

## Community pharmacists' assessment of the factors that influence the recommendation of complementary medicines in Lagos State, Nigeria: a pilot study

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### ABSTRACT

**Background:** Individuals are now more proactive about their healthcare and complementary medicines (CMs) are usually utilized for self-care. They are widely sold in community pharmacies in Nigeria.

**Objectives:** This study evaluated the factors that influence the recommendation of complementary medicines by community pharmacists.

**Methods:** A cross-sectional and descriptive survey was carried out in three community pharmacy zones in Lagos State. Data were analyzed with the IBM Statistical Product and Service Solutions (SPSS) Statistics for Windows, Version 20.0 (IBM Corp, Version 20.0, Armonk, NY, USA) with statistical significance set at  $p \leq 0.05$ .

**Results:** Most of the respondents were below 30 years of age (45.5%), male (61.8%), recent graduates (76.4%), had only an undergraduate degree (61.8%) with less than 10 years of community pharmacy experience (81.8%). Only 43.6% had overall adequate knowledge of CMs. Many (98.2%) agreed that knowledge about CMs is important to them as practicing pharmacists. About 91% reported that they will not recommend a CM that has no evidence of safety. Only 40% of the respondents agreed that their undergraduate pharmacy training equipped them to be providers of information on CMs. Those who stocked CMs in their community pharmacies had better knowledge scores than those who did not ( $P = 0.033$ ).

**Conclusion:** Community pharmacists in some zones in Lagos State, Nigeria had poor knowledge about complementary medicines. This served as a major barrier to their recommendation of these medicines. Community pharmacists should engage in continuing education programmes and the undergraduate curriculum should be reviewed to produce better equipped professionals in this regard.

**Keywords:** barriers, complementary medicines, community pharmacists, drivers, knowledge

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## **Évaluation par des pharmaciens communautaires des facteurs qui influencent la recommandation des médicaments complémentaires (de médecine douce) dans l'État de Lagos, au Nigeria: une étude pilote**

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### **RESUME**

**Contexte:** De nos jours, les individus sont plus proactifs sur leurs soins de santé et les médicaments complémentaires (de médecine douce) sont généralement utilisés pour les soins personnels. Ils sont largement vendus dans les pharmacies communautaires au Nigeria.

**Objectifs:** Cette étude a évalué les facteurs qui influent sur la recommandation de médicaments complémentaires par les pharmaciens communautaires.

**Méthodes:** Une enquête transversale et descriptive a été menée dans trois zones de pharmacie communautaire de l'État de Lagos. Les données ont été analysées avec les Solutions statistiques pour les produits et services (SPSS) Statistiques pour Windows, version 20.0 (IBM Corp, version 20.0, Armonk, NY, États-Unis) avec une signification statistique établie à  $p \leq 0.05$ .

**Résultats:** La plupart des répondants avaient moins de 30 ans (45,5%), des hommes (61,8%), des diplômés récents (76,4%), seulement un diplôme de premier cycle (61,8%) ayant moins de 10 ans d'expérience en pharmacie communautaire (81,8%). Seulement 43,6% avaient une connaissance suffisante des MC (médecine douce). Beaucoup (98,2%) ont convenu que la connaissance des MC est importante pour eux en qualité de pharmaciens praticiens. Environ 91% ont indiqué qu'ils ne recommanderaient pas un MC qui n'a aucune preuve de sûreté. Seulement 40% des répondants ont convenu que leur formation en pharmacie pendant le premier cycle les a équipés de connaissance pour fournir des informations sur les MC. Ceux qui ont stocké des MC dans leurs pharmacies communautaires avaient de meilleures notes de connaissances que ceux qui n'en avaient pas ( $P = 0,033$ ).

**Conclusion:** Les pharmaciens communautaires de certaines zones de l'État de Lagos, au Nigeria, connaissaient mal les médicaments complémentaires (de la médecine douce). Cela a constitué un obstacle majeur dans leur recommandation de ces médicaments. Les pharmaciens communautaires devraient s'engager dans des

programmes de formation continue et le programme de premier cycle doit être revu afin de produire des professionnels mieux équipés à cet égard.

**Mots-clés:** barrières, médicaments complémentaires, pharmaciens communautaires, conducteurs, connaissances

## INTRODUCTION

A therapy is generally considered to be “complementary” when it is used with conventional treatments. Conventional treatments are defined as those that are widely accepted and practiced by the mainstream medical community.<sup>1</sup>

Globally, individuals are now more proactive in their healthcare and complementary medicines (CMs) are commonly utilized for self-care.<sup>2, 3</sup> Despite the increased use of CMs, inadequate research supporting efficacy claims and a lack of uniform product standardization has raised concerns.<sup>4</sup> The mass media has contributed immensely to the widespread use of CMs and has enhanced some irrational claims or advertisements by manufacturers.<sup>5</sup> Although, they are not as well researched as orthodox drugs and their formulation and sales are poorly regulated, herbal medicines are used by Nigerians for a variety of ailments.<sup>5</sup>

