, Nigeria. *Tobacco Induced Diseases* 5:13 doi: 10.1186/1617-9625-5-13

- Buari B. Sikiru and **Aina A. Bolajoko** (2017). Evaluation of Documentation of Patient Medication Records in Community Pharmacies in Ilorin, Kwara State, Nigeria: A before and after study (Short Communication). *The Nigerian Journal of Pharmacy*; 51(2), 39 – 43.
- Federal Ministry of Health (FMOH). (May 2001). National Malaria and Vector Control Division. Federal Republic of Nigeria National Antimalarial Treatment Policy
- FIP 2018 World Pharmacists Day, 25 September 2018
- Goel P, Ross-Degnan D, Berman P, Soumerai S (1996). Retail pharmacies in developing countries: a behaviour and intervention framework. *Soc Sci Med*; 42(8):1155-61
- Hepler C.D (2004). Clinical Pharmacy, Pharmaceutical Care and quality of Drug Therapy. *Pharmacotherapy* 24(11), 1491-1498
- Hepler C.D, Strand L.M. (1989). Opportunities and responsibilities in pharmaceutical care. *Am J Pharm Ed*; 53(suppl): S7–15. <http://www.escpweb.org/site/cms/contentViewArticle.asp?article=1712#definition> accessed Oct 10th 2018
- Igun U.A (1994). Reported and actual prescription of oral rehydration therapy for childhood diarrhoeas by retail pharmacists in Nigeria. *Social Science & Medicine* 39 (6), 797-806
- International Pharmaceutical Federation (FIP) 1998: Good Pharmacy Practice in Developing Countries. Recommendation for Stepwise Implementation. Report of the working group, the Hague. www.fip.org Accessed October 10 2018
- Johns Hopkins Bloomberg School of Public Health; Centre for Health Security. Serving the greater good. Public health and community pharmacy

- partnerships. Centre for Health Security website. centerforhealthsecurity.org/our-work/pubs_archive/pubs-pdfs/2017/public-health-and-community-pharmacy-partnerships-report.pdf. Accessed November 20, 2018.
- Kazeem.B.Yusuff, FolaTayo and **Bola.A.Aina**. (2009). What probable factors underline inadequacy of medication history information recorded in patients' case notes by physicians in a Nigeria teaching hospital? *International Journal of Pharmacy Practice*, 17: 317-321.
- Laufer MK, Thesing P.C, Eddington N.D, Masonga R, Dzinjalama F.K, Takala S.L, Taylor T.E and Plowe C.V (2006).Return of Chloroquine Antimalarial Efficacy in Malawi. *New England Journal of Medicine* 355: 1959- 1966
- Odukoya O.O, Poluyi E.O., **Aina B.A.**, Ejemom C, Faseru B (2016). Pharmacist-led smoking cessation: The attitudes and practices of community pharmacist in Lagos State, Nigeria: A mixed methods survey. *Tobacco Prevention and Cessation* 2 (January):2 <http://www.dx.doi.org/10.18332/tpc/61546>. ISSN 2459-3087
- Office of the Inspector General.The Clinical role of the community pharmacist. Washington DC, US Department of Health and Human Services, Nov 1990.
- Ogbo P.U., **Aina B.A.** and Aderemi-Williams RI (2014).*Pharm Pract (Granada)*. Jan-Mar; 12(1): 376. Published online 2014 Mar 24.
- Oyetunde Olubukola, **Aina B.A.** and Tayo Fola (2014). An Assessment of generic drug use in management of chronic diseases in Lagos State. *Nigerian Quarterly Journal of Hospital Medicine* 24(3), 258 – 264.

- Poluyi EO, Odukoya OO, **Aina BA**, Faseru B (2015). Tobacco related knowledge and support for smoke-free policies among community pharmacists in Lagos state, Nigeria. *Pharmacy Practice* Jan-Mar; 13(1):486.
- Wale T Ajiboye, Fola Tayo, **Bolajoko A. Aina** and Abdulganiyu Giwa (2014). Barriers to medication counselling in Community pharmacies in Lagos South West Nigeria. *The Nigerian Journal of Pharmacy* 48(2), 21-26.
- Walker R (2000). Pharmaceutical public health: the end of pharmaceutical care? *Pharm J* 264: 340-341.
- WHO (2018b). <http://www.who.int/news-room/detail/31-05-2018-world-no-tobacco-day-tobacco-and-heart-disease> (Accessed Oct 11, 2018)
- WHO report on the global tobacco epidemic (2008): the MPOWER package Geneva, World Health Organization.
- World Health Organisation (2018a). Tobacco fact sheet. Available at <http://www.who.int/news-room/factsheets/detail/tobacco>. (Accessed 11 Oct 2018)
- World Health Organization (2004): Code of practice on tobacco control for health professional organizations. [<http://www.who.int/tobacco/en/>]. Geneva, Switzerland: World Health Organization
- World Health Organization (1994). The role of the pharmacist in the health care system. WHO/PHARM/94.569 Geneva.
- World Health Organization (1985). WHO conference of experts, Nairobi.
- World Health Organization (2003): WHO framework convention on tobacco control. [<http://www.who.int/fctc/>]. Geneva, Switzerland: World Health Organization

- Yusuff KB, Tayo F, **Aina BA**. (2010). Pharmacists' participation in the documentation of medication history in a developing setting: An exploratory assessment with new criteria. *Pharmacy Practice* (Internet) Apr-Jun; 8(2):139-145.
- Zachariah R, Harries AD, Ishikawa N, Rieder H.L., Bissell K, Laserson K, Massaquoi M, Van Herp M, Reid T (2009). Operational research in low income countries: what, why and how? *Lancet Infect Dis* 9(11): 711-717.