2017

Roles of Community Pharmacists in Improving Oral Health Awareness in Plateau State, Northern Nigeria

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2017

Abstract

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MSc, University of Liverpool, 2013

MPH, University of Lagos, 2008

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Dissertation Submitted in Partial Fulfillment

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Abstract

There is poor oral health awareness in Nigeria. This is mainly attributed to limited access to correct information on oral health as well as a lack of oral health care providers. The impact of the poor oral health awareness is worse in Northern Nigeria due to the uneven distribution of oral health care workers and training facilities. The purpose of this cross-sectional study was to describe the roles of community pharmacists (CPs) in Plateau State, Nigeria as sources of oral health information. Theoretical framework for this study was the theory of planned behavior (TPB). Background knowledge and practices of oral health care by CPs were assessed as related to their demographic characteristics. A 1 sample *t*-test was used to assess CPs' knowledge of oral health. A binary logistic regression model was conducted to evaluate if some demographic variables could predict Plateau State CPs' interest in becoming more involved in provision of services on oral health problems. According to the study findings, the CPs had a good disposition towards engaging in oral health prevention services by providing some oral health services to patients with oral health problems. In addition, 94.7% of the CPs were willing to advance the cause of oral health care. The disposition of CPs towards oral health could serve as a platform to help propagate oral health care and awareness in their communities. Engaging the CPs might help reduce oral health disparities by increasing oral health awareness, improving oral health-seeking behavior and oral hygiene practices, and improving quality of life via cost effective delivery of pharmacy-based oral health care services.

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Dedication

To Oluwafunmilayo, Ayotomiwa and Boluwatife, three people who have added colors to my world.

Acknowledgments

The completion of this doctoral dissertation journey was made a reality with the support of many people. I want to sincerely appreciate them all. Let me start by recognizing the support, encouragements, advices and guidance received from my dissertation committee chair, Professor Raymond Panas. It was a privilege working under his leadership. He made the journey a pleasant experience. I thank you very much for everything. My special thanks also go to Dr. Donald Goodwin, my Dissertation committee member. His inputs were erudite, exhaustive, and very constructive. He opened my eyes to many salient features of scholarly academic writing. I feel very accomplished and confident being one of his students. I thank Dr. Namgyal Kyulo, my University Research Reviewer, for comments on my submitted work. It re-energized me to pursue academic excellence.

I want to appreciate my colleagues and superiors at ICOH for Africa, Jos under the leadership of Dr. O. A. Adeleke. They made my study period pleasant. I thank the Directorate of Pharmaceutical Services, the Plateau State Ministry of Health, the Chairman, Association of Community Pharmacists of Nigeria, Plateau State branch, all the CPs who volunteered their time for this study, Mr. Jalo Philip and Nnamdi Onyejiaka for their help, and importantly, Mr. Samuel Pam, who drove me around the whole of Plateau State for data collection. They were all instrumental to my success.

Finally, I want to appreciate my amiable wife and kids for their understanding during the period of my study and for their many sacrifices. I cannot have a better family. I thank my siblings also for their constant encouragements and series of support and very

importantly, I thank my mum: Mrs. Eunice Omogbemile Taiwo for her incessant prayers, supports and encouragements. Thank you very much.

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Chapter 1: Introduction to the Study

Introduction

Oral health conditions are globally regarded as public health issues requiring attention because of their effects on general health and productivity of those affected (Adeniyi, Sofola, & Kalliecharan, 2012). In the last 2 decades, the World Health Organization (WHO), via its Global Oral Health Program, had been working to increase oral health awareness. This program was designed to bridge the gap between developed and developing countries in terms of oral health status, access, affordability, and availability of oral health services (Karim, Mascarenhas, & Dharamsi, 2008; Petersen, 2009). However, in many African countries, there are still challenges with the availability of and accessibility to oral health services, especially among poor and socially disadvantaged people (Karim et al., 2008; Varennes et al., 2006). Thus, oral disease is still a challenge, and its burden is mounting in Africa (Petersen, 2009).

There is poor oral health awareness in Nigeria. Less than one-fifth of Nigerians have access to oral health care (Braimoh, Ogunbodede, & Adeniyi, 2014; Etiaba et al., 2015; Olusile, 2010; Osazuwa-Peters, 2011). This lack of access to oral health is mainly attributed to limited access to correct information on oral health and a lack of oral health workers (Olusile, 2010). This low awareness of oral health care leads to poor illness seeking behavior among the people as they are not well informed on preventive steps to avert the occurrence of oral diseases or how to get treatment for existing diseases (Sofola, 2010). Consequently, the few available oral health facilities are underused, and patients mostly present late for treatment with complications that may have been prevented

(Sofola, 2010). The dental profession, though young in the country, is fraught with many challenges, most important of which is poor funding (Arigbede, 2011; Olusile, 2010). The oral health sector receives less than 1% of the budgetary allocation to the Federal Ministry of Health (FMOH) in Nigeria (Ogunbodede, 2014). The budgetary allocations to FMOH are monitored for effectiveness and efficiency via the Department of Health Planning, Research and Statistics (FMOH, 2015a; Technical Working Group - National Strategic Health Development Plan/Health Sector Development Team, 2009). Poor allocation of funds to the oral health sector has resulted in ill equipped, poorly maintained, and obsolete facilities, as well as challenges with training oral health care providers and the exodus of those trained out of the country. Other problems are professional rivalries between oral health practitioners, inability to keep pace with current trends in oral health care, and a lack of data for policy and planning (Adeniyi et al., 2012; Braimoh et al., 2014).

Although there is poor oral health awareness throughout Nigeria, the impact is worse in Northern Nigeria (Olusile, 2010). According to Olusile, Adeniyi, and Orebanjo (2014), more than 70% of Nigerian adults have periodontal disease. This condition is associated with poor oral hygiene. They also stated that less than 20% of Nigerians visit their dentist regularly. Akpata (2004) highlighted a difference in the prevalence of dental caries among 12–15-years-old in the South-South geopolitical zone of Nigeria (3%) compared to that of the North-Central geopolitical zone (13%). Likewise, the mean number of decayed, missing and filled teeth (DMFT) in the South-South zone was 1.0 in contrast to 2.6 recorded for the North-Central zone (Akpata, 2004). Dental fluorosis, a

condition associated with a high concentration of fluoride in drinking water, is also more common in Northern Nigeria (Akpata, 2004). Dental fluorosis in Northern Nigeria is the result of poor oral health knowledge of those affected in the endemic areas. Olusile et al. (2014) also established that oral hygiene practices were poorer in Northern Nigeria compared to the South.

Poor oral health awareness in Nigeria is also due to an uneven distribution of oral health care workers and training facilities in the country. These factors do not support adequate access to oral health care services (Adeniyi et al., 2012; Olusile, 2010; Olusile et al., 2014). There are about 2,733 registered dentists in Nigeria expected to attend to more than 177 million Nigerians (Ogunbodede, 2014). This figure means an average dentist/population ratio of 1:64,800. The WHO (2015a) stated that there were 0.017 dentists per 1,000, a ratio of 1: 58,824, unlike the 1: 1,500 observed in developed countries. These ratios are not reflective of the entire country as the dental workforce is skewed to Southern Nigeria. The dentist/population ratio in the South is approximately 7 times as great as it is in the North (Table 1). Of the total number of registered dentists in the country, 86% are located in Southern Nigeria compared to 14% in the North (Ogunbodede, 2014). There are nine dental schools in Nigeria with a cumulative annual intake of 185 students (Medical and Dental Council of Nigeria [MDCN], 2014; Ogunbodede, 2014). Seven of these schools are located in Southern Nigeria, although Northern Nigeria is more populous (Ojiabor & Anofi, 2014); Northern Nigeria accounts for just 13.5% of the annual student intake. This disproportionate distribution of oral

Table 1

Distribution of Dentists in Northern and Southern Nigeria

NORTHERN NIGERIA			**SOUTHERN NIGERIA**		
States	Pop.[a]	No of Dentists[b]	States	Pop.[a]	No of Dentists[b]
FCT	1,405,201	50	Ebonyi	2,176,947	5
Nassarawa	1,869,377	6	Imo	3,927,563	29
Benue	4,253,641	14	Anambra	4,177,828	42
Plateau	3,206,531	30	Abia	2,845,370	17
Niger	3,954,772	18	Enugu	3,267,837	44
Kwara	2,365,353	22	Cross River	2,882,988	8
Kogi	3,314,043	6	Bayelsa	1,704,515	4
Adamawa	3,178,950	0	Akwa Ibom	3,902,051	5
Taraba	2,294,800	3	Rivers	5,198,716	46
Gombe	2,365,040	6	Delta	4,112,445	84
Yobe	2,321,339	3	Edo	3,233,366	195
Borno	4,171,104	15	Ondo	3,460,877	43
Bauchi	4,653,066	7	Lagos	9,113,605	885
Kebbi	3,256,541	1	Osun	3,416,959	96
Jigawa	4,361,002	1	Ekiti	2,398,357	22
Kaduna	6,113,503	59	Oyo	5,580,894	202
Kano	9,401,288	33	Ogun	3,751,140	58
Katsina	5,801,584	2			
Zamfara	3,278,873	1			
Sokoto	3,702,676	15			
Total	**75,268,684**	**292**		**65,151,458**	**1,785**

FCT -Federal Capital Territory; Pop. – Population. [a]National Population Commission Nigeria (2016). [b]Ogunbodede (2014).

health capacity and services in the country (as a result of the skewed training of oral health professionals and poor access to oral health care services) made oral health awareness poorer in Northern Nigeria, causing predilection for the development of preventable dental pathologies (Etiaba et al., 2015; Olusile, 2010). This is not the same with other health care facilities in the country as these are fairly distributed (FMOH, 2015b).

In order to address inequalities in oral health care, studies had proposed a paradigm shift from the traditional downstream biomedical approach (which predominantly focuses on cure of established disease conditions and addressing recognized harmful health behaviors) to the upstream model. The upstream intervention is preventive in nature, directed at circumstances that bring about harmful health behaviors and conditions. This model focuses on primary prevention and health promotion at the community level with such activities as educational media campaigns, legislative actions, healthy public polices, and community engagement. It is hoped that emphasis on the community level would elicit the desired oral health outcomes on disadvantaged populations (Karim et al., 2008). This study aimed at addressing this problem (poor oral health awareness in Plateau state, one of the states in Northern Nigeria) by identifying how community pharmacists (CPs) can be used as a medium to improve oral health care and awareness among the people. This chapter provides the background of the study, problem statement, purpose of the study, research questions and hypotheses, nature of the study, theoretical framework, assumptions and limitations, delimitations, significance and summary.

Background

One of the parastatals of the FMOH Nigeria under the Department of Dentistry to cater for the oral health needs and research initiatives of the WHO's African region is the Intercountry Centre for Oral Health (ICOH) for Africa. ICOH for Africa located in Jos, Plateau State, Nigeria was set up in 1988 in collaboration with the WHO. The Center is involved in conducting research, training, clinical services, advocacy, and demonstration activities relating to oral health problems. Due to the catchment area of the center, which extends to sub-Saharan Africa, the name of the center was changed from Intercountry Centre for Oral Health (ICOH) for Africa to the Regional Centre for Oral Health Research and Training Initiatives (RCORTI) for Africa. Though the Center is engaged in oral health research and training initiatives both within and outside Nigeria, the roles of CPs and other health care workers in improving oral health had not been assessed.

CPs in the past were druggists with very limited public health engagement (Meyerson, Ryder, & Richey-Smith, 2013). However, due to changing health environments and demands, their activities kept evolving. For example, in the 18th century, the apothecary who was a temporary vaccine distributor had his or her roles expanded to serve within prisons in the 20th century (Meyerson et al., 2013). The mid-1900s witnessed the emergence of the pharmacist immunizer and vaccine advocate while over the last 20 years, their duties had gone beyond routine dispensary of drugs to include active participation in public health promotion and education (Amien, Myburgh, & Butler, 2013; Offu, Anetoh, Okonta, & Ekwunife, 2015; Meyerson et al., 2013). They now constitute an important member of the health care team with crucial roles in health

promotion and preventive services. This is because they are accessible, often situated close to people's homes and generally not operating on appointment-based schedules (Cohen, 2013). More so, their advice is usually trusted, and visits to them are not charged (Cohen, 2013; Rubio-Valera, Chen, & O'Reilly, 2014; Steel & Wharton, 2011).

In Nigeria, as well as other developing countries, most illnesses are treated by self-medication, though this practice increases risks of drug resistance, adverse drug reactions, drug interactions, and polypharmacy (Afolabi, Ehalaiye, Fadare, Abdur-Rahman, & Ehalaiye, 2011; Eticha & Mesfin, 2014). Because of self-medication, the pharmacy is usually the first place for people with varied disease conditions or symptoms (Ogbo, Aina, & Aderemi-Williams, 2014). The pharmacy therefore constitutes a viable medium for dissemination of health information.

Some of the roles of CPs in general health promotion include screening, smoking cessation, drug misuse and alcohol consumption, osteoporosis screening, vaccinations, and health education (Cohen, 2013; Eades, Ferguson, & O'Carroll, 2011; Laliberté, Perreault, Damestoy, & Lalonde, 2012; Odedina, Warrick, Vilme, & Young, 2008; O'Loughlin, Masson, De´ry, & Fagnan, 1999). Others health topics considered for potential CP services include counselling for oral contraceptives use, rendering services for Type-2 Diabetes monitoring, and advising on medication regimen during Ramadan in Muslim communities (Amin, 2016; Amin & Chewning, 2016; Wibowo, Parsons, Sunderland, & Hughes, 2015).

Though CPs are positioned to offer advice on oral health and susceptibility to a variety of oral problems (Amien et al., 2013; Cohen, 2013; Mann, Marcenes, & Gillam,

2015; Wibowo et al., 2015), globally, only a few studies had been conducted to ascertain their roles in promoting oral health care. These were in countries with favorable dentist to population ratios like the United Kingdom (Chestnutt, Taylor, & Mallinson, 1998; Mann et al., 2015), North England (Maunder & Landes, 2005), South Africa (Amien et al., 2013; Gilbert, 1998), Saudi Arabia (Bawazir, 2014), New Zealand (Buxcey, Morgaine, Meldrum, & Cullinan, 2012) and India (Priya, Madan-Kumar, & Ramachandran, 2008). There is no record of similar studies in countries with poor oral health capacity like Nigeria. This study addressed this gap by identifying Nigerian CPs' self-assessed knowledge of oral health and their interests in providing support for oral healthcare for people in Plateau State, Northern Nigeria.

Problem Statement

Oral health is an integral component of general health and a major determinant of quality of life (Cohen, 2013; Petersen, 2009). The WHO (1992) found a dentist to population ratio of 1:7,500 effective for oral health delivery. However, in Nigeria, the ratio is approximately 1: 58,824, reaching around 1: 257,769 in Northern Nigeria, thus ranking the country as one of the poorest oral healthcare providers globally (Adetokunbo, Bamgbose, Adeoye, & Ladeinde, 2014; Ogunbodede, 2014; Olusile, 2010). Although there had been a gradual increase in the proportion of funds apportioned to oral health from the monetary allocations to FMOH rising from about 0.24% in 2006 to the present level of about 1%, the health sector as a whole is generally underfunded as with many other low income countries (Ichoku & Okoli, 2015; Mumghamba et al., 2015; Ogunbodede, 2014). Health funding in Nigeria is basically derived from budgetary

allocations sourced from petroleum taxes. These could account for up to 70% of total foreign exchange earnings and about 30% of Gross Domestic Product (GDP) in some years (Ichoku & Okoli, 2015). The impact of the country's GDP over years, specifically on oral health care, had not been assessed as oral health is usually merged with other conditions such as congenital anomalies, non-malignant disorders, blood and immune disorders, skin diseases, and genitourinary diseases under "non-communicable diseases" when assessing burden of diseases (WHO, 2015b).

Governmental expenditure on health had presently stagnated at less than 5% (Ichoku & Okoli, 2015). The parts related to oral health are mainly used in sustaining clinics managed by the Federal government, leaving little to no resources for conducting national programmes on oral health (Adeniyi et al., 2012). As a result, there is widespread poor oral health awareness in Nigeria with a preponderance in Northern Nigeria (Olusile, 2010; Sofola, 2010). Poor oral health awareness can further be attributed to the lopsided distribution of oral health care workers and training facilities in the country, grossly inadequate resources which are often over stretched in many areas, and insufficient stewardship of the Nigerian oral health care system (Adeniyi et al, 2012; Olusile, 2010). This has led to often preventable dental diseases (Olusile, 2010). To date, in Nigeria, there are no studies addressing this challenge via the engagement of CPs as a medium to improve oral health awareness. This study described the roles CPs in Plateau State, Northern Nigeria can play as potential sources of oral health information.

Purpose of the Study

The basic responsibilities of pharmacists as agents for dispensing medications had broadened to encompass other areas of health care including health promotion and preventive services (Amien et al., 2013; Amin, 2016; Cohen, 2013; Wibowo et al., 2015). As a result, they are suitably positioned to offer advice on oral health care, oral complications of medications, and susceptibility to a variety of oral problems (Amien et al., 2013; Cohen, 2013; Laliberté et al., 2012; O'Loughlin et al., 1999). This quantitative study described the roles CPs in Plateau State play as potential sources of oral health information. The study was done by assessing the background knowledge and practices of oral health care of CPs and relating these with their demographic characteristics. This would serve as a platform upon which CPs in Plateau State can be empowered and engaged as media to propagate oral health care and awareness in their communities.

Research Questions and Hypothesis

The following are the research questions this study answered:

RQ1: What is the relationship between seven demographic factors and knowledge of oral health by CPs practicing in Plateau State, Northern Nigeria?

1. Age
2. Gender
3. Duration of practice
4. Geographical location
5. Educational level
6. Prior dental education

7. Previous dental visits of CPs practicing in Plateau State, Northern Nigeria

$H1_o$: Age, gender, duration of practice, geographical location, educational level, previous dental visits, and prior dental education are not significantly correlated with knowledge of oral health by CPs practicing in Plateau State, Northern Nigeria.

$H1_1$: Age, gender, duration of practice, geographical location, educational level, previous dental visits, and prior dental education are significantly correlated with knowledge of oral health by CPs practicing in Plateau State, Northern Nigeria.

RQ2: What is the relationship between eight demographic factors and CPs' interest in becoming more involved in provision of services for oral health problems?

1. Age
2. Gender
3. Duration of practice
4. Geographical location
5. Educational level
6. Average number of patients with dental complaints seen per week
7. Prior dental education
8. Previous dental visits of CPs practicing in Plateau State, Northern Nigeria

$H2_o$: Age, gender, duration of practice, geographical location, educational level, average number of patients with dental complaints seen per week, prior dental education, and previous dental visits of CPs practicing in Plateau State, Northern Nigeria are not

significantly correlated with their interest in becoming more involved in provision of services on oral health problems.

$H2_1$: Age, gender, duration of practice, geographical location, educational level, average number of patients with dental complaints seen per week, prior dental education, and previous dental visits of CPs practicing in Plateau State, Northern Nigeria are significantly correlated with their interest in becoming more involved in provision of services for oral health problems.

RQ3: Is there any significant difference between CPs registered with Association of Community Pharmacists in Nigeria (ACPN) practicing in Plateau State and those not registered with ACPN regarding knowledge of oral health?

$H3_o$: There is no statistically significant difference between CPs registered with ACPN practicing in Plateau State and those not registered with ACPN regarding knowledge of oral health.

$H3_1$: There is a statistically significant difference between CPs registered with ACPN practicing in Plateau State and those not registered with ACPN regarding to knowledge of oral health.

Theoretical Framework for the Study

The theoretical framework for this study was the theory of planned behavior (TPB). The TPB is a behavioral theory developed as an extension of the Theory of Reasoned Action (TRA; Ajzen, 1991). Since TRA's model had shortcomings in dealing with behaviors which people have limited free will over, an extra construct - perceived control over behavior was added by Icek Ajzen, and colleagues in the early 90s (Ajzen,

1991). Therefore, having attitudes, subjective norm, and behavioral intentions (the three constructs of TRA) as constant, TPB postulates that voluntary behaviors are largely determined by intentions regarding the behavior while intentions are predicted by attitude, views of what individuals think of the behavior (subjective norms), and the extent to which one feels either capable or incapable of performing the behavior (perceived behavioral control) (Ajzen, 1991; Eades et al., 2011; Fleming et al., 2014). More insights on the development and propositions of TPB appear in Chapter 2.

Both TRA and TPB had been widely used in predicting a wide variety of health behaviors and intentions (Albarracin, Johnson, Fishbein, & Muellerleile, 2001; Armitage, & Conner, 2001; Gangal, 2013). TPB had also been used in studies to assess health care professionals' intentions and behaviors such as pharmacists' asthma management, reporting of adverse drug events, and the provision of medication therapy (Fleming et al., 2014). TPB had also been used to assess the potential collaboration and barriers between CPs and physicians in their roles as public health agents, and to predict CPs' behavioral intention in providing general clinical services (Puspitasari, Costa, Aslani, & Krass, 2016; Rubio-Valera et al., 2014).

Nature of the Study

This study was quantitative, employing a non-experimental research design. Cross sectional study, a quantitative research design was used for this study. This design is ideal for a large population of research participants scattered over a geographical area (Levin, 2006).

CPs' interest in becoming more involved in provision of services on oral problems and knowledge of oral health were the main dependent variables in this study. Other variables included attitudes towards the provision of oral health care and provision of oral health services to patients with oral complaints. Independent variables in this study were age, gender, duration of practice, geographical location, educational level, and average number of patients with dental complaints seen per week. Other variables were frequency and average number of patients requiring oral health care seen at the practice per week, most frequent oral health advice required by the patients, and barriers to the provision of oral health services. The frequency based variables were objectively recorded through having CPs maintain a log in their practices for two weeks from where the needed information was extracted. Identified confounding variables that could influence the associations between some of the independent variables and dependent variables were prior dental education, prior visit to a dental clinic, stocking of oral health care products, and reimbursement or payment for oral service provision.

All practicing CPs in Plateau State served as the study sample. The figure was given as 120 by the Chairman of the Plateau State branch of the ACPN though not all practicing CPs in the state were registered with the body (Appendix A). A survey instrument developed by Mann et al. (2015) was modified and used for data collection. The Mann et al. instrument by was designed to collect information on potential roles of CPs in the promotion of oral health advice and to determine the level of knowledge that CPs may already possess concerning oral health. The modified survey instrument included a section for me to note those CPs who were registered or not with the

Department of Pharmaceutical Services, Plateau State Ministry of Health. This helped during data analysis to compare responses from both categories. I kept a list of how many were found in each category.