Most CMs are sold as non-prescription medicines in community pharmacies and there have been reported cases of patients who used such medicines while hospitalized. [6] Patients often seek advice and information on medicines, including CMs, from pharmacists in patient-oriented practice (community or hospital settings). Other healthcare providers also make enquiries on CMs from pharmacists who should serve as a resource for the questions posed.<sup>4</sup> Community pharmacists are the most accessible healthcare providers and with the rise in the use of CMs, pressure is mounting on pharmacists to develop their competence

in this area.<sup>7</sup>

Many patients use a wide range of CMs in addition to their conventional medicines.<sup>6</sup> However, some patients may not inform their healthcare providers that they are already on a CM placing them at risk of drug-herb interactions. Also, health care professionals may be reluctant to ask about their patients' CM use due to inadequate knowledge about CMs, particularly herbal medicines.<sup>4</sup> With the emergence of the role of pharmacists as pharmaceutical care providers and drug experts,<sup>8</sup> it is therefore expedient that they take active roles such as providing information on indications, contra-indications or possible interactions associated with CM use, explaining drug administration and encouraging patients to disclose their use of CMs to all their healthcare providers.

The factors that influence whether or not pharmacists recommend CMs to their customers can be classified as drivers or barriers. The drivers of the recommendation of CMs refer to those factors that prompt pharmacists to utilize these medicines for their patients while those that impede the recommendations of CMs are the barriers.<sup>9</sup>

Previous studies in Australia, Kuwait, Nigeria, Oman, and United Arab Emirates suggest inadequacy in the knowledge of community pharmacists with regards to counselling patients on potential interactions and side effects of herbal medicines.<sup>6, 7, 10 - 14</sup> Variation in the extent to which complementary medicine is taught in pharmacy schools and lack of accurate and easily accessible information are possible reasons.<sup>6, 15</sup>

Pharmacy educators, individual pharmacists, pharmacy managers, patients, and other health professionals have expressed concerns about pharmacists' ability to address issues related to the use of herbal and dietary supplements.<sup>7</sup> If pharmacists do not keep abreast with knowledge of CMs, particularly in combination with conventional medicines, patients may be put in danger and the reputation of the profession at risk.<sup>5</sup>

The specific objectives of this study were: to evaluate community pharmacists' knowledge base, sources for information and beliefs on CMs; to determine the differences between the demographic variables in their mean knowledge scores; to evaluate the drivers and barriers to recommending CMs; to assess community pharmacists' perception of undergraduate pharmacy training on complementary medicines.

## **METHODS**

Complementary Medicine (CM) in the context of this study, refers to herbal medicines, vitamins, minerals, and amino acids formulated into suitable pharmaceutical dosage forms such as tablet, capsule, syrup, etc.

This pilot study was a cross-sectional and descriptive survey carried out in Lagos State, the commercial capital of Nigeria. In Lagos State, community pharmacists under the aegis of the Association of Community Pharmacists' of Nigeria (ACPN) are grouped into 21 zones. Three community pharmacists' zones were conveniently sampled for the study: Oriade zone, Amuwo zone, and Surulere zone. These three zones have a total of 105 registered community pharmacies and a combined population of 822,141 residents based on the 2006 census by the National Population Commission (NPC) of Nigeria. In the controversial 2006 census, the population of Lagos was 9,013,534. As of 2014, the NPC estimated the population of Lagos to be 21 million.<sup>16</sup>

All community pharmacies within the selected zones run by pharmacists who were registered and licensed by the Pharmacists' Council of Nigeria (PCN) were included in the study. Community pharmacies that were unregistered, out of the selected zones or without a

pharmacist in attendance were excluded from the study.

All the 105 registered pharmacies in the three zones were included in the study. Community pharmacies with branches or other outlets were counted as one, with only one of its outlets selected for the study. In cases where more than one pharmacist was available in the pharmacy, only one was allowed to participate in the study.

Data were collected by structured self-administered questionnaires which were given to the selected participants to fill in their respective pharmacies without the consultation of any reference material. The questions/statements were drafted from previously validated questionnaires and published interviews of pharmacy students on CMs. The questionnaires were filled in the consulting room within a 25-minutes time interval. Confidentiality was maintained as neither the name of the pharmacy nor pharmacist was requested. The pharmacists were also prior informed that their willingness to participate in the study was optional. Agreement to fill the questionnaires was taken as consent.

The questionnaire comprised sections on the pharmacists' demographic information; use/background; knowledge on CMs; beliefs about CMs as well as the influences on these beliefs; education and resources; drivers of, and barriers to the recommendations of CMs.

Data were coded and entered into the IBM Statistical Product and Service Solutions (SPSS) Statistics for Windows, Version 20.0 (IBM Corp, Version 20.0, Armonk, NY, USA) for analysis. Descriptive statistics were used to summarize data. The independent t-test and analysis of variance (ANOVA) were utilized to determine the differences between the demographic variables in their mean knowledge scores with statistical significance set at  $p \leq 0.05$ .

The Association of Community Pharmacists of Nigeria (ACPN), Lagos State Branch was informed before the commencement of this study.

