

Pharmacists' role in public health: a residency report

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ABSTRACT

Background: The residency training programme of the West African Postgraduate College of Pharmacists is an opportunity for residents to acquire competencies in specialized disciplines to advance pharmacy practice.

Objective: To report competencies acquired in public health pharmacy from a residency training programme.

Methods: In each of the twelve units visited, information about the unit: its operations, activities, and challenges were learnt, with interventions made in some of the units. Opportunities were given for field visits in some units. Health education on vaccination schedules, precautions and possible side effects to watch out following vaccination of children and the actions to take were provided for mothers.

Results: Competencies acquired included the ability to carry out active case search upon the outbreak of a disease, pedagogy, communication skill, vaccine management, knowledge, project management, logistics and drug supply management, health policy implementation and conflict management.

Conclusion: The residency training in public health enabled competencies such as the ability to carry out operational research, risk assessment, forecasting, and data management to be acquired. This will expand and improve the pharmacist's role in providing quality health care service and delivery.

Keywords: Residency Report, Public health pharmacy, Competency, Nigeria

Rôle des pharmaciens en santé publique : un rapport d'internat

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RÉSUMÉ

Contexte : Le programme de formation en interne du Collège de troisième cycle des pharmaciens de l'Afrique de l'ouest est une occasion pour les internes d'acquérir des compétences dans des disciplines spécialisées pour faire progresser la pratique de la pharmacie.

Objectif : Rendre compte des compétences acquises en pharmacie de santé publique dans le cadre d'un programme de formation en interne.

Méthodes : Dans chacune des douze unités visitées, des informations sur l'unité : son fonctionnement, ses activités et ses défis ont été recueillies, avec des interventions effectuées dans certaines unités. Des visites sur le terrain ont été organisées dans certaines unités. Une éducation sanitaire sur les calendriers de vaccination, les précautions à prendre et les effets secondaires possibles à surveiller après la vaccination des enfants, ainsi que les mesures à prendre, ont été dispensées aux mères.

Résultats : Les compétences acquises comprennent la capacité à effectuer une recherche active de cas lors de l'apparition d'une maladie, la pédagogie, la communication, la gestion des vaccins, les connaissances, la gestion de projet, la logistique et la gestion de l'approvisionnement en médicaments, la mise en œuvre de la politique de santé et la gestion des conflits.

Conclusion : La formation en interne en santé publique a permis d'acquérir des compétences telles que la capacité à mener des recherches opérationnelles, l'évaluation des risques, la prévision et la gestion des données. Cela permettra d'élargir et d'améliorer le rôle du pharmacien dans la prestation de services et des soins de santé de qualité.

Mots-clés : Rapport d'internat, pharmacie de santé publique, compétences, Nigeria.

INTRODUCTION

Pharmacy residency is an organized and directed postgraduate training programme in a defined area of pharmacy practice.¹ It provides the opportunity for inter-professional collaboration, instills personal and professional confidence, provides avenues in which to advocate for the profession of pharmacy, broadens clinical decision-making abilities, and serves as bridge between education and practice.² Pharmacist's services are being expanded to include more patient-oriented, administrative and public health functions, so as to showcase the unique expertise of Pharmacists in public health such as pharmacotherapy, access to care, and prevention services.³

The West African Postgraduate College of Pharmacists (WAPCP) is an arm of the West African Health Organization (WAHO) that was established in 1990, to address the growing and diverse patient needs that require the pharmacist's expertise. Residency programmes were introduced using the industry, hospital, community pharmacy, and public health facilities as training sites.⁴ The residency training programme of the West African Postgraduate College of Pharmacists (WAPCP) provides an opportunity for residents to acquire skills and competencies from the field to reinforce knowledge gained prior to the training. This is to enhance recall, and improve skill as well as competency in patient healthcare and delivery. Competence is defined by the International Pharmaceutical Federation-FIP as "knowledge, attitudes, skills and behaviours that a professional acquires, accumulates and develops through education, training and work experience". It is characterized by strong knowledge base, good problem-solving and decision making skills, and the ability to apply knowledge and experience to diverse patient care situations.⁵ Competence indicates the ability to perform one's duties accurately and confidently, make the correct judgment, and interact appropriately with patients and colleagues. This is in line with the mission of the WAPCP which is "to advance postgraduate education and training in all disciplines of pharmacy for the acquisition of knowledge, attitudes, skills, and competency to promote and maintain a high standard of professional pharmacy practice".⁶ The residency programme prepares the Pharmacist to succeed in his/her expanding roles in healthcare service and delivery. One of the objectives of the fellowship programme, among others, is to promote and advance Public Health Pharmacy.⁶

This residency training in public health was undertaken in

the Plateau State Epidemiological Unit, under the Public Health Unit of the Plateau State Ministry of Health (SMOH), from the 9th of October, 2017 to the 13th of April, 2018. The SMOH is located in the complex of the Plateau State secretariat complex which serves as link between the Federal Ministry of Health and the Local Government Health Authority. The SMOH also partners with donor and international agencies to implement health programmes. There are nine Units in the Ministry, each headed by a Director, who reports to the Permanent Secretary, who in turn reports to the Commissioner for Health. The nine Units are: Pharmaceutical Services, Medical Services, Nursing Services, Laboratory Services, Planning, Research and Statistics, Administration, Finance and Supplies, Internal Audit, and Public Health. The Units directly linked to the State Epidemiological Unit, which were also the units visited were: Disease Surveillance, State Vaccine Cold Chain Store, Vaccination, Family Planning, Roll Back Malaria (RBM), Neglected Tropical Disease (NTD), Tuberculosis and Leprosy Control, Logistics Management Commodity Unit (LMCU), Health Education, Occupational Health, Primary Health Care/Primary Health Care Development Agency, and Nutrition. The objective of this study was to report competencies acquired in public health pharmacy from rotations through each of these units.

METHODS

In each of the twelve Units visited, information about the Unit: its operation, activities, and challenges were gathered, with presentations made in some of the Units. Opportunities were given for field visits such as in the surveillance, vaccination, nutrition, and family planning units. Health education on vaccination schedules, precautions, side effects to watch out following vaccination of their children (Adverse Events Following Immunization), and remedial actions to take were provided for the mothers.

RESULTS

The experiences, observations, competencies acquired, and interventions made are reported below:

Disease Surveillance Unit (a)

A rapid response team (RRT) from the Nigerian Center for Disease Control (NCDC), Abuja came to Plateau State from the 9th to 12th October, 2017, in response to the reported outbreak of yellow fever. The two reported cases were six and ten year old female and male children from same parents, residing at NIPOST Quarters, Tudun Wada, Jos North LGA, with the same date of onset (15/09/17). They were both admitted at the Bingham

University Teaching Hospital (BUTH) on the 29/07/17, with recent travel history to Adikpo, Kwande LGA of Benue State on 21/07/17. The suspected index case was an 82 year female resident of Adikpo, Benue State (the grandmother of the 6 and 10 year old children), who was brought to Jos by her son. While on the field, the State Disease Surveillance and Notification Officer (DSNO) was again notified by BUTH of three additional suspected cases of viral haemorrhagic fever (VHF), from the same family. Blood samples were collected and sent to the Lagos University Teaching Hospital for laboratory confirmation. The results confirmed yellow fever in the 6-year old girl, and yellow and Lassa fevers in the 10-year old boy. (Yellow fever and Lassa fever are classified as viral haemorrhagic fever).⁷

The aim of the RRT visit was to support Plateau State in the assessment of the outbreak. The objectives among others were to conduct an active case search for yellow fever through record review, and to conduct a detailed risk analysis in the affected communities (agent, host and environment). During the record review, the prescription of the index suspect was reviewed by the resident public health pharmacist at the Tudun Wada PHC. The index suspect later died, but the 6 and 10-year old children with confirmed cases of VHF recovered. The outbreak response activity involved advocacy and support where the resident public health pharmacist accompanied the RRT and the State epidemiology team to pay advocacy visits to the Plateau State Ministry of Health, Plateau State Primary Health Care Development Agency, World Health Organization (WHO) Plateau State, Plateau State Specialist Hospital, BUTH, Our Lady of Apostles Hospital, and Jos North LGA, with the aim of coordinating all efforts towards curtailing the outbreak. The recommendations from the RRT, of which the resident public health pharmacist was part of, were:

- Environmental sanitation including clearing of surrounding bushes, netting of house windows, proper refuse disposal, blocking of holes and cracked walls, as well as fumigation of houses and surroundings.
- Sensitization and Education of all health care workers in Plateau State especially in Jos North LGA on VHFs, continuous active case search, contact tracing, and monitoring.
- The Plateau State yellow fever RRT should provide free treatment and supportive care for hospitalized cases, sustain support to BUTH and Jos North LG on infection, prevention and control.
- Intensify public media enlightenment campaign

for yellow fever, support the case management team with financial incentive, provide yellow fever vaccination, and support the procurement of ribavirin injection and tablet.

- The NCDC should upgrade the Plateau State Human Virology Research Center (PLASVIREC) to the status of VHF referral laboratory.
- Provide continuous training for health workers in the State on yellow fever and other VHFs epidemiology, prevention, and control.

Disease Surveillance Unit (b)

Training was conducted by WHO and NCDC for Disease surveillance notification officers and disease focal persons in all the 17 LGAs of Plateau State, as well as decision makers on the epidemic preparedness and response plan (EPR) for cerebrospinal meningitis (CSM) epidemic. The steps for an EPR were similar to that of project management which includes: risk analysis/assessment, definition of general and specific objectives, discussion of activities to be implemented to reach the goal, definition of the process and tools needed to conduct the activities, implementation, monitoring, and evaluation activities.

Forecasting: Estimating the number of expected cases of the next CSM

Assuming a total population of 20,000

No. of cases in the previous outbreak = 20

1. Population at risk = 70% of the total population (poln) = 14,000
2. Attack rate = cases/total poln X 100,000
= 20/20,000 X 100,000 = 100/100,000
3. Estimated no. of cases in the next epidemic = Attack rate X poln at risk/100,000
100 X 14,000/100,000 = 14
Therefore, the forecasted no of cases for the next CSM epidemic = 14
4. 25% margin of error = 25% of 14 = 3.5 + 14 = 18

Forecasting is done after outbreaks so that the number of real cases during the next outbreak is subtracted from the forecasted number.

Vaccine Needs Estimation

Given a total population of 1,000,000

Constant for wastage adjustment = 1.17 and for buffer stock = 1.25

Population at risk = 70% of 1,000,000 = 700,000

Adjusting for wastage = 17% X 700,000 = 119,000 + 700,000 = 819,000

Security/Buffer stock = 25% X 819,000 = 204,750 + 819,000 = 1,023,750

Therefore, the estimated number of vaccines needed for the next outbreak of meningitis = 1,023,750

Competencies Acquired

- The ability to carry out active case search upon the outbreak of a disease. Active case search involves going to the health facility, community and anywhere the index case had contact.
- Conduct risk assessment at the State, community, health facility, and case (index and suspected) levels.
- Ability to carry out operational research by carrying out a situation analysis, doing a needs assessment, mapping out strategies to provide solutions to the challenges faced, implementation, monitoring, and evaluation.
- Ability to forecast in preparation and response to cerebrospinal meningitis outbreak.

Vaccination/Immunization Unit

The vaccination unit offers vaccination services to the community, including yellow fever vaccine for travelers. The unit had a fridge donated by the European Union Prime Project, where vaccines were stored at temperatures between +2°C and +8°C. The temperature of the vaccines is recorded every morning before administration. The dry vaccines such as measles, yellow fever and BCG, are live vaccines stored at the bottom part of the fridge which is cooler, while the liquid or multi-dose vaccines were stored at the top part of the fridge at a temperature of +8°C. All vaccines on the immunization schedule were administered to children 0-9 months, at no cost. Health education on the benefits of the vaccination, summary of the vaccines administered at specific ages of the child, injection sites for each vaccine, possible side effects and precautions as well as the correct positioning of the child for the vaccination was given to the mothers before vaccine administration to the children.

At the end of the vaccination exercise each day, a report of the total number of children and adults vaccinated, with the vaccines, and needle and syringes used were collated both in registers and sent immediately by SMS to the Local Government focal person for immunization for onward state collation.

Competencies acquired: Teaching/health education, vaccines management, communication skills, and data management (collection, harmonization, presentation, and transmission) skills.

Family Planning Unit

A family planning unit was created so that the needs of both children and their mothers can be met in one place, and to ease the burden of transportation to other health facilities for the mothers. The activities of the unit include pre-counseling, administration of the contraceptive and post counseling. It was observed that the most preferred contraceptive was the implanon NXT-68mg etonogestrel implant, administered sub-dermally. It is a non-biodegradable progestin-only implant whose release rate decreases from 70 µg/day to 25 µg/day at the end of the third year. Two types of implants were available based on the duration of effect: 3 years and 5 years. The other contraceptives available were oral contraceptives (lynestrenol-500 µg and intrauterine contraceptive device- IUCD). This experience contributed positively to my teaching skill by making the teaching of final year pharmacy students' family planning the following week more practical.

Competencies acquired: Knowledge, Pedagogy and Counseling skills.

Logistics Management Commodity Unit

The Logistics Management Commodity Unit (LMCU) in Plateau State is an independent unit that manages all health commodities, including the distribution and implementation plan of all donor health commodities. The unit also generates repository reports of all such health commodities. Programmes whose health commodities were managed by the LMCU included: roll back malaria (RBM), HIV, TB/Leprosy, family planning, vaccines, nutrition, and neglected tropical diseases. The State logistics officers were trained on the Logistics Management Information System-LMIS of all donor commodities by consultants from the Nigerian Supply Chain Integration Project (NSCIP).

The integrated LMIS tool was the software used to manage the supply and distribution of all the seven programs listed above for all the Local Governments in Plateau state, with the Last Mile Distribution Matrix (LMD) software managing the distribution of all the health commodities in each programme. For example, the LMD for TB/Leprosy LMIS is called 'pick and pack'. Other components of the integrated LMIS apart from the LMD include: Average annual, quarterly and monthly consumption report, list of all health facilities (private and public), all health facilities submission status report, program commodities (medicines, laboratory reagents), reporting rate, stock on hand, average monthly consumption, quantities lost, issued and received by the

health facilities.

Competencies acquired: Project and supply chain management.

Health Education Unit

Basic education is an integral part of being healthy. If an individual lacks basic health knowledge, the ability to reason, emotional capacities of self-awareness and emotional regulation, and skills of social interaction, then s/he is said to be unhealthy.⁸ Health education is more of a preventive approach that teaches humans personal hygiene and environmental health and awareness. It is an integral component of all the health units. The activities which are planned at the beginning of the year include home visits, inspection of surroundings, health education in primary health care centers, antenatal clinics, and vaccination centers. The Emir of Kanam (a Local Government Area in Plateau State) is the representative of the State traditional council for health education and advocacy. During program planning, other traditional leaders and subjects (ward heads and community leaders), as well as other social mobilization committee members- National Orientation Agency (NOA), women leaders, educational sector, religious leaders and the Local Government health and education workers are mobilized before the project is implemented. A summary of health education activities include: workshops, training of trainers, supervision, advocacy, sensitization and mobilization.

Competencies acquired: Knowledge, teaching, program planning and implementation.

Primary Health Care Development Agency

The Primary Health Care Development Agency (PHCDA) is referred to as the Primary Health Care (PHC) Board in Plateau State, established in line with the National Primary Health Care Development Agency Act to provide support to the National Health Policy.⁹ There are seven directorates under the PHC Board:

Primary Health Care (Nutrition and family planning), immunization and disease control, logistics and health commodities, planning, research and statistics, finance and supply, internal audit, and administration. There was only one pharmacist in the state PHC board who was the Director of the Logistics and Health commodities unit, and a Fellow of Social and Administrative Pharmacy of the West African Postgraduate College of Pharmacists.

Competencies acquired: Knowledge, Health policy

implementation, Communication skill, Conflict management.

Nutrition Unit

Nutrition is a component of primary health care (PHC). PHC is the platform used to achieve health care for all as declared in 1978 in Alma Ata.¹⁰⁻¹¹ Countries are beginning to experience the double burden of overweight among both adults and children, and stunting in children. More of the world's overweight people now live in low- and middle-income countries- LMIC than in high income countries, with no prospects of decline in obesity rates. Due to economic growth in the LMICs, the poor will likely achieve a greater share of the burden of overweight and obesity, increasing their vulnerability to negative health and economic effect.¹²

The nutritional components of PHC include: good food supply, proper food nutrition, nutrition education, and food security (availability, affordability, right quality, and eating). The nutritional unit carries out nutritional epidemiology, which is the epidemiological assessment of the nutritional status of communities, nutritional and dietary surveys, growth monitoring, nutritional surveillance, rehabilitation and intervention. In summary, the activities in the nutritional unit include: Infant and Young Child Feeding Program (IYCF), Micronutrient deficiency control, Dietary fortification and diversification, Nutrition education, Community Management of Acute Malnutrition (CMAN), Maternal nutrition, and Child growth monitoring. In overseeing these nutritional activities, the unit aims to reduce malnutrition in all ages, especially in children and pregnant women as well as promote good feeding.

The activities are implemented through specific programs funded by donor agencies such as the World Bank, WHO and UNICEF in order to improve the nutritional data of the State. Examples of such funded programs include: Infant and young child feeding program, Maternal nutrition, Control of micronutrient deficiency such as vitamin A supplementation, child deworming program to increase micronutrient absorption, and dietary fortification such as salt iodization. These activities are monitored through routine checks and supervision. A test kit is available to check the iodine level in salt since iodine is volatile. As such, salt should always be covered. Growth rate in children is monitored through height, weight, and mid-upper-arm circumference (MUAC). The nutritional unit is located next to the vaccination unit so that as children come for routine vaccination. Their growth level is monitored as well. The mother is given vitamin A

supplementation immediately after delivery for transfer to the child during breastfeeding. From 6 months of age, the child receives 100,000 IU vitamin A every 6 months till 59 months (5 years). Albendazole- 400 mg stat is administered to the child every six months from 24 months to 59 months. Poor breastfeeding and complementary feeding practices also play key roles in determining the nutritional status of under-five children.¹³ The Nutritional data for children under 5 years of age for Plateau State in 2018 was: Malnutrition rate - 43.2%, Underweight rate - 18.6%, Rate of wasting - 4.6%, and Exclusive breastfeeding rate - 29.2%.¹⁴ Maternal factors such as age, education, level of income, family size and marital status have also been found to significantly influence the nutritional status of their under-five children.^{15,16}

The exclusive breastfeeding rate in the State was very low, with the resultant effect reflecting in the high malnutrition rate. The World Bank has therefore funded nutritional programs to reduce the rate of wasting in women and children.¹⁷ The hidden form of malnutrition is caused by deficiency of vital micronutrients (vitamins, minerals, and trace elements needed for mental and physical growth) in the body. Deficiency of vitamin A, iodine and iron are the 3 types of malnutrition prioritized by the international community. Zinc deficiency is also being targeted. Vitamin A deficiency for example manifests as higher risk of infection, visual impairment and higher mortality rates. Anaemia due to iron deficiency impairs learning in children and reduces agility in adults. The three main types of intervention to prevent and combat vitamin and mineral deficiencies are; short-term supplementation, medium-term food fortification, and long-term balanced nutrition/dietary diversification.¹⁸

Competencies acquired: knowledge, project management and counseling skills.

DISCUSSION

The residency training enabled competencies to be acquired in public health. Specific interventions done during the residency period included: provision of drug information services to the rapid response team on the field, review of the medicines prescribed to the index suspect during the record review of the active case search, and health education. The presence of a pharmacist during the advocacy visit to major stakeholders and policy makers showed that trained competent pharmacists could contribute positively to field epidemiology. The recommendations after

assessment from the rapid response team to the State Government included a pharmacist's input. Teaching and learning were made more interesting and active as the knowledge gained from the field during the family planning clinic were immediately transferred to the classroom. The outcome of this training was the approval given by the Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmaceutical Sciences, University of Jos to post undergraduate pharmacy and postgraduate clinical pharmacy students to the Plateau State Epidemiological Unit for public health rotation.

Challenges

The challenges encountered in the Plateau State Epidemiological Unit included the lack of public health pharmacist mentors in the epidemiological unit and the absence of pharmacists with expertise in sub-units such as field epidemiology, health education, nutrition, and vaccination.

Prospects and Recommendations

- Generally, the staff of the Plateau State Epidemiological Unit were very receptive and gave all the support needed.
- Pharmacists were involved in the Logistics and Supply chain Management of TB and Leprosy Health Commodities.
- There are numerous opportunities for competent pharmacists to contribute to public health care service and delivery, especially in health education, trainings, neglected tropical diseases, nutraceuticals, medicines and vaccines management.
- Field training of public health pharmacists should begin from the undergraduate to postgraduate and professional levels. This is because the involvement and contribution of competent pharmacists in public health care service and delivery will go a long way to ensuring quality health care for all.
- Pharmacists should be involved in field epidemiology to give direct pharmaceutical contributions/interventions on the field.

CONCLUSION

The ability to carry out operational research, risk assessment, forecasting, project and supply chain management, project planning and implementation, and data management were competencies acquired during the residency training in public health from the West African Postgraduate College of Pharmacists. Other competencies acquired were: knowledge, pedagogy, and

vaccines management. It is hoped that pharmacists will take advantage of the opportunities in public health service and delivery, particularly in the epidemiological unit, for research and practice to improve health care service and delivery as well as the image of the profession.

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