



## Cardiovascular disease prevention; impacts of an intervention on clinical practice

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### Abstract

**Aim:** To explore approaches to improve healthcare practice associated with reduced cardiovascular disease (CVD) in an urban community setting in Nigeria.

**Methods:** Snowball sampling was used to recruit ten healthcare workers from a hospital within a community in Lagos State, Nigeria. The researcher collaboratively developed tools with the ten healthcare workers to explore barriers to the prevention of CVD; designed, and implemented approaches to overcome some of the identified modifiable barriers to CVD prevention. Subsequently, the researcher in collaboration with the healthcare workers recruited a total of 22 outpatients in an outpatient clinic in the hospital and explore their knowledge and behaviour in relation to CV health. In collaboration with the healthcare workers, the researcher also developed tools to identify practices of screening for CVD risk factors in relation to the WHO recommendations and implemented approaches to improve screening practices.

**Results:** A wide range of barriers to the prevention of CVD within the community were identified, including knowledge and organisational barriers, medication compliance, cultural and religious beliefs, and socio-economic factors. Some of the approaches adopted by the healthcare workers to address the prevalence of CVD within the community include continuation of health education as it affects the CVD, establishment of smoking cessation programme, and keeping in touch with the patients after they have been discharged from the hospital. Cardiovascular health knowledge among outpatients does not always translate to healthy behaviours. The most screened risk-factor for CVD was blood pressure while the least screened risk-factor for CVD was physical activity.

**Conclusion:** A research collaboratively planned, designed, facilitated, monitored, and evaluated with healthcare practitioners could be a vital tool to improve healthcare practice. The strategies used in this research could inform policy formulations for healthcare improvement and can be adapted to improve healthcare practice in similar context.

**Keywords:** Cardiovascular disease, secondary prevention, healthcare practice improvement.

### Introduction

There is substantial evidence that the majority of cardiovascular disease (CVD) is caused by risk factors that can be controlled, treated or modified, including hypertension (high blood pressure), cholesterol, unhealthy diets, overweight/obesity, tobacco use, physical inactivity and diabetes.<sup>1,2,3</sup>

Owolabi and colleagues recommended using mass communication channels, including interpersonal communication strategies to promote changes in health behaviours such as changes in dietary behaviours.<sup>4</sup> There are limited published

researches that aimed to improve primary healthcare practice.<sup>5,6</sup>

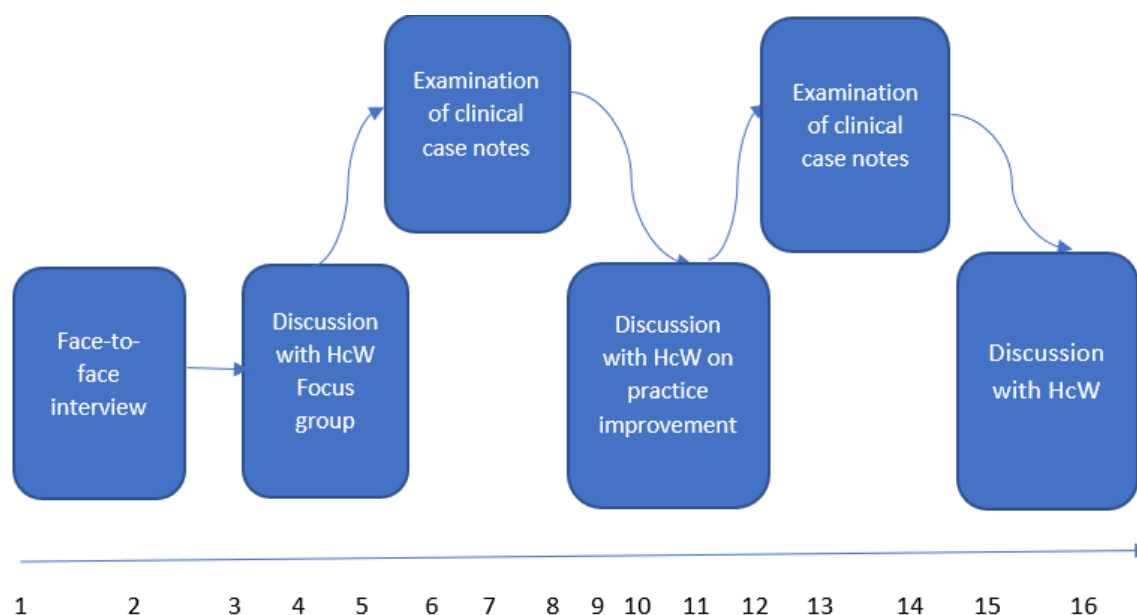
Constructing knowledge on how to improve CV health knowledge and healthcare practice associated with reduced CVD is necessary for policy formulations to inform healthcare improvement practices which can be adapted to healthcare facilities in Nigeria and countries with similar healthcare context. This study has four objectives. First was to explore healthcare providers views in relation to the barriers to the prevention of CVD. Second was to explore and

implement approaches to tackle identified barriers to the prevention of CVD. Third was to explore the knowledge and behaviour in relation to CV health of patients attending a community hospital outpatient clinic. Fourth was to examine patients' records to identify the practice of screening for CVD risk factors in relation to WHO recommendations, discuss the findings with healthcare practitioners, and determine (whether there were) changes in healthcare practice one month later.