## RESULTS

A total of sixty one questionnaires were completed and returned but data for 6 respondents were discarded for incompleteness in demographic information, leaving only 55 valid questionnaires, 52.4% participation rate (55/105). The results of the responses obtained from the valid respondents are presented in the tables and figure below.

Table 1 below shows that most of the respondents were below 30 years of age (45.5%), male (61.8%) and had only an undergraduate degree (61.8%). Most of the respondents were recent graduates (76.4%) with less than 10 years of community pharmacy experience (81.8%). Majority stocked CMs in their community pharmacies.

Table 2 shows the community pharmacists' knowledge about CMs. They exhibited poor knowledge in questions on CMs bordering on dose, interactions and contra-indications.

Knowledge scores were summed up to give the total knowledge score for each respondent. Knowledge score ranged from 0 (minimum) to 21 (maximum). These knowledge scores were categorized such that those who scored above the median (11) of the total knowledge scores had adequate knowledge of complementary medicines. Only 43.6% had overall adequate knowledge of CMs.

All the respondents believed that CMs have beneficial effects with only 49.1% of the opinion that CMs have fewer side effects than conventional medicines. Most of the respondents (98.2%) agreed that knowledge about CMs is important to them as practicing pharmacists (Table 3).

Table 4 shows that majority of the respondents (96.3%) believed that knowledge of a CM will enhance their confidence to recommend it. It also shows that they find it easier convincing customers to use a CM that has worked for them (92.7%). Most of the respondents (87.3%) recommend CMs for specific conditions and health benefits.

The barriers to the recommendation of CMs are shown in table 5. Majority of the respondents (91%) reported that they will not recommend a CM that has no evidence of safety, even if there is a high profit-margin. Also, 85.5% of the respondents will not recommend patients taking drugs that have a narrow therapeutic index to take CMs concurrently.

Table 6 shows that only 40% of the respondents agreed that their undergraduate pharmacy training equipped them to be providers of information on CMs with 92.7% of the respondents suggesting that there should be a different approach to the way CM is taught in undergraduate pharmacy school.

Majority of the respondents (92.7%) agreed that learning (more) about CMs has positively influenced their attitudes towards recommendation of CMs to patients (table 7).

Table 8 depicts the mean difference analysis. Although there was a statistically significant difference in the mean knowledge score between the age groups, posthoc tests were not performed for the total knowledge because at least one group had fewer than two cases. Those who stocked CMs in their community pharmacies had better knowledge scores than those who did not. The internet (37%) was the respondents' most regular source of information on CMs (see figure).

**Table 1: Demographics/background information on complementary medicines by participating pharmacists (N = 55)**

<b>Variable</b>	<b>n (%)</b>
<b>Age (in years)</b>	
– 30	25 (45.5)
31 – 40	20 (36.4)
41 – 50	6 (10.9)
51 – 60	3 (5.5)
> 60	1 (1.8)
<b>Gender</b>	
Male	34 (61.8)
Female	21 (38.2)
<b>Undergraduate qualification</b>	
BPharm	49 (89.1)
PharmD	6 (10.9)
<b>Post-qualification experience (in years)</b>	
< 5	22 (40.0)
5 - 10	20 (36.4)
11 - 20	9 (16.4)
> 20	4 (7.3)
<b>Community pharmacy experience (in years)</b>	
< 5	29 (52.7)
5 - 10	16 (29.1)
11 - 20	9 (16.4)
> 20	1 (1.8)
<b>Additional qualification</b>	
Diploma	6 (10.9)
Masters degree	12 (21.8)
Fellowship	3 (5.5)
Doctorate degree	0 (0.0)
None	34 (61.8)
<b>Highest level of formal herbal training</b>	
Undergraduate pharmacognosy	31 (56.4)
Postgraduate studies	6 (10.9)
Seminars/workshops	12 (21.8)
None	6 (10.9)

<b>Have you used CMs before?</b>	
Yes	50 (90.9)
No	5 (9.1)
<b>Have you taken any CM(s) in the past 12 months?</b>	
Yes	34 (61.8)
No	21 (38.2)
<b>Has any immediate family member (e.g. partner, parents, siblings) used CM(s) before?</b>	
	50 (90.9)
Yes	
No	5 (9.1)
<b>Do you stock CMs in your pharmacy?</b>	
Yes	52 (94.5)
No	3 (5.5)

