

Health education curriculum to prevent hypertension: an epidemiologic investigation

Abstract

A health education curriculum about hypertension for community health advocates was designed for the Healthy Columbia campaign for Richland County in Columbia, South Carolina. Health disparities contribute to various health concerns that creates campaign goals. One campaign goal is to reduce non-emergency Emergency Room (ER) visits. Another campaign goal is to reduce the risk of stroke and hypertension is a major risk factor for stroke. Statistics demonstrate Black individuals are more likely to have hypertension compared to White individuals. Also, Black individuals have more ER visits than White individuals due to hypertension. The campaign will use community health advocates to educate groups about preventive measures to better manage blood pressure. The community health advocates may outreach to neighborhood associations and faith communities to discuss how diet and exercise can lower blood pressure. The curriculum was adapted from the training manual for community health workers from the Centers for Disease Control and Prevention [CDC].

Keywords: health education, curriculum, prevent, hypertension, epidemiologic, investigation, community health

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Abbreviations: BCBSSC, bluecross blueshield of south Carolina; CDC, centers for disease control and prevention; ER, emergency room; CHAs, community health advocates; CHWs, community health workers; BRFSS, behavioral risk factor surveillance system questionnaire

Introduction

Stroke is the loss of function resulting from blood flow interruption to the portion of the brain responsible for controlling that function.¹ South Carolina had the 8th highest stroke death rate in 2006 and one campaign targeting stroke prevention is the Healthy Columbia campaign in Columbia, South Carolina.² Hypertension or high blood pressure is a major risk factor for stroke and is defined as greater than or equal to 140 millimeters of mercury (mm Hg) systolic pressure or greater than or equal to 90 mm Hg diastolic pressure.¹ One healthy lifestyle change to lower blood pressure is a low sodium diet.³ Another lifestyle change to lower blood pressure is exercise.⁴ An epidemiologic investigation can help lower blood pressure through education involving healthy eating and exercise.¹

During a 10 week period, this MPH candidate will design a health education curriculum for community health care advocates of the Healthy Columbia campaign in Richland County of Columbia, South Carolina to identify and prevent health risks of hypertension. The first goal is to conduct research on the risks of hypertension and identify an educational model for community health advocates.

The two objectives are:

1. Identify an evidenced-model for community health advocates and
2. Identify methods to integrate education about hypertension into Healthy Columbia campaign.

The second goal is to design a curriculum model about

hypertension for community health advocates to educate the public. The two objectives are:

1. Curriculum will describe hypertension and identify the health risks of high blood pressure and
2. Curriculum will identify methods to assist individuals with hypertension to manage blood pressure.

The third goal is to evaluate the educational curriculum for hypertension. The four objectives are:

- a. Review and present education curriculum for hypertension to the Healthy Columbia campaign,
- b. Develop a pre-survey and a post survey tools to evaluate knowledge of individuals about the risks of hypertension and methods to manage blood pressure,
- c. Present the curriculum model to a sample population, and
- d. Evaluate learning survey tools and implement changes to improve education curriculum.

The Healthy Columbia campaign began early 2012 with a goal to reduce high-non Emergency Room utilization and high hospitalization rates in the 29203 zip code located in Richland County due to chronic diseases.⁵ The zip code 29203 was chosen based on having the highest number of individuals that are Medicaid eligible or uninsured with the highest number of non-ER visits and hospitalization rates in Columbia.² Some of the major planners are BlueCross BlueShield of South Carolina (BCBSSC), the Department of Health and Environmental Control, and Palmetto.⁵ These planners involve personnel such as health care providers, health administrators, pharmacists, health coaches, and community members.² Some of the planners and personnel are included in the resource inventory.

The resources for this project will include peer-reviewed journals and personal interviews. The journals are available through the Kaplan

library and provide evidence-based studies to support how healthy eating and exercise can help lower blood pressure. Also, the peer-reviewed journals provide research and studies that can act as a guide for the MPH candidate in conducting research. The personal interviews are in-person or telephonic and involve the individuals participating in the Healthy Columbia project including health administrators and work colleagues that help patients better manage blood pressure. The interviews will provide information on hypertensive individuals living in Richland County and will connect the MPH candidate with the appropriate contact individuals to design a curriculum model about hypertension for community health advocates (CHAs). The resources are beneficial when a timeline is in place.

The timeline is based on the deadlines established for the course. The MPH candidate will receive the capstone defense question and will acknowledge understanding of the question by July 31st. The response to the defense question will involve research and critical thinking skills to provide a proper defense. The capstone defense along with a project implementation update detailing the current status of project completion is due by August 7th. The MPH candidate will post the written report for peer review including the abstract, introduction, and personal assessment by August 14th. A second rough draft adding the discussion and conclusion is due August 21st. The timeline also helps the MPH candidate to discern the project's feasibility.

Hypertension is a chronic disease that is prevalent and puts individuals at risk for cardiovascular disease and stroke. This MPH candidate feels the capstone project is feasible because of extensive research that is available on hypertension associated with diet and exercise. One potential short-coming is not receiving timely assistance from Healthy Columbia contacts. A way to overcome this shortcoming is to expand networking to other Healthy Columbia participants. Another potential shortcoming is confusion regarding assignment and project directions along with criteria. One way to overcome this shortcoming is to work closely with the professor in order to complete assignments and projects correctly and in a timely manner. Also, maximizing peer review discussions and soliciting assistance from peers can assist the MPH candidate in overcoming this obstacle.

Discussion

This section will discuss how I was introduced to the Healthy Columbia campaign and steps taken to find an opportunity to contribute to the campaign's efforts. Also, this section will discuss evidence found in the literature review to manage blood pressure along with describe the framework for the curriculum.

My coworker who is a health coach suggested I attend a meeting for the Healthy Columbia campaign to explore additional coaching opportunities.⁶ I went to a meeting hosted by BCBSSC and found that one strategy involves voluntary CHAs to reach out to community members with chronic conditions, including high blood pressure.² The community health advocates are similar to community health workers (CHWs) (Martinez, Ro, Villa, Powell, & Knickman, 2011). The CHWs focus on prevention and act as liaisons to coordinate care in underserved populations (Martinez et al. 2011). This is accomplished through community outreach, health education, and education about and referral to appropriate health care and community programs to improve quality of services and avoid duplicating services (Martinez et al. 2011). The advocates assist community members with understanding what providers are asking and how to use medical, behavioral, and social services (Martinez et al. 2011). The CHAs

usually represent the first point of contact for people with no previous access to preventive care (Martinez et al. 2011).

Many CHAs will share a common ground with community members due to living and/or working in 29203 or Richland County, having similar racial and ethnic backgrounds, and life experiences that will enable them to better help community members receive timely care (Martinez et al. 2011). In zip code 29203, 83.8% of the population is Black and 14.1% is White.² Studies show that hypertension is more prevalent in Blacks in comparison to Whites in the United States.⁷ Interestingly, Black people develop hypertension earlier in life than other racial groups and demonstrate health disparities.⁷ In addition, findings report that Black people are more likely to take preventive measures to manage blood pressure, but studies usually report poor blood pressure control.⁷ This leads me to think that some Black people perceive they are taking correct measures, but may need more education about how to manage blood pressure. Findings indicate blood pressure control with lifestyle modifications such as, physical activity and nutrition, improves in Blacks.⁸ For example, one study observed how a 12-week program helped Blacks better manage blood pressure through increased walking, fruit and vegetable consumption along with weight loss.⁸ The participants kept data logs to monitor blood pressure improvement.⁸ Also, managing blood pressure contributes to better health outcomes.

I found lowering blood pressure will contribute to lowering ER visits, reducing insurance premiums, and reducing Medicaid and Medicare spending and can help reinvest money back into the community.² For instance, lower blood pressures can lead to reduced medication adjustments and follow-up visits needed to improve blood pressure by approximately \$37 dollars per person annually.⁹ Also, lower blood pressure can reduce hospitalizations for urgent hypertensive cases approximately \$92-162 dollars annually.⁹ The ER visits demonstrate there are many uninsured individuals in the area and a high percentage have chronic conditions (Martinez et al. 2011). Studies show CHAs improve outcomes for underserved populations for some conditions and noteworthy cost reductions (Martinez et al. 2011). After the meeting, I expressed interest in working with the Healthy Columbia campaign and my coworker connected me to the team leader over the CHAs. She explained the CHAs team structure and their role in the campaign.¹⁰

The volunteer CHAs tailor interventions to community members' social and physical health needs (Martinez et al. 2011). I wanted to originally participate as a CHA, but found my schedule does not allow it. I revisited the health coach team leader for an interview later to discuss other ways to participate in the campaign. She explained that the CHA structure expanded to three levels.¹⁰ The first level concentrates on helping community members making general lifestyle changes and connecting them to resources.¹⁰ The third level is for those that want to participate full time as CHAs and require a background check due to the job description requiring advocates to do home visits.¹⁰ The health coach team leader wants me to focus on the second level which entails advocates receiving training on a specific health condition and speaking to group organizations such as neighborhood associations and faith communities.¹⁰ The CHAs may include individuals that are new to volunteering for the campaign and/or individuals that are currently CHAs on the first level and want to increase their activity in the community (Health Coach Team Leader). Also, the CHAs are required to have a high school diploma along with some college background.¹⁰ My role is to create a curriculum based on hypertension to help CHAs know what to communicate to community

members that helps manage blood pressure. I conducted a literature review about how nutrition and exercise affects hypertension for volunteer CHAs to assist community members with managing high blood pressure.

I found that one way to lower blood pressure is through dietary changes. The Dietary Approaches to Stop Hypertension (DASH) eating plan involves lowering sodium intake, lowering total fat, saturated fat, and cholesterol, and consuming low-fat dairy products.¹¹ Also, it includes lots of fruits and vegetables, whole grains, eating meat, fish, and chicken in moderation, along with eating nuts, seeds, and legumes several times a week.¹¹ A study shows that participants on an average United States (US) diet with added fruits and veggies and the DASH eating plan had the greatest effect in people with hypertension compared to individuals on an average US diet. The maximum blood pressure reduction followed after two weeks. Another study shows that blood pressure lowered most in people with hypertension on the low-salt DASH eating plan compared to high and average salt intake using the DASH eating plan or average US diet. Also, greater blood pressure reductions were correlated with an African-American ethnicity in the female sex with an age over 45 years old. The whole DASH eating plan is needed in order to maximize the DASH eating plan benefits instead of focusing on select elements. For instance, the DASH eating plan contains more than seven servings of fruit and vegetables a day which are two servings more than healthy eating guidelines. A decrease in potassium is associated with a rise in blood pressure and fruits and vegetables are rich in potassium and antioxidants and contribute to lowering blood pressure along with a reduced salt intake. Potassium from fruits and vegetables is more effective than oral potassium supplements that show no effect on blood pressure. I spoke with the team leader about CHAs directing community members to DASH classes or scheduling a health professional to host DASH classes for the targeted group. The DASH classes would also include information about recommendations for sodium intake.

I notice sodium and alcohol consumption is another concern. Sodium is necessary for the body's water and electrolyte balance. The average concentration is maintained through neural and hormonal control of sodium excretion and absorption, and excess sodium is excreted in urine. The kidney maintains sodium concentrations during an increase in sodium intake by retaining water that leads to vascular damage, which includes arterial stiffness that increases blood pressure. Reducing salt in the general population would reduce new cases of coronary heart disease, but the Black population benefits more due to having a greater sensitivity to salt than other ethnic groups and has a higher prevalence of hypertension. Salt is found in most processed foods such as bread, frozen meals, salted snacks, and condiments for preservation. The recommended salt intake for the general public is 2300 mg, but is 1500 mg for those with hypertension.¹² Some guidelines include reducing the amount of processed foods, reducing the amount of salt in cooking and using more herbs or spices for flavor, along with increasing fresh products in preparing meals. Another concern is alcohol consumption. The World Health Organization (WHO) notes that 16% of all hypertensive disease was due to excessive alcohol intake. Alcohol causes dehydration and cell destruction and increased alcohol consumption increases the risk of stroke. The United States recommendation is no more than two serving of alcohol a day for men and no more than one serving of alcohol for women a day.¹³ Women have a lower recommended serving due to having less body water than men. A heavy drinking weekend may lead to raised blood pressure for the following three to four days for men and women. One

may reverse this effect by reducing alcohol intake to recommended servings over one to four weeks. Alcohol consumption is a vital area in managing blood pressure and alcohol intervention counseling is suggested if needed.¹¹

I notice weight is a contributor to high blood pressure too. According to the body mass index (BMI) chart, overweight is having a BMI 25-29 and obesity is a BMI of 30 and above (CDC, 2012). Some factors that contribute to obesity are genetic, metabolic, hormonal, pharmaceutical, and social. Obesity impacts hypertension and weight loss in people with a BMI above 24 kg/ show improved outcomes for hypertension. A review reported that weight loss around 10kg or 22 lbs. maintained for two years is associated with a decrease in systolic blood pressure of approximately 6mmHg and in diastolic blood pressure of approximately 46mm HG. One group of authors found that for each 1 kg or 2 lbs. lost one can expect systolic and diastolic blood pressures to be reduced by 1mmHg. One way to lose weight in addition to changing diet is through exercise.

In my discussion with the health coach team leader about lowering blood pressure, I mentioned reading information about how exercise helps to manage blood pressure. Exercise can be separated in two broad categories of aerobic training and resistance training.¹⁴ Aerobic exercise refers to activities that increase aerobic endurance performance including walking, jogging, running, and/or cycling. One study with a varied study duration from 4 to 52 weeks with aerobic training ranging from 1 to 7 days a week's showed an overall reduction of resting blood pressure averaging 3.0/2.4mmHg along with a reduction in day time ambulatory blood pressure.¹⁴ Also, the change in blood pressure was more pronounced in hypertensive individuals.¹⁴ A 2mmHg reduction in systolic blood pressure is estimated to reduce stroke mortality by 6% and coronary heart disease by 4%. Aerobic exercise decreases blood pressure through a reduction in systemic vascular resistance. One study suggests that short exercise sessions as little as 10 minutes can produce post exercise hypotension (PEH)⁴ also, exercising infractions multiple times a day yield benefits similar to single session exercise. For instance, one study reported that pre hypertensive adults that performed 10 minute exercise sessions at one hour intervals demonstrated similar PEH as compared to a single 40-minute exercise session. Also, the PEH was 3-4 hours longer after the four 10 minute sessions.⁴ The PEH for systolic blood pressure occurred just after the third 10 minute exercise session. Another study compared PEH in subjects that performed three 10 minute exercise four hours apart compared with the day in which subjects performed a single continuous session of exercise. Systolic blood pressure was constantly lower during the three 10 minute sessions in the afternoon and early evening hours than one 30 minute exercise session. Interestingly, lower blood pressure all day after a morning exercise session was observed in subjects with high blood pressure, but not in subjects with normal blood pressure. I used this information in my curriculum to serve as a motivating tool for community members that feel they need long exercise sessions to manage blood pressure and feel they have little time for exercise. The average reduction in systolic blood pressure was 5mm Hg daily then it could reduce stroke by incidence by 14% and cardiovascular mortality by 9 %. Resistance training involves strength, weight, static, and/or isometric exercises that increases muscle strength and endurance. One study with a varied duration from 6 to 26 weeks using static and muscular exercise with variable resistance resulted in a 3.5mmHg change in diastolic blood pressure and a non-significant reduction in systolic blood pressure of 3.2mmHg. The comparison between aerobic exercise

and resistance training shows aerobic exercise has more impact in lowering blood pressure than resistance training. Aerobic exercise is a recommendation to lower blood pressure and the health coach team leader e-mailed a CHW sourcebook containing aerobic exercise to guide me in creating the curriculum.

The CDC's CHW training manual is a good tool for the Healthy Columbia campaign. The overall sourcebook concentrates on preventing heart disease and stroke through various lifestyle changes. Some lifestyle changes include being more physically active and eating more fruits and vegetables. It also encourages people to know their blood pressure and cholesterol numbers, keep doctor and nurse appointments, along with taking medications as prescribed. This sourcebook targets community members that want to prevent hypertension or have been diagnosed and want to better manage blood pressure. The sourcebook covers many topics for other public health practitioners to use to develop other classes for the campaign. The topics include depression and stress, high cholesterol, diabetes, tobacco control, and others that contribute to lowering risk of heart disease and stroke. Each chapter includes an introduction to the topic, what community health advocates should know about the topic, and key points. The instructional format is intended to be informal and encourage questions and comments from community health advocates. The chapter format is approximately 2½ hours and allows time for discussion, group activity, and handouts. Also, the sourcebook provides reminder tips for the instructor.¹⁵ For instance, it reminds the instructor to take breaks, give praise to CHAs when deserved to keep them motivated, relate concepts to CHAs' personal lives, and to have a good time.¹⁵ After I completed an overview of the manual, I started reviewing and creating the curriculum for hypertension.

The CDC's community health worker training manual served as a framework in creating the hypertension curriculum for the Healthy Columbia campaign. I found the sourcebook to be a comprehensive guide and used most of the educational information that was included. My curriculum outline includes: an overview of blood pressure, high blood pressure causes, how high blood pressure is diagnosed, how high blood pressure is measured and what the numbers mean, high blood pressure warning signs, why high blood pressure is harmful, where blood pressure can be checked, how high blood pressure is prevented and controlled, along with taking blood pressure medicine. The curriculum also corresponds with handouts available in the source book. One handout I included was "8 things you can do to prevent and control high blood pressure" (See [Appendix A](#)). Also, I included "Other Questions to Ask your Doctor" (See [Appendix B](#)). The health coach team leader wanted me to incorporate information about the Healthy Columbia campaign into the curriculum and how community health advocates will serve as a valuable asset to the campaign's efforts. For example, I added information about the campaign's goal to reduce non-emergency ER visits.² I also included information about the stroke death rate and how managing high blood pressure can reduce the risk of stroke.¹ I added a brief overview for the community health advocate role to include cultural competence, connecting clients to resources, and promoting health and disease prevention. The CHAs will need to be able to interact with a variety of people, make community members aware of community resources, and coach community members to establish healthy lifestyles. Also, the health coach team leader wanted me to incorporate role play activities for the CHAs. One activity I incorporated is for the instructor to use his/her discretion to have CHAs do a presentation in front of the group or form groups of four and have each group member role play in educating the group about a topic. After all hypertension topics are discussed,

each group member will have five minutes to role play and discuss a topic towards the end of the workshop. The topics are pulled by each CHA from a bucket. For instance, one participant may pull "sodium-intake" as a topic. The participant may discuss major salt sources, the recommended sodium intake for those with high blood pressure, and quick tips on how to lower sodium intake. The participant may appeal to target audiences by discussing how one can plant herbs in his/her garden to add fresh seasonings to meals. After all participants have an opportunity to role play, there will be a discussion about the role play exercise. For instance, the instructor will invite participants to share their experiences in the educator role and express observations about group mates' strengths in presenting his/her topic. Also, the instructor will invite participants to ask questions and express any concerns in educating groups about hypertension along with feedback about the role play activity. I compared the information in the sourcebook to my peer-reviewed journals and government websites from my bibliography to find opportunities to add to the information from the sourcebook. For instance, I added the information regarding how one can lower blood pressure by exercising as little as 10 minutes for three sessions over the course of a day.⁴ Also, I added a few statistics, such as the state having a prevalence of 34.5% for hypertension and Richland County having a prevalence of 19.5% for hypertension.¹⁶ The sourcebook mentions how Black people develop high pressure more often than Whites and it tends to occur at an earlier age. One detail I added was that Black people are more sensitive to salt than other ethnic groups. This can help CHAs make Black community members more aware that lowering sodium intake will have a major impact in managing their blood pressure. I developed the curriculum and then I began to evaluate the curriculum.

I reviewed and presented the education curriculum for hypertension to the Healthy Columbia campaign. After the health coach team leader received the curriculum via e-mