HOSPITAL PHARMACISTS’ KNOWLEDGE ABOUT CARDIOVASCULAR DISEASE RISK FACTORS

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Abstract

Background: Pharmacists can play an important role in hypertension treatment by helping patients improve their chances of reaching therapeutic and lifestyle goals. This study aimed to assess hospital pharmacists’ knowledge of cardiovascular disease (CVD) risk factors and their practice of primary prevention of CVD. This was a prospective cross sectional survey of all the Hospital pharmacists in Federal Medical Centre Lokoja (FMCL), and Kogi State Specialist Hospital (KSSH) both in Lokoja L.G.A of Kogi State Nigeria. A Questionnaire on diagnostic cut-off for common cardiovascular diseases (CVD) and practice of primary prevention of CVD was used for the study. The Statistical Package for Social Sciences (SPSS for windows, Version 16.0. SPSS Inc. 2007.Chicago, USA) software was used for data analysis. Continuous data were presented as mean± standard deviation while categorical data were presented as percentages and frequencies.

Results: About half, 20(46.5) of the hospital pharmacist were less than 40 years with a mean age of 43.44 years. The hospital pharmacist had poor knowledge of diagnostic cut-off for common cardiovascular disease risk factors. Also, the hospital pharmacists had poor practice of primary prevention of cardiovascular diseases. Age, gender and years of practice were associated with knowledge of CVD risk factors while age alone was associated with practice of primary prevention of CVD.

Conclusion: Hospital pharmacists in Kogi state have a poor knowledge of CVD risk factors and also a poor practice of primary prevention of CVD.

Keywords: Hospital pharmacists, Knowledge, Practice, Cardiovascular diseases.

INTRODUCTION

In Nigeria, hypertension has become an important health problem. The burden of hypertension has been on the increase because of the increasing adult population and change
in lifestyles of Nigerians (Ogah et al. 2012). According to a recent meta-analysis, about 28.9% of Nigerian adults are hypertensive (Adeloye, Basquill, and Aderemi 2015). Also, research data has shown that there is a rising trend of cardiovascular disease and trend in Nigeria (Oguanobi et al. 2013). During the last two decades, there has been a rise in the number of prevalence studies regarding hypertension and other non-communicable diseases (Ekpenyong et al. 2012). In 2011, the prevalence of hypertension was reported to range from 6.2% to 48.9% in males and 10% to 47.3% in females using a BP benchmark of 140/90 mmHg (Ulasi et al. 2011). The overall crude prevalence was reported to be 2.1% to 47.2% (95%CI) in Nigerian adults aged 18 years and above (Mathers and Loncar 2006). Studies also have shown a higher prevalence in urban areas (17.5% to 51.6%) compared to rural areas (4.6% to 43%) (Oluyombo et al. 2014). In fact, the pooled prevalence of hypertension in Nigeria has increased over the past four decades from 8.9% to 22.5% (Ogah et al., 2012). There has been a continuous and steady increase in the incidence and prevalence of hypertension around the world (Bosworth, P. et al. 2007). Presently, over 1.5 billion people are affected with high blood pressure worldwide (Chockalingam 2008).

Pharmacists can play an important role in hypertension treatment by helping patients improve their chances of reaching therapeutic and lifestyle goals (Isabelle et al. 2003). It has been observed that pharmacists can help patients either individually or with other health care professionals in designing, implementing, and monitoring special therapeutic plans in order to improve the disease state outcomes through a process known as Pharmaceutical care (PC) (Hepler and Strand 1997). The main responsibilities of a pharmacist is optimization of the patients medical treatment and help patients achieve maximum adherence to their medications. Presently, pharmacists do not provide pharmaceutical care in terms of disease state management to patients in public hospitals or out-patient settings. Over the years, it is believed that the primary responsibility of the pharmacist in to dispense medications to patients.

**OBJECTIVE**

This study aimed to assess hospital pharmacist’s knowledge about cardiovascular risk factor and their practice of primary prevention of cardiovascular diseases.

**METHODS**
**Study design:** This was a prospective cross sectional survey of all the Hospital pharmacists in Federal Medical Centre Lokoja (FMCL), and Kogi State Specialist Hospital (KSSH) both in Lokoja L.G.A of Kogi State Nigeria.

**Study Centre:** The Federal Medical Centre (FMCL) is the only tertiary health institutions in Kogi State and it is located in the heart of the state capital, Lokoja. The hospital serves as a referral centre for all primary and secondary health facilities in the state, as well as neighbouring states. The Kogi state specialist hospital is one of secondary health institution in Kogi State and it is located in the heart of the state capital, Lokoja. The hospital serves as a referral centre for all the primary health facilities in the state, as well as neighbouring states.

**Ethical Clearance:** Ethical Clearance obtained from the Health and Research ethics committee of FMCL was used for this study. Also, oral and written consent were obtained from the pharmacists who agreed to participate in this study

Eligibility criteria: All the registered pharmacists in FMCL and KSSH who agree to participate were included in the study.

**Data collection:** A Questionnaire on diagnostic cut-off for common cardiovascular diseases was developed by the researcher to access the pharmacist knowledge on these diagnostic cut-off points. Also, questionnaire on practice of primary prevention of cardiovascular disease was adopted from Amadi C.E. et al, and was used to evaluate the pharmacist practice of primary prevention on cardiovascular disease (Amadi et al. 2018). The questionnaire was shared for the hospital pharmacist during their clinical meeting in June 2020.

**Outcome measure:** Hospital pharmacists knowledge about cut-off for cardiovascular disease risk factors and practice of primary prevention of cardiovascular diseases.

**Data Analysis**

The data cleaning was conducted in Microsoft excel after which information were exported and analysed using the Statistical Package for Social Sciences (SPSS for windows, Version 16.0. SPSS Inc. 2007.Chicago, USA) software. Continuous data were presented as mean± standard deviation while categorical data were presented as percentages and frequencies. Chi square and correlation test was also used to examine association between the variables in the data collected.

**RESULTS**

**Socio demographic Characteristics of Hospital Pharmacists**
From Table 1, out of 39 registered pharmacists who are on permanent appointment at FMCL, only 30 of them were available and agreed to participate in the study. However, only 13 out of the 22 pharmacist at KSSH were able to participate in the study. About half, 20 (46.5) of the hospital pharmacist were less than 40 years with a mean age of 43.44 years. A majority of the hospital pharmacist 31 (72.1) were males. More than 79% of them were married. Also, more than three-quarter of the hospital pharmacist have only Bachelor of pharmacy as their only clinical degree. A majority of the pharmacists who participated in the study reported that they have been practicing for more than 10 years [Table 1].

Table 1: Socio-Demographic Characteristics of Hospital Pharmacists (N=43)

| Socio-demographic                              | Hospital Pharmacists n (%) |
|------------------------------------------------|----------------------------|
| **Age (years)**                                |                            |
| <30                                            | 0 (0)                      |
| 30-40                                          | 20 (46.5)                  |
| 41-50                                          | 15 (34.9)                  |
| 51-60                                          | 8 (18.6)                   |
| Mean ± SD                                      | 43.44 ± 7.80               |
| **Gender**                                     |                            |
| Male                                           | 31 (72.1)                  |
| Female                                         | 12 (27.9)                  |
| **Marital status**                             |                            |
| Married                                        | 34 (79.1)                  |
| Single                                         | 9 (20.9)                   |
| **Addition qualification obtained after B.pharm**|                            |
| None                                           | 34 (79.1)                  |
| FCPPharm                                       | 5 (11.6)                   |
| Pharm D                                        | 0 (0)                      |
| FCPPharm+ PharmD                               | 4 (9.3)                    |
| **Number of years of practice after graduation (years)** |                |
| <5                                             | 12 (27.9)                  |
| 5-10                                           | 19 (44.2)                  |
| >10                                            | 12 (27.9)                  |
Table 2: Pharmacist Knowledge of diagnostic cut-off for common cardiovascular disease risk factors

| Risk Factor                                      | Hospital Pharmacists |
|-------------------------------------------------|----------------------|
| Risk Factor                                     | n (%)                |

Hypertension

**What is the cut-off for diagnosis of Hypertension (SBP<140 mmHg; DBP<90mmHg)**
12 (27.9)

**What is the cut-off for diagnosis of uncontrolled DM (HbAic 6.5-7.5)**
9 (20.9)

**What is the cut-off for diagnosis of Obesity (BMI <30kg/m²)**
16 (37.2)

**What is the cut-off for diagnosis of Hypercholesterolemia (Tc >240mg/dl)**
10 (23.3)

SBP= systolic blood pressure; DBP= diastolic blood pressure; DM= diabetes mellitus; HbAIC= glycosylated haemoglobin; BMI= body mass index; Tc= triglycerides

Pharmacist Knowledge of diagnostic cut-off for common cardiovascular disease risk factors

From Table 2, Only 12(27.9) of the hospital pharmacist knew the cut-off for diagnosis of hypertension and only 9(20.9) of them knew the cut-off for uncontrolled diabetes mellitus. In addition, only 16(37.2) of the hospital pharmacist knew the cut off for diagnosis of obesity and only 10(23.3) of them knew the cut-off for hypercholesterolemia. In summary, the hospital pharmacist had poor knowledge of diagnostic cut-off for common cardiovascular disease risk factors [Table 2].

Pharmacist practice of primary prevention of cardiovascular diseases

From table 3, about 39(90.7) of the hospital pharmacist reported that they have functional sypgymomanometers available in their unit. Meanwhile only 2(4.7) of the pharmacist agreed...
to routinely measure the BP of their hypertensive patients. Also, 2(4.7) of the hospital pharmacists respectively reported that they have a functional glucometer to measure blood glucose of their diabetic patients. Furthermore, only 3(7.0) of the pharmacists agreed that they routinely measure the BMI of their hypertensive and/or diabetic patients. More than half of the hospital who participated in the study were aware of the recent guidelines for the management of hypertension. Only 16 (37.2) of the pharmacists do inform their hypertensive and/or diabetic patients on the need to always check their cholesterol level. However, about 26(60.5) of the hospital pharmacist do advise their hypertensive and/or diabetic patients on the need for lifestyle management. In summary, the hospital pharmacists had poor practice of primary prevention of cardiovascular diseases [Table 3].

Table 3: Pharmacist practice of primary prevention of cardiovascular diseases

| Practice                                                                 | Hospital Pharmacists N= 43 |
|--------------------------------------------------------------------------|----------------------------|
| Are functional sypgymomanometers readily available in your unit?         | Yes n (%) | No n (%) |
| Do you routinely measure the BP of hypertensive patients?                | 2 (4.7)    | 41 (95.3) |
| Are there functional glucometer to measure blood glucose?                | 2 (4.7)    | 41 (95.3) |
| Do you routinely measure the BMI of your hypertensive and/or diabetic patient? | 3 (7.0)    | 40 (93.0) |
| Are you aware that there are guideline for the management of hypertension? | 28 (65.1)  | 15 (34.9) |
| How frequent do you inform hypertensive and/or diabetic patients to check their cholesterol level | never | rarely | Some times | Very often |
| 11 (25.6) | 16 (37.2) | 16 (37.2) | 0 (0) |
| How frequent do you advise hypertensive and/or diabetic patients on lifestyle | 6 (14.0) | 11 (25.6) | 24 (55.8) | 2 (4.7) |
|                  | HBP cut off | DM cut off | Obesity cut off | Hypercholesterola mia cut off |
|------------------|-------------|------------|----------------|-----------------------------|
| **Age**          |             |            |                |                             |
| >30              | 0 (0.0)     | 0 (0.0)    | 0 (0.0)        | 0 (0.0)                     |
| 30-40            | 10 (23.3)   | 6 (14.0)   | 5 (11.6)       | 4 (9.3)                     |
| 40-50            | 1 (2.3)     | 3 (7.0)    | 9 (20.9)       | 4 (9.3)                     |
| >50              | 1 (2.3)     | 0 (0.0)    | 2 (4.7)        | 2 (4.7)                     |
| **Gender**       |             |            |                |                             |
| Male             | 10 (23.3)   | 5 (11.6)   | 13 (30.2)      | 8 (18.6)                    |
| Female           | 2 (4.7)     | 4(9.3)     | 3 (7.0)        | 2 (4.7)                     |
| **Marital status** |         |            |                |                             |
| Married          | 6 (14.0)*   | 8 (18.6)   | 14 (32.6)      | 7 (16.3)                    |
| Single           | 6 (14.0)    | 1 (2.3)    | 2 (4.7)        | 3 (7.0)                     |
| **Additional qualification** |     |            |                |                             |
| Yes              | 4 (9.4)     | 0 (0)*     | 5 (11.7)       | 4 (9.4)                     |
| No               | 8 (18.6)    | 9 (20.9)   | 11 (25.6)      | 6 (14.0)                    |
| **Years of practice** |     |            |                |                             |
| < 5              | 5 (11.6)*   | 4 (9.3)*   | 3 (7.0)        | 3 (7.0)                     |
| 5-10             | 7 (16.3)    | 5 (11.6)   | 7 (16.3)       | 4 (9.3)                     |
| > 10             | 0 (0.0)     | 0 (0)      | 6 (14.0)       | 3 (7.0)                     |
Association Between Pharmacist Demographics And Knowledge About CVD Risk Factors

From table 4, the younger pharmacists were more knowledgeable about the diagnostic cut-off of some of the cardiovascular risk factors although this may be because they were more in number as it was not statistically significant. Male hospital pharmacist were more knowledgeable than their female counterparts about the CVD risk factors. Marital status was associated with knowledge of HBP diagnostic cut off for CVD risk factors among the hospital pharmacists as most of the singles were knowledgeable than the married ones. In addition, having an additional qualification was associated with knowledge of CVD risk factors and this was significant for HBP, DM and hypercholesterolemia. Hospital pharmacists who had less years of practice had more knowledge about CVD risk factors than those who had spent more years [Table 4].

Table 5: ASSOCIATION BETWEEN PHARMACIST DEMOGRAPHICS AND PRACTICE OF PRIMARY PREVENTION OF CVD

|                | Routinely measures BP | Routinely measures BMI | Informs patient to always check cholesterol | Informs patient on lifestyle management |
|----------------|-----------------------|------------------------|---------------------------------------------|----------------------------------------|
| Age            |                       |                        |                                             |                                        |
| >30            | 0 (0)                 | 0 (0)*                 | 0 (0)                                       | 0 (0)                                  |
| 30-40          | 1 (2.3)               | 0 (0)                  | 10 (23.3)                                   | 10 (23.3)                              |
| 40-50          | 0 (0)                 | 3 (7.0)                | 5 (11.6)                                    | 12 (28.1)                              |
| >50            | 1 (2.3)               | 0 (0)                  | 1 (2.3)                                     | 4 (9.3)                                |
| Gender         |                       |                        |                                             |                                        |
| Male           | 1 (2.3)               | 3 (7.0)                | 11 (25.6)                                   | 19 (44.2)                              |
| Female         | 1 (2.3)               | 0 (0)                  | 5 (11.6)                                    | 7 (16.3)                               |
| Marital status |                       |                        |                                             |                                        |
| Married        | 1 (2.3)               | 3 (7.0)                | 12 (27.9)                                   | 23 (53.5)                              |
| Single         | 1 (2.3)               | 0 (0)                  | 4 (9.3)                                     | 3 (7.0)                                |
| Additional qualification |           |                        |                                             |                                        |
### Association Between Pharmacist Demographics And Practice Of Primary Prevention Of CVD

From table 5, more of the older pharmacists routinely measured BMI of hypertensive patients and also informs them to always check their cholesterol level while more of those with an additional qualification measured the BMI of their hypertensive patients routinely than those who had only Bachelor of pharmacy and this was statistically significant.

**DISCUSSION**

This study shows that a majority of the hospital pharmacists were less than 50 years old with a mean age of 43.33 years. About three-quarter of the pharmacist who worked in the hospital were males. This finding is contrary to a study in an Indonesian hospital were two third of the pharmacist were females (Khairunnisa, Tanjung, and Sumantri 2015). Interestingly, more than three quarter of the hospital pharmacist do not have any other pharmacy degree besides Bachelor of Pharmacy. This shows that majority of the hospital pharmacist became comfortable after graduating from their first degree and probably getting a job with the civil service commission. Furthermore, more than two third of the hospital pharmacist have more than 5 years working experience.

Interestingly, less than one third of the hospital pharmacists know the diagnostic cut off for hypertension. A majority of them said that once a patient’s SBP is greater than 120 mmHg, then the patient is diagnosed of hypertension. Also, only one-fifth of the hospital pharmacist knew the diagnostic cut off for an uncontrolled diabetes mellitus. Although in this study, the question was based using patient glycosylated haemoglobin, about half of them knew the diagnostic cut off using Fasting blood sugar. Glycosylated haemoglobin gives more insight on DM control over three months. It can also be used to assess patients’ adherence to their anti-diabetics. Only about one-third of the hospital pharmacist knew the cut-off for diagnosis of obesity. However, less than one-quarter of the pharmacists knew the diagnostic cut off for hypercholeresterolemia. In summary, hospital pharmacists have a poor knowledge of
diagnostic cut off for CVD risk factors. This is in contrast to a study carried out among community pharmacist in Lagos Nigeria where a majority of the pharmacist had good knowledge about CVD risk factors and their diagnostic cut off (Amadi et al. 2018). However, a similar study conducted in a tertiary health institution in South west Nigeria showed that only 19.9% of the hospital pharmacist had a good knowledge about CVD risk factors (Akintunde, Akintunde, and Opadijo 2015). Poor knowledge about CVD risk factors could be because most of these pharmacists did not further their studies after their first degree. Most of them who have been practicing for more than 10 years and have not obtained any other clinical degree aside from Bachelor of pharmacy are not expected to be up-to-date with the current guidelines used in the management of hypertension. There is a need for an educational intervention targeted at hospital in Lokoja L.G.A. in Kogi state.