**Table 2: Pharmacists' knowledge about complementary medicines**

<b>Variables</b>	<b>Correct responses (%)</b>
1. St John's wort is commonly used for mild to moderate depression (Yes)	28 (50.9)
2. Echinacea is commonly used for cold and flu symptoms (Yes )	30 (54.5)
3. Long-term use of Echinacea is recommended (No)	46 (83.6)
4. Garlic can lower blood lipid levels (Yes)	52 (94.5)
5. Ginseng can be used safely in people with high blood pressure (No )	30 (54.5)
6. Ginkgo biloba is commonly used in people with Alzheimer's disease (Yes)	42 (76.4)
7. Ginseng should be avoided in diabetic patients (Yes)	10 (18.2)
8. Ginkgo biloba can increase the risk of bleeding when combined with warfarin (Yes)	33 (60.0)
9. Valerian should be used cautiously in patients using benzodiazepines (Yes)	24 (43.6)
10. In which of these conditions could ginseng be useful? (A)	51 (92.7)
11. What is the recommended daily adult dosage of ginseng extract? (B)	13 (23.6)
12. Ginseng use could be linked to which of these side effects? (A)	26 (47.3)
13. Which of these drugs is known to interact with ginseng preparations? (C )	27 (49.1)
14. Which of these is a known indication for garlic? (B)	48 (87.3)
15. What is the recommended daily adult dosage (oral) of garlic extract? (C )	12 (21.8)
16. Which of these is a side effect of garlic? (A)	30 (54.5)
17. Garlic is capable of interacting with which of these? (C)	4 (7.3)
18. Which of these is a popular indication for ginkgo? (B )	45 (81.8)
19. What is the recommended daily adult dosage of ginseng extract? (B )	16 (29.1)
20. Which of these is a side effect of ginkgo? (B)	11 (20.0)
21. Which of these drugs could interact with ginkgo? (B)	8 (14.5)

**Table 3: Pharmacists' beliefs about complementary medicines**

<b>Variables</b>	<b>Agree (%)</b>	<b>Disagree (%)</b>
1. Clinical care should integrate CMs	50 (90.9)	5 (9.1)
2. CMs have beneficial effects	55 (100.0)	0 (0.0)
3. CMs are safe	35 (63.6)	20 (36.4)
4. CMs have less side effects than conventional medicines	27 (49.1)	28 (50.9)
5. A number of CMs hold promise for the treatment of symptoms, conditions, and/or diseases	37 (67.3)	18 (32.7)
6. Treatment with CMs which are not tested in a scientifically recognized manner should be discouraged	44 (80.0)	11 (20.0)
7. The results of CMs are in most cases due to a placebo effect	11 (20.0)	44 (80.0)
8. Patients should inform their pharmacists about their use of CMs	53 (96.4)	2 (3.6)
9. Knowledge about CMs is important to me as a practicing pharmacist	54 (98.2)	1 (1.8)
10. It is important to have CMs available for sale in my pharmacy	51 (92.7)	4 (7.3)
11. CMs have significant interactions with conventional medicines	37 (67.3)	18 (32.7)
12. CMs are a threat to public health	7 (12.7)	48 (87.3)

**Table 4: Drivers for recommending complementary medicines**

<b>Variables</b>	<b>Agree (%)</b>	<b>Disagree (%)</b>
1. I recommend CMs for specific conditions & health benefits e.g. Bgroup vitamins to stressed workers	48 (87.3)	7 (12.7)
2. High customer demand motivates sale of CMs	36 (65.5)	19 (34.5)
3. I am comfortable recommending CMs from reputable companies	43 (78.2)	12 (21.8)
4. I recommend CMs which my patients can afford without spending too much time convincing for a more expensive brand	41 (74.5)	14 (25.5)
5. In my area of practice, cost is not an issue	16 (29.1)	39 (70.9)
6. I recommend CMs only when they are evidence based	33 (60.0)	22 (40.0)
7. Knowledge of a CM will enhance my confidence to recommend it	53 (96.4)	2 (3.6)



Community pharmacists' recommendation of complementary medicines

8. It is easier to convince customers to use a CM that has worked for me	51 (92.7)	4 (7.3)
9. For sleep issues I prefer recommending a CM to conventional medicines	27 (49.1)	28 (50.9)
10. I recommend CMs to provide a holistic care	27 (49.1)	28 (50.9)
11. I recommend CMs only when I have cross-checked that there will be no undesirable interactions	43 (78.2)	12 (21.8)
12. It is part of my protocol to do 'companion selling' e.g. probiotics with antibiotics; glucosamine &/or fish oils with conventional arthritic medications	33 (60.0)	22 (40.0)
13. Sale of CMs enhances the customers' image of the pharmacy	30 (54.5)	25 (45.5)
14. Sale of CMs could increase customer numbers	36 (65.5)	19 (34.5)
15. Sale of CMs could increase annual sales	44 (80.0)	11 (20.0)

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**Table 5: Barriers to the recommendations of complementary medicines**

<b>Variables</b>	<b>Agree (%)</b>	<b>Disagree (%)</b>
1. I will not recommend a CM to a pregnant/breast feeding woman, even if it claims to be safe for use in such category	29 (52.7)	26 (47.3)
2. I will not recommend a CM that I know works if I am not sure about the possible interactions	43 (78.2)	12 (21.8)
3. Low customer demand is a barrier to the sale of CMs	39 (70.9)	16 (29.1)
4. I will not recommend a CM from an 'unpopular' company	21 (38.2)	34 (61.8)
5. I will not recommend patients taking drugs that have narrow therapeutic index to take CMs concurrently	47 (85.5)	8 (14.5)
6. I will not recommend a CM that has no evidence of safety, even if there is a high profit-margin	50 (90.9)	5 (9.1)
7. I will not convince my patient to buy a CM or do 'companion selling' if he/she cannot afford it	45 (81.8)	10 (18.2)
8. I will not convince a customer to use a CM that has not worked for me	20 (36.4)	35 (63.6)
9. I will not sell 'Fad' products e.g. magical weight loss products, even if there is a high demand for it	22 (40.0)	33 (60.0)
10. I will not actively recommend a 'Fad' product	26 (47.3)	29 (52.7)
11. Counselling or convincing a customer to take a CM is more timeconsuming than for conventional medicines	28 (50.9)	27 (49.1)
12. Sale of CMs may tie down capital and reduce money available for purchase of conventional medicines	24 (43.6)	31 (56.4)
13. Legal issues that may arise from recommending a CM is different from that with conventional medicines	28 (50.9)	27 (49.1)
14. Lack of knowledge will hinder my confidence to recommend a CM	52 (94.5)	3 (5.5)

**Table 6: Education and resources on complementary medicines**

<b>Variables</b>	<b>Agree (%)</b>	<b>Disagree (%)</b>
1. My undergraduate pharmacy training adequately equipped me to be a provider of information on CMs	22 (40.0)	33 (60.0)
2. I have learnt more about CM from my day-to-day work experience than from my university education	45 (81.8)	10 (18.2)
3. There should be a different approach to the way CM is taught in undergraduate pharmacy school	51 (92.7)	4 (7.3)
4. Customer demand increases my desire to learn more about CMs	49 (89.1)	6 (10.9)
5. Most pharmacy students do not become aware of the potential benefits of CMs until they work in a community pharmacy	49 (89.1)	6 (10.9)
6. Pharmacists who stock CMs should regularly update their knowledge of CMs	54 (98.2)	1 (1.8)

7. There should be sources in the pharmacy to consult for information on CMs e.g. reference books, internet 54 (98.2) 1 (1.8)

**Table 7: Influences on beliefs about complementary medicines**

<b>Variables</b>	<b>Agree (%)</b>	<b>Disagree (%)</b>
1. CM use by self has positively influenced my beliefs about CMs	34 (61.8)	21 (38.2)
2. CM use by family or friends has positively influenced my beliefs about CMs	39 (70.9)	16 (29.1)
3. Learning (more) about CMs has positively influenced my beliefs about CMs	51 (92.7)	4 (7.3)
4. Being a member of a CM network has positively influenced my beliefs about CMs	15 (27.3)	40 (72.7)

Table 8: Mean difference analysis of variables

Variable	N	Mean Knowledge Score (SD)	95% Confidence Interval	P-value
<b>Age (in years)<sup>b</sup></b>				
20 - 30	25	10.64 (3.13)	9.35 – 11.93	<b>*0.005</b>
31 - 40	20	10.15 (3.53)	8.50 – 11.80	
41 - 50	6	9.67 (3.39)	6.11 – 13.22	
51 - 60	3	17.67 (1.53)	13.87 – 21.46	
> 60	1	6.00 (0.00)	-	
<b>Gender<sup>a</sup></b>				
Male	34	11.15 (4.14)	- 0.72 – 3.30	0.204
Female	21	9.86 (2.52)		
<b>Undergraduate qualification</b>				
BPharm	49	10.49 (3.74)	- 4.67 – 1.65	0.342
PharmD	6	12.00 (2.53)		
<b>Post-qualification experience (in years)</b>				
< 5	22	10.86 (2.85)	9.60 – 12.13	0.794
5 - 10	20	10.05 (3.86)	8.24 – 11.86	
11 - 20	9	11.00 (2.78)	8.86 – 13.14	
> 20	4	11.75 (7.85)	- 0.74 – 24.24	
<b>Community pharmacy experience (in years)</b>				
< 5	29	10.07 (3.17)	8.86 – 11.28	0.284
5 - 10	16	11.63 (3.90)	9.55 – 13.70	
11 - 20	9	11.33 (4.39)	7.96 – 14.71	
> 20	1	6.00 (0.00)	9.67 – 11.64	
<b>Additional qualification</b>				
Yes	21	10.57 (3.94)	- 2.18 – 1.91	0.896
No	34	10.71 (3.49)		
<b>Highest level of herbal training</b>				
Undergraduate pharmacognosy	37	10.57 (3.78)	- 2.38 – 1.85	0.802
PG studies	18	10.83 (3.42)		
<b>Have you ever used CMs before?</b>				
Yes	50	10.74 (3.72)	- 2.50 – 4.38	0.586
No	5	9.80 (2.86)		
<b>Do you stock CMs in your pharmacy?</b>				
Yes	52	10.90 (3.57)	0.38 – 8.76	<b>*0.033</b>
No	3	6.33 (1.53)		

**Are you a member of any CM network?**

Yes	15	10.00 (2.48)	- 3.12 – 1.32	0.419
No	40	10.90 (3.99)		

Tests: a = ANOVA; b = Independent t-test;  $p \leq 0.05$  is statistically significant; SD = standard deviation

**Sources of information on complementary medicines**

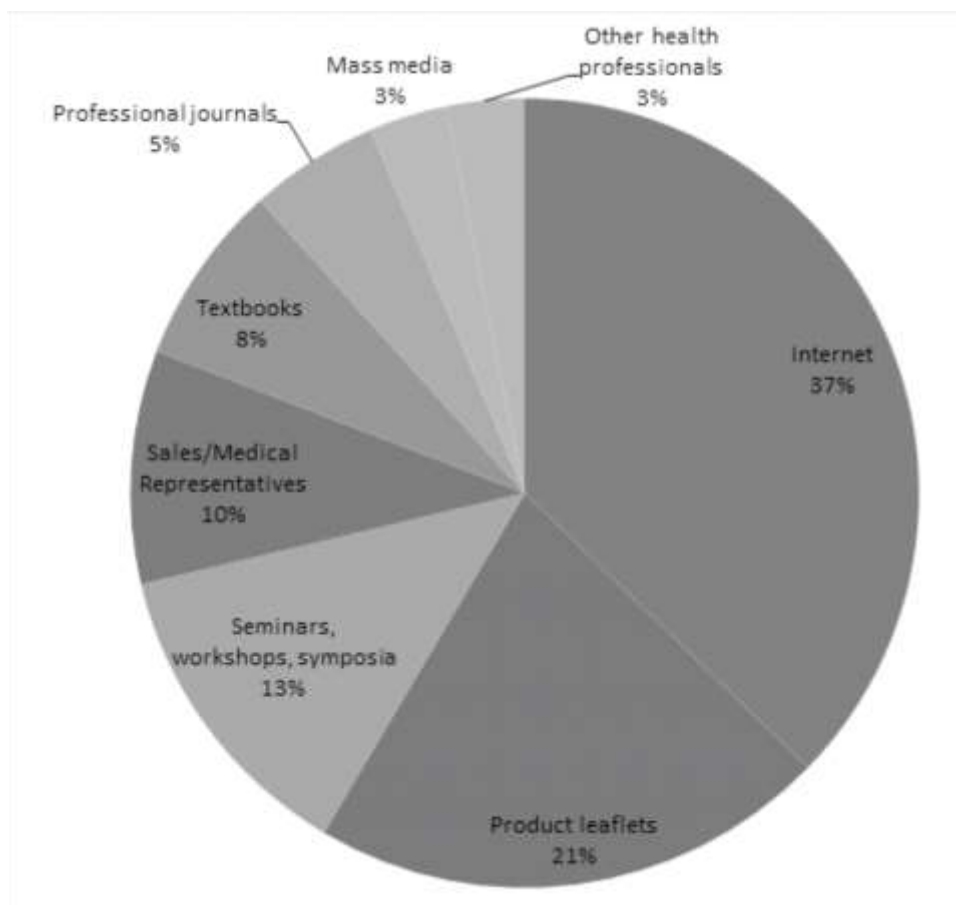


Figure: Community Pharmacists' most regular sources of information on Cms

**DISCUSSION**

Most of the respondents were recent graduates with less than 10 years of community pharmacy experience. Majority stock CMs in their community pharmacies. They exhibited poor knowledge in questions on CMs bordered on dose, interactions and contra-indications. Less than half had overall adequate knowledge of CMs. All the respondents believed that CMs have beneficial effects with almost all agreeing that knowledge about CMs is important to them as practicing pharmacists. Majority believed that knowledge of a CM will enhance their confidence to recommend it. A bulk of the respondents reported that they will not recommend a CM that has no evidence of safety, even if there is a high profit-margin. Majority will not recommend the concurrent use of CMs and orthodox drugs with a narrow therapeutic index. Less than half agreed that their undergraduate pharmacy training equipped them

to be providers of information on CMs with majority suggesting that there should be a different approach to the way CM is taught in undergraduate pharmacy school. Most of the respondents agreed that learning (more) about CMs has positively influenced their attitudes towards CMs. Those who stocked CMs in their community pharmacies had better knowledge scores than those who did not. The internet was the respondents' most regular source of information on CMs.

This study shows that majority of the community pharmacies stock CMs. It is important to note that there have been reports of negative health consequences caused by the use of herbal medicines necessitating the subjection of herbal products to scientific evaluations like conventional medicines.<sup>17</sup>The regulation of herbal medicinal products by the National Agency for Food and Drug Administration and Control

(NAFDAC) is primarily focused on the labeled packaged products or finished herbal medicinal products.<sup>18</sup> Despite NAFDAC's role in ensuring safe and effective herbal medicines, not all CMs sold in community pharmacies in Nigeria have NAFDAC registration number. Also, some herbal medicines are hawked, sold in commercial buses or open drug markets.

Few of the community pharmacists had adequate knowledge of CMs. This poor knowledge of CMs was also reported in a study in South-Western Nigeria where majority of the respondents scored less than 53% on the questions on the use, adverse effects and interaction potentials of the commonly sold CMs. In fact, only 2% scored above 70%.<sup>6</sup> An Asian study showed that about half of the respondents felt it was the pharmacists' professional responsibility, even more than doctors, to provide information on herbal medicines, though many felt they did not require advice from a health professional. Thus, pharmacists need to take their rightful place as custodians of drugs (including CMs) to meet up with the information demands of their patients and provide reliable information to the public. In an Australian study, 91% of the respondents believed that pharmacists should have a good knowledge of both conventional medicines and complementary and alternative medicines (CAMs).<sup>19</sup> Another Australian study stressed the need for pharmacists to improve their knowledge as less than one-fifth reported that they were confident in answering queries about safety, interactions or benefits of CAMs.<sup>20</sup> Three studies in the Middle East also showed that pharmacists had poor awareness about herb-drug interactions.<sup>7,13,21</sup> Similarly, in Missouri, USA, over half of those surveyed indicated that they received natural product questions on a weekly basis, but only a minority felt they could "always answer natural product questions".<sup>15</sup> Pharmacists should be able to provide accurate information to consumers on the safe use of CMs.

Lack of knowledge deflates the confidence of community pharmacists to recommend CMs.

Pharmacists in Australia reported knowing that they should regularly ask customers if they are using CAMs but many lacked the confidence to do so.<sup>14</sup> Pharmacists should improve their knowledge on CMs by regular update lectures, seminars, workshops, symposia, postgraduate studies etc. Knowledge on CMs is an objective influencer of attitudes towards CMs. They

should be knowledgeable about the drugs or CMs sold in their pharmacies.

Although more than half of the respondents agreed that a number of CMs hold promise for the treatment of symptoms, conditions, and/or diseases, about fourfifth were of the opinion that treatment of CMs which are not tested in a scientifically recognized manner should be discouraged. A comparable result was obtained in a survey in Singapore where a fifth of the respondents said they will not use CAMs due to the lack of evidence of effectiveness. In a Palestine study, about <sup>1</sup> half of the respondents believed that herbal products have placebo effect with about 60% stating that herbal products may cause fewer side effects than conventional medicines.<sup>21</sup> Our study also shared similar results with the Palestine study as 70% of the respondents agreed that herbal products have significant interactions with conventional medicine.<sup>21</sup> In another Nigerian study, more than 90% of the respondents believed in a potential for herb-drug interaction.<sup>3</sup>

The recommendation of CMs to provide a holistic care was agreed to by about half of the respondents, a lot higher than the 12.1% in a Singaporean study.<sup>1</sup> In a study on the attitudes of Australian pharmacists towards CAMs, 57% of the respondents believed that CAMs enhance the customers' image of the pharmacy with 87% of the opinion that CAMs increase customer numbers and 72% of the view that CAMs increase annual sales.<sup>20</sup> This results are similar to those obtained in this study with regards to customers' image of the pharmacy and increase of annual sales. However, only 65.4% believed sale of CMs could increase customer numbers.

Majority of the respondents in this study agreed that they have learnt more from their day-today work experience than from their university education. In Missouri, only 12.5% of pharmacists indicated that they had gained knowledge about natural products from their didactic pharmacy education.<sup>15</sup> Perhaps, there should be a different approach to the way CM is taught in undergraduate pharmacy school. Pharmacy students in Nigeria are usually shocked on graduation to see how much of CMs are sold in most community pharmacies considering the fact that focus is usually on the conventional medicines during their undergraduate years. The bodies responsible for the training of pharmacists in Nigeria - Pharmacists Council of Nigeria (PCN) and the National Universities

Commission (NUC) – may need to review or update the curriculum or if already done, ensure that CMs are taught in pharmacy schools to reflect the recent trends in pharmacy practice worldwide.

The most regular source of information was the internet, followed by product leaflets. This contradicts a study in Australia where the frequently used CAM information sources were those from manufacturers and distributors, professional newsletters, journals and textbooks.<sup>19</sup> Another Nigerian study showed the pharmacists' major source of information on herbal medicines as the package leaflet insert, followed by the internet.<sup>3</sup> Community pharmacists should be encouraged to have reference books in their pharmacies – hard copies, to add to the British National Formulary and EMDEX<sup>®</sup> which were commonly available. Access to peer-reviewed sources of information on the internet should also be actively encouraged by the relevant regulatory bodies.

The results of this study cannot be generalized as it was just a pilot study conducted in a few zones in Lagos State. Due to the selection bias, it is not representative of all community pharmacists in Lagos State or Nigeria, as a whole. References can be made to this study while more elaborate studies are carried out in Lagos State or nationwide.

## CONCLUSION

Community pharmacists in some zones in Lagos State, Nigeria did not demonstrate good knowledge of complementary medicines. This served as a major barrier to their recommendation of these medicines. They believed that CMs have beneficial effects and rate knowledge about CMs as important to their practice. Major drivers for recommending complementary medicines included knowledge of complementary medicines; if complementary medicines have previously worked for them and if relatives use complementary medicines. Barriers to recommending complementary medicines included safety of complementary medicines and undesirable interactions. Less than half of the respondents agreed that their undergraduate pharmacy training adequately equipped them to be providers of information on complementary medicines. The major source of information on complementary medicines was the internet. Community pharmacists should engage in continuing education programmes and the undergraduate curriculum should be

reviewed to produce better equipped professionals in this regard.

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## REFERENCES

1. Hwee-Ling K, Hui-Ling N, Hsiao-Huei T (2004). A survey on knowledge, attitudes and usage of complementary and alternative medicine in Singapore. *Asia-Pacific Biotech News*. 8(23):1266-1270.
2. World Health Organization (WHO) (2014). General guidelines for methodologies on research and evaluation of traditional medicine. Available at: [http://whqlibdoc.who.int/hq/2000/WHO\\_EDM\\_RM\\_2000.1.pdf](http://whqlibdoc.who.int/hq/2000/WHO_EDM_RM_2000.1.pdf). Accessed May 20, 2014.
3. Oshikoya KA, Oreagba IA, Ogunleye OO, Oluwa R, Senbanjo IO, Olayemi SO (2013). Herbal medicines supplied by community pharmacies in Lagos, Nigeria: pharmacists' knowledge. *Pharmacy Practice*. 11(4):219-227.
4. Miller LG, Hume A, Harris IM, Jackson EA, Kanmaz TJ, Cauffield JS, Chin TWF, Knell M (2000). White paper on herbal products. *Pharmacotherapy*. 20(7):877-891.
5. Oshikoya KA, Senbanjo IO, Njokanma OF, Soipe A (2008). Use of complementary and alternative medicines for children with chronic health conditions in Lagos, Nigeria. *BMC Complementary and Alternative Medicine*. 2008; 8:66. doi:10.1186/1472-6882-8-66.
6. Adisa R, Fakeye T (2006). Assessment of the knowledge of community pharmacists regarding common phytopharmaceuticals sold in South Western Nigeria. *Tropical Journal of Pharmaceutical Research*. 5(2):619-625.
7. Alkharfy KM (2010). Community pharmacists' knowledge, attitudes and practices towards herbal remedies in Riyadh, Saudi Arabia. *East Mediterranean Health Journal*. 16(9):988-993.
8. Hepler CD, Strand LM (1990). Opportunities and responsibilities in pharmaceutical care. *American Journal of Hospital Pharmacy*. 47(3):533-543.
9. Culverhouse SE, Wohlmut H (2012). Factors affecting pharmacists' recommendation of complementary medicines – a

- qualitative pilot study of Australian pharmacists. *BMC Complementary and Alternative Medicine*. 12:183.
10. Abahussain NA, Abahussain EA, Al-Oumi FM (2007). Pharmacists' attitudes and awareness towards the use and safety of herbs in Kuwait. *Pharmacy Practice (Granada)*. 5(3):125-129.
  11. Fahmy SA, Abdu S, Abuelkhair M (2010). Pharmacists' attitude, perceptions and knowledge towards the use of herbal products in Abu Dhabi, United Arab Emirates'. *Pharmacy Practice (Granada)*. 8(2):109-115.
  12. Lin H-W, Pickard S, Mahady GB, Karabatsos G, Crawford SY, Popovich NG (2010). An instrument to evaluate pharmacists' patient counseling on herbal and dietary supplements. *American Journal of Pharmaceutical Education*. 2010; 74(10): article 192.
  13. Duraz AY, Khan SA (2011). Knowledge, attitudes and awareness of community pharmacists towards the use of herbal medicines in Muscat region. *Oman Medical Journal*. 26(6):451-453.
  14. Bushett NJ, Dickson-Swift VA, Willis JA, Wood P (2011). Rural Australian community pharmacists' views on complementary and alternative medicine: a pilot study. *BMC Complementary and Alternative Medicine*. 11:103.
  15. Clauson K, McQueen C, Shields K, Bryant P (2003). Knowledge and attitudes of pharmacists in Missouri regarding natural products. *American Journal of Pharmaceutical Education*. 67: article 41.
  16. National Population Commission of Nigeria (NPC) 2016. Available at: <http://www.population.gov.ng> Accessed May 21, 2016.
  17. Obinna C (2015). Herbal medicines must be scientifically evaluated, says NAFDAC. *The Vanguard*. September 2, 2015. Available at: <http://www.vanguardngr.com/2015/09/herbal-medicines-must-be-scientifically-evaluated-says-nafdac>. Accessed June 12, 2016.
  18. National Agency for Food and Drug Administration and Control (NAFDAC) (2016). Available at: <http://www.nafdac.gov.ng/index.php/guidelines/herbal-guidelines>. Accessed June 12, 2016.
  19. Naidu S, Wilkinson JM, Simpson MD. Attitudes of Australian pharmacists toward complementary and alternative medicines (2005). *The Annals of Pharmacotherapy*. 39(9):1456-1461.
  20. Semple SJ, Hotham E, Rao D, Martin K, Smith CA, Bloustien GF (2006). Community pharmacists in Australia: barriers to information provision on complementary and alternative medicines. *Pharmacy World and Science*. 28(6):366-373.
  21. Sweileh WM, Abu Arrah EM, Abu Taha AS, Sawalha AF, Salah OA, Jamous RM, Adawi D (2013). Dispensing practices, attitudes and knowledge of pharmacists towards herbal products in Palestine. *Ibnosina Journal of Medicine and Biomedical Sciences*. 5(3):123-130.