**Methods**

Ethics approvals were obtained from the Ethics Committee, University of the West of Scotland and Lagos State Ministry of Health. Snowball sampling was used to recruit ten healthcare workers from a hospital within a community in Lagos State, Nigeria. Face-to-face interviews were used to explore the views of ten healthcare workers in a hospital of barriers to prevention of CVD within the wider community. The findings were then discussed with the healthcare workers in a focus group to explore ways to tackle the identified barriers and implement possible strategies to prevent CVD within the hospital. A total of 22 outpatients in an outpatient clinic in the hospital were administered with questionnaires

collaboratively designed with healthcare workers after consulting with their General practitioners to assess their CV health knowledge and behaviour. Clinical case notes (patients' record) of 30 patients aged 40 or older that had been admitted as new patients in the internal medicine department of the hospital three months previously were examined to identify practices of screening for CVD risk factors in relation to the WHO recommendations. The findings from the clinical case notes were discussed with healthcare practitioners, and there was an agreement among the healthcare practitioners that CVD screening practices should be improved to align with the WHO recommendations for preventing and managing the disease. 30 new clinical case notes one month later were examined to find out if there were changes in healthcare practice. Non-parametric Pearson correlation coefficient was carried out to determine the correlation between the knowledge and reported behaviour of the 22 patients. Pearson chi-square was also carried out to compare the findings before, and after the findings on screening for CVD risk factors were discussed with healthcare workers. The research lasted for sixteen weeks. Figure 1 represents the timeline of key research activities in the hospital.



**Figure 1.**Timeline of research activities at the hospital in weeks. HcW means healthcare workers.

## Results

### Identification of key barriers to the prevention of cardiovascular disease

When the healthcare workers were asked about the key barriers to the prevention of CVD in the community, the following themes emerged.

*1. Knowledge and organisational barriers:* The views below suggest that lack of knowledge and inability of the people to go for a medical check-up are critical barriers to prevention of CVD in the community.

‘Another barrier is lack of awareness because most people don’t even know what cardiovascular disease is’ [P<sub>10</sub>, female, nurse, 50 – 59years]

Lack of policies on the part of the government which regulate advertising of products that are harmful to CV health could be a factor that limits the prevention of CVD within the community.

‘Another barrier is ehm, the government not doing what they should do, in terms of cardiovascular disease, there are a lot of products in the market that when being analysed, you know it is not good for cardiovascular health, some products may contain something that may be harmful, I think government can control (regulate) the advertisement of these products’ [P<sub>7</sub>, female, nurse, 50 – 59 years]

Some healthcare workers highlighted that late detection of CVD-prone conditions could be a barrier to secondary prevention of CVD.

‘Late detection, by the time most people know they have high blood pressure; it has eaten deep into their blood vessels’ [P<sub>2</sub>, female, nurse, 40 – 49 years]

Some healthcare workers in the current study argued that lack of time on the part of healthcare professionals, hampers healthcare delivery.

‘No time to attend to the patients, no time for the patients to ask questions, even the doctors don’t have time because there are so many patients’ [P<sub>4</sub>, male, Medical doctor, 50 – 59 years]

*2. Medication compliance:* Some healthcare workers postulated that poor drug compliance constitutes a substantial barrier to CVD prevention in the community.

‘If they (patients) feel a bit better they withdraw from using the drugs without medical (healthcare practitioners’) consent’ [P<sub>6</sub>, Female, Medical doctor, 60 – 70 years]

The healthcare workers stated that drinking and smoking behaviours while on certain medications could impair the effectiveness of the medication thereby affecting secondary prevention of CVD.

‘Let me say lifestyle, for example, if they (patients) are still smoking and drinking alcohol. It may affect their drugs’ [P<sub>5</sub>, Male, Nurse, 30 – 39 years]

Addictive nature of tobacco use was highlighted as a barrier to prevention of CVD.

‘When you know that a particular health behaviour is not good for you, it can make people withdraw, but sometimes addiction can make people continue. If you tell somebody that smoking one packet of cigarette is not good for him, the person may know, but he is addicted. ‘The person may need help to stop’ [P<sub>3</sub>, Male, Public Health practitioner, 30 – 39 years]

*3. Cultural and religious beliefs:* It is a common view in the communities that modern medicine cannot cure diabetes or hypertension and leads individual to choose alternative approaches. There were contrasting views among healthcare workers about the effect of the herbal medicine on cardiovascular health. Some healthcare workers believed that use of alternative medicine could be a barrier to the prevention of CVD in the community.

‘People are so oriented to this herbal stuff (medicine), and this affects their kidney. Once the kidney is affected, the heart is affected. All the organs in the body work hand to hand’ [P<sub>5</sub>, Male, Nurse, 30 – 39 years]

However, other healthcare professionals in this current study argue that *Agbo* (herbal medicine) can be useful for cardiovascular health.

‘*Agbo* can be very good; some contain a mixture of herbs and roots which can remove the fats from the veins. For example, some contain mixture of beetroot, ginger, garlic, bitter leaf, zobo (juice made from dried hibiscus flower) and other

medicinal herbs. However, the key challenge the herbalist have is how to extract the active ingredients in the herbs and prescription of the right dosage' [P<sub>9</sub>, Female, Pharmacist, 49 – 50 years]

Many of the healthcare workers were of the view that religious belief is one of the barriers to prevention of CVD in the community.