A majority of the pharmacists reported that they have a functional sphygmomanometer readily available in their units but only two of the hospital pharmacists said they routinely measure hypertensive and/or diabetic patients BP and BMI. However, a majority of the pharmacists are aware that there are guidelines used for the management of hypertension. It is interesting to note that only one-quarter of the hospital pharmacist inform their hypertensive and/or diabetic patients to always check their cholesterol level while about half of the pharmacist frequently advise their hypertensive and/or diabetic patients on lifestyle management. In summary, there is poor practice of primary prevention of CVD among hospital pharmacists. This poor practice can be attributed to the inter-professional rivalry commonly experienced by hospital pharmacists in the health sector leading to friction between physicians and other health care workers. When asked why they do not frequently measure their hypertensive and/or diabetic patients BP and BMI, a majority of them blamed it on ‘turf encroachment’. This is where the physicians have the feeling that pharmacist try to usurp or compete rather than collaborate with them. ‘Ownership of patients’ by physicians has been identified as a major hindrance to the practice of pharmaceutical care in Nigerian hospitals and this can only be resolved with the help of operational guidelines set in this health care facilities. They can also collaborate with physicians in ensuring continuity of care among the hypertensive population (Chiazor et al. 2015).

Another reason for poor practice of primary prevention of CVD among these pharmacists could be work overload or staff shortage. Performing these practices sometimes can take not less than five minutes and this is somewhat unrealistic as less than 30 pharmacists have to attend to over 250 hypertensive and/or diabetic patients at every clinic day. Majority of them
confessed that even without performing these activities, they go home each day exhausted from work as they are not only involved in dispensing medications but also medication reconciliation, distribution of medications to inpatients and patients in the emergency, receiving drugs from drug companies and documenting use and supply of drugs daily. Limited physical space to ensure privacy of patients, need for further training and time constraints have been identified as barriers which can affect pharmacists’ participation in the provision of primary prevention strategies for CVD (Jahangard-Rafsanjani et al. 2014).

Medication intervention has been identified as the mainstay of hypertension management. Since pharmacists are specially trained to be custodians of drugs, they are more likely to have adequate knowledge to identify medication risks (Sabouhi et al. 2011). Pharmacists are one of the key players in the healthcare system and they directly interact with patients when they come to fill their prescriptions. Pharmacist with good knowledge about cardiovascular risk factors and the importance of lifestyle modifications in the management of hypertension can help reduce morbidity and mortality especially among the hypertensive population. Studies have proven that pharmacist play a vital role in improving medication adherence and treatment compliance among hypertensive patients (Nasution, Khairunnisa, and Tanjung 2015). In summary, pharmacists play a vital role in detecting uncontrolled hypertension and can improve medication adherence as well as encourage healthy lifestyle behaviours among hypertensive patients (Rabia and Sebahat 2011).

**Conclusion**

Findings from this study show that hospital pharmacists have poor knowledge about diagnostic cut of cardiovascular risk factors. They also have poor practice of prevention of CVD. An educational intervention is necessary as a more knowledgeable hospital pharmacist can help encourage patients on health lifestyle behaviours.

**Declarations**

Ethics approval and consent to participate: The ethical clearance for this study was obtained from the Health Research ethics committee, Federal Medical centre Lokoja, Kogi state. Also, informed consent was obtained from all the pharmacists who participated in this research. No personal information related to any of the participants was included in the results. In addition, all methods were performed in accordance with all the relevant guidelines and regulations.

Consent for publication: The authors have given their consent to publish the result of this
study.

Availability of data and materials: All the data and materials used for this study has been included in this manuscript.

Competing interest: The authors declare that there are no competing interests.

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Authors contributions: Ukoha-kalu, B.O. prepared the data collection instruments and collected the data. Ukoha-kalu, B.O and Adibe, M.O did the data analysis and writing of the manuscript. All authors reviewed the manuscript.

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