Data collection was the survey method using paper based self-administered questionnaires. I handed the instrument to identified CPs who fulfilled the inclusion criteria (at their practice locations). The details of this process are expounded in Chapter 3. Collected data was analyzed using SPSS software version 23. Analysis included both descriptive statistics and bi/multivariate analysis for inferential questions.

Definitions

Community: A group of people in a geographic setting with different characteristics sharing common social perspectives (MacQueen et al., 2001)

Community Pharmacist (CP): The health care provider most accessible to the public. They supply medicine based on prescription, counseling patients, and participating in health promotion activities. They also maintain links with other health care professionals (WHO, 1994).

Community Pharmacy: The first level of contact of individuals of a community with health care. It includes all those privately-owned establishments whose functions in varying degrees includes the provision of the drug need services for the community and other pharmaceutical needs (Meyerson et al., 2013)

Oral Health: A state of health of the mouth and associated tissues which allows an individual to function well without disease, uneasiness, or humiliation, contributing to general well-being (Kamran, Bakhteyar, Heydari, Lotfi, & Heydari, 2014).

Oral Health Awareness: Personal or public awareness of the existence and prevention of oral diseases and knowledge of the requisite steps to take for treatment when such diseases occur (Sofola, 2010)

Pharmacist: One of few medical professionals with a minimum professional (university) qualification in pharmacology to whom a patient or anyone else can easily access for consultation or advice without an appointment (Berg, Dodd, & Dodd, 2009).

Assumptions

For this study, it was assumed that oral health consultations in community pharmacies were handled by the CPs rather than pharmacy counter assistants (PCAs) or drug dispensers. PCAs, being the first set of people encountered by the public in community pharmacies for different requests, traditionally handle a large proportion of transactions before challenging ones are referred to the CPs on duty. It was also assumed that not all practicing CPs in Plateau State, Northern Nigeria were registered with their parent body, the ACPN, Plateau State branch, such that the actual population of CPs practicing in Plateau State may be more than the registered figure (120) with the state branch of ACPN. Lastly, it was assumed that participation in the study was based on the participants' free will and responses were as truthful as possible.

Scope and Delimitations

A delimitation for this study was the geographic limit of the study: Plateau State, one out of 20 States which comprised Northern Nigeria. Due to time, logistics, and financial constraints, it was impossible to incorporate or survey more than a state. Another delimitation in this study was the scope of the study which was community

pharmacies alone. Community pharmacies are not the only retail outfit where people can consult for oral health care. In Nigeria, there are other retail stores such as Patent Medicine Stores and Chemists which also sell government approved over-the-counter medicines. Though they do not offer pharmaceutical services, patients with oral health concerns can also visit them for desired oral health care.

Limitations

A cross sectional design is generally limited in not being able to establish sequence of events. This was addressed by ensuring that the survey instrument (used for this study) captured the needed constructs for this study. More so, the research questions for this study did not require a temporal association to answer them. Though this type of design is limited in that it is prone to bias (measurement and recall) and low response (Levin, 2006), this challenge was addressed by accessing the CPs individually at their practice which improved response level. More so, the use of a log to objectively assess patient flow in the pharmacies two weeks before the administration of the survey instrument went a long way to minimize recall bias.

Even though all the community pharmacies in the state were approached, the geographic distribution of the pharmacies was lopsided. Only 5 Local Government Areas (LGAs) out of 17 LGAs in the state had presence of CPs, the bulk of which were clustered around the state capital Jos. Being commercial entities, the community pharmacies were found in urban areas and not all the views of the CPs in the state were captured, as some declined, a sizeable amount were not available, and others were excluded. Though it was assumed that the CPs answered the questions truthfully, this

could never be fully guaranteed. Some of the CPs may have fallen victim to obsequiousness bias because the interviewer was a dentist.

Significance

This research filled a gap by ascertaining the roles CPs play in promoting oral health care and awareness in Plateau State, Nigeria, a developing country with a poor dentist to population ratio. This is the first account of such a description in Nigeria. Findings of this study provided relevant information regarding what are the presently obtained knowledge levels and practices of oral health care according to CPs in Plateau State. These findings could aid relevant stakeholders in fashioning a capacity development program in oral health care for CPs and how they can be engaged to propagate oral health care and awareness, thus complimenting the work of oral health care workers in rendering dental services. This is because CPs are more accessible to patients than any other healthcare professional (Adje & Oli, 2013; Soyemi & Hunponu-Wusu, 2015). This could help reduce oral health disparities by increasing oral health awareness, improving oral health seeking behavior and oral hygiene practices, and improving quality of life via cost effective delivery of pharmacy-based oral health care services.

Summary

Oral health conditions are global public health issues. Though the WHO had been making efforts towards reducing oral health disparities and inequalities among member states by improving oral health awareness, there are still many challenges affecting oral health care provision in Africa. Nigeria is grappling with the effects of poor oral health

awareness. This is caused by poor budgetary allocation to oral health care and services culminating in poor oral health capacity and services. Though there is poor oral health awareness in Nigeria, it is more pronounced in Northern Nigeria due to the disproportionate distribution of oral health manpower and services in the country. This had made this part of the country have problems with oral diseases. An approach towards addressing inequality in oral health is a paradigm shift from the traditional downstream approach to the more innovative upstream approach, which has a prevention focus. It is hoped that by engaging the community, desired oral health outcomes can be achieved.

This study identified the roles CPs in Plateau State, Northern Nigeria can play in improving oral awareness because of their many advantages including accessibility and availability by being often situated close to people's homes and rendering services not on an appointment based schedule. More so, visits to them do not constitute any direct charge on people.

By virtue of the evolving health care field, the traditional roles of CPs have advanced to include many areas of health care including health promotion and prevention. This development had made them a source of information for the public and a potential medium through which much-needed information on oral health can be conveyed to the disadvantaged population. Chapter 2 detailed a review of literature on the roles of CPs in various aspects of public health including their reported roles in oral health care, opportunities, challenges, and recommendations for engaging them as agents of transformation in oral health care.

Chapter 2: Literature Review

Introduction

There is poor oral health awareness in Nigeria with preponderance in Northern Nigeria (Olusile, 2010; Sofola, 2010). This is due to the lopsided distribution of oral health care workers and training facilities in the country, inadequate resources which are often overstretched in many areas, and the insufficient stewardship of the oral health care system in the country (Adeniyi et al., 2012; Olusile, 2010). This poor oral health awareness has led to often preventable dental diseases (Olusile, 2010). In Nigeria, to date, there are no studies addressing this challenge by engaging CPs as media to improve oral health awareness. This study described roles CPs in Plateau State, Northern Nigeria play as sources of oral health information for the people. This could serve as basis upon which they can be empowered and engaged as media for dissemination of oral health care and awareness in their communities.

Summary of Literature Establishing Relevance

Despite the WHO's efforts to improve global awareness of oral health, in many African countries, there are still challenges with availability and accessibility of oral health services (Karim, et al., 2008; Petersen, 2009; Varennes et al., 2006). For this reason, oral disease remains a major challenge, and its burden is mounting in the continent (Petersen, 2009). During the Sixtieth World Health Assembly, member states were urged among others to promote availability of oral health services geared towards disease prevention and general health promotion, especially for the poor and disadvantaged populations (Petersen, 2009).

Oral health awareness can be defined as the individual or public awareness of the existence and prevention of oral diseases and knowledge of the requisite steps to take for treatment when such diseases occur (Sofola, 2010). There is poor oral health awareness in Nigeria, and less than 20% of Nigerians have access to oral health care (Braimoh et al., 2014; Etiaba et al., 2015; Olusile, 2010; Osazuwa-Peters, 2011). Sofola (2010) reported that 52%-80% of Nigerians had never visited a dentist. This did not mean that they had no oral health needs as within the previous year alone, about 37.8% of the respondents experienced dental pain (Sofola, 2010).

Dental pathologies could be signs of underlying systemic conditions, though some of them may have benign or mild manifestations (Amien et al., 2013). The burden of oral diseases is a result of poverty, high illiteracy rate, poor oral hygiene habits, lack of timely access to oral health services, unavailability and unaffordability of oral health services, and absence of oral health education (Karim et al., 2008). Some of the dental pathologies in socially disadvantaged people include dental caries, erosion, trauma, and fluorosis. Others are gingivitis, periodontal diseases, oral cancers and oral manifestations of HIV/AIDS (Karim et al., 2008). Apart from these clinical manifestations and their detrimental effects on health (quality of life), this leads to loss of function which can lead to malnutrition, facial mutilation, time lost from work, business, or school, and general social isolation (Braimoh et al., 2014; Karim et al., 2008; Okunseri, Chattopadhyay, Lugo, & McGrath, 2005).

It is likely an individual suffering from toothache would contact the pharmacist rather than the dentist (Mann et al., 2015). Amien et al. (2013) stated that many people

with dental lesions often bypass the doctors and dentists to see the pharmacists for symptomatic relief. This happens because most dental conditions are painful and disturb the activities of the day as well as affect quality of life of. Such an experience propels people to seek or request an over-the-counter drug for pain relief as it is more convenient compared to scheduling an appointment with the dentist where there might be a long waiting time for such an emergency (Mann et al., 2015).

In Nigeria, as with many other developing countries, the pharmacy is the first resource for people with varied disease conditions (George, Molina, Cheah, Chan, & Lim, 2010; Ogbo et al., 2014). Though Sofola (2010) argued that physicians are probably the first point of contact for those with oral disease in developing countries, a culture of self-medication and self-care is rife in these areas (Afolabi et al., 2011; Auta et al., 2012). This behavior of self-care is augmented by high cost of medical care, poor access to health facilities, and a belief that such ailments are minor (Afolabi et al., 2011; Auta et al., 2012). Self-care, which can be defined as those things people do for themselves to institute and maintain health and prevent and address illness, is a very common practice in Nigeria (Afolabi et al., 2011; Mohamed, Mahmoud, & Ali, 2014).

Community pharmacies are independent, chains, or supermarket based pharmacies directly serving the general public (Meyerson et al., 2013). They are becoming an important source of treatment in developing countries, contributing as much as 80% of health provision in many countries (Faduyile, Oparah, & Oreagba, 2012). With the volume of nonprescription products in the market, a lot of people visit CPs as their first point of contact for health care (Azmi, Nazrin, & Azmi, 2012). According to Cohen

(2013), over 250 million people visit the pharmacy weekly. This positions them as a source of public health resources for the public and a medium to deliver dental health care related information (Amien et al., 2013; Cohen, 2013). Patient-centered activities of CPs have had a positive impact in terms of health outcomes, quality of life, cost-effectiveness of the patient orientated services, and improvement of patients' drug use and compliance (Azmi et al., 2012).

There has been increased interest in extending CPs' functions toward playing a greater role in public health services (Laliberté, Perreault, Damestoy, & Lalonde, 2013). This is an alternative to addressing many public health challenges, which are over stretching the capacities of local government agencies like in Nigeria, a country burdened by paucity of adequately trained health care workforce (Laliberté et al., 2012; Offu et al., 2015; Rubin et al., 2014). CPs are now required to work in partnership with the governments not only through their traditional roles of dispensing medications, but through other areas such as disease surveillance, health promotion campaigns, smoking cessation services, community outreach, and risk communication (Eades et al., 2011; Rubin et al., 2014).

The regulatory body for pharmacy practice in Nigeria, the Pharmacist Council of Nigeria (PCN) also recognizes the changing role of CPs. Consequently, the PCN formulated novel standards to improve practices of pharmaceutical care in the country. These standards stipulate some areas of public health activities for the pharmacists, including control of infectious diseases such as HIV/AIDS and sexually transmitted diseases (STDs), birth control, health promotion initiatives on substance abuse, smoking

cessation, drug use during pregnancy, and programs to help with baby development (Offu et al., 2015). Additionally, the standard encouraged disease prevention activities such as immunization campaigns and screening for chronic diseases (Offu et al., 2015). This new position for pharmacists could be explored to see how it could help reduce oral health disparities and improving quality of life (Soyemi & Hunponu-Wusu, 2015).

Preview of Major Sections of the Literature Review

In this chapter, I establish the relevance of this study. The remaining sections of this chapter cover the strategy used for literature search, the theoretical framework for the study, a review of the public health roles of CPs, the perception of both pharmacists and the general public to the roles, barriers against these roles, and a classification of these roles. The chapter also includes an overview of CPs and oral health. This section is comprised of their knowledge of oral health, encounters with patients requiring oral health care, the types of oral health conditions they see, and their general roles in oral health care. The effects of demographic factors of CPs on their roles in oral health are also discussed as well as potential barriers to these.

Literature Search Strategy

Material for the literature review was obtained by searching electronic databases, dissertations and theses available electronically, and reference lists of identified relevant articles. Electronic databases included CINAHL plus with full text, Medline with full text, Dissertations and Theses at Walden University, and PubMed. The Google search engine was also used to supplement the electronic databases. The databases were searched from January 1, 2010 to December 30, 2015 to identify relevant citations. The

search was restricted to articles published in English, peer reviewed, and full text for the electronic databases. Reference sections of identified relevant articles were further checked to retrieve more materials. For those important materials identified from articles and Google whose full text was not available in Walden Library, requests were sent to the Walden Library team for help with the full text copies.

Keywords were used in the search of databases and Google. These terms were searched individually or in combination to ascertain relevant articles for consideration. The keywords were:

- *Community pharmacists*
- *Public health*
- *Oral health*
- *Dental health*
- *Oral health awareness*
- *Dentistry*
- *Self-medication*
- *Nigeria*

Theoretical Foundation

The Theoretical framework for this study was the theory of planned behavior (TPB). The TPB is a model that has been widely used to predict and change behavior across a range of settings (Gangal, 2013). TPB's development was necessitated by the TRA model's shortcomings in dealing with behaviors which people have limited free will (Ajzen, 1991). According to the TRA, the stronger one's convictions that positively

valued outcomes would proceed from a behavior, the stronger the attitude towards it. Also, if one believes that important or respected authorities (individuals or institutions) would approve of a particular behavior, there would be strong subjective norms towards that behavior and vice versa (Fishbein, 1967).

Perceived control initially originated from the self-efficacy theory (SET) proposed by Bandura in 1977 (Ajzen, 1991; Bandura, 1977; Gangal, 2013). The concept considers situations where one may not be able to exercise complete freewill over the behavior in view of perceived presence or absence of barriers to behavioral performance (Ajzen, 1991; Ajzen, 2002). Therefore, having attitudes, subjective norms, and behavioral intentions (the three constructs of TRA) as constant, TPB postulates that a person's view of how easy or difficult performing a behavior is will affect their intentions for such an action (Figure 1) (Ajzen, 1991).

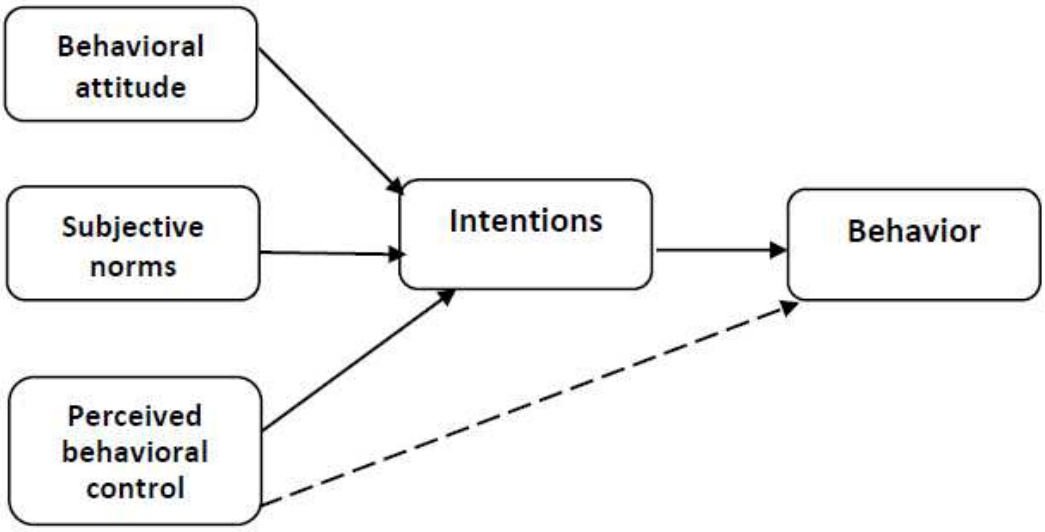

Figure 1. Ajzen's theory of planned behavior model.

Voluntary behaviors are largely determined by intentions regarding the behavior while intentions are predicted by attitudes towards the behavior (Eades et al., 2011). Likewise, views of what important people think of the behavior (subjective norms), and the extent to which one feels either capable or incapable of performing the behavior (perceived behavioral control) affect the intentions in performing the behavior (Eades et al., 2011; Fleming et al., 2014). Additional variables could be included in the TPB model, making it a modified TPB model (Ajzen, 1991). For example, knowledge can be included on the premise that there is a direct relationship between knowledge and intentions (Gangal, 2013). Therefore, the more knowledgeable a person is about a particular situation, the more the tendency or intention towards that particular behavior (Gangal, 2013). Another modified TPB was the inclusion of the variable past behaviors to investigate the motivation of pregnant women towards practice of pelvic floor exercises during pregnancy (Gangal, 2013).

According to Fleming et al. (2014), the TPB had also been used to assess health care professionals' intentions and behaviors such as pharmacists' asthma management, reporting of adverse drug events, and the provision of medication therapy management. Similarly, in order to assess the potential collaboration and barriers between CPs and physicians in their roles as public health agents, Rubio-Valera et al. (2014) utilized TPB to interpret the framework. Constructs in TPB had also been used to predict CPs' behavioral intention in providing general clinical services, not necessarily specific to a condition (Puspitasari et al., 2016). An advantage of TRA/TPB is that it helps to create a

framework which aids in identifying the reasons and factors that motivates people to take up a behavior of interest (Ajzen, 1991).

In pharmaceutical studies utilizing TPB, perceived behavioral control refers to the perception of the pharmacists' ability and the ease or challenges and the extent of control over performing the behaviors. In the same vein, subjective norms in these studies refers to pharmacists' perception of the views of the patients, general practitioners, colleagues, regulatory bodies, and the government about their behaviors (Puspitasari et al., 2016). According to Eades et al. (2011), in order to understand and assist the behavior changes associated with providing public health services in community pharmacies, it is important to establish the beliefs of the general public and pharmacists regarding this role. Pharmacists had frequently reported negative attitudes from patients and general practitioners and low expectation of the services as significant barriers to the services (Puspitasari et al., 2016).

Though TPB cannot entirely predict behaviors as it had not been able to sufficiently accommodate the influences of other factors like environment on beliefs and attitudes in adopting a practice change, findings from the studies using constructs from TPB had been able to highlight the important roles of beliefs in understanding behaviors (Eades et al., 2011; Puspitasari et al., 2016). More so, many researchers had concluded that TPB is a useful framework in predicting levels of clinical pharmaceutical services (Puspitasari et al., 2016). The use of this theoretical framework in pharmaceutical research has been cited as an avenue to improve the value and understanding of research findings (Eades et al., 2011; Puspitasari et al., 2016).

Community Pharmacists

In 1988, at the regional office of the WHO in New Delhi, India, a consultative meeting was convened on the roles of the pharmacist in the health care system (WHO, 1994). Among the objectives of this meeting was the delineation of the body of knowledge and skills upon which the contribution of pharmacists to health care is based and to review the traditional duties of the pharmacists alongside other health related activities (WHO, 1994). In the report of this group, community pharmacists were defined as stated below:

> Community pharmacists are the health professionals most accessible to the public. They supply medicines in accordance with a prescription or, when legally permitted, sell them without a prescription. In addition to ensuring an accurate supply of appropriate products, their professional activities also cover counselling of patients at the time of dispensing of prescription and non-prescription drugs, drug information to health professionals, patient and the general public and participation in health-promotion programmes. They maintain links with other health professionals in primary health care (WHO, 1994, p. 10)

They are usually found in the community setting such as independently owned pharmacies, those attached to shopping malls, retail stores and pharmacy chains. Their functions readily differentiate them from other pharmacists in established health care institutions (e.g. hospital pharmacists), industrial pharmacists, nuclear pharmacists, pharmacists serving as sales representatives of pharmaceutical companies, intern

pharmacists, veterinary pharmacists, those in the academia (as lecturers/faculties) and other pharmacists not having direct professional contact with the community (Mann et al., 2015; WHO, 1994).

Though CPs have some sort of involvement in health promotion, in the last 20 years, focus on this aspect had received more attention (Eades et al., 2011; Meyerson et al., 2013). In the last decade, a lot of effort had been put into changing the role of the CPs from traditional drug dispensing into a provider of public health services (Saramunee et al., 2014). This involvement of CPs in health promotion activities was anticipated to reposition the profession in the 21st century (Beshir & Hanipah, 2012).

Different methodologies had been utilized in accessing the roles of CPs in public health. Some of these includes cross sectional studies (Bello & Bello, 2013; Laliberté et al., 2012), quasi-experimental study (Faduyile et al., 2012), systemic reviews (Eades et al., 2011; Lai, Trac, & Lovett, 2013; Todd et al., 2014), personal opinions, viewpoints (Cohen, 2013; Meyerson et al., 2013; Rubin et al., 2014) and qualitative interviews (Buxcey et al., 2012). The large sample sizes of most of the cross-sectional studies and the number of reviewed studies in the systematic reviews were a boost to the external validity of the findings (Levin, 2006). A challenge with some of the studies was the response rate of the research particiants (Amien et al., 2013; Gilbert, 1998; Mann et al., 2015). Heterogeneity of some articles (in terms of data collection methods, research designs, different demographic parameters) included in the systemic reviews decreased the ability to summarize trends and may account for some of the inconsistencies in findings (Eng, 2003).

Major constructs examined in these studies were CPs' perception of their roles as public health agents, competence, knowledge, barriers and trainings (Eades et al., 2011; Laliberté et al., 2012; Offu et al., 2015). The effects of attitudes and beliefs of CPs were assessed as determinants of public health practices (Eades et al., 2011; Odedina et al., 2008). Independent correlates of prevention practices such as size of the pharmacy, being proprietors, job satisfaction, educational level and attendance at professional development courses were also checked (O'Loughlin et al., 1999). Practice location of the CPs was examined as a possible influence to the type of services rendered by CPs (Amien et al., 2013). Identified factors affecting the roles of CPs on oral health included perceived socio-economic status of the clients, gender, location of practice and age of both the pharmacist and patients (Amien, 2008; Cohen, 2013; Gilbert, 1998; Mann et al., 2015; Maunder & Landes, 2005; Priya et al., 2008). Others were number of years in practice, number of years' post-graduation and the local profile and prevalence of oral diseases (Amien, 2008).

Public Health Roles of Community Pharmacists

Introduction to expanded role. The basic responsibilities of pharmacists as agents for dispensing medications had broadened to encompass other areas of health care including public health (Laliberté et al., 2012; O'Loughlin et al., 1999). Public health is a well-structured or organized effort of the community for protecting, promoting, and restoring the general health of the community (Hassali, Subish, Shafie, & Ibrahim, 2009). Public health roles of CPs are those which act on factors influencing the health of a population, group or sub-group rather than that of an individual in which case it would be

classified as clinical service (Laliberté et al., 2012). Cohen (2013), identified new roles of pharmacists in the United States to include vaccinations, health education and health promotion. In Great Britain, following the introduction of a new pharmacy contract in 2005 in England and Wales and in 2006 in Scotland, pharmacists were required to provide information on healthy living, self-care, smoking cessation, sexual health services and health promotion (Eades et al., 2011). Other non-traditional roles engaged in by pharmacists includes counseling, patient follow-up to monitor drug compliance and screening for risk factors of common chronic diseases (O'Loughlin et al., 1999; Odedina et al., 2008).

Advantages of community pharmacists in public health. CPs are the most accessible healthcare provider with greater than 90% of the population visiting them during a year (Adje & Oli, 2013; Hassali et al., 2009; Soyemi & Hunponu-Wusu, 2015). According to Cohen (2013), globally, up to 250 million people visit the pharmacy in a week. Chestnutt et al. (1998) put the figure at six million people daily – possibly a reflection of when the paper was published. Notwithstanding, for many patients seeking care, the CP may be the first or only contact with a health care worker (Cohen, 2013). This is because they are most often located beside people's homes requiring no appointment for visits (Cohen, 2013; Faduyile et al., 2012; Mann et al., 2015). They are readily available as most are opened for long working hours spanning a whole day in some situations (Laliberté et al., 2012; Mann et al., 2015). They have deep understanding of many public health issues and their advices are usually trusted by the general public (Laliberté et al., 2013; Lai et al., 2013). In addition, visits to the CPs do not constitute any

direct charge on the people, even in situations where there might be some charges, it is far less to what could have been required for physician or dental consultations (Cohen, 2013; Rubio-Valera et al., 2014).

Community pharmacists can cooperate with dentists to meet the oral health needs of the people (Mann et al., 2015). Their use in public health initiatives also serves as a mechanism to increase accessibility to a range of public health services, thus strengthening health care systems and surveillance (Rubin et al., 2014; Saramunee et al., 2014). However, factors such as funding, regulation and how CPs operate is what eventually determines their impact in public health. (Saramunee, Chaiyasong, & Krska, 2011). On the contrary, Jin et al. (2014) were of the view that accessibility of pharmacists to the general public was a pattern noticed in developed countries as the pharmacists' population ratio is very poor especially with the poor and in rural locations. As a result, community members hardly come across pharmacists. Irrespective of these views, CPs are more accessible to patients than any other healthcare professional (Adje & Oli, 2013; Soyemi & Hunponu-Wusu, 2015).

Pharmacist's perception of extended public health roles. Majority of pharmacists in a survey in Scotland agreed or strongly agreed that public health is important to their practice. More than half were of the view that they were public health practitioners. Likewise, in a Nigerian study, most of the CPs interviewed believed it was acceptable for pharmacists to be involved in health promotion activities. Pharmacists and support staff taking part in focus groups in Sweden on the whole also welcomed their role as health promoters. Perceptions regarding the pharmacists' role in smoking cessation

counselling were generally favorable likewise the pharmacist's role in sexual health services were generally positive. Furthermore, the attitudes of CPs towards providing services for drug misusers have become more favorable over recent years (Eades et al., 2011). These findings ascertain the professions' widespread acceptance of the changing roles of CPs from the traditional dispensing of medications to include health promotion and prevention and an understanding of the relevance of such services (Laliberté et al., 2012). In spite of being positive about their roles as agents for public health activities, some pharmacists rated public health activities significantly lower in importance compared to other aspects of professional practice (Cohen, 2013; Eades et al., 2011; Laliberté et al., 2012; WHO-AFRO, 2016).

Public perception of public health roles of community pharmacists. Though the roles of CPs had been extended to include public health services, literature shows that majority of the public are not aware of such public health roles and that most of such services were not utilized (Saramunee et al., 2014). Users of nicotine replacement therapy in a study in the USA on average rated the appropriateness of pharmacists taking an active role in smoking cessation as 6.9 out of 10 (1 = not at all appropriate and 10 = extremely appropriate) (Eades et al., 2011). In a Pakistani study, the perception of the public on CPs' public health roles was based on the potential benefits derivable such, i.e. the ability of the pharmacists to help them (Jin et al., 2014). Another study in South Carolina, USA, showed that physicians approve of the extended roles of CPs as an avenue for advocacy to help provide patients with medical information (Lai et al., 2013).

Barriers to public health practice. There is considerable interest on the part of CPs to expand their services to include public health activities but a lot of barriers are militating against this desire (O'Loughlin et al., 1999). Such barriers include lack of time (Eades et al., 2011; Laliberté et al., 2012; Offu et al., 2015), no reimbursement for public health related services rendered (Laliberté et al., 2012; Meyerson et al., 2013), and lack of adequate facilities (Eades et al., 2011). Others are pharmacist – physician – patient relationships, unavailability of private counselling area, lack of customer demand for such services, customer reactions, lack of awareness of pharmacists' role in public health, confidentiality concerns, lack of access to patient's records, uncooperative patients, government regulations, inadequate staff and inadequate training for public health services (Eades et al., 2011; Laliberté et al., 2012; Offu et al., 2015; Wibowo et al., 2015). This study ascertained if these factors also apply in a Nigerian setting.

Between one third and one half of pharmacists in three studies felt that lack of training or lack of knowledge and skills was a barrier to their smoking cessation practice. Pharmacists and support staff in Scotland also felt that lack of training was a main difficulty in providing advice on prevention of HIV/hepatitis while over 80% of pharmacists in a study in New Zealand felt that lack of training was a barrier to providing alcohol screening and interventions (Eades et al., 2011).

Findings regarding confidence and competence in providing health promotion services were mixed. A survey of pharmacists in Scotland found that around one third of participants did not feel that they were competent in promoting and protecting the populations' health or encouraging behavioral change. Two thirds felt they lacked the

requisite knowledge and one third felt they could not apply their knowledge. Pharmacists taking part in a survey in Moldova rated their competence in health promotion activities as medium in aspects of professional practice. In contrast, the majority of pharmacists (95%) in a survey in Nigeria felt confident in advising patients on health promotion (Eades et al., 2011).

Another barrier worthy of note is the role of policy. Classic example is the definition of who a health care provider is. Despite provision of health services, pharmacists are not classified as health care providers (Meyerson et al., 2013). Though nurses, physician assistants and pharmacists share similar roles as primary health care providers: promoting the health of the public, preventing and treating disease, counselling and education of the public; only nurses and the physician assistants are listed as Non Physician Practitioners (NPPs) by the American Academy of Family Physicians (AAFP) (Lai et al., 2013). As a result of this inequality, pharmacists are not adequately reimbursement nor compensated for services rendered to the public and are also subject to litigations without protection (Lai et al., 2013; Meyerson et al., 2013). It is not known whether Nigerian pharmacists acting as non-physician practitioners experience same. This study sought to know about such barriers. It is important to honor pharmacists for the extended services they provide (Lai et al., 2013). This would require policy amendments for the recognition of health care provider designation status for pharmacists so as to encourage a sustainable, qualitative and reimbursed service provision (Meyerson et al., 2013).

Classification of roles in public health. Since the inclusion of public health roles in the practice of CPs, some of the medical disciplines where CPs had been active includes: health promotion and screening, smoking cessation, drug misuse and alcohol consumption. Others are weight management, osteoporosis screening, chlamydia testing, oral health, asthma management, cancer screening, emergency hormonal contraception, maternal and child health, and mental health (Cohen, 2013; Eades et al., 2011; Faduyile et al., 2012; Laliberté et al., 2013; Odedina et al., 2008; Rubio-Valera et al., 2014). Health promotion and preventive services refers to public health services geared towards the improvement of the general health of the population via interventions aimed at improving health and wellbeing (Laliberté et al., 2012). The public health roles of CPs could be better understood when viewed from three levels of prevention: primary, secondary and tertiary (Farris & Johnson, 2010; Offu et al, 2015).

Primary prevention. Primary prevention involves intervening to inhibit the initiation of a negative health outcome in otherwise healthy individuals. In oral health, these includes encouraging less consumption of sugars, proper oral hygiene methods to reduce caries risk and the use of fluoridated toothpaste (Hovius, 2016). Primary prevention by pharmacists includes their involvement in distribution of vaccine materials, health education, counselling and health promotion, and provision of immunizations (Cohen, 2013; Lai et al., 2013; Farris & Johnson, 2010; Meyerson et al., 2013; Offu et al., 2015). Other examples are breast cancer health promotion services (Beshir & Hanipah, 2012), screening for chronic obstructive pulmonary disease and uncontrolled asthma (Fathima, Naik-Panvelkar, Saini, & Armour, 2013), breast and cervical cancer screening

program (McGuire, Leypoldt, Narducci, & Ward, 2007), and primary prevention of cardiovascular diseases (McNamara, et al., 2010)

Secondary prevention. Secondary prevention involves intervening early in the disease process before the manifestation of illness (Farris & Johnson, 2010; Meyerson et al., 2013; Offu et al., 2015). Procedures such as screening for caries, periodontal screening and recording for periodontal disease are examples of secondary prevention in oral health (Hovius, 2016). Secondary prevention by CPs include early intervention for behavior change or disease diagnosis for example in cases of HIV (Meyerson et al., 2013), diabetes, substance abuse etc. (Offu et al., 2015). Others are early detection of prostate cancer (Odedina et al., 2008), prevention of cardiovascular disease (Puspitasari et al., 2016), osteoporosis and the risk of fall (Laliberté et al., 2013), counselling on obesity (Awad & Waheedi, 2012), mental health service provision (Mey et al., 2013), improving knowledge and control of Type 2 diabetes (Venkatesan, Manjula-Devi, Parasuraman, & Sriram, 2012).

Tertiary prevention. Tertiary prevention activities seek to slow the progression and negative impact of already-established disease by restoring function and reducing disease related complications. The use of different types of fillings for dental caries, prosthetic replacement of missing teeth with implants, bridges, or dentures are examples of such activities in oral health (Hovius, 2016). Such practices by CPs are executed through medication evaluations especially for special group of patients e.g., HIV patients, patients on multiple and possibly conflicting medications due to comorbidities (Farris & Johnson, 2010; Meyerson et al., 2013; Offu et al., 2015), management of diarrhea (Ogbo

et al., 2014), management of sleep disorders (Noor, Smith, Smith, & Nissen, 2014), management of common skin lesions (Hafejee & Coulson, 2006).

There is presently evidence on effectiveness of the roles of CPs in health promotion in other areas of health care (Mann et al., 2015). Therefore, there is ample opportunity to utilize the knowledge and skills of CPs in promoting oral health care and awareness (Mann et al., 2015). As discussed below, public health roles of CPs in oral health encompasses the three levels of prevention previously mentioned.

Community Pharmacists in Oral Health Care

CPs are an indispensable member of the health care team having important roles in addressing oral health care challenges (Cohen, 2013). This is because they are suitably positioned to offer advices on oral health, and a variety of oral problems due to their frequent contact with people susceptible to a variety of dental conditions (Amien et al., 2013; Amin & Chewning, 2016; Cohen, 2013; Wibowo et al., 2015). Their consultative role is therefore important for those disadvantaged people who ordinarily do not have access to the dentist (Cohen, 2013).

Knowledge of community pharmacists on oral health care. Despite being adequately positioned to offer advices on a host of oral health care challenges, according to Cohen (2013), CPs seldom provide such. This was attributed to their less than optimum education and skills in oral health issues (Cohen, 2013). For example, about 30% of CPs from South Africa in a study assessing their roles in oral care never partook in any form of education on oral health during their undergraduate training (Gilbert, 1998). In another study, in United Kingdom (UK), where pharmacists were queried on

patient's complaints (basic oral pathologies as regards oral health care), less than half could respond. Among the cited challenges was inadequate knowledge. Poor knowledge of oral health care was also reported among CPs in Riyadh, Saudi Arabia (Bawazir, 2014) and India (Priya et al., 2008). Apparently, studies from UK indicates that pharmacists there were not well trained in oral health related topics (Cohen, 2013; Maunder & Landes, 2005). Conversely, in another UK study, out of about 583 pharmacists interviewed, 91.5% had fairly high level of knowledge for common oral conditions and also signified interest in further training on oral conditions (Mann et al., 2015). This study assessed the knowledge of oral health of CPs in Plateau State, Northern Nigeria and prior education on oral health care.

The extent of pharmacy education concerning oral health issues has not been formally assessed in the United States neither is oral health education incorporated into the study curriculum of pharmacy in Nigerian Universities (Cohen, 2013; University of Maiduguri, 2015). In a review by Chestnutt et al. (1998), increased awareness of oral health related issues was found to be a result of production of educational packages and publication of oral health articles in pharmaceutical journals. It was also suggested that producing leaflets and materials related to oral health care could further improve knowledge on oral health care (Chestnutt et al., 1998). The use of such materials have not been documented as effective in increasing knowledge of oral health of CPs though other approaches including distance learning packages and postgraduate courses have been employed as initiatives for oral health education of pharmacists (Cohen, 2013).

Frequency of encounters of community pharmacists with patients requiring oral health care. Only a few studies had been conducted to ascertain roles of CPs in promoting oral health (Amien et al., 2013; Bawazir, 2014; Chestnutt et al., 1998; Gilbert, 1998; Mann et al., 2015; Maunder & Landes, 2005; Priya et al., 2008; Wibowo et al., 2015). These studies affirmed that CPs were regularly approached (at least more than once a week) for advices on oral health. In a South African study, it was found that most of the CPs (91%) dealt with oral problems regularly irrespective of the age, practice location, gender and experience of the CPs (Amien et al., 2013)**.** An earlier study, also in South Africa, assessing the extent to which pharmacists were asked about oral health care showed that 44.1% of the respondents (out of 54 CPs) were approached every day with oral health complains, 44.2% about once a week, 8.8% twice a week and the rest (2.9%) once a month (Gilbert, 1998). In Saudi Arabia, out of 141 CPs interviewed, 33.8% reported 10 daily requests for oral health advice, 35.5% reported less than that while 30.7% stated that they had more than 10 daily requests for oral health advice (Bawazir, 2014). This is similar to an Indian study where 84% of the respondents also claimed that they had about ten patients with dental complain visit their pharmacy every day (Priya et al., 2008). Of the 17 CPs interviewed in a Northern England survey, 67.4% reported more than 11 requests per week (Maunder & Landes, 2005).

Types of conditions encountered. The most common dental reasons for approaching CPs in a South African study were oral ulcers (55.8%), oral thrush (49.2%), and toothache (33.3%) (Amien et al., 2013). In this study, it was noticed that prevalence of dental abscess was significantly higher in high socio-economic status (SES) locations

compared to the low SES locations. A review of the literature as reported in Amien et al. (2013) on the types of oral conditions most often encountered by CPs showed that oral ulcers (20% – 93%) were the most common followed by toothache (18% – 88%), bleeding gums (4% – 84.4%) and loose dentures (1% – 48.5%). However, in an Indian study, toothache was the most common oral complaint encountered followed by bleeding gums, mouth odor and oral ulcers (Priya et al*.,* 2008). A similar pattern was observed for a UK study where toothache (93.5%), oral ulcers (88.1%) and teething (76.3%) were the most commonly encountered oral health complaints from patients (Mann et al., 2015). In Saudi Arabia, the types of oral conditions most commonly encountered were toothache (29.7%), mouth ulcers (24.9%) and halitosis (11.7%) (Bawazir, 2014). In Northern England, mouth ulcers (20%) and toothache (18%) were the most common presentations (Maunder & Landes, 2005). Generally, less commonly sought advices were for teething problems, types of toothpastes and toothbrush to use (Amien et al., 2013; Maunder & Landes, 2005; Priya et al., 2008). This study evaluated the most common types of oral health issues encountered by CPs in Plateau State, Nigeria.

Roles of community pharmacists in oral health care. The roles of CPs in oral health care has gained ascendancy in view of the need to deliver primary dental services to the public (Bawazir, 2014). They may be consulted for a lot of oral health-related issues. This includes supply of prescription medications, providing counsel concerning over-the-counter medications including recommendations on how to adjust medication schedules during Ramadan for Muslim patients and responding to clients presenting with varied signs and symptoms. Others are referrals to general dental practitioners, oral health

promotion services, retailing and guidance on oral hygiene aids, and monitoring dietary fluoride supplement prescriptions (Amin & Chewning, 2016; Cohen, 2013).

About 72% of CPs in a South African study were receptive of their roles in oral health care and prevention of dental diseases describing it as an avenue to offer better service to the public. Those who declined cited being too busy or much work as their reasons (Gilbert, 1998). A review by Chestnutt et al. (1998) on the provision of dental and oral health advice by CPs, showed that 80% of the pharmacists believed oral health care was part of their roles. This agrees with a UK study where 99.4% of the CPs acknowledged that pharmacists should have a role in oral health care (Mann et al., 2015). Most of the CPs (97.1%) interviewed in a Saudi Arabian study were of the view that they also play an important role in oral health care and 81% showed enthusiasm to participate in oral health promotional activities. Nearly all the respondents (98%) in the Saudi Arabian study were interested in giving oral health advice (Bawazir, 2014). In an India study, 70% of the CPs signified willingness to give oral health advice to patients (Priya et al., 2008). A semi-structured interview with 49 CPs in New Zealand showed that most of them agreed that providing oral health advice was within their roles (Buxcey et al., 2012).

Though the CPs cannot assume the position of the dentists, they can endorse the advices given by them (Bawazir, 2014). Bawazir (2014) also proposed some ways through which CPs can actively partake in oral health care to include identification, assessment and referral. However, a more comprehensive description was given by Gilbert (1998) to include dispensing of prescriptions and over-the-counter medicine, responding to clients presenting with signs and symptoms, referral to the dentist, oral

health promotion and advice on oral hygiene aids. For whatever role CPs choose to partake in, it could be improved via support and education from the dental professionals (Bawazir, 2014).

Dispensing of prescriptions and advice on over-the-counter (OTC) medicine. When approached by customers with oral complaints, an Indian study showed that 38.5% of the CPs referred the patients to a nearby dentist after dispensing medications, while 22.4% of the pharmacists dispensed antibiotics and painkillers without any referral (Priya et al., 2008). Additionally, in a Saudi Arabian study, 44% of the CPs dispensed a painkiller and 13% prescribed an antibiotic when approached by patients with oral complaints (Bawazir, 2014). In Northern England, all the CPs interviewed provided short term pain relief when approached by patients with oral health complains (Maunder & Landes, 2005). This study assessed the types of prescriptions recommended by CPs in Plateau State, Northern Nigeria for patients with oral health complaints.

Responding to Clients presenting with signs and symptoms. CPs had been shown to be involved with oral cancer detection, management (treatment and referral) of oral ulcers and oral thrush (Amien, 2008; Maunder & Landes, 2005). Though it is not expected that they make a differential diagnosis of these lesions, their practice accommodates the identification of these lesions as indicators of underlying systemic diseases requiring referral to the dentist for further management. A South African study assessing roles of CPs in the management of oral ulcers found that 55.4% of the CPs would take a history, recommend a treatment and refer the patient to either a GP or a dentist while 25.6% would only take a history and recommend a treatment while 9.9%

would treat and refer the patient (Amien, 2008).

Referral to a general dental practitioner. A study to determine the existing state of oral healthcare advice, products and information provided by community pharmacies in Northern England showed that in 94.1% of cases, CPs advised customers to see a dentist, 23.5% to see a doctor, and 41.2% gave oral hygiene advice (Maunder & Landes, 2005). In another study, in India, with respects to oral health practices when approached by customers with oral complains, 38.5% of the pharmacists referred the patients to a nearby dentist after dispensing medications while 22.4% of the pharmacists dispensed antibiotics and painkillers without any referral (Priya et al., 2008). A South African study showed that overall, 66.9% of the CPs would refer their clients presenting with oral ulcer to either the GP or a Dentist if topical management did not work (Amien, 2008). In UK, a study reported that 74.6% of the CPs provided referrals to the dentist for various conditions while the rest did not make any referrals (Mann et al., 2015). Out of 141 CPs interviewed in Saudi Arabia, 81.7% of them do refer patients requiring dental care to the dentist (Bawazir, 2014). The oral healthcare advices, products and information provided by CPs in Plateau State, Nigeria in response to patients with oral health complaints would be assessed in this study. This is sequel to the knowledge gap on what CPs in the country do when approached by patients with oral health complains.

Oral health promotion and advice on dental hygiene aids. The pharmacy is an important source of dental hygiene aids. The CPs and their staff are usually able to offer advices to clients making enquiries on the type of mouthwash, dental floss, toothbrush and toothpaste to use (Chestnutt et al., 1998). According to Bawazir (2014), factors that

could affect the recommendations of a particular oral hygiene product includes knowledge of the product (38%), personal experience (22.8%) and dentist's opinion (15.7%). Other are product advertisements (11.6%) and popularity of the product (9.3%). As for the CPs interviewed in Northern England, their recommendation of oral health care products was based on personal experience and attendance at update courses on oral health (Maunder & Landes, 2005). Some advice given to patients presenting with oral thrush in a South African study includes regular use of multivitamin supplements, supplementary use of antibiotics and dietary counselling. Likewise, for mouth sores, CPs told their patients to apply medicine, use multivitamins and dietary counsel though most of the advices were based on causes of the mouth sores (Amien, 2008).

For oral hygiene practices, out of 54 CPs in another South African study, 57.7% recommended a dental examination at least twice a year (six monthly) while the others suggested once a year. The main recommendations to prevent tooth decay were brushing (87.9%), flossing (69.7%) and visiting the dentist (57.6%) (Gilbert, 1998). Other avenues via which CPs can render oral health advices to consumers includes promoting the use of topical fluorides in toothpastes, the use of soft filament toothbrushes, encouraging healthy eating, regular dental visits, and preventive prophylactic measures (Mann et al., 2015).

Role of demographic characteristics of community pharmacists. Some identified factors influencing practices of CPs on oral complaints and presentations are the perceived socio-economic status of the clients, gender, location of practice and age of both the pharmacist and patient. Others are number of years in practice, number of years'

post-graduation and the local profile and prevalence of oral diseases (Amien, 2008).

Gender. A South African study found that more female CPs (69.2%) would comprehensively manage their patients presenting with oral ulcers (take history, recommend a treatment and referral) compared to their male counterparts (50%). In the same study, females would more eagerly recommend probiotics for oral thrush, give dietary advices and specify an active ingredient for the treatment of mouth sores (Amien, 2008).

Geographic location of practice. The location of the pharmacy in a South African study did not affect the frequency of oral health complaints encountered by the CPs. Conversely, when the influence of socio-economic status (SES) of the location where the CPs were located and frequency of patients' presentation with oral problems were checked, the authors found a higher presentation from the high SES location (everyday) compared to the infrequent presentation from those in low SES locations (Amien et al., 2013).

Prior attendance at an oral health training/seminar. Those CPs who had attended some form of dental education either while in school or during internship in a South African study alluded that it was very useful in 58.3% of the oral health cases they encountered and useful in 41.7% of cases (Gilbert, 1998).

Prior dental visit. Most of the CPs in a Northern England study knew of the nearest dental practices but only a few were aware of arrangements for scheduling emergencies / appointments (Maunder & Landes, 2005). When about 54 CPs in a South African study were asked if they had contacted a dentist at any time for whatever

purpose, 72.8% said they had never had to ask the dentist for anything, 21.2% occasionally had to contact the dentist for some information while only 6.1% did it regularly. For those who had some form of contact with the dentist, it was either by telephone (75%), visit to the dental clinic (12.5%) or being a friend to the dentist (12.5%) (Gilbert, 1998). A UK study showed that 92.8% of the CPs who referred patients to the dentist for management were aware of the location of the dentist; furthermore, 45.7% knew the local dentists' working hours (Mann et al., 2015).

In Saudi Arabia, out of 141 interviewed CPs, 11(9.5%) had no dental clinics near their practice while 99 CPs had one to three dental clinics close to them. More than half (53.9%) of the CPs had at some time met with the dentists in their vicinity. About sixteen percent had regular contact with the dentists though 65.2% were not aware of the work time of the dentists near their pharmacies (Bawazir, 2014). In an Indian study, of the 50 CPs interviewed, 60% said there were less than four dentists within 5km radius to their practice and 24% said there were between five to nine dentists within the same radius to their practice. When asked about prior visits to the dental surgery, 48% gave a positive answer among whom 86% of them had a frequency of about six times within the last year. Sixty percent of the CPs had never had any form of interaction with the dentist on oral health and 52% were not aware of the appointment schedules of the local dentist (Priya et al., 2008).

No association was reported on the duration of practice of the CPs and their educational level on their practice or response to clients presenting with oral health complains. The roles of these demographic characteristics (duration of practice and

educational level of CPs) including their religious affiliations, location of practices, gender, age, previous dental visits and prior attendance at oral health seminars as it affects the practices of CPs in Plateau State on patients with oral complaints were assessed in this study.

Challenges of community pharmacists in oral health care.

Training and competence. Oral health is needed for both general health and wellbeing, as such, it should be incorporated in any health promotion initiative within the community (Mann et al., 2015). Deficiencies in oral health care knowledge of pharmacists had previously been noted (Priya et al., 2008). Though pharmacists are well positioned to render education and oral health promotional activities, they seldom give such counsels (Cohen, 2013). This has been attributed to lack of oral health education, training and skills (Amien et al., 2013; Cohen, 2013). Despite these deficits, CPs have shown eagerness to increasing their oral health knowledge (Cohen, 2013). In a UK study, CPs were keen on improving their oral health knowledge (Maunder & Landes, 2005). Same was noticed in a South African study where 59.4% of the CPs responded positively to their willingness to partake in trainings on oral health (Gilbert, 1998). There is no Nigerian study specifically addressing the knowledge of CPs as regards oral health care.

Different approaches had been utilized in UK to educate pharmacy staff on oral health education including postgraduate courses and distance learning packages. It was also noted that pharmacists who receive training on oral health related issues would be more equipped to give counsel on oral health diseases, methods of prevention and possible management (Cohen, 2013). Poor knowledge of oral health care is a major

hindrance to CPs integrating oral health promotional activities in their practices (Cohen, 2013; Priya et al., 2008).

Participants in a UK study reported that they were very confident when giving counsel concerning basic dental conditions like teething, bleeding gums, mouth ulcers and mouth odors as opposed to more complex ones like oral cancer and dental trauma (Mann et al., 2015). In a study in Northern England, 71% of the interviewed CPs stated that they were very confident giving oral health advices. This competence was based on previous attendance at oral health seminars (Maunder & Landes, 2005). According to Mann et al. (2015) a trained CP would be more competent to provide appropriate oral health advice for the public.

Notion that such is not the duty of pharmacists. In a UK study assessing the roles of CPs in the promotion of oral health, 92.4% of the participants claimed that provision of oral health promotion was not part of their contract. Of those who did not have oral health promotion as part of their contract, 72.5% of them were willing to incorporate this into their contract (Mann et al., 2015). When some CPs were asked of their willingness to partake in oral health promotional activities, their response was based on the type of pharmaceutical store they were practicing. Most of the CPs (82.4%) were willing to partake in oral health promotional activities. However, those practicing at multiple owned pharmacies (11.8%) were of the view that their head office would have to be contacted first though it may not be approved and 5.9% would definitely not participate (Maunder & Landes, 2005).

The following potential barriers mentioned in other areas of health promotion

practice or intervention by CPs were not highlighted in any of the reviewed literatures on roles of CPs in oral health care: policy, payment for services rendered, lack of time or being too busy. Others were the public not requesting for such services and lack of private counselling areas.

Recommendations for community pharmacists on oral health care. In an assessment of knowledge and attitudes of CPs in Riyadh, Saudi Arabia towards oral health care and oral hygiene products, the author recommended training on oral health and the provision of information on oral health care products for the CPs (Bawazir, 2014). Amien et al. (2013) also recommended that CPs should be trained on oral health care and that such training should be made mandatory from their undergraduate training. Continuous professional development courses for pharmacists could also be utilized. From the outcome of the Indian study, Priya et al. (2008) recommended training for CPs to be able to assess dental services. Anderson (1998) was of the view that CPs should be incorporated into multidisciplinary oral health teams.

Community pharmacists on their part suggested that to improve their knowledge and services of oral health care, inter-disciplinary meetings with dental professionals to discuss challenges and continuing professional development focusing on oral health could be introduced (Maunder & Landes, 2005; Priya et al., 2008). Others are production and circulation of oral health information relevant to the location of the pharmacists and a list of key contacts needed for advisory and referral purposes, incorporation of oral health into both undergraduate trainings and post graduate programs (Mann et al., 2015; Maunder & Landes, 2005). A preferred choice for improving knowledge of oral health by

some CPs was the production of leaflets, pamphlets and posters on oral health and organizing seminars and training on oral health care (Priya et al., 2008). For training on oral health, CPs in a New Zealand study recommended that it should take place in the evening (Buxcey et al., 2012).

Summary and Conclusions

There is poor oral health awareness in Nigeria and less than 20% of Nigerians have access to oral health care (Braimoh et al., 2014; Etiaba et al., 2015; Olusile, 2010; Osazuwa-Peters, 2011). This poor oral health awareness is worse off in Northern Nigeria with a dentist to population ratio of 1:257,769. This is attributed to the disproportionate distribution of oral health care workers and training facilities in the country, grossly inadequate resources which are often over stretched in many areas and the insufficient manpower occasioned by the nascent nature of the profession in the country (Adeniyi et al., 2012; Olusile, 2010). These have led to limited access to correct information on oral health and poor oral health causing varied dental conditions with different consequences.

Community pharmacists are the health professionals most accessible to the public. They supply medicines in accordance with prescription or, when legally permitted, sell them without a prescription (WHO, 1994). It had been clearly demonstrated that their roles had gone beyond that of traditional dispensing of drugs to include many health promotion and prevention activities. They have constituted key membership in the health care team with significant duties in addressing public health issues including oral health concerns. Although CPs and public health authorities believe pharmacists should play a

significant role with public health intervention, they acknowledge a wide gap between the ideal and actual levels of pharmacist involvement.

The effectiveness, relevance and challenges of the integration of these new roles had been examined in different health disciplines and conditions. Some studies had been conducted to answer series of questions about the roles of CPs and the provision of preventive oral health services. However, these studies were conducted in locations with appreciable dentist to population ratio where oral health awareness may not be an issue. There is no record of any study to describe the knowledge of oral health by CPs and what they do as regards dissemination of oral health care related information when approached by patients with oral complains in developing countries like Nigeria - a country grappling with low dental capacity and widespread low oral health awareness (Olusile, 2010).

This research filled these gaps by ascertaining the roles CPs play in promoting oral health care in Plateau State, Northern Nigeria. In Chapter 3, I described the research methodology for this study, highlighting the settings, study population, instrumentation, data collection and analytical techniques used. Chapter 3 also discussed ethical considerations for the study and a description of both the independent and dependent variables in the study.

Chapter 3: Research Method

Introduction

Since the basic responsibilities of pharmacists as agents for dispensing medications had broadened to encompass other areas of health care including health promotion and preventive services, this had positioned them to offer advice, treatment, and recommendations on oral health care, oral complications of medications, and susceptibility to a variety of oral problems. I did not see any study that shows a relationship between CPs' knowledge of oral health hygiene and how they provide oral health care education to the patient. The purpose of this study was to describe the roles CPs in Plateau State, Northern Nigeria play as potential sources of oral health information. This was done by ascertaining the background knowledge and practices of CPs and their relationship with demographic characteristics. This could serve as basis upon which the CPs can be empowered and engaged as media for propagation of oral health care and awareness in their communities.

This chapter described the research design for this study and the rationale for its choice. It also described the study population and how they were recruited. It includes instruments for the study, data collection methods, and how the data was analyzed. Potential threats to both internal and external validity of the study were discussed and ethical concerns addressed. The chapter ended with a summary of the research methods. This also served as the transition of this section to the next chapter.

Research Questions and Hypotheses

The following are the research questions this study answered:

RQ1: What is the relationship between seven demographic factors and knowledge of oral health by community pharmacists?

1. Age
2. Gender
3. Duration of practice
4. Geographical location
5. Educational level
6. Prior dental education
7. Previous dental visits of CPs practicing in Plateau State, Northern Nigeria

$H1_o$: Age, gender, duration of practice, geographical location, educational level, previous dental visits, and prior dental education are not significantly correlated to knowledge of oral health by CPs practicing in Plateau State, Northern Nigeria.

$H1_1$: Age, gender, duration of practice, geographical location, educational level, previous dental visits, and prior dental education are significantly correlated to knowledge of oral health by CPs practicing in Plateau State, Northern Nigeria.

RQ2: What is the relationship between these eight demographic factors and CPs' interest in becoming more involved in provision of services on oral health problems?

1. Age
2. Gender
3. Duration of practice
4. Geographical location

5. Educational level
6. Average number of patients with dental complaints seen per week
7. Prior dental education
8. Previous dental visits of CPs practicing in Plateau State, Northern Nigeria

$H2_o$: Age, gender, duration of practice, geographical location, educational level, average number of patients with dental complaints seen per week, prior dental education, and previous dental visits of CPs practicing in Plateau State, Northern Nigeria are not significantly correlated to their interest in becoming more involved in provision of services on oral health problems.

$H2_1$: Age, gender, duration of practice, geographical location, educational level, average number of patients with dental complaints seen per week, prior dental education, and previous dental visits of CPs practicing in Plateau State, Northern Nigeria are significantly correlated to their interest in becoming more involved in provision of services on oral health problems.

RQ3: Is there any significant difference between CPs registered with Association of Community Pharmacists in Nigeria (ACPN) practicing in Plateau State and those not registered with ACPN as regards to knowledge of oral health?

$H3_o$: There is no statistically significant difference between CPs registered with ACPN practicing in Plateau State and those not registered with ACPN as regards to knowledge of oral health.

$H3_1$: There is a statistically significant difference between CPs registered with ACPN practicing in Plateau State and those not registered with ACPN as regards to knowledge of oral health.

Research Design and Rationale

This quantitative study described CPs' roles as sources of oral health information. This study assessed the background knowledge and CPs' background knowledge and practices of oral health care and its relationships with their demographics characteristics (independent variables). These independent variables were age, gender, duration of practice, geographical location, educational level, and average number of patients with dental complaints seen per week. The CPs maintained a log in their practices for two weeks. The patient frequency form is a log developed and utilized for this purpose (Appendix F). A copy of this form was given to the CPs and they were advised on how to fill it. Other independent variables were prior dental education and previous dental visits. Quantitative research is an appropriate research design for this study considering the fact that the study tested hypotheses based on assessing relationships between the independent and dependent variables and the strength of such relationships.

In view of the research questions and hypotheses for this study, a non-experimental research design was suitable for this study. A cross sectional study which is a quantitative research design was used for this study. A cross sectional study is an observational study where both exposure and outcome are measured simultaneously, usually described as a snapshot of the study population per given time. The stated research questions required a single evaluation of the study population. Since the study

mainly described the demographics of the CPs and the relationships between the independent and the dependent variables, it did not require comparison of two or more groups to assess the effects of an intervention as would have been for an experimental or quasi-experimental design.

Another advantage of this design is that it can readily be conducted in the natural setting, consequently increasing external validity of findings. A cross sectional study has the advantage of immediate outcome assessment; hence, there is no attrition or loss to follow-up. It is also ideal for a large population of research subjects, especially those scattered over a wide geographical area.

Methodology

Study Population

This study took place among CPs in Plateau State, one of the states in the North-Central geopolitical zone of Nigeria. Due to the geographical spread of CPs in Northern Nigeria, financial considerations, logistics, and time constraints, the whole population of CPs (in Northern Nigeria) could not be interviewed. Plateau State thus served as the geographical extent of the study population.

The population of CPs was defined as those that had been in practice on or before 31st of March, 2016 in Plateau State. According to ACPN, Plateau State branch, there are about 120 CPs in Plateau State, though not all practicing CPs in the state were registered with them (Appendix A).

Sampling and Sampling Procedures

All CPs, including those not registered with the ACPN Plateau State branch, were included in the study. As pharmacies are commercial outfits, they are usually located along major streets. All the major streets in the 17 Local Government Areas (LGAs) of Plateau State were navigated to find the pharmacies to identify CPs.

Inclusion and Exclusion Criteria

CPs included in this study fulfilled the following inclusion criteria:

- Must have been in practice on or before the 31st of March, 2016.
- Must be a practicing pharmacist, not an intern or a student pharmacist.
- He/she is not an ancillary staff such as pharmacy counter assistants or dispensing staff.
- Must be in constant contact with community members practicing in settings such as independently owned pharmacies, those attached to shopping malls, retail stores, and pharmacy chains.
- Must have consented to participate in the study.

CPs who did not fulfil the above listed conditions were excluded from participating in the study.

Sample Size Analysis

There was no sampling for this study as all practicing CPs (registered or non-registered) in Plateau State served as the study sample.

Recruitment and Participants

After obtaining the necessary ethical approval from Walden University's Institutional Review Board (IRB), CPs in Plateau State were traced (by navigating all the major roads/streets in the State) and contacted at their pharmacies in the 17 LGAs that make up the State. A list comprising of registered pharmacies in the state compiled by the Director of Pharmaceutical Services, Ministry of Health served as the starting point for locating the CPs in their practices. There were 106 community pharmacies on the list.

I recruited CPs at community pharmacies and no personal identifiers were specified apart from study identity numbers which were put on each survey instrument denoting the community pharmacy that had been visited. There was a brief introduction of the purpose of the project where an informed consent form about the project was given (Appendix B). Willingness to partake in the study was based on signing the consent form after addressing any question that arose from the participants. Total number of CPs approached and the number of those who agreed to participate in the study was noted. Below was the step-by-step approach to CP recruitment:

- I visited the community pharmacies in the 17 LGAs of Plateau State.
- I approached the CP or requested to meet with the CP if person at the counter was the Pharmacy Counter Assistant (PCA)
- I gave a brief introduction of myself and the purpose of my visit
- I asked if CP was an intern or a student pharmacist. If yes, I appreciated CP for their time and took my leave.

- I asked if CP had been in practice before 31st March, 2016. If no, I appreciated CP for their time and took my leave.
- I handed CP a copy of the consent form to peruse. If CP declined to participate, I appreciated CP for their time and took my leave.
- I gave a copy of the patient traffic form (Appendix F) to CPs that consented to participate to keep a log of patients. I showed CPs how to fill it.
- I returned to CP after two weeks to collect patient traffic form and administer the survey.
- I waited to collect filled questionnaire answering any question that arose during the process.
- I thanked the CPs for their time and cooperation and took my leave.

Data Collection

This was done using a structured paper based, self-administered questionnaire. After the CPs agreed to participate in the study, I handed a copy of the questionnaire to the CPs for them to complete. Every filled questionnaire was checked for adequacy and completeness and any question about the exercise was addressed to dispel any misconceptions. A completed questionnaire was adequate if most of the relevant questions were filled (as there were some contingency questions that required skipping). Data collection was during working hours (9am – 3pm) at the practice locations of the CPs.

At the close of each day of data collection (for locations close to my office), the questionnaires were entered into my personal laptop computer. This is a password protected system while the hard copies were kept in a filing cabinet and locked. For data collection in locations remote to my office (requiring me to stay out), at the end of the day, the questionnaires were entered into my computer while the hard copies were compiled and kept with me till I returned back to my office where they were kept in the filing cabinet. This was repeated till the entire CPs in Plateau state had been visited and all the data collected. At the end of data collection, I got a Data Entry Clerk who re-entered the questionnaires into my computer as a duplicate entry. I personally collected the data, entered a copy into the computer, kept the hard copies in my office and analyzed the data. The hard copies will be shredded after five years of storage.

Instrument

A modified survey instrument developed by Mann et al. (2015) was used for data collection. A copy of the questionnaire was requested from the authors with permission to format and adapt it to suit the local population of CPs in Plateau State, Northern Nigeria. Appendix C is a copy of the permission letter from the authors while Appendix D is a copy of the survey instrument. Due to variations with demographic variables, the need to maximize space and the additional questions for this study, the questionnaire was formated and customized to reflect the local population of CPs in Plateau State and to comprehensively answer the research questions for this study. Appendix E is a copy of the questionnaire used for this study.

The questionnaire comprised of 37 multiple choices, close and open ended questions. Questions were divided into six sections collecting information on (1) the demographic characteristics of the pharmacists. This section deal with details of the participating pharmacist and the pharmacy including age, gender, year of graduation, highest qualification, location of the pharmacy, prior formal dental education and average daily patient turnover in the pharmacy; (2) the second section assessed perceptions of the roles of CPs in promoting oral health care (measured as Yes or No) and attitudes of CPs in oral health promotion (measured on five point scale from strongly agree to strongly disagree); (3) knowledge of oral health was measured in section three. This was measured as True or False; (4) the pharmacists' involvement in the provision of services for oral diseases and the level of interest expressed by pharmacists in receiving further training on oral conditions; (5) Section five focused on the dental patients attending the pharmacies; their number, common complaints, and advices sought by them regarding dental problems and the oral health services rendered by the CPs; (6) the last section dealt with the willingness of the CPs to incorporate oral health promotion as a part of the Pharmacists' Council of Nigeria (PCN) community pharmacy practice standard, the suggestions of the CPs on how to improve oral health knowledge, expand services on oral health care and the major barriers to CPs providing oral health care services.

Types of variables and measurement

The variables of interest in this study were dependent, independent and confounding variables. Independent variables considered in this study included location of practice, gender, age, duration of practice and highest educational level. Others were

the type of pharmacy, number of years' post-graduation of the CP, frequency and average number of patients requiring oral health care seen at the practice per week, most frequent oral health advice required by the patients and barriers to the provision of oral health services. Dependent variables comprised practice of oral health care by CPs, knowledge of oral health care and attitudes towards the provision of oral health services. Practice of oral health care included variables such as patient referral, counselling, prescription for dental problems, treatments, recommendation and sale of oral health products. Identified confounding variables that could influence the associations between some of the independent variables and dependent variables were prior dental education, prior visit to a dental clinic, stocking of oral health care products and reimbursement or payment for oral service provision.

Measurement of the dependent variables: attitudes towards the provision of oral health care and knowledge of oral health was by the use of a composite questionnaire design on a 5-level Likert scale (strongly agree = 5, agree = 4, neutral = 3, disagree = 2 and strongly disagree = 1) and a True or False response. Scoring for this scale was by the use of mean opinion score (MOS) for ordinal scale data for each CPs. This was for questions 12 and 13. Every respondent's MOS for attitude with a score ≤ 3 was taken as having poor attributes while all those with scores > 3 denoted good attributes**.** A knowledge score was computed for each CP based on the number of correct answers given to questions asked on knowledge of oral health care (Question 14). Correct responses were scored one (1) while incorrect ones were scored zero (0). The maximum possible score was 24. The possible scores were graded as follows: and a score of 8 and

below was poor knowledge, 9-16 average knowledge while 17-24 was taken as good knowledge (Braimoh et al., 2014).

Table 2 shows the variables of interest and their operationalization.

Table 2

Variables and Operationalization

Independent Variables	How variable was measured	Measurement scale
Age	Number in years	Interval
Gender	Male or Female	Nominal
Geographical location	Name of the LGAs	Nominal
Duration of practice	Number in years	Interval
Highest educational level	Basic degree, Masters, PhD	Ordinal
Number of years' post-graduation from Basic degree	Number in years	Interval
Number of patients seen per day in the Pharmacy for a week	Average number	Interval
Number of patients seen with dental complaints per week	Average number	Interval
The most common dental complain encountered in practice per week	Name (Frequency)	Nominal
Training for Oral health problem	Yes/No	Nominal

Membership of ACPN Plateau State branch	Yes/No	Nominal
Type of oral health advice patients are requesting for	Name (Frequency)	Nominal
Type of services rendered to patients with dental complain	Name (Frequency)	Nominal
Dependent variables		
Attitudes towards provision of oral health care	5-level Likert scale. (strongly agree = 5, agree = 4, neutral = 3, disagree = 2 and strongly disagree = 1)	Ordinal
Knowledge of oral health	True or False	Nominal
Provision of services to clients with oral health problem	Yes or No	Nominal
Interested in becoming more involved in provision of services on oral health problems	Yes or No	Nominal
Confounding variables		
Previous dental education	Yes or No	Nominal
Previous visit to the dentist	Yes or No	Nominal
Do you stock oral health care products?	Yes or No	Nominal
Do you get paid for rendering oral health care?	Yes or No	Nominal

Data Analysis Plan

After data collection and cleaning (verification of retrieved questionnaires), it was entered into the computer and analyzed with statistical package for social scientists (SPSS) software version 23. Frequency distributions was ran on the two databases for comparison and to check for missing fields, omissions, entry errors and double entries. Where such was found, the source questionnaire(s) was traced, compared with the database entries and such errors corrected to reflect what is obtained in the questionnaire. Analysis was based on research questions, measurement scale of data collected and the research hypothesis.

Demographic characteristics of CPs was analyzed using descriptive statistics. For those with nominal and ordinal data, frequency distribution, cross-tabulation, and bar charts was used to represent the data. On the other hand, for those data that were continuous, measures of central tendencies were used to describe the data.

A one sample t-test was used to check the attitude of CPs towards provision of oral health care, and the level of knowledge oral health. One sample t-test is used to evaluate whether population mean of a test variable is different from a constant. This was done by assuming a "standard pass score" of 3.01 for the analysis based on the mean opinion score for the Likert scale data. The comparison of these variables (attitude of the CPs towards provision of oral health care and the level of knowledge oral health) between binary independent variables such as gender, prior dental visits and prior receipt of dental education was done by using an independent-sample t-test. This test is used to estimate the difference(s) between the means of two independent groups. However,

where the comparison entailed more than two groups such as within the locations or among educational level, one-way analysis of variance (ANOVA) was used.

RQ1 was analyzed using linear multiple regression. This is a statistical technique that allows one to assess the relationship between one dependent variable and several independent variables. Here, the dependent variable is continuous while the independent can either be continuous or discreet. This statistical test can help reveal the strength of relationship between the dependent and the independent variable and the importance of each independent variable on the dependent variable. The dependent variable here was the score of each CP on knowledge of oral health. The independent variables were the stated demographic characteristics (age, gender, duration of practice, geographical location, educational level, previous dental visits, and prior dental education).

RQ2 was analyzed using logistic regression. Logistic regression is a type of regression in which the outcome variable is categorical (as the case of the dependent variable in this question - involvement in the provision of services on oral health problems) and the predictor (or independent) variables are continuous or categorical. When the prediction is on an outcome categorical variable that is dichotomous, binary logistic regression was used in modeling a response for the dependent variable using the independent variables stated in RQ2. Binary logistic regression afforded the opportunity to check for effects of confounding variables.

RQ3 was analyzed using an independent-sample t-test. The test was used to estimate the difference(s) between the means of two independent groups. Here, the mean knowledge of oral health (scored on a continuous variable) between two groups of CPs

was compared. These groups were those registered with ACPN and those not registered with ACPN. This grouping variable (registration with ACPN) was categorical, dichotomous and independent thus indicated for an independent-sample t-test.

Threats to Validity

Threats to External Validity

A threat to external validity in this study was the possibility of some CPs not being involved in the study either by refusal to participate or being absent at the time of survey. Findings from such CPs could impact significantly on the outcome variables as the eventual CP population may not reflect the full range of diversity of the CPs in Plateau State. To address other possible threats to external validity, retrieved questionnaires were checked before leaving the CPs to assure that any unanswered question(s) was not unintended. If there was such an omission (after confirming from the CP), it was returned for correction. Also, duplicate data entry was done during computerizing the survey responses which enabled validation of the accuracy of data entry.

Threats to Internal Validity

Threats to internal validity can reduce the confidence in saying that a relationship exists between the independent and dependent variables. This can be measurement errors arising from varied sources such as measuring the wrong attributes, duplicate data entry, differences in study setting, dissimilar administration of study instrument, lack of uniformity in coding and varied interpretation of the measuring instrument by people. For different aspects of measurements, three basic types of validity are cited: content validity,

empirical validity and construct validity. Content validity was checked by review of the survey instrument by my supervisors to ascertain that the measurement reflects or covers all the attributes intended for measurement. Empirical validity also known as instrument validity or criterion validity was checked by comparing the survey instrument with similar instrument for measuring the constructs of the study (knowledge of oral health) in the literature (Braimoh et al., 2014). On the other hand, construct validity of the survey instrument was statistically checked by surveying six of the CPs a week later after data collection. This helped assess the degree of agreement (Kappa) between their responses. The study identity numbers were used to link the first and second responses of the CPs for calculating the Kappa scores. Cohen's Kappa was .646, 95% CI [.181, .927] $p <$ .0001.

To address other threats that could arise from measurement errors, the same questionnaire was administered to all the respondents. I personally administered the instrument to the CPs which simultaneously addressed the issue of dissimilar administration of survey instrument. This also reduced attrition.

Another potential threat to internal validity of the study was information bias. Potential sources of information bias in this study included defective definitions of study variables or faulty data collection methods. These could lead to outcome identification bias an example of which is respondent bias due to inability to obtain objective confirmation of some of the responses and recall bias where the research participant may not adequately recall information especially those in the past. There was an assumption that responses from CPs were as truthful as possible.

Ethical Concerns

To ensure that participants in the study were adequately protected, the study proposal was submitted to Walden University's Institutional Review Board (IRB) for review and approval. This afforded the IRB opportunity to check the merits of the study with the possible harm that may be inherent in it. This process also helped ascertain that any form of risk was minimized such that the study was beneficial to the respondents and if at all there was any risk, it ensured that it was reasonable with regards to the potential benefits of the study. In order to ensure equitable selection of CPs, for justice such that benefits and risk were equally distributed among the participating population, the utilized research design (cross sectional study) coupled with the recruitment process addressed this, ensuring that every CP who fulfilled the inclusion criteria had equal chance of being recruited into the study.

Prior to administration of the survey instrument, an informed consent form was given to respondents (Appendix B). This explained the purpose of the study also giving the opportunity to clarify any questions or concerns that may arise about the study. CPs who read and signed the informed consent form were those who were given the survey instrument to complete**.** This is essential to be certain that participation was autonomous and voluntary devoid of any coercive influence.

In order to maintain confidentiality, data collection was by survey method employing a self-administered questionnaire method. This instrument was without personal identifiers. Retrieved questionnaires were entered into a personal computer that is password protected. This ensured that only the investigator had access to the entered

data. The paper questionnaires were kept in a filing cabinet and locked. These would be kept with me for upwards of 5 years after which they can be shredded.

Summary

Cross sectional study was utilized for this study. The population for this study were those CPs that have been in practice on or before 31st of March, 2016 in Plateau State. All the CPs practicing in Plateau State who fulfilled the inclusion criteria were used for this study. Qualification to partake in this study was based on fulfilling specified inclusion criteria failure of which the CP was excluded from participation.

Data collection was by survey method using a paper based, survey instrument. This was a modified instrument used for a similar study in London and adapted for the local population of CPs in Plateau State. I personally collected the data which addressed some threats to study validity. Collected data were analyzed using SPSS software version 23. Descriptive statistics was used to present the demographic characteristics while for the inferential questions, a one sample t-test, independent sample t-test, ANOVA, linear multiple regression, Pearson's correlation and binary logistic regression were used.

The chapter concluded with how ethical issues likely with the conduct of the study were addressed. The next chapter described the findings from the study.

Chapter 4: Results

Introduction

There is poor oral health awareness in Northern Nigeria which has led to often preventable dental diseases (Olusile, 2010; Sofola, 2010). Since the basic responsibilities of pharmacists, as agents for dispensing medications, had broadened to encompass other areas of health care, this had suitably positioned them to offer advice, treatment, and recommendations on oral health care. To date, in Nigeria, there is no record of any study to describe the knowledge of oral health by CPs and what they do as regards to dissemination of oral health care related information when approached by patients with oral complaints. The purpose of this study was to describe the roles CPs in Plateau State, Northern Nigeria can play as sources of oral health information for the people. This would serve as a platform upon which they can be empowered and engaged as media for propagation of oral health care and awareness in their communities.

There were three major research questions for this study. The first question was an assessment of the relationship between some demographic characteristics of the CPs and their knowledge of oral health. The second question was whether there is a relationship between the CPs' demographic characteristics and their willingness in becoming more involved in provision of services on oral health problems, while the last question centered on whether there is any significant difference between the CPs registered with ACPN practicing in Plateau State and those not registered with ACPN as regards to knowledge of oral health.

This chapter presents data regarding these questions and associated findings. The chapter also explains the procedures for data collection, the different statistical analyses employed for addressing the research questions, and a summary of the results.

Data Collection

Prior to receiving approval from Walden IRB (approval number: 10-21-16-0497336), I set out identifying the community pharmacies in the 17 local government areas (LGAs) of Plateau State. Data collection started on 26 October 2016 and lasted until 25 November 2016. During this period, a total of 207 community pharmacies were identified. These were found in 5 of the 17 LGAs of the state. Of this number (207), 12 community pharmacies were no longer in operation (they remained shut after a minimum of 3 random visits), and 26 community pharmacies were without a resident CP. They were either manned by a Pharmacy Technician or a Pharmacy Counter Assistant (14), Nurses (2), or had CPs who visited occasionally (10). Thus, 169 community pharmacies with resident CPs were available for participation.

Of the 169 CPs identified, 32 were not around during visits to the pharmacies: many had travelled for different reasons (26), 4 were sick and stayed home, and 2 were on maternity leave. Out of the remaining 137 CPs, 11 did not fulfil the inclusion criteria for practice as a CP before 31 March 2016 and 13 CPs declined participation. This left a total of 113 CPs as participants (Figure 2).

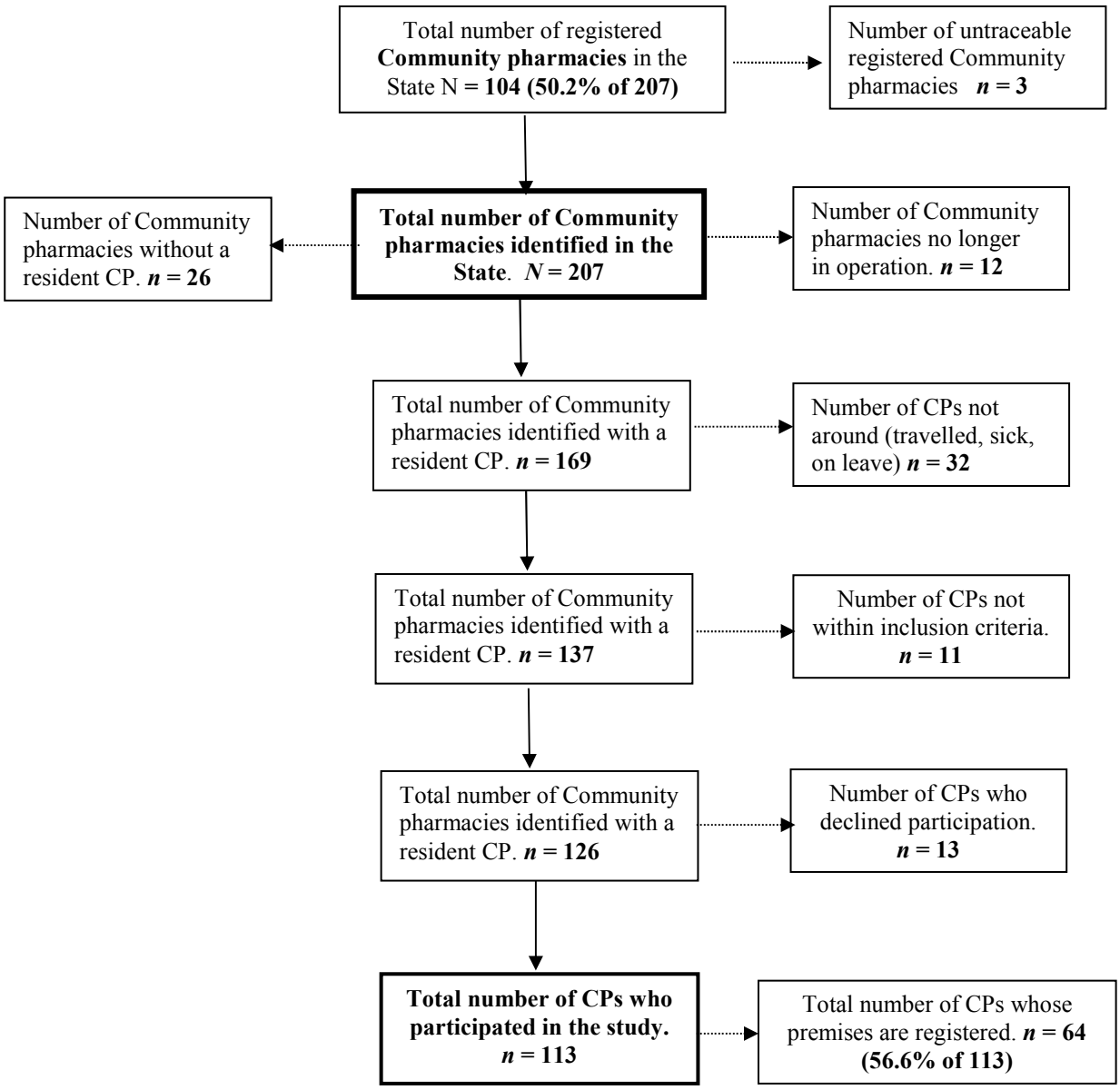

Figure 2. Flow chart of CPs identification for Data Collection. Please note that a CP (an individual community pharmacist) may be either a registered or unregistered member of the Association of Community Pharmacists in Nigeria (ACPN) working in a non-licensed (unregistered) or licensed community pharmacy.

There were no major discrepancies observed during data collection using the methodology described in Chapter 3. Two of the community pharmacies in the list (from the MOH) were duplicated. As such, the total number of registered community pharmacies in the state ought to be 104 (instead of 106). Furthermore, three community pharmacies on the list could not be identified and remained untraceable after a repeated search of their stated addresses. A completed questionnaire for this study was deemed adequate if most of the relevant questions were filled. As such, there are some questionnaires with missing questions (few random questions unfilled by the CPs).

The survey instrument was re-administered to six randomly selected CPs after a week of filling the first administered one to assess the internal reliability of the instrument. Reliability was determined using the Test-Retest method. A correlation coefficient of 0.9991 suggested a high reliability for the survey instrument used for this study. In Table 3, Cohen's κ showed substantial agreement between the first and second responses (Viera & Garrett, 2005) with $\kappa = .646$, 95% CI [.181, .927], $p < .0001$.

Table 3

Cohen's Kappa Analysis

				95% CI	
	Value	SE	*P*	LL	UL
Measurement of agreement Kappa	.646	.187	.000	.181	.927
Number of valid cases	77				

Note. SE = Standard Error, LL = lower level, UL = upper levels and CI = confidence interval

Demographic Characteristics of the Community Pharmacies

Table 4 is a summary of the demographics of the community pharmacies involved in the study. 56.6% of the pharmacies were registered with the Directorate of Pharmaceutical Services, Plateau State Ministry of Health. Only 5 out of the 17 LGAs in Plateau State had community pharmacies. 95.5% of these pharmacies were located in the state capital Jos. Jos town is made up of 3 LGAs: Jos North (62.8%), Jos South (32.7%) and Jos East (0% - does not have a pharmacy).

Most of the pharmacies (89) were individually owned while 4 were owned by cooperative societies and missionary groups. Daily patient traffic in these pharmacies ranged from 400-500 patients with a mean of 66.18 ± 70.6. Cumulatively, about 7,018 people visit the included community pharmacies daily. When the daily patient traffic in these pharmacies was grouped into three groups, 39.8% of the pharmacies had patient flow between 31 – 90 patients/day followed by ≤ 30 patients/ day (31%) and >90 patients (22.1%).

Community pharmacies whose premises were registered with the Ministry of Health had more patient flow for all the categories related to daily traffic of patients to the pharmacies. For those with ≤ 30 patients/day, pharmacies with registered premises (20) had 57.1% of traffic compared to 42.9% for those not registered. For the 31– 90 group, 55.6% of traffic was with those whose premises was registered (25) while 44.4% was for those not registered and for >90 patients/day group, 56% were for those with registered premise (14) and 44% for those not registered.

Table 4

Demographics of Community Pharmacies Involved in Study (N =113)

Variable	Frequency	Percentage (%)
Premise Registered with MOH		
Yes	64	56.6
No	49	43.4
Location (LGAs)		
Jos North	71	62.8
Jos South	37	32.7
Bassa	3	2.7
Mangu	1	0.9
Bokkos	1	0.9
Type of Community Pharmacy[a]		
Individually owned	89	78.8
Attached to a Hospital	5	4.4
Part of a chain of pharmacies	14	12.4
Others	4	3.5
Traffic of all patients in pharmacy/day[b]		
≤ 30 patients/day	35	31
31 – 90 patients/day	45	39.8
> 90 patients/day	25	22.1

[a,b] Has one or more missing systems (unfilled response), MOH - Ministry of Health

Demographic Characteristics of Study Population (Community Pharmacists)

Most of the CPs (89.4%) were registered with the ACPN. Their ages ranged from 23–70 years. The average age was 41.28 ± 11.62 years with more male CPs in the population (62.8%). 28 CPs had post graduate qualifications. Number of years' post-graduation (from basic degree) also ranged from 1-40 years with a mean of 13.29 ±

11.86. Duration of practice ranged from 0.5-36 years, mean of 9.26 ± 9.28. Table 5 summarizes other demographic details of the CPs.

More of the CPs not registered with ACPN were females (55.6%) compared with 35.6% for members of ACPN. None of the CPs not registered with ACPN had any form of post-graduate qualification but 67% had prior dental education unlike 28 (27.7%) members of ACPN who had either a Masters or a Doctorate degree. Also, 47% of ACPN members had prior dental education. All CPs who were non-members of the ACPN graduated within the last 10 years compared to 57% for those CPs registered with ACPN ($p < .05$). CPs' Membership in the ACPN was significantly related to them seeing oral health promotion as an opportunity to make a difference in their communities ($p < .001$).

Table 5

Demographic Characteristics of Study Population – CPs (N =113)

Variable	Frequency	Percentage (%)
Registered member of ACPN?		
Yes	101	89.4
No	9	8.0
No response	3	2.6
Age group (years)		
20 – 35	41	36.3
36 – 55	40	35.4
>55	32	28.3
Gender		
Male	71	62.8
Female	42	37.2
Highest educational level		
University degree	85	75.2
Masters	26	23.0
PhD	2	1.8

Religious affiliations		
Christianity	102	90.3
Islam	7	6.2
None	1	0.9
No response	3	2.6
Number of years' post-graduation		
1 – 10	64	56.6
11 – 20	15	13.3
>20	26	23.0
No response	8	7.1
Duration of Practice (years) [a]		
≤ 10	80	70.8
11 – 20	16	14.2
>20	16	14.2
Previous Dental Education[b]		
Yes	58	51.3
No	54	47.8
Previous visit to the Dentist		
Yes	78	69.0
No	35	31.0

[a,b] Have one missing system each (unfilled response). ACPN - Association of Community Pharmacists of Nigeria

Research Question 1: Results

This question addressed the relationships between the demographic characteristics of the CPs and knowledge of oral health. Knowledge score for the CPs showed a range of 11-21 and a mean score of 17.18 ± 2.44. None of the CPs fell into the group of poor knowledge of oral health. Forty-four CPs (38.9%) had average knowledge of oral health (score 9-16) while 61.1% had good knowledge of oral health (score > 16). Taking 16 (out of 24) as the minimum pass score for knowledge of oral health by CPs, a one-sample t-test reported good knowledge of oral health by the CPs: $M = 17.2$, $SD = 2.44$, $t(112) =$

5.14, $p < .001$. A score of 17 to a maximum of 24 out of 24 refers to a good knowledge score.

A multiple regression analysis was conducted to evaluate the relationship between the following demographic characteristics: age, gender, location of practice, duration of practice, highest education level, prior dental visit, number of years' post-graduation, registration of pharmacy, prior dental education, stocking of oral health care products, and knowledge of oral health. This was done using the forced entry method for the independent variables. The relationships between the predictors and knowledge of oral health were not statistically significant, with $R^2 = 0.12$ and adjusted $R^2 = 0.005$, $F(10, 78) = 1.041$, and $p = 0.418$. About 12% of the variance in the score of knowledge of oral health can be accounted for by its linear relationship with the predictor variables. Table 6 shows the weights of the *B* coefficients for the predictor variables. All of the predictors were not significantly related to knowledge of oral health apart from stocking of oral health care products, which has a statistically significant negative correlation as the *t*-tests associated with the β values is statistically significant. Though prior dental education (β = -.081, $sr_i^2 = .052$), gender (β = -.121, $sr_i^2 = .012$) and duration of practice (β = .001, $sr_i^2 = .012$) are better predictors of knowledge of oral health than stocking of oral health products (β = -.246, $sr_i^2 = .006$), they were not statistically significant ($p > 0.05$).

The unstandardized beta readings are the *B* coefficients for the predictor variables without considering the influence or effects of the other covariates in the regression equation. The standardized beta reading is when the influence of other covariates in the regression equation had been controlled for to assess the effect of the predictor variable.

For example, in Table 6, for every CP who does not stock oral health products, there is a corresponding 4.16 unit reduction in knowledge score of oral health. However, if the effects of the other covariates in the regression equation are considered, the unit reduction in oral health knowledge for those CPs who do not stock oral health products would be .246 utilizing the standardized beta coefficient.

Table 6

Relationship between Demographic Characteristics of Community Pharmacists and Knowledge of Oral Health

Model	Coefficient			*T*	*P*	sr_i	sr_i^2
	Unstandardized		Standardized				
	Beta	SE	*Beta* (β)				
Constant	23.420	3.471		6.747	.000		
Age (years)	.027	.074	.118	.365	.716	.039	.001
Gender	-.632	.597	-.121	-1.058	.293	-.113	.012
Location of practice	.111	.294	.044	.377	.707	-.044	.001
Duration of practice	.000	.063	.001	.002	.989	-.110	.012
Highest education	-.594	.576	-.119	-1.031	.306	.040	.001
Prior Dental visit	-.506	.684	-.095	-.741	.461	.000	.000
Years post-graduation	-.033	.080	-.154	-.412	.682	.022	.000
Registered premise	.116	.573	.023	.203	.840	-.074	.005
Dental education	-.409	.584	-.081	-.700	.486	-.229	.052
Stock OH products	-4.159	1.933	-.246*	-2.152	.035	-.079	.006

Note. SE = Standard Error. * $p < .05$; sr_i = semi partial correlation, sr_i^2 = squared semi partial correlation

Research Question 2: Results

This question addressed the relationships between demographic characteristics of CPs and their interest in becoming more involved in the provision of services on oral health problems. A binary logistic regression analysis was conducted to evaluate how the following demographic characteristics age, gender, location of practice, duration of

practice, highest education level, prior dental visit, number of years' post-graduation, registration of pharmacy, prior dental education, and payments for dental treatment would predict CPs' interest in becoming more involved in provision of services on oral health problems. This was done using a standard logistic regression entry method for the independent variables. The set of independent variables was found to not be statistically significantly related to the dependent variable or outcome. The independent variables did not predict the interest of CPs in becoming more involved in the provision of services on oral health problems, with χ^2 (7) = 7.72, ($p > 0.05$), and $R^2 = .08$.

This Chi-Square value shows that the predictors do not relate with the outcome variable while the effect size (.08) signifies very little overlap between the predictors and the outcome variable. The overall correct classification was 95.6% with 100% of those that are interested in becoming more involved in provision of services on oral health problems being correctly classified, and 0% of those not interested being correctly classified. Table 7 shows the variables in the logistic regression. Having Table 7 as the model logistic regression relationship between the outcome variable and the predictor variables, Table 8 shows the influences of the proposed confounding variables: receiving payments for rendering oral health service, prior dental education, previous dental visits and stocking of oral health products. Table 8 shows that stocking of oral health products does not have confounding effects on the OR of the preceding model (Model 4). This is unlike the remaining three variables which have varying effects (positive and negative confounding effects) on the covariates.

Table 7

The Relationship between Demographic Characteristics and interest of CPs in becoming more involved in Provision of Services on Oral Health problems

	B	SE	Wald	df	*P*	e^B	95% CI of e^B	
							LL	UL
Age	.277	.195	2.033	1	.154	1.320	.901	1.932
Gender	-18.632	6425.84	.000	1	.998	.000	.000	.
Location	-.532	.643	.682	1	.409	.588	.167	2.074
Duration of practice	-.067	.094	.509	1	.475	.935	.777	1.125
Highest education	-.840	1.579	.283	1	.595	.432	.020	9.527
Years Post-Graduation	-.169	.173	.954	1	.329	.845	.602	1.185
Registered premise	.704	1.294	.296	1	.586	2.023	.160	25.545
Constant	7.966	6425.84	.000	1	.999	2882.09		

Note. SE = Standard Error, LL = lower level, UL = upper levels and CI = confidence interval, e^B = Exponential of B

Table 8

Effects of confounding variables on the regression model

	Model 1		**Model 2**		**Model 3**		**Model 4**		**Model 5**	
Covariates	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age	1.32	0.90-1.93	1.40	0.89-2.20	1.49	0.94-2.36	1.57	0.93-2.66	1.57	0.93-2.65
Location	0.59	0.17-2.07	0.62	0.19-2.04	0.41	0.09-1.98	0.39	0.08-1.93	0.40	0.08-2.04
Gender	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Duration of practice	0.84	0.75-1.13	0.97	0.79-1.17	0.93	0.76-1.13	0.92	0.74-1.13	0.92	0.75-1.13
Highest education	0.43	0.02-9.53	0.37	0.02-9.26	0.47	0.02-13.5	0.57	0.02-20.7	0.56	0.02-20.3
Registered premise	2.02	0.16 - 25.55	2.28	0.17 - 30.73	4.89	0.19 - 123.51	7.81	0.17 - 362.86	7.68	0.17 - 348.40
Years Post-graduation	0.85	0.60-1.19	0.79	0.52-1.18	0.74	0.50-1.12	0.73	0.47-1.12	0.73	0.48-1.12
Confounders										
Payment for service			0.44	0.03-5.60	0.13	0.00-4.27	0.09	0.00-4.49	0.10	0.00-2.85
Dental Education					0.06	0.00-1.97	0.03	0.00-2.59	0.03	0.00-2.85
Prior Dental visit							3.06	0.09 - 110.36	3.09	0.09 - 117.98
Stocking OH products									0.00	0.00

OR = Odds ratio, OH = Oral health, CI = Confidence intervals

Research Question 3: Results

Research question 3 addressed the difference between the mean knowledge score of CPs registered with ACPN and those not registered with ACPN. An independent sample t-test showed that CPs registered with ACPN (N = 101) had slightly higher knowledge scores (M = 17.2, SD = 2.5) than did those not registered with ACPN (N = 9) M = 16.6, SD = 1.9, $t(108)$ =.760, p = .45. The proportion of CPs registered with ACPN having good knowledge scores for oral health was 61.4% unlike 44.4% for the CPs not registered with ACPN. Despite the differences between the mean knowledge scores of the two groups, it was not statistically significant.

Additional Results

Several additional results were reviewed from the collected data. These were constructs identified during the literature review and deemed relevant to the purpose of the study. While not part of the primary analysis, they are provided as supporting results to help expound the interpretations of the research questions and help create understanding for the discussion in Chapter 5.

Attitudes of CPs Towards Provision of Oral Health Care

Working with a standard pass score of 3.01 (as stated in the data analysis plan) for the attitudes of CPs, a one-sample t-test of the attitudes of CPs towards provision of oral health care reported a positive attitude: M = 4.54, SD = .59, $t(111)$ = 27.65, $p < .001$. No demographic factor had statistically significant differences in the mean opinion scores for attitudes towards provision of oral health services.

Encounters of CPs with Patients Requiring Oral Health Care

On average, per week, the number of patients requiring oral health care seen by the CPs ranged from 1-50, mean of 5.13 ± 6.15. In all, per week, about 534 patients were seen by the CPs in the visited pharmacies with requests on oral health advice. Figure 3 shows that a quarter (25%) of the CPs come across these patients on a daily basis while 2.7% hardly see these patients. Figure 4 shows a scatter plot correlating the average weekly number of patients requiring oral health advice and the daily patient traffic in the pharmacies. There is a moderate positive correlation $r = .446$, $p < .001$

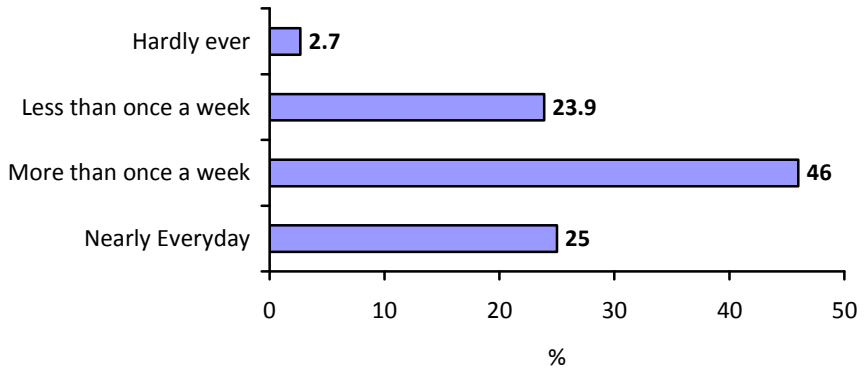

Figure 3. Community pharmacists' encounters with patients requiring oral health care.

Types of Oral Health Condition/Advice Patients are Requesting

Toothache (94.7%) is the most common oral health advice patients are requesting followed by bad breath (69.9%) and Teething (69%). Table 9 documents the frequencies of the other requests.

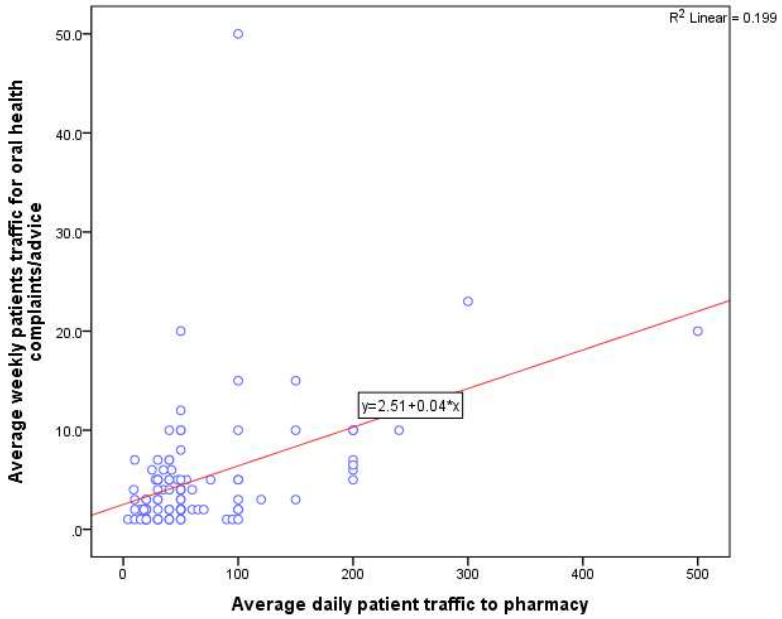

Figure 4. Correlation between traffic inflow to pharmacies with patients requiring oral health care.

Table 9

Frequency of Oral Health Condition/Advice as requested by patients

Condition/Advice	Frequency	Percentage (%)
Mouth Ulcers	68	60.2
Toothache	107	94.7
Teething	78	69.0
General Oral Hygiene	31	27.4
Mouth wash	62	54.9
Dentures	2	1.8
Broken teeth	26	23.0
Location of a Dentist	36	31.9
Bleeding gums	55	48.7
Toothpaste/toothbrush advice	41	36.3
Sensitive teeth	51	45.1
Tooth whitening	29	25.7
Bad breath/mouth odour	79	69.9

Services Rendered by CPs for Oral Health Problems

Nearly all (96.5%) the respondents provide services to clients who approach them with oral health problems. 90.3% of the CPs prescribe pain relievers, 77.9% prescribe an antibiotic while 90.3% refer the clients to the Dentist. Other services provided are recommendation of oral health product to use (54%) and others (5.3%) which includes referral to other health care institutions. Only 28.3% of the CPs received payments for rendering these services. Most (94.7%) of the CPs are interested in becoming more involved in provision of services on oral health problems.

Challenges of CPs in Oral Health Care

The major barriers listed by the CPs as militating against the provision of oral health services are depicted in Figure 5. The figure shows that poor knowledge of oral health (76.1%) is the most mentioned barrier.

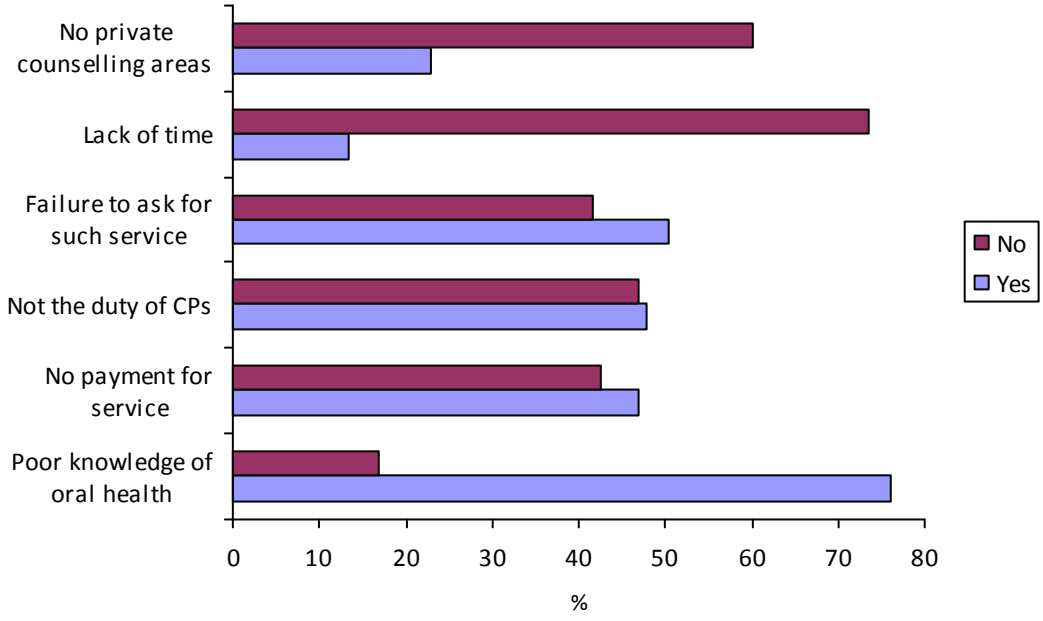

Figure 5. Major barriers to providing oral health services by community pharmacists

Preferred Media for more Information on Oral Health by CPs

A lot of the CPs (86.7%) said they knew where to access more information on oral health if needed. Table 10 shows that the most preferred media of communication for any new information on oral health are via organizing seminars, conferences and workshops on oral health (76.11%), oral health products and medication leaflets (74.34%) and through the Dentist or other oral health care professionals (72.57%).

Table 10

Preferred communication medium for disseminating new information on oral health

Medium	Frequency	Percentage (%)
Oral health products/medication leaflets	84	74.34
Internet	79	69.91
Pharmacist Council of Nigeria	41	36.28
The Dentist or other oral health professional	82	72.57
Educational materials such as posters, fliers on oral health	76	67.26
Seminars, workshops, conferences on oral health	86	76.11
Association of Community Pharmacists in Nigeria	62	54.87
Media (TV/Radio/Newspaper)	70	61.95
Pharmaceutical journals	81	71.68

The CPs felt they would benefit from trainings on oral health to give advice for all the stated oral health conditions in Table 11. Bad breath (97.3%), teething (96.5%) and

bleeding gums (95.6%) being the most common conditions mentioned. Denture problems was the least at 71.7%.

Pharmacy Practice Standard

Twenty-six (23%) CPs were convinced that oral health promotion was part of the Pharmaceutical Council of Nigeria (PCN) community pharmacy practice standard. Others were either unsure (43.4%) or affirmative that oral health promotion was not part of the practice standard (30.1%). However, 82.3% of those who said 'no' or 'unsure' would want oral health to be incorporated into PCN's community pharmacy practice standard.

Table 11

List of topics CPs feel they would benefit from in training

Condition/Advice	Frequency	Percentage (%)
Teething	109	96.5
Lost dental fillings	83	73.5
Bleeding gums	108	95.6
Trauma to teeth	89	78.8
Bad breath / mouth odour	110	97.3
Denture problems	81	71.7
Dental caries	99	87.6
Dry mouth	96	85.0
Sensitive teeth	106	93.8
Discolored teeth	103	91.2
Gum diseases	106	93.8
Mouth ulcers	107	94.7
Oral cancers	95	84.1

Recommendations and Opinions of CPs

How knowledge of oral health can be improved among CPs. Although about half (51.3%) of the CPs claimed to have had some form of dental education in the past, most of these were via scheduled lectures during undergraduate training (17.7%) and attendance at dedicated seminars, trainings and conferences (14.2%). Notwithstanding, the cardinal method suggested by most of the CPs on how to improve their knowledge of oral health is via organizing seminars, workshops and training on oral health (63%). Other proposed methods include establishing a dentist – pharmacists partnership (6%), incorporating oral health education as part of the mandatory continuing education program (MCEP) for pharmacists (4%), including it in undergraduate study (4%), regular presentations at monthly ACPN meetings (2%) and introducing oral health promotion into PCN community pharmacy practice standard (2%).

Expansion of the services of CPs on oral health care. Some of the CPs (16%) were of the opinion that it would be a welcomed idea. Others added that it would be an avenue to render preventive services to the community (5.3%). Training of pharmacists with requisite knowledge, removal of restrictive policies in the health bill, sensitizing the public on the availability of such services at the pharmacies and ensuring the availability, accessibility and affordability of oral health care products would ascertain the success of such an initiative.

Summary

This chapter gave a flow of how data was collected and the results of data analysis. The findings to the research questions were also enumerated. Overall, 207

community pharmacies were identified in the state with 113 included in the study. Of the community pharmacies included in the study, 56.6% were registered with the Ministry of Health while 89.4% of the CPs who participated in the study were members of ACPN. Most of the community pharmacies were in the state capital and only 5 out of the 17 LGAs in the state had community pharmacies. It was found that demographic characteristics of the CPs had no statistically significant relationship with knowledge of oral health apart from stocking of oral health products which has a statistically significant negative contribution to the regression model. However, dental education ($\beta = -.081$, $sr_i^2 = .052$), gender ($\beta = -.121$, $sr_i^2 = .012$) and duration of practice ($\beta = .001$, $sr_i^2 = .012$) are better predictors of knowledge of oral health than stocking of oral health products ($\beta = -.246$, $sr_i^2 = .006$), they were not statistically significant ($p > 0.05$).

Also, an assessment of which demographic factor(s) would predict the interest of CPs to be more involved in provision of oral health services revealed that none was statistically significant $\chi^2 (7) = 7.72$, ($p > 0.05$), Cox and Snell $R^2 = .08$. The meaning of these results and other findings are provided in Chapter 5. Chapter 5 will also discuss limitations of this study, avenues for further research, recommendations, and the study's implications for positive social change.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Oral health is an important component of general health and a major determinant of quality of life (Cohen, 2013; Petersen, 2009). Attainment of oral health can happen through different measures including knowledge, especially of dental diseases and their prevention, acceptable oral health behaviors, and the utilization of oral health care facilities. Oral health awareness is the individual or public awareness of the existence and prevention of oral diseases and knowledge of the requisite steps to take for treatment when such diseases occur (Sofola, 2010). There is poor oral health awareness in Nigeria and less than one-fifth of Nigerians have access to oral health care (Braimoh et al., 2014; Etiaba et al., 2015; Olusile, 2010; Osazuwa-Peters, 2011). This is mainly attributed to limited access to correct information on oral health and poor oral health manpower (Olusile, 2010). The impact of poor oral health awareness in Nigeria is worse in Northern Nigeria (Olusile, 2010). A direct effect of this low awareness is poor illness seeking behavior as people are not well informed on preventive steps to avert the occurrence of oral diseases or how to get treatment for existing diseases. As a result, patients present late for treatment mostly with complications that may have been prevented (Sofola, 2010). Invariably, oral disease is still a major challenge in Nigeria and its burden mounting.

Because the basic responsibilities of pharmacists as agents for dispensing medications had broadened to encompass other areas of health care including health promotion and preventive services, they are positioned to offer advice on oral health care

and susceptibility to a variety of oral problems (Amien et al., 2013; Amin, 2016; Cohen, 2013; Laliberté et al., 2012; Wibowo et al., 2015). In this quantitative study, I described the roles CPs in Plateau state, Northern Nigeria and how they serve as a potential source of oral health information. This was done by assessing their background knowledge and practices of oral health care and relating these with their demographic characteristics. This served as a platform upon which they can be empowered and engaged as media for propagation of oral health care and awareness in their communities.

Generally, CPs' basic knowledge of oral health was above average, and they had a good disposition towards engaging in oral health prevention services. Though the CPs provide oral health services ranging from treatment, referral, and counsel to serving oral health problems, they were willing to do more to advance the cause of oral health care. Despite not finding any association between prior dental education and time in practice and oral health knowledge scores, many oral health topics were specified as areas where more training would improve their capacity and competence in attending to patients presenting with such complaints. Barriers necessitating adequate provision of oral health services were mentioned and recommendations given on how to improve knowledge of oral health among the CPs and the expansion of PCN community pharmacy practice standards to include oral health care.

Interpretations of Findings

Knowledge of Oral Health of Community Pharmacists

All the CPs surveyed in this study exhibited an above average knowledge of oral health (i.e. a knowledge score of greater than 70%). Braimoh et al. (2014) reported a high

proportion where 60.4% and 34.3% of the respondents had average and good knowledge scores of oral health respectively. The respondents were primary health care (PHC) workers and these scores were not significantly related to previous training on oral health (Braimoh et al., 2014). Disparities with this finding may be due to the more comprehensive measuring instrument for this study and varying demographics of the study populations as CPs have higher educational requirements than PHC workers.

Community pharmacists who were members of the ACPN had similar mean knowledge score of oral health compared to nonmembers. Though the knowledge score among ACPN members was not statistically significant compared to that of nonmembers, presentations at ACPN meetings (54.9%) was one of the preferred methods of communication for disseminating new information on oral health. All other examined demographic factors had no statistically significant association with knowledge of oral health. Of all the covariates, only stocking of oral health products had a statistically significant predictive relationship with knowledge of oral health (Table 6). For every CP who does not stock oral health products, there is a corresponding .246 unit reduction in the knowledge score of oral health, controlling for the other covariates. Many oral health products come with educational leaflets and posters for advertorials that could have served as a source of information about one or more conditions for which the product was developed.

About half (51.3%) of the respondents claimed that they received formal dental education in the past. Most of these were scheduled lectures during undergraduate training (17.7%) and attendance at dedicated oral health seminars, trainings, and

conferences (14.2%). Oral health education had not been officially incorporated into the study curriculum of pharmacy in Nigerian Universities. Similarly, about 30% of CPs from South Africa did not partake in any form of education on oral health during their undergraduate training (Gilbert, 1998). This seems not to have changed not only in South Africa; other southern and eastern African countries like Zambia, Malawi, Botswana, Sudan, Tanzania, Zimbabwe, and Uganda do not have oral health education as part of undergraduate training for pharmacy (South African Pharmacy Council [SAPC], 2016; University of the Western Cape, 2013; WHO, 2002).

Sixty-three percent of the respondents opted for workshops, seminars, and conferences on oral health education, unlike only four CPs (3.5%) who recommended its inclusion in undergraduate study. Seminars and conferences may be preferred as they could be scheduled many times within a year and repeated yearly compared to incorporation into undergraduate studies whose impact tends to wane with increasing years post-graduation.

The most common barrier mentioned as affecting effective rendering of oral health services in their practice was poor knowledge of oral health (Figure 5). The oral health knowledge assessment in this study was a general overview of what oral health is and how it was at variance to the views of the CPs. This assertion is contingent on the disclosure by nearly all the CPs in this study that they would benefit from training or more information on the stated oral health topics and in Table 11. Teething, bleeding gums, mouth odor, sensitive teeth, discolored teeth, gum diseases, and mouth ulcers had requests from more than 90% of the CPs.

Though Mann et al. (2015) did not objectively assess knowledge of oral health but the perceived confidence level of the participants when delivering advice on oral health problems, the participants (91.5%) with high self-assessed knowledge score on oral health still desired further training on oral conditions. Pharmacists who were not well trained in oral health related topics showed eagerness to increasing their oral health knowledge (Cohen, 2013; Maunder & Landes, 2005). The same pattern was noticed where 59.4% of the CPs responded positively to their willingness to partake in trainings on oral health (Gilbert, 1998). Their competence was based on previous attendance at oral health seminars (Maunder & Landes, 2005).

Though a lot of the CPs (86.7%) said they knew where to access more information on oral health if needed, it seems such resources were not utilized going by the huge requests for more training on the oral health conditions. The most preferred medium of communication for any new information on oral health was through seminars, conferences and workshops on oral health (76.11%) which confirms earlier recommendations on how to improve the knowledge of oral health of CPs (Table 10). Others were via oral health products and medication leaflets (74.34%) and through the Dentist or other oral health care professionals (72.57%). Eighty-one CPs (71.7%) in this study cited publications in pharmaceutical journals as a preferred medium for disseminating oral health information. Increased awareness of oral health related issues has been found to be a result of production of educational packages, and publication of oral health articles in pharmaceutical journals (Chestnutt et al., 1998; Cohen, 2013).

Interests of Community Pharmacists in Providing Support for Oral Health Care

Twenty-three percent of the CPs in this study were convinced that oral health promotion was part of the practice standard. A higher proportion (43.4%) were unsure of its inclusion in the practice standard. This may signal ignorance of the contents of the PCN community pharmacists practice standard. Of the population of those who affirmed that oral health promotion was not part of the practice standard and those not sure (83), 82.3% would want oral health to be incorporated into PCN community pharmacy practice standard. This shows a positive disposition towards oral health care among the surveyed CPs in this study.

About ninety percent of the CPs surveyed in this study perceived a role for themselves in promoting good oral health in their practice. They had positive attitudes towards oral health promotion, seeing it as an avenue to make a difference. Chestnutt et al. (1998) showed that 80% of pharmacists believed oral health care was part of their role. This agrees with Mann et al. (2015) who said 99.4% of CPs acknowledged that pharmacists should have a role in oral health care. Though 92.4% of the participants in his study claimed that provision of oral health promotion was not part of their contract, 72.5% of them were willing to incorporate this into their contract (Mann et al., 2015). Also, most of the CPs (97.1%) interviewed by Bawazir (2014) were of the view that they play an important role in oral health care and 81% showed enthusiasm to participate in oral health promotional activities.

There was considerable interest (94.7%) also on the part of CPs to become more involved in provision of services for oral health problems. An assessment of the

predictive effects of the demographic factors (Age, gender, duration of practice, geographical location, educational level, average number of patients with dental complaints seen per week, prior dental education, and previous dental visits) on this outcome did not yield any that was statistically significant. CPs whose practice was registered with the Ministry of Health were two times more likely to be more involved in oral health service provision (Table 7). When some CPs in a study by Maunder & Landes (2005) were asked of their willingness to partake in oral health promotional activities, their response was based on the type of pharmaceutical store they were practicing: if it was independently owned or part of a chain of pharmacies. Most (82.4%) were willing to partake in oral health promotional activities. However, those practicing at multiple owned pharmacies (11.8%) were of the view that their head office would have to be contacted first for approval (Maunder & Landes, 2005). Receiving payment for oral health service rendered (28.3%), previous dental education (51.3%) and previous dental visits (69%) were variables which had varying confounding effects (positive and negative) on the relationship between the demographic covariates and becoming more involved in provision of services on oral health problems in this study.

A lot of the CPs (95.6%) were willing to do more as oral health advisers and when asked of their views regarding expansion of the services of CPs to include oral health care, they thought it was a welcome idea and an avenue to render preventive services to the public. This is the same view of 72% of CPs in South Africa who were also receptive of their roles in oral health care and prevention of dental diseases, also describing it as an avenue to offer better services to the public (Gilbert, 1998). The major

barrier cited against their willingness to do more as an oral health adviser in this study was poor knowledge of oral health. Others were the belief that it was not the duty of CPs (47.8%), failure of clients to ask for such services (50.4%) and not being paid for service rendered (46.9%). Two CPs were of the view that restrictive policies in the country's health care bill should be removed to encourage CPs to embrace oral healthcare in their practice. The role of policy had earlier been cited as a barrier to provision of preventive services by CPs. Despite provision of health services, pharmacists are not classified as health care providers (Meyerson et al., 2013).

Regardless of the fact that nurses, physician assistants, and pharmacists share similar roles as primary health care providers, promoting the health of the public, preventing and treating disease, counselling and education of the public, only nurses and physician assistants are listed as Non Physician Practitioners (NPPs) by the American Academy of Family Physicians (AAFP) (Lai et al., 2013). Due to this inequality, pharmacists are not adequately reimbursed nor compensated for services rendered to the public (Lai et al., 2013; Meyerson et al., 2013). Though about 70% of the surveyed CPs do not receive payments for oral health services rendered and 46.9% do not see not receiving payments as a barrier to offering oral health care services, it is important to honor CPs for the extended services they provide (Lai et al., 2013). As stated above, this would require policy amendments for the recognition of health care provider designation status for pharmacists to encourage a sustainable, qualitative, and reimbursed service provision (Meyerson et al., 2013).

Community Pharmacists as Potential Sources of Oral Health Information

An average of 7,018 people visit the community pharmacies included in this study daily. The community pharmacy by virtue of its vantage position, ready accessibility, long opening hours, and no appointment prerequisite for visits makes it a frequently visited facility, positioning them as a ready source of information. Global patient traffic figures are close to 250 million people per week, six million people daily, and greater than 90% of the population visiting them during a year (Adje & Oli, 2013; Chestnutt et al.,1998; Cohen, 2013; Hassali et al., 2009**)**. All these figures confirm that there is high traffic flow of patients into community pharmacies daily.

In the visited pharmacies, the average number of patients per week requiring oral health care seen by the CPs ranged from 1-50. This frequency varies with the location and size of the pharmacy and positively correlated with general patient flow of the pharmacies. In all, per week, about 534 patients requesting on oral health advice were seen by the CPs. When asked about the frequency of contact with these patients, 25.7% of the CPs see these patients nearly every day (Figure 3). This buttresses the high prevalence of oral health challenges in the population. Only 3 CPs hardly come across such patients.

The few studies conducted to ascertain roles of CPs in promoting oral health also affirmed that CPs were regularly approached (at least more than once a week) for advices on oral health. Amien et al. (2013) found that most of the CPs (91%) dealt with oral problems regularly. On the other hand, Gilbert, (1998) assessing the extent to which pharmacists were asked about oral health care showed that 44.1% of the CPs were

approached every day with oral health complains, 44.2% about once a week, 8.8% twice a week and the rest (2.9%) once a month. In Saudi Arabia, out of 141 CPs interviewed, 33.8% reported ten daily requests for oral health advice, 35.5% reported less than that while 30.7% stated that they had more than 10 daily requests for oral health advice (Bawazir, 2014). This is similar to Indian where 84% of the respondents also claimed that they had about ten patients with dental complain visit their pharmacy every day (Priya et al., 2008). Of the 17 CPs interviewed in a Northern England survey, 67.4% reported more than 11 requests per week (Maunder & Landes, 2005). The higher proportion of CPs reporting daily oral visit in these countries compared to this study may be due to higher oral health awareness in such places.

Toothache (94.7%) was the most common oral health advice patients were requesting in this study. This is followed by bad breath (69.9%) and Teething (69%). This is similar to an Indian study where toothache (78%) was the most common oral complaint encountered followed by bleeding gums, mouth odor and oral ulcers (Priya et al*.,* 2008). A similar pattern was in UK with toothache (93.5%), oral ulcers (88.1%) and teething (76.3%) presenting as the most commonly encountered oral health complaints from patients (Mann et al., 2015). In Saudi Arabia, the types of oral conditions most commonly encountered were toothache (29.7%), mouth ulcers (24.9%) and halitosis (11.7%) (Bawazir, 2014). Toothache is pain in or around the tooth with varied causes. It is the most common type of orofacial pain and its presence (or absence) could be a reflection of the oral hygiene of the host. The varying causes could account for the differences in the proportion of its presentation. It is likely that some mouth ulcers could

have been misclasified as toothaches especially those in close proximity to the teeth as CPs may not have the ability to differentiate this. However, in South Africa, oral ulcers (55.8%), oral thrush (49.2%), and toothache (33.3%) were the most common presentations (Amien et al., 2013). Likewise, in Northern England, mouth ulcers (20%) and toothache (18%) were the most prevalent presentations (Maunder & Landes, 2005). Unlike what was seen in this study (especially for teething), less commonly sought advices reported were teething problems, types of toothpastes and toothbrush to use (Amien et al., 2013; Maunder & Landes, 2005; Priya et al., 2008).

Roles of Community Pharmacists in Oral Health Care

Nearly all the CPs surveyed (96.5%) in this study provide some form of oral health care service to patients approaching them with oral health concerns. This is a common trend with CPs as they are consulted for a lot of oral health-related issues. This includes prescription of medications for pain and infections, providing counsel or advice in response to clients presenting with varied signs and symptoms. Others are referrals to general dental practitioners, oral health promotion services, retailing and recommendations on oral health products (Amin & Chewning, 2016; Cohen, 2013).

Prescription of over-the-counter (OTC) medicine. When approached by customers with oral complaints, 90.3% of CPs in this study prescribe pain relievers while 77.9% prescribe an antibiotic. This proportion is high possibly because toothache is the most prevalent presentation. It is very likely an individual suffering from toothache would bypass the doctors and dentists to see the pharmacists for symptomatic relief (Amien et al., 2013; Mann et al., 2015). This happens because most dental conditions are

acutely painful disturbing the activities of the day as well as affecting the quality of life of the people. Such an experience drives people to seek or request for advice for an over-the-counter drug for pain relief as it is more convenient compared to scheduling an appointment with the dentist where there might be long waiting time for such an emergency (Mann et al., 2015).

In India, 38.5% of CPs surveyed referred the patients to a nearby dentist after dispensing medications, while 22.4% of the pharmacists dispensed antibiotics and painkillers without any referral (Priya et al., 2008). Additionally, in a Saudi Arabian study, 44% of the CPs dispensed a painkiller and 13% prescribed an antibiotic when approached by patients with oral complaints (Bawazir, 2014). In Northern England, all the CPs interviewed provided short term pain relief when approached by patients with oral health complains (Maunder & Landes, 2005). Both (pain killers and antibiotics) are usually dispensed together because a lot of the causes of toothache are bacterial infections. Though this combination is not the treatment of choice for toothaches, it is a palliative measure pending proper assessment, diagnosis and treatment by the dentists. Unfortunately, with the pain relieved, most patients are not compelled to see the dentists but rather continue with their activities until pain resurfaces and they return to the CPs again for medications and the cycle repeats itself. This poor oral health seeking behavior could also account for the increased frequency in prescriptions from the CPs.

Referral to a general dental practitioner. A lot of the CPs (90.3%) in this study also refer their patients with oral complaints to the Dentist for further management. Though only 69% had visited a dentist before, 85.8% knew the location of the nearest

dental practitioner which may explain the high proportion with the referral. In Northern England, in 94.1% of cases, CPs advised customers with oral complaints to see a dentist, 23.5% to see a doctor, and 41.2% gave oral hygiene advice (Maunder & Landes, 2005). In another study, in India, with respects to customers with oral complains, 38.5% of the pharmacists referred the patients to a nearby dentist after dispensing medications (Priya et al., 2008). Sixty-seven percent of the CPs would refer their clients presenting with oral ulcer to either the GP or a Dentist if topical management did not work (Amien, 2008). In UK, Mann et al. (2015) reported that 74.6% of the CPs provided referrals to the dentist for various conditions while the rest did not make any referrals. Out of 141 CPs interviewed in Saudi Arabia, 81.7% of them refer patients requiring dental care to the dentist (Bawazir, 2014). Referral, which is an indication of a limitation in the CPs' expertise in oral health field, is a cardinal avenue to enlighten patients especially in Nigeria where awareness about oral health practice is very low. The CPs could direct people to the right place to seek further treatment.

Oral health counsel and advice. 82.4% of CPs in this study do counsel patients with oral requests on what to do. Though I did not seek to know the types of counsel rendered, Amien (2008) reported some advice given to patients presenting with oral thrush in a South African study includes regular use of multivitamin supplements, supplementary use of antibiotics and dietary counselling. Likewise, for mouth sores, CPs told their patients to apply medicine, use multivitamins and dietary counsel (Amien, 2008). For oral hygiene practices, out of 54 CPs in another South African study, 57.7% recommended a dental examination at least twice a year (six monthly) while the others

suggested once a year. The main advices to prevent tooth decay were brushing (87.9%), flossing (69.7%) and visiting the dentist (57.6%) (Gilbert, 1998). Nearly all the respondents (98%) in a Saudi Arabian study were interested in giving oral health advice (Bawazir, 2014). In an Indian study, 70% of the CPs signified willingness to give oral health advice to patients (Priya et al., 2008) while a semi-structured interview with 49 CPs in New Zealand showed that most of them agreed that providing oral health advice was within their roles (Buxcey et al., 2012).

Recommendation on dental products to use. The pharmacy is an important source of dental hygiene aids. Nearly all (98.2%) CPs in this study stock oral health care products. Most of these are toothbrushes, toothpastes and mouth rinses. CPs and their staff are usually able to offer advices to clients making enquiries on the type of mouthwash, dental floss, toothbrush and toothpaste to use (Chestnutt et al., 1998). Only 54% of the CPs in this study gave recommendations of oral health products to use. This maybe a reflection of the types of products they have which are beneficial for few oral health complaints. According to Bawazir (2014), factors that could affect the recommendations of a particular oral hygiene product includes knowledge of the product (38%), personal experience (22.8%) and dentist's opinion (15.7%). Other are product advertisements (11.6%) and popularity of the product (9.3%). As for the CPs interviewed in Northern England, their recommendation of oral health care products was based on personal experience and attendance at update courses on oral health (Maunder & Landes, 2005).

Limitations of the Study

Apart from community pharmacies, there are other retail outlets people with oral health concerns can visit for care. In Nigeria, Patent Medicine Stores and Chemists also sell government approved over-the-counter medicines. Though they don't offer pharmaceutical services, patients with oral health concerns can also visit them for desired oral health care. Invariably, findings from this study can't be generalized to cover oral health care experiences from these other avenues.

Secondly, for this study, it was assumed that oral health consultations in community pharmacies were handled by the CPs rather than pharmacy counter assistants (PCAs). It is possible that the volume of patients with oral health complains seen by the CPs was undermined. PCAs being the first set of people encountered by the public in community pharmacies for different requests, traditionally handle a large proportion of transactions before challenging ones are referred to the CPs on duty. They might have attended to some of the oral health complaints seen in the pharmacies before referring challenging ones to the CPs. This could have impaired the full picture of the CPs' role with oral health care.

Although about half of the pharmacies included in this study were not licensed, close to 90% of the CPs who were surveyed were licensed. Thus, this study reflects primarily the views of those who are licensed. This means that the views of the unlicensed CPs who are predominantly women graduates within the last 10 years having no post graduate qualifications may not be accurately reflected in this study. This may constitute a limitation with generalizability.

Though the initial study criteria required that all the survey instrument be fully filled for inclusion for data analysis, it was found that some of the CPs opted to skip some questions in the questionnaire leaving them unfilled. Though such questionnaires were included in the analysis, the few questions left unfilled by some of the CPs could have had an impact on the study findings.

Lastly, though all the community pharmacies in the state were approached, the geographic distribution of the pharmacies was lopsided. Only 5 LGAs out of 17 LGAs in the state had presence of CPs. The bulk of which were clustered around the state capital – Jos, which also serves as the base of the few Dental clinics in the state. Being commercial entities, community pharmacies were found in urban areas. Apart from that, not all the views of the CPs in the state were captured as some declined, a sizeable amount was not available and others were excluded. Views from these other CPs could have had some significant influences on the study findings. Though it was assumed that the CPs answered the questions truthfully, this could never be fully guaranteed. Some of the CPs may have fallen victim to obsequiousness bias because I'm a dentist.

Recommendations

This study demonstrates that CPs play an important role in improving oral health awareness of the people. The recommendations below should be considered for effectively engaging them for oral health care service provision alongside other areas for further research.

1. Training of CPs on oral health care by incorporation of select modules on oral health into undergraduate trainings, Mandatory Continuing Education Programme

for CPs to include topics on oral health, and organizing seminars and workshops on oral health regularly in association with ACPN.

2. Corporate or government funding for production of fliers and leaflets on oral health matters to be circulated to pharmacies for distribution to patients when approached and posters to be placed at strategic locations in the pharmacies.
3. Setting up strategic dentist – CPs collaboration for partnership in propagation of oral health information, discussing challenges, raising oral health awareness and circulation of list of key contacts needed for advisory and referral purposes.
4. Further research to assess the roles of primary health care workers, and Patent Medicine Stores in improving oral health awareness as they are statutorily located in every LGA of the States in the country. The knowledge of PCAs on oral health and their role in improving oral health awareness should also be assessed. Being the first contact with patients, they see more patients compared to the CPs. Lastly, research is needed to evaluate the effectiveness or correctness of oral health advices given to the public by the CPs.

Implications for Social Change

Oral health awareness is the individual or public awareness of the existence and prevention of oral diseases and knowledge of the requisite steps to take for treatment when such diseases occur. This can be attained via different measures including knowledge – especially of dental diseases and their prevention, acceptable oral health behaviors and the utilization of oral health care facilities. Poor oral health awareness in Nigeria is mainly attributed to limited access to correct information on oral health and

inadequate oral health manpower. A direct effect of this low awareness is poor illness seeking behavior among the people as they are not well informed on preventive steps to avert the occurrence of oral diseases or how to get treatment for existing diseases. As a result, patients present late for treatment mostly with complications which may have been prevented. Thus, oral disease is still a major challenge in Nigeria and its burden mounting.

In Nigeria, as with many other developing countries, a culture of self-medication is rife which makes the pharmacy the first port of call for people with varied disease conditions. It is clear that CPs in Plateau State, Northern Nigeria are very accessible healthcare providers with more than 7,000 people visiting them per day. They also come across a lot of people with oral health complains or requiring oral health advice on a regular basis. This positions them as ready source of oral health resource for the public and a medium to deliver oral health care related information. They are therefore a valuable alternative in addressing many oral health challenges which are presently over stretching the capacities of the local government agencies like is experienced in Nigeria.

Since there are still challenges with availability of and accessibility to oral health services especially among poor and socially disadvantaged people, this study has shown that CPs – especially those licensed with ACPN can be empowered via capacity development programs in oral health care. Membership of ACPN by the CPs was found to be significantly related to them seeing oral health promotion as an opportunity to make a difference in their communities. They can also be engaged to propagate knowledge of oral diseases and their prevention, acceptable oral health behaviors and the utilization of

oral health care facilities. This would complement the work of oral health professionals in rendering dental services. This could help reduce oral health disparities by increasing oral health awareness, improving oral health seeking behavior, better oral hygiene practices and improving quality of life via this cost-effective delivery of pharmacy-based oral health care services.

Conclusions

The findings from this study suggests that CPs have a very good disposition towards engaging in oral health prevention services and do recognize that they have a role in the promotion of oral health. This disposition is significantly obvious among CPs registered with ACPN thus suggesting the encouragement of the licensure of CPs who would be supported for an expanded role in oral health promotion. Though the CPs presently provide some degree of oral health advice, they were keen to do more and to expand their knowledge and gain confidence in providing the appropriate advice related to oral health conditions Additionally, CPs may be effectively employed in oral health promotion because patients frequently contact them and regularly ask for their advice on both general and oral healthcare. As a result of their established role in promoting and improving the health within the community, CPs in Plateau state, Northern Nigeria may be underutilized for such purposes. It would be beneficial to empower them via trainings and access to oral health information so as to engage them as conduit pipes to improve oral health awareness of the people. It may also be possible to incorporate oral health within the PCN's community pharmacy practice standard to help them take a more active

and integrated role as part of a multidisciplinary healthcare team attending to the oral health concerns of the people.

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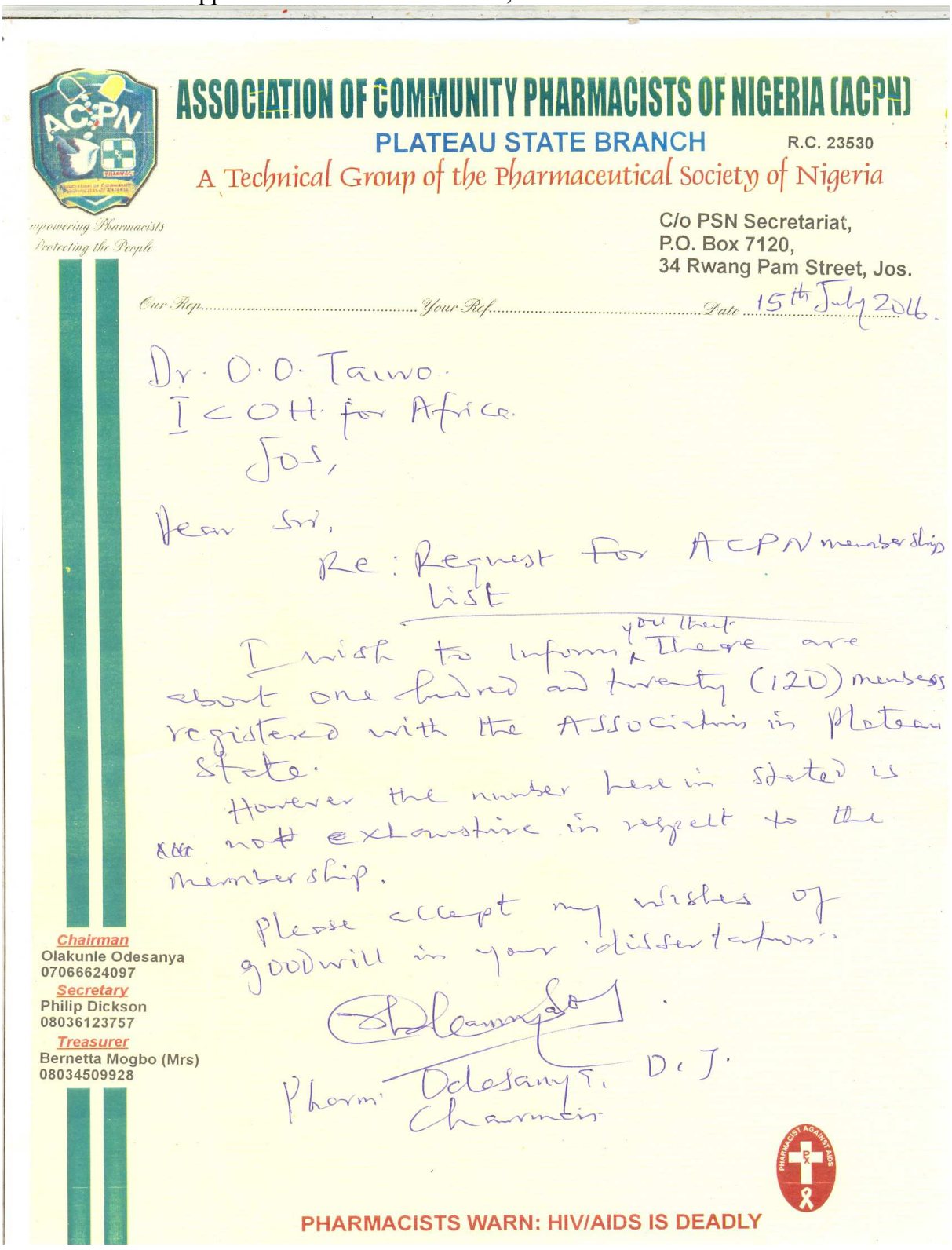
Appendix A: Letter from ACPN, Plateau State Branch



ASSOCIATION OF COMMUNITY PHARMACISTS OF NIGERIA (ACPN)

PLATEAU STATE BRANCH R.C. 23530

A Technical Group of the Pharmaceutical Society of Nigeria

Empowering Pharmacists
Protecting the People

C/o PSN Secretariat,
P.O. Box 7120,
34 Rwang Pam Street, Jos.

Our Ref..... Your Ref..... Date 15th July 2016.

Dr. O.O. Taiwo.
ICOH for Africa.
Jos,

Dear Sir,

Re: Request for ACPN membership list

I wish to inform you that There are about one hundred and twenty (120) members registered with the Association in Plateau State.

However the number here in stated is not exhaustive in respect to the membership.

Please accept my wishes of goodwill in your dissertations.

Pharm. Odesanya T. D. J.
Chairman

Chairman
Olakunle Odesanya
07066624097
Secretary
Philip Dickson
08036123757
Treasurer
Bernetta Mogbo (Mrs)
08034509928

PHARMACISTS WARN: HIV/AIDS IS DEADLY

Appendix B: Consent form

CONSENT FORM

You are invited to take part in a research study about identifying what roles community pharmacists could play in improving oral health awareness in Plateau State. The researcher is inviting practicing pharmacist working in an independently owned pharmacy, pharmacy chains or retail stores in a community setting to be in the study. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named **Dr Olaniyi Taiwo**, who is a doctoral student at Walden University.

Background Information:
The purpose of this study is to describe the roles community pharmacists in Northern Nigeria play as potential sources of oral health information for the people.

Procedures:
If you agree to be in this study, you will be asked to:

- Keep the log of patients in your pharmacy using the Patient Traffic Form (to be given to you) over the course of 2 weeks
- After which you would be given a questionnaire to fill which may take up to 25 minutes to complete.

Here are some sample questions:

- How long have you been practicing as a community pharmacist?
- Do you perceive a role for yourself in promoting good oral health? Yes / No
- How often do you come across patients with dental complaints or needing oral health advice?
- Do you provide services (referral/treatment/advice) to clients with oral problems? Yes/No

Voluntary Nature of the Study:
This study is voluntary. You are free to accept or turn down the invitation. If you do not participate, there would be no repercussions. If you decide to be in the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study:
Being in this study would not pose any risk to your safety or wellbeing.

This study may not directly benefit you. However, it aims to broaden or expand future public health roles of community pharmacists which may benefit the larger community.

Payment:

Participation in this study will not cost you anything and you will not be paid for your time.

Privacy:
Reports coming out of this study will not share the identities of individual participants. Details that might identify participants, such as individual practice location of the study respondents, also will not be shared. The researcher will not use your personal information for any purpose outside of this research project. Data will be kept secure by password protection in my personal laptop while hard copies (questionnaires) would be locked up in a filing cabinet in my office: The Regional Centre for Oral Health Research and Training Initiatives (RCORTI) for Africa, Jos, Nigeria, Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via xxxxxxx or xxxxxxx@waldenu.edu. If you want to talk privately about your rights as a participant, you can call the Research Participant Advocate at my university at 001-612-312-1210 (USA number) or email address IRB@waldenu.edu. Walden University's approval number for this study is **10-21-16-0497336** and it expires on **October 20, 2017.**

The researcher will give you a copy of this form to keep.

Obtaining Your Consent

If you feel you understand the study well enough to make a decision about it, please indicate your consent by signing below.

Printed Name of Participant _____

Date of consent _____

Participant's Signature _____

Researcher's Signature _____

Appendix C: Copy of the Permission Letter

From: Olaniyi Taiwo <xxxxx@waldenu.edu>
Sent: 25 May 2016 18:12:35
To: David Gillam
Cc: Raymond Panas; Donald Goodwin
Subject: Re: Survey Instrument

Hello David,

I really appreciate your prompt response and added information. I do think this should suffice but if more information is needed, please kindly oblige me to still contact you. Once again, thank you very much.

Niyi

On Tue, May 24, 2016 at 5:11 PM, David Gillam <d.g.gillam@xxxx.xx.uk> wrote:

Dear Niyi, many thanks for the e-mail. The actual questionnaire was from a Master's project conducted at QMUL. The published paper was based on the thesis. I was one of the Supervisors on the project and together with my colleagues I was involved in the design. Thee Master's student is no longer in the UK but I could ask him if he is happy with it being used. I do not think there should be a problem as most Investigators would be happy to have their work verified by other Investigators. If your Institute is happy to acknowledge that the questionnaire was from QMUL and cite Mann et al. (year) then I would have thought that would be ok.

Let me know if you still have a problem.

Best wishes

David

From: Olaniyi Taiwo [mailto: xxxxxxx@waldenu.edu]
Sent: 24 May 2016 16:30
To: David Gillam; Raymond Panas
Cc: Donald Goodwin
Subject: Re: Survey Instrument

Hello David,

I hope you are doing great. I apologize for bothering you again. Recall that you gave me permission to adapt your questionnaire (the one used for your study on "Is there a role for community pharmacists in promoting oral health?") for my dissertation work. I saw from my school's (Walden) IRB application checklist that for my IRB application to scale through, **it should be stated in your mail to me that the instrument is copyrighted and that you being the copyright holder grant me permission to format or customize portions of the questionnaire** (if need be) to reflect the demographics or other variables of the local population of community pharmacists for my dissertation study.

If you are not the copyright holder, I would be very grateful if you could direct me to the copyright holder. I appreciate you.

Niyi

On Mon, Mar 7, 2016 at 9:12 PM, David Gillam <d.g.gillam@xxxx.xx.uk> wrote:

You are very welcome hope the research works out.

Best wishes

David

From: Olaniyi Taiwo < xxxxxx@waldenu.edu>
Sent: 07 March 2016 20:11
To: David Gillam
Subject: Re: Survey Instrument

Hello David,

I deeply appreciate your kind gesture. Thanks

Niyi

On Mon, Mar 7, 2016 at 1:12 PM, David Gillam <d.g.gillam@xxxx.xx.uk> wrote:

Dear Olaniyi thank you for contacting me regarding your project. I hope you will be successful in your research. I have attached a word document which should help. I think it was the one we used in the study. Any problems please let me know.

Best wishes

David

David Gillam
Clinical Senior Lecturer
Barts and The London School of Medicine & Dentistry
Institute of Dentistry
New Road
London E1 2AD
Tel: +44 (0)20 xxxx xxxx
http://www.dentistry.qmul.ac.uk/

From: Olaniyi Taiwo [mailto: xxxxxx@waldenu.edu]
Sent: 06 March 2016 12:39
To: David Gillam

Cc: Raymond Panas
Subject: Survey Instrument

Hello Dr Gillam,

Re: Is there a role for community pharmacists in promoting oral health?

My name is Olaniyi Taiwo, a Dentist and Research Fellow practicing in Jos, Nigeria. I'm an online Doctoral student (PhD Public Health – Epidemiology Specialization) with Walden University, a US based institution. About 2 years ago, I started considering this topic "**Roles of Community Pharmacists in improving Oral Health Awareness in Northern Nigeria**" as a possible dissertation topic for my program. Presently, the topic had been approved by the school for my dissertation and I had commenced work on it. My Dissertation Committee Chair is Prof. Raymond Panas (copied in this mail) while my Dissertation Committee Member is Dr Donald Goodwin both of the same institution.

In the course of my literature reviews, I came across your very informative paper: **Is there a role for community pharmacists in promoting oral health?** It is an excellent work. The description of the contents of your survey instrument aptly describes the objectives of my present study. I also believe that it is a validated survey instrument. In view of this, I do request that you kindly avail me a soft copy of this questionnaire for use as the survey instrument for my dissertation. I also request your permission to format or customize portions of the questionnaire (if need be) to reflect the demographics or other variables of the local population of community pharmacists here in Northern Nigeria. The source of this instrument would definitely be acknowledged. I would greatly appreciate a favorable response in this regard. Many thanks.

Dr Olaniyi Taiwo

Appendix D: Copy of the Questionnaire by Mann et al., 2015

Dear Pharmacist,
We are very interested in your opinions in relation to oral health promotion and common dental problems encountered in your day to day practice.
Add a sentence about the purpose of the survey being to identify how pharmacists can help in promoting good oral health
There are a number of treatment possibilities to be considered in this questionnaire, relating to different types of dental problem (e.g., toothache, cold sores, teething etc.). We would be grateful if you could go to the following link provided in this email and fill up the questionnaire.
Your replies will be confidential and anonymous and will only be used for research and teaching purposes. The questionnaire should only take a few minutes of your time and it will benefit our current research programme at the Bart's and The London School of Medicine and Dentistry, Queen Mary University of London.
Thank you for your help.

Please ✓ where necessary when you respond to the questions.

Questionnaire –

1. **Your year of birth_____**

2. **Gender:** ❑ Male ❑ Female

3. **Location (Post code of area can be used)**

   ❑ Barnet ❑ Enfield
   ❑ Haringey ❑ Camden
   ❑ Islington

4. **Type of Pharmacy:**

   ❑ Retail Store (e.g., ASDA) ❑ Independent Pharmacy
   ❑ Other (Please Specify)……

5. **Year of Graduating as Pharmacist:** [ ]

6. **A) Do you subscribe (access or read) to any Pharmacy Journals?**

   ❑ Yes ❑ No

   B) If your answer is "yes", to how many? [ ]

C) On average how many hours CPD do you complete each year? (Please circle) (minimum 9 per year as per the general pharmaceutical council)

10 20 30 40 50 60 70 80 90 >100

Other……

7. Do you perceive a role for yourself in promoting good oral health?

☐ Yes

☐ No

If Yes Please give your reason(s)……suggest you delete this section as the reasons will be covered in questions 8,9 and 10……..……
……..……
…….

How strongly do you aree or disagree with the statements in questions 8,9,10 and 11

8. Oral health promotion will be an opportunity for you to help the community?

Please, tick only one box

☐ Strongly agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly disagree

9. Oral health promotion will be an opportunity for you to make a difference?

Please, tick only one box

☐ Strongly agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly disagree

10. "I have sufficient knowledge about oral health to advice patients correctly"?

Please, tick only one box

☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree

11. "I feel confident in giving advice on treatment to the following dental problems"

PROBLEM	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGY DISAGREE
1. Teething	○	○	○	○	○
2. Lost dental fillings	○	○	○	○	○
3. Loose crowns	○	○	○	○	○
4. Bleeding gums	○	○	○	○	○
5. Trauma to teeth	○	○	○	○	○
6. Bad breath	○	○	○	○	○
7. Denture problems	○	○	○	○	○
8. Cold sores	○	○	○	○	○
9. Dry mouth	○	○	○	○	○
10. Sensitive teeth	○	○	○	○	○
11. Discoloured teeth	○	○	○	○	○
12. Gum diseases	○	○	○	○	○
13. Tobacco related dental problems	○	○	○	○	○
14. Oral Ulcer	○	○	○	○	○
15. Oral cancer	○	○	○	○	○

Please, tick only one box per problem

12. Do you feel you would benefit from the training of oral care to give advice on following dental problems –

Please, tick √

Problems	**Yes**	**No**
Teething	☐	☐
Lost dental fillings	☐	☐
Loose crowns	☐	☐
Bleeding gums	☐	☐
Trauma to teeth	☐	☐
Bad breath	☐	☐
Denture problems	☐	☐
Cold sores	☐	☐
Dry mouth	☐	☐
Sensitive teeth	☐	☐
Discolored teeth	☐	☐
Gum diseases	☐	☐
Tobacco related dental problems	☐	☐

13. Are you interested in attending training programmes focusing on oral health?

a). Yes
b). No

14. In your experience what are the most frequent oral advice patients are requesting for?

Please, tick √

☐ Ulcers
☐ Toothache/pain relief
☐ Teething
☐ Sore mouth
☐ Mouthwash
☐ Dentures
☐ Bleeding gums
☐ Toothpaste advice
☐ Toothbrush
☐ Tooth whitening
☐ Other
Specify: ……..

15. Do you provide referral services to patients with oral diseases?

a) Yes
b) No

If answer to Q. 15 is Yes,

a) Do you know the location of your nearest practitioner?
b) Do you know their opening hours?

16. Do you have oral health promotion as a part of your NHS Community pharmacy contract?

a). Yes
b). No

If No, do you want oral health promotion to be incorporated into your pharmacy contract?

a). Strongly agree
b). Agree
c). Neutral
d). Disagree
e). Strongly disagree

17. Postcode of your Pharmacy……..

THANK YOU

Appendix E: Questionnaire for the Study

Roles of Community Pharmacists in improving Oral Health Awareness in Plateau State, Northern Nigeria

QUESTIONNAIRE Study ID ☐☐☐–☐☐

(Please put the appropriate number in the boxes provided)

1. Age (years) _____
2. Gender ……..☐
   1. Male 2. Female
3. Number of years' post-graduation as Pharmacist _____
4. Highest educational level……..☐
   1. University degree 2. Masters 3. PhD
5. Location of practice (Please specify the LGA) _____
6. Type of pharmacy……☐
   1. Individually owned (Independent) 2. Attached to a Hospital
   3. Part of a Chain of pharmacies 4. Others (Please specify) …….
7. How long have you been practicing as a community pharmacist? _____
8. On an average, about how many people visit this pharmacy **per day**? _____

   (Please refer to the **Patient Traffic Form** for question 8)
9. In the course of your undergraduate training till date, did you receive any formal dental education?
   1. Yes 2. No ☐
10. **If yes, when**?
    1. Scheduled lectures during undergraduate training in the University
    2. During internship
    3. Post-graduate lecture ☐
    4. Attendance at dedicated seminars, trainings and conferences
    5. Others (Please specify) …….

11. Do you perceive a role for yourself in promoting good oral health? ☐

1. Yes 2. No

For the following questions, please tick the most appropriate box for your response(s)

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
12	As a community pharmacist, I play an important role in the improvement of community oral health					
13	Oral health promotion would be an opportunity for me to make a difference					
14	**Knowledge of oral health**				**True**	**False**
	Toothpastes with fluoride is good for preventing tooth decay					
	Consuming sugary foods/drinks can lead to tooth decay					
	Salt and bicarbonate can be substituted for commercial toothpastes					
	A toothbrush should be changed **at most** every 3 months					
	General body health has a relationship with oral health					
	Dirty mouth causes tooth decay					
	Dirty mouth causes gum diseases					
	Worms causes tooth decay					
	Consuming sugary foods/drinks can lead to gum diseases					
	Tooth decay is a communicable disease					
	HIV/AIDS can manifest in the mouth					
	Tooth decay is mainly caused by bacteria					
	Regular brushing of the teeth can protect one from gum bleeding					
	Excessive tooth brushing can lead to teeth sensitivity					
	You can see evidence of Type-2 diabetes in the mouth					
	Gum diseases are usually bacterial infections					
	Ingestion of excessive fluoride (in water, food and toothpastes) can discolor the teeth					

		True	False
	Tobacco smoking or chewing can lead to oral (mouth) cancer		
	Loss of teeth can interfere with speech		
	Gingival bleeding during tooth brushing is normal		
	It is necessary to attend the dental clinic for routine dental check-up		
	One should brush twice daily for good oral health		
	In the morning, ideally one should brush **after** breakfast		
	Water, fluoride, abrasives and detergents are major components of a toothpaste		

15. If you need more information on oral health, do you know where to access such?

    1. Yes 2. No ☐

16. Which of these sources would be the preferred communication medium if new sources of oral health information and/or training were to become available to support an expanded role of community pharmacists in oral health (**Please tick all that applies**)

    Oral health product/medications leaflets…… ☐

    Internet…… ☐

    Pharmacists Council of Nigeria…….. ☐

    The Dentist or other oral health professionals …….. ☐

    Educational materials (posters/fliers) on oral health…… ☐

    Seminars, conferences or workshop on oral health…….. ☐

    Association of Community Pharmacists in Nigeria…… ☐

    Media (TV/Radio/Newspaper) …… ☐

    Pharmaceutical Journals …… ☐

17.

Do you feel you would benefit from the training of oral care to give advice on the following dental problems?		**Yes**	**No**
	Teething		
	Lost Dental fillings		
	Bleeding gums		
	Trauma to teeth		
	Bad breath / mouth odor		
	Denture problems		
	Holes on the teeth (Dental caries)		
	Dry mouth		
	Sensitive teeth		
	Discolored teeth		
	Gum diseases		
	Mouth ulcers		
	Oral cancers		

19 How often do you come across patients with dental complaints or needing oral health advice? (Please refer to the **Patient Traffic Form** for question 19)

1. Nearly everyday
2. More than once a week
3. Less than once a week
4. Hardly ever

20. On the average, **per week**, about how many patients do you come across with dental complaints and/or needing oral health advice? _____
(Please refer to the **Patient Traffic Form** for question 20)

21. In your experience **what are the most frequent** oral advice patients are requesting? (Please refer to the **Patient Traffic Form** for question 21)

Please, tick √ (you can tick more than one option please)

☐ Mouth Ulcers

☐ Toothache

☐ Teething

☐ General oral hygiene

☐ Mouthwash

☐ Dentures (plastic artificial teeth)

☐ Broken teeth

☐ Location of a dentist

☐ Bleeding gums

☐ Toothpaste / toothbrush advice

☐ Sensitive teeth

☐ Tooth whitening

☐ Bad breath / mouth odor

☐ None

22. Do you provide services (referral/treatment/advice) to clients with oral problems? ☐

1.Yes 2.No

23. **If YES in Q 20,** for clients with **dental complaints**, what do you do? (**Yes=1, No=2**) (Please refer to the **Patient Traffic Form** for question 23)

1. Prescribe pain reliever…… ☐
2. Prescribe an antibiotic…… ☐
3. Refer patient to the Dentist …… ☐
4. Counsel them on what to do…… ☐
5. Recommendation of dental products to use…… ☐

6. Others (please specify) ……

24. Do you receive payments for rendering services on oral health care?
    1.Yes 2.No

25. Are you interested in becoming more involved in provision of services on oral health problems?
    1.Yes 2.No

26. Do you know the location of your nearest dental practitioner?
    1.Yes 2.No

26. Do you know their opening hours?
    1.Yes 2.No 3. Not applicable

27. Have you visited a Dentist before?
    1.Yes 2.No

28. Do you stock oral health care products?
    1. Yes 2. No

29. If Yes, please tick the oral health care products you have in your pharmacy
    - ☐ Toothbrushes
    - ☐ Toothpastes
    - ☐ Dental floss
    - ☐ Mouth rinses
    - ☐ Others (Please specify) …….

30. Do you have oral health promotion as a part of the Pharmacists' Council of Nigeria (PCN) Community pharmacy practice standard?
    1. Yes 2. No 3. Don't know

31. If No or Not sure, do you want oral health promotion to be incorporated into the practice standard?
    1. Yes 2. No

32. Would you like to do more as an oral health adviser?
    1. Yes 2. No

33. The following are **major barriers** to community Pharmacists providing oral health care services?

(**Please insert the corresponding number**: **Yes = 1, No = 2**)

1. Poor Knowledge of Oral health care…… ☐
2. Not being paid for services rendered…….. ☐
3. The belief that it is not the duty of the pharmacists…… ☐
4. Failure of clients to ask for such services…… ☐
5. Lack of time…… ☐
6. Unavailability of private counseling areas…… ☐

34. How do you think knowledge of oral health could be improved among community pharmacists?

……

……

……

35. What are your opinions or suggestions as regards the expansion of the services of community pharmacists on oral healthcare?

……

……

……

36. What is your religious affiliation?

1. Christianity 2. Islam 3. Traditionalist 4. None ☐

37. Are you a member of the Association of Community Pharmacists of Nigeria (ACPN) Plateau State branch?

1. Yes 2. No ☐

Thank you very much.

Appendix F: Patient Traffic Log Form

Patient Traffic Form

	LOG	**Week 1**						**Week 2**					
		Mon	Tue	Wed	Thur	Fri	Sat	Mon	Tue	Wed	Thur	Fri	Sat
1	Number of people visiting the pharmacy per day												
2	Number of people visiting the pharmacy per day **with dental complaints**												
3	The most frequent oral advice patients are requesting (**Please tick – you can tick more than one and more than once**)	-Mouth Ulcers ☐ ☐ ☐ -Toothache ☐ ☐ ☐ -Teething ☐ ☐ ☐ -General oral hygiene ☐☐ -Mouthwash ☐ ☐ ☐ -Teeth Whitening ☐ ☐☐		-Broken teeth ☐ ☐☐ -Location of dentist ☐ ☐ -Bleeding gums ☐ ☐ ☐ -Toothpaste/ tooth brush advice ☐ ☐ -Sensitive teeth ☐ ☐ ☐		-Mouth odor ☐ ☐ ☐ -Dentures (plastic artificial teeth) ☐ ☐ ☐	
4	Actions taken for dental complaints (**Please tick – you can tick more than one and more than once**)	Prescribed **pain reliever** ☐ ☐ ☐ ☐ Prescribed an **antibiotic** ☐ ☐ ☐ ☐ **Referred** patient to the Dentist ☐ ☐ ☐ ☐ **Counselled** them on what to do ☐ ☐ ☐ ☐ **Recommendation of dental** products to use ☐ ☐ ☐ ☐ Others (please specify) …… ☐ ☐ ☐ ☐											