'Religious extremism is one of them (barriers to CVD prevention), some patients when they have recovered a bit; they stop taking medication and believe by faith they are healed' [P<sub>10</sub>, Female, Nurse, 50 – 59 years]

'Some people believe that their body is the temple of the Holy Spirit and have nothing to do with sicknesses [P<sub>1</sub>, Female, Nurse, 50 -59 years]

These views are underreported in the literature as a barrier to the prevention of CVD.

*4. Socio-economic factors:* The comments below suggest that socio-economic variables constitute a major barrier to the prevention of CVD in the community.

'If you (patient) go to the pharmacy to buy drugs and the pharmacist say the cost is #5,000, the patient would say please Ma (madam), tell me the one I will buy; I have only #1,500 on me. Meanwhile, the doctor has prescribed the drugs for two weeks, and the patient will not be able to buy drugs that would last for that period' [P<sub>9</sub>, Female, Pharmacist, 40 – 49 years]

Some healthcare workers in this current study stated that lack of time is not only limited to the available time for the healthcare workers to attend to their numerous patients but the time available for the patients to prepare homemade foods.

'Another thing (factor) is time, maybe you go to work, what you see on the road is gala, chinchin, you see soft drink...these are the things you see, and you buy them...so the problem is (lack of) time to even prepare the foods' [P<sub>3</sub>, Male, Public Health Practitioner, 30 – 39 years]

This view suggests that food availability influences eating habits because of busy work schedule which together influences our heart health. The increase in the number of people that

do white collar jobs in Lagos state which make people leave for work in the morning and return late at night may leave them with little or no time to prepare homemade foods.

### **Approaches to tackle identified barriers to the prevention of CVD**

A discussion session was facilitated by the healthcare workers on how the healthcare facility can contribute to overcoming the challenges to the prevention of CVD within the community. The following resolutions were reached and initiated within the healthcare facility.

*1. Need for continuation of health education as it affects CVD:* The healthcare workers emphasised the need for continuation of nutrition education and enhancement of its scope as it affects CVD. They argue that changes in health behaviour begin with empowerment in knowledge via health education.

'Until you tell them (patients) that they need to take fruit and vegetables every day, and sometimes we show them pictures that you need to eat all these to prevent heart diseases and problems' [P<sub>3</sub>, Male, Public Health practitioner, 30 – 39 years]

The healthcare workers also agreed on the need to advise patients on how to plan their meals even with limited financial resources.

'We tell them (patients) how they can plan their meals, how they can combine it, even with the little money they have, we teach them how to manage it, if they are the local type we plan based on available foods, we do not enforce certain foods. We tell them if you take these (foods) these are the benefits, if you take that (food), these are the benefits' [P<sub>8</sub>, Female, Dietician, 40 – 49 years]

Although this tone seemed authoritative, it aligned with the way power is sometimes exercised in Nigeria in particular, and Africa at large. Power in this context means having leverage over others in terms of knowledge or influence. Power is displayed more assertively in Nigeria compared with the west where power may be exercised more subtly. The healthcare workers agreed on the need

to create awareness on medical check-up not just within the healthcare facility but the community.

‘People should constantly check their bodies even if they are not feeling unwell; you can go to the hospital and have a complete check-up’ [P<sub>4</sub>, Female, Nurse, 40 – 49 years]

Nonetheless, the healthcare workers emphasised the need to encourage patients to seek health information by themselves.

‘The minute (moment) somebody tells you, you are hypertensive or diabetic, you should try to find out what that means, sometimes in this healthcare facility it is difficult (to provide detailed health information) due to workload’ [P<sub>3</sub>, Male, Public Health Practitioner, 30 – 39 years]

The healthcare workers agreed on the need to enhance awareness on CVD via distribution of flyers and handbills. As a result, the healthcare workers partnered with some pharmaceutical companies that supply drugs to the healthcare facility which provided funding for the printing of flyers and handbills whereas the healthcare facility agreed to organise health talks in the faith-based organisation within the community.

*2. Healthcare workers made case for sustenance of drugs subsidy:* The healthcare workers stated that government may subsidise the cost of healthcare.

‘Government can subsidise the cost of the drugs if a drug that can go for #5,000 (Nigeria currency) Naira is available for #2,000 (Nigeria currency) it can help a lot. NGO’S can also provide funds for the subsidy’ [P<sub>9</sub>, Female, Pharmacist, 40 – 49 years]

Another healthcare worker agreed with the position above and argued that the Lagos State and some other states in Nigeria are indebted, wondering how subsidy could be achieved if left in the hands of the government.

‘I don’t know how it (subsidy) will be achieved; even some states in Nigeria are telling you that they are bankrupt; how can that be then?’ [P<sub>6</sub>, Female, Nurse, 60 – 67 years]

Fortunately, certain drugs are provided free for those who are 60 and above and those less than 12

in the healthcare facility where this study was undertaken. One of the healthcare workers was of the view that economic difficulty should not be a barrier, that what matters is how the limited financial resources are put to use regarding healthy eating.

‘Issue of poverty may not be a major constraint, even if you don’t have a lot of money, the little one you have may be used to eat good diet’ [P<sub>8</sub>, Female, Dietician, 40 – 49 years]

*3. Religious and cultural beliefs:* Deliberating on how to minimise negative religious views among some patients about taking medications, the healthcare workers were of the view that scriptural books will be used to let the patients know that some of the materials used in making drugs are made by God.

‘We should use a portion of the bible to convince them, to open their eyes that the materials that are used to produce drugs are made by God’ [P<sub>5</sub>, Male, Nurse, 30 -39 years]

‘You know some of the patients are very spiritual, we need to let them know that we understand spiritual issues as well, that way they can believe us’ [P<sub>7</sub>, Female, Nurse, 50 – 59 years]

These views are embedded in the cultural and religious dynamics in the community.

*4. Establishing smoking cessation programme:* The healthcare workers reflected on the challenges of changing difficult health behaviours such as smoking and agreed on the need to start smoking cessation services.

‘Those that are addicted to smoking need help; willpower alone may not be sufficient’ [P<sub>3</sub>, Male, Public Health practitioner, 30 – 39 years]

One of the healthcare workers agreed with the above submission and substantiated the discourse with the quote below.

‘There are many patients that have been assessed as smokers, but we only advise them to stop smoking, we can’t help them beyond that because we don’t have smoking cessation services’ [P<sub>1</sub>, Male, Nurse, 50 – 59 years]

One of the healthcare workers was of the view that they (healthcare workers) are already

overstretched due to workload. She agreed that smoking cessation services should be a useful programme to start but suggested that more workers need to be employed.

‘Smoking cessation programme would help our patients who are smokers to manage withdrawal symptoms and hence stop smoking, but the problem is that we are already overstretched, we need new hands (workers) although it won’t stop us from looking at the resources we need for the programme’ [P<sub>5</sub>, Male, Nurse, 30 – 39 years]

A healthcare worker highlighted the need for them to make the best possible use of human capital available at the healthcare practice at the time while they articulate policies that would be submitted to the hospital management for necessary action.

‘Starting smoking cessation programmes will be nice, we have some public health nurses among us, we need to submit a proposal to the hospital management’ [P<sub>2</sub>, Female, Nurse, 40 – 49 years]

In line with the above expressions, a team of five members was constituted among the healthcare workers to look identify the resources required to start the project. Official proposal was submitted to the hospital management and smoking cessation programme was established.

*5. Need to keep in touch with the patients:* The healthcare workers suggested that there is need to keep in touch with the patients to find out how they are doing at home.

‘...Yes, for instance when the patient is going after discharge, you may still need to reach that patient, maybe you call on phone to know how they are doing’ [P<sub>3</sub>, Male, Public Health practitioner, 30 – 39 years]

Importance of creating a new department that would be saddled with the responsibilities of following up and supporting outpatients for secondary prevention was emphasised.

‘I don’t think there is anything that could be done except if they (Lagos State Ministry of Health) will employ nurses that will go and check patients at home like homecare nurses (health visitors) ... they (nurses) will ask patients (at home) how do

you prepare your meal? Do you use salt to cook it? Which type of meat do you use? Those kinds of things (jobs) are for health visitors or community health nurses’ [P<sub>2</sub>, Female, Nurse, 40 – 49 years]

Given the above findings, the research team agreed to work out strategies to keep in touch with the patients after they are discharged from the hospital. Part of the strategies agreed on is to phone the patients in between their appointment days to find out the barriers to their health behaviour changes. The idea of sending community nurses to the patients’ residential homes was discussed. The challenge the research team was facing from getting this idea implemented was inadequate community health nurses at the healthcare facility. The healthcare facility does not have the power to employ healthcare workers. They are employed by Lagos State Ministry of Health and posted to different healthcare facilities within the state.

Furthermore, the research team agreed on the need to involve the family of the patients in planning for health promotion.

‘If they come along with their relative, you have to tell them the risk factors...their children will tell them (their parents) dad you don’t have to do this (get involved in health-risk behaviour) you have been told. It cannot be 100%, but I think it can help’ [P<sub>3</sub>, Male, Public Health Practitioner, 30 – 39 years]

Given the above comments, the research team agreed to encourage the patients to always come to the hospital with their loved ones whenever possible. Another issue the research team deliberated on was a change of strategies during follow up appointments. The following views inform the need for modification in practice and strategies.

‘We give them appointments; we need to check them, all the parameters, the anthropometric measurements - have there been any changes, the symptoms they have the first time they came, is it still there? Biochemical and dietary’ [P<sub>6</sub>, Female, Nurse, 60 – 70 years]

‘Through an appointment, the patient comes, you find out if he is complying with drugs regimen. If they are coming you ask them to come with the remaining drugs to be able to evaluate if that patient is doing well’ [P<sub>7</sub>, Female, Nurse, 50 – 59 years]

6. *Need to take anthropometric measurements:* In the healthcare facility, the new patients are offered appointments for a medical check-up. During the appointments, their BP is taken. However, anthropometric measurements such as height, weight, BMI, waist circumference are usually not taken. This issue was raised by the healthcare workers who resolved to henceforth to take anthropometric measurements for new patients. The values of the anthropometric measurements for new patients will be compared with the subsequent ones during a medical check-up. This practice will help to establish if an obese patient, for example, has been able to lose some weight. Also, the healthcare workers deliberated and agreed on the need for the use of carbon monoxide monitor to confirm the information given by a smoker who says he/she no longer smokes.

**Knowledge and behaviour in relation to cardiovascular health of patients attending a community hospital outpatient clinic.**

Figure 2a depicts patients’ knowledge about intake of fruit and vegetables and their health behaviour whereas Figure 2b depicts patients’ knowledge of physical activity with their health behaviour.

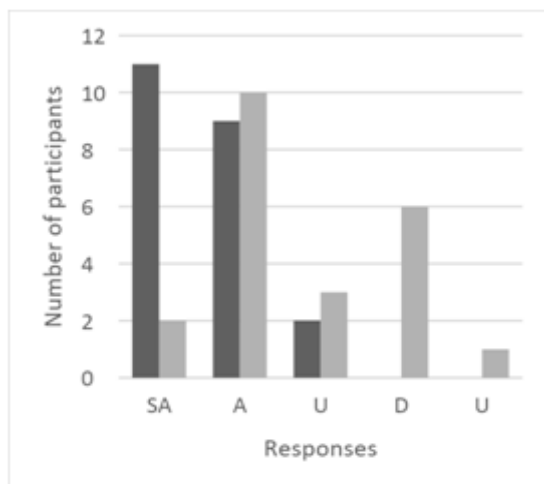


Figure 2a

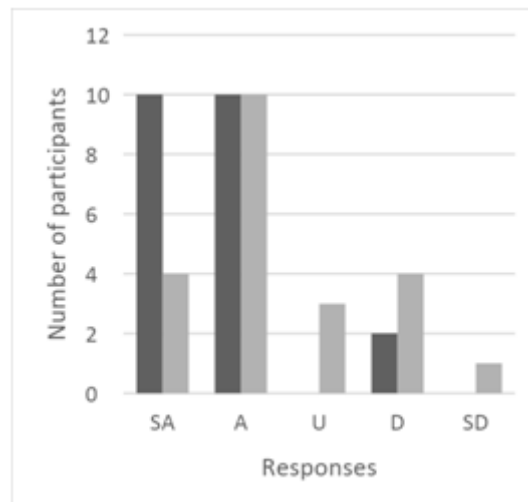


Figure 2b

Figure 2. An investigation of patients’ knowledge and behaviour about intake of fruit and vegetables and physical activity

Knowledge and health behaviour of 22 patients in relation to fruit and vegetable intake (a) and physical activity (b) were investigated using questionnaires. The black bars in both figures represent responses to knowledge related questions while grey bars represent responses to behaviour related questions. SA = Strongly Agree, A = Agree, U = Uncertain, D = Disagree, SD = Strongly Disagree.

91% patients have heard about the importance of eating five (400g) portions of fruit and vegetables per day to cardiovascular health. 55% patients eat five (400g) portions of fruit and vegetables per day. They believed it has become part of their behaviour and think they can continue with the behaviour ( $r = 0.705, p = 0.0002$ ). 92% patients have heard about the need to spend at least 30 minutes a day doing a moderate-intensity physical activity such as brisk walking, cycling, and exercising, and the need to do these activities at least five days per week. 65% patients believed that they now do at least 30-minutes moderate-intensity physical activity per day for at least five days per week. They believed it has become part of their behaviour and think they can continue with the new behaviour ( $r = 0.6904, p = 0.0004$ ). There is a strong correlation between patients that

have heard about the importance of eating five portions (400g) of fruit and vegetables per day to cardiovascular health and those that have heard about the need to spend at least 30 minutes a day doing a moderate-intensity physical activity such as brisk walking, cycling, and exercising ( $r = 0.6091$ ,  $p = 0.0026$ ). However, the awareness of the importance of intake of fruit and vegetables and physical activity to cardiovascular health does not commensurate to health behaviour change in that context.

Figure 3a demonstrates patients' knowledge and behaviour about the need to limit intake of sugary foods and beverages while Figure 3b illustrates patients' knowledge and behaviour about the need to maintain a healthy weight.

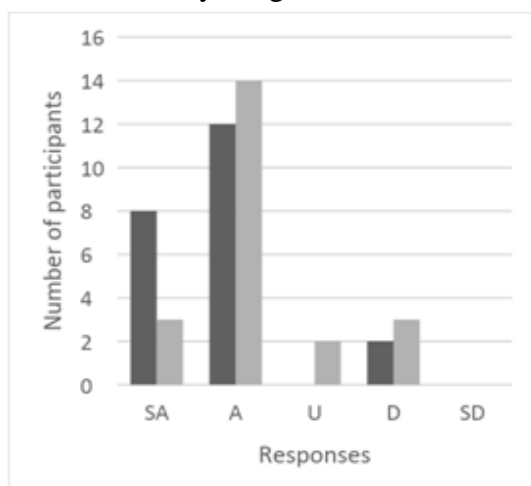


Figure 3a

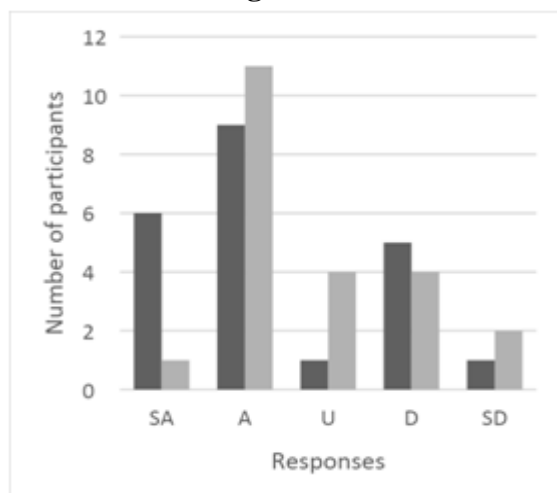


Figure 3b

**Figure 3.** An investigation of the patients' knowledge and behaviour about the need to limit intake of sugary foods and beverages and maintain a healthy weight

Knowledge and behaviour of 22 patients in relation to the need to limit intake of sugary foods and beverages (a) and maintain a healthy weight (b) were investigated using questionnaires. The black bars represent responses to knowledge related questions while grey bars represent responses to behaviour related questions. SA = Strongly Agree, A = Agree, U= Uncertain, D = Disagree, SD = Strongly Disagree.

91% patients admitted that they have heard about the need to limit the intake of sugary (sweetened) foods and beverages. 78% patients admitted that they now limit the intake of sweetened foods and beverages ( $r = 0.3556$ ,  $P = 0.1044$ ). This part is compared with findings from body weight because the substantial evidence established the link between excessive intake of refined sugar with weight gain. 68% patients stated that they have heard about the need to maintain a healthy weight while 55% patients stated that they now work hard to maintain a healthy weight ( $r = 0.6953$ ,  $P = 0.0003$ ). There was a very weak correlation between knowledge of the need to limit the intake of sugary foods and beverages and reported effort to maintain a healthy weight ( $r = 0.0711$ ,  $p = 0.7533$ ).

Figure 4a demonstrates patients' knowledge and behaviour about the need to limit intake of fried foods such as eggs while Figure 4b illustrates patients' knowledge and behaviour about the need to limit salt intake per day.

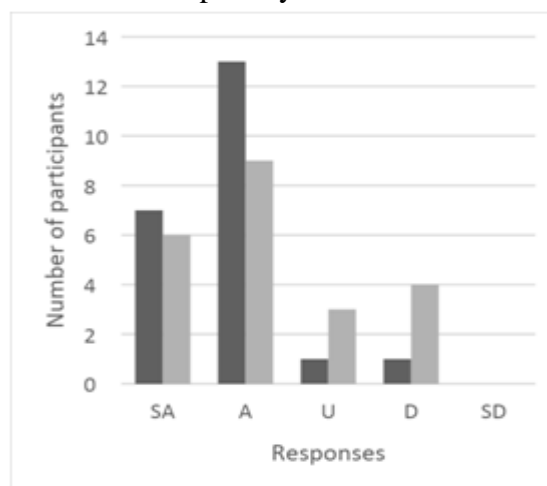
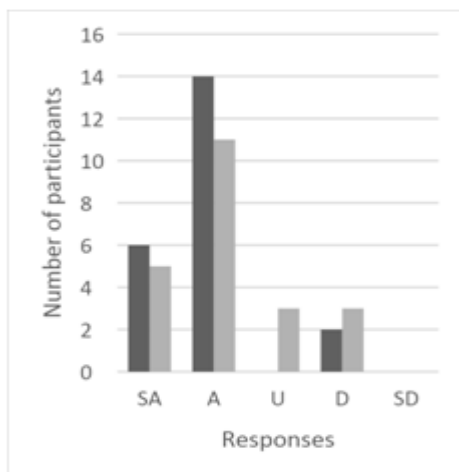


Figure 4a





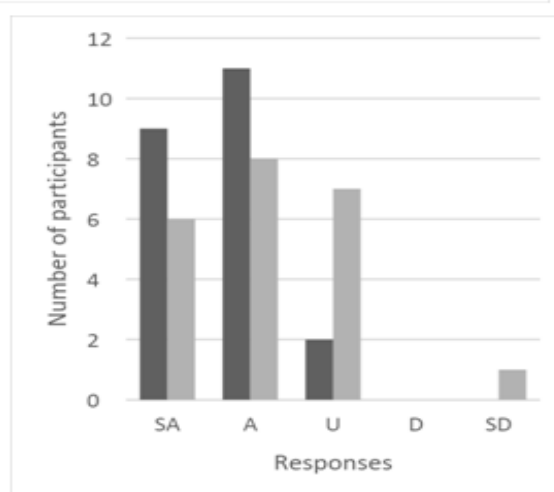
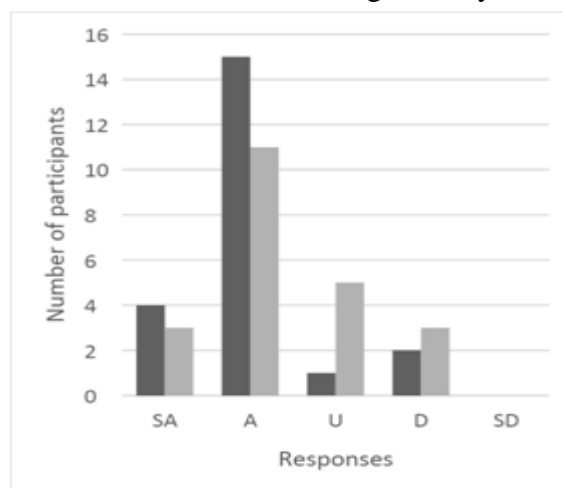
**Figure 4b**

**Figure 4.** An investigation of patients’ knowledge and behaviour about the need to limit intake of fried foods such as eggs and limit salt intake per day

Knowledge and behaviour of 22 patients in relation to the need to limit intake of fried foods such as eggs (a) and limit salt intake per day (b) were investigated using questionnaires. The black bars represent responses to knowledge related questions while grey bars represent responses to behaviour related questions. SA = Strongly Agree, A = Agree, U= Uncertain, D = Disagree, SD = Strongly Disagree.

91% patients have heard about the need to limit intake of fried foods such as eggs while 69% participants admitted that they now abstain from the intake of processed foods such as eggs ( $r = 0.7137, P = 0.0002$ ). This part is compared with the findings on salt intake per day because many people in Nigeria are likely to add salt to their local dishes, including egg sauce, tomato sauce, and beans cake when they are frying it. 92% patients accepted that they have heard about the need to limit salt intake per day whereas 73% stated that they now limit salt intake per day ( $r = 0.6904, P = 0.0004$ ). There is no correlation between the awareness of the need to limit salt intake per day with abstaining from the intake of fried foods such as eggs ( $r = -0.1467, p = 0.5149$ ). Figure 5a demonstrates patients’ knowledge and behaviour about the need to limit the intake of fatty foods such as fatty meat. Figure 5b illustrates

patients’ knowledge and behaviour of the need to eat fish which are rich in omega-3-fatty acids.



**Figure 5a.** An investigation of patients’ knowledge and behaviour about the need to limit the intake of fatty foods such as fatty meat and eat fish which are rich in omega-3-fatty acids. Knowledge and behaviour of 22 patients in relation to the need to limit the intake of fatty foods such as fatty meat (a) and eat fish which are rich in omega-3-fatty acids (b) were investigated using questionnaires. The black bars represent responses to knowledge related questions while grey bars represent responses to behaviour related questions. SA = Strongly Agree, A = Agree, U= Uncertain, D = Disagree, SD = Strongly Disagree.

86% patients stated that they have heard about the need to limit the intake of fatty foods such as fatty meat. 64% patients admitted that they now limit the intake of fatty foods such as fatty meat ( $P = 0.0032, r = 0.5992$ ). This suggests a moderate correlation between awareness of the need to limit

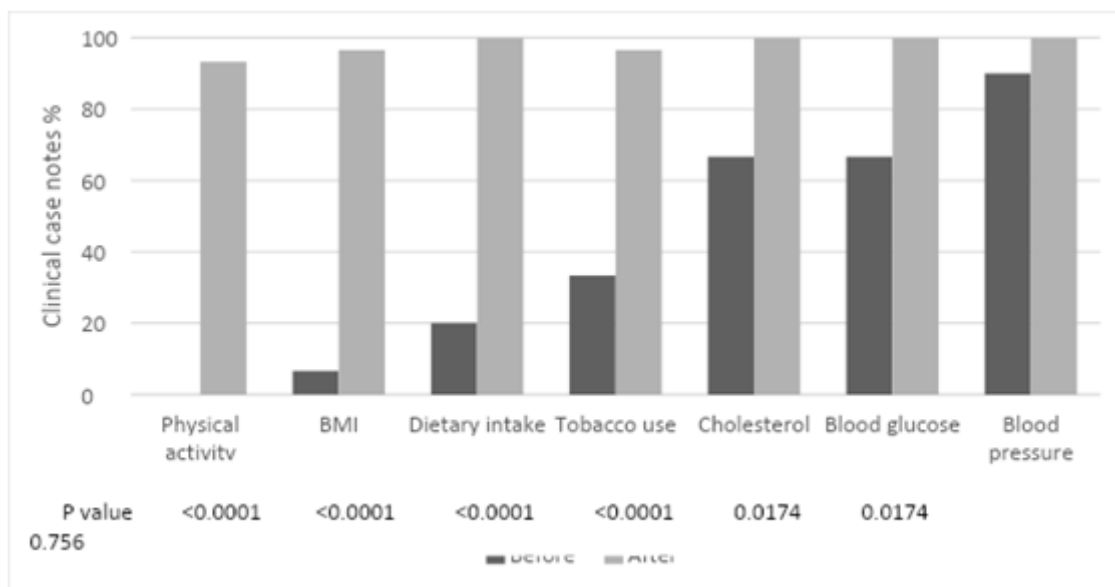
the intake of fatty foods such as fatty meat and limiting the intake of fatty foods. The findings from this question are compared with the findings on the need to eat fish which is rich in omega-3-fatty acids because fish is recommended as a healthier alternative to meat.

91% patients have heard about the need to eat fish which is rich in omega-3-fatty acids. 64% patients admitted that they now eat fish which is rich in omega-3-fatty acids ( $r = 0.4892$   $P = 0.0209$ ). There was a weak correlation between

awareness of the need to limit the intake of fatty foods such as fatty meat with eating fish which is rich in omega-3-fatty acids as a healthier alternative ( $r = 0.02218$ ,  $p = 0.3211$ ).

**Examination of clinical case notes to identify practice of screening for CVD risk factors in relation to WHO recommendation.**

The findings depicted in Figure 6 demonstrates the findings from the examination of thirty clinical case notes of patients recently attending a hospital in Lagos State, Nigeria.



**Figure 6.** Findings from clinical case notes

Thirty clinical case notes for patients recently attending the hospital were screened for information on assessments of CVD risk factors. Findings were discussed with healthcare workers, and another thirty records for new patients were scrutinised four weeks later. Pearson chi-square was carried out to compare the findings before, and after the findings were discussed with healthcare workers, the P-values are indicated.

The improvements in assessment and/or screening practices for physical activity, BMI, dietary intake, and tobacco use increased from 0 (0%) to 28 (99.3%), 2 (6.6%) to 29 (96.6%), 6 (20%) to 30 (100%), and 10 (33.3%) to 29 (96.6%) respectively. These translate to 99.3%, 90%, 80%, and 63.3% improvements in assessment or

screening practices for physical activity, BMI, dietary intake and tobacco use respectively. The improvements in assessment or screening practices for cholesterol, blood glucose and blood pressure increased from 20 (66.6%) to 30 (100%), 20 (66.6%) to 30 (100%), and 27 (90%) to 30 (100%) respectively. These translate to 33.4%, 33.4%, and 10% improvements in assessment or screening practices for cholesterol, blood glucose and blood pressure, respectively. The evidence of assessment of all the risk factors one month after the first set of findings were discussed with the healthcare workers can be described as excellent, which implies that all the values are greater than 90%. The new results are linked to other activities, including a resolution by the healthcare

workers to improve assessment or screening practices as well as documentation.

### Discussion

Lack of access to health information materials as a barrier to prevention of CVD is consistent with the findings from a study in which the participants believed that drinking bitter gourd juice would neutralise the effect of consuming excess refined sugar<sup>7</sup>. The inability of the healthcare workers to dedicate adequate time to the patients which was highlighted as a barrier to prevention of CVD by the healthcare workers may be an unavoidable choice they had to make considering the prevailing economic realities that make it untenable for the Lagos State Ministry of Health to recruit sufficient workers. Ferrante and colleagues reported lack of time as a barrier to the prevention of CVD in a different way, not highlighted by participants in this study<sup>8</sup>. The authors reported that the healthcare practitioners in Argentina do not have enough time to keep themselves updated with the new evidence in the guidelines used in the prevention of CVD. George and colleagues reported the role of addiction as a barrier to the prevention of CVD in a different way, not highlighted by the participants in this study<sup>7</sup>. The authors explained that participants in their study believed that once they start taking medication as part of the treatment regimen, their body becomes addicted to the medication. As a result, they are resistant to starting medication regimen. George and colleagues reported that financial constraints among patients are a key barrier to managing hypertension and diabetes in India<sup>7</sup>. Some healthcare workers in this current study posited that socio-economic factors influence patients to eat unhealthy diets thereby contributing to CVD.

In a questionnaire format, nearly 88% of the patients identified factors that contribute to improving CV health in a hospital setting. Overall, 65% of the patients reported that they engaged in behaviours that promote CV health, and this figure is lower than the number of the outpatients

that identified factors that contribute to improving CV health in a hospital setting. This finding means that CV health knowledge does not always translate to healthy behaviours. However, there is a relationship between health literacy and health behaviours in the current study and this was supported by a systematic review by Fleary and colleagues which found a meaningful relationship between health literacy and adolescents health behaviours.<sup>9</sup> While the current study focused on the adults attending an outpatient's clinic in relation to CVD, Fleary and colleagues focused on health literacy among adolescents.

A qualitative study involving participants from five primary care centres, carried out by Ferrante and colleagues explored the barriers to prevention of cardiovascular disease in primary care settings in Argentina<sup>8</sup>. The study also examined 226 clinical case notes at baseline and one year after an intervention to determine the screening practices for CVD risk factors within the five primary care centres. The study found that the highest improvement in CVD risk factor screening was in diabetes (68.4%,  $P < 0.0001$ ) while the highest in this current study is a physical activity (99.3%,  $P < 0.0001$ ). The lowest improvement in screening practices in the former study was observed in physical activity (25.2%,  $P < 0.0001$ ) while the lowest in this current study was observed in blood pressure (10%,  $P < 0.756$ ). Overall, the average improvement in screening practices for BP, cholesterol, diabetes, tobacco use, BMI, dietary intake, and physical activity in the study by Ferrante and colleagues was nearly 35% while in the current study is almost 58%. The reason the average improvement in the current study is higher may be as a result of the fact that the re-examination of new patients' clinical case notes was one month after the intervention unlike in the former which was one year later. The study by Ferrante and colleagues was compared with the current study because they have a similar context. While the study by Ferrante and colleagues was conducted in Argentina, the current study was

conducted in Nigeria, and both countries are developing countries.

### Conclusion

A wide range of barriers to the prevention of CVD within the community were identified, including knowledge and organisational barriers, medication compliance, cultural and religious beliefs, and socio-economic factors. Some of the approaches adopted by the healthcare workers to address the prevalence of CVD within the community include continuation of health education as it affects the CVD, need for the sustenance of drug subsidy for over 60's, and establishment of smoking cessation programme. Other strategies adopted by the healthcare practitioners to prevent CVD within the community include the need to take anthropometric measurements of the patients, and the need to keep in touch with the patients after they have been discharged from the hospital. The findings from the investigation of outpatients' knowledge and behaviours in relation to cardiovascular health demonstrate that CV health knowledge does not always translate to healthy behaviours. Research collaboratively designed, planned, facilitated, and monitored with healthcare practitioners could be a vital tool to improve healthcare practice. To understand the impact of health literacy on health behaviours relating to cardiovascular health, future research should focus on longitudinal study in which the health knowledge and health behaviours of the outpatients attending outpatient's clinic for cardiovascular health related issues should be determined at a given time, followed by health education on cardiovascular health, and a repeat of the measurement of the health knowledge and behaviour.

### Declaration of conflicting interest

The author has no conflicting interest to declare.

### Funding

The author did not receive any financial support for this study.

### Ethical approval

Ethical approval was sought and obtained from the University of the West of Scotland Ethics Committee and Lagos State Ministry of Health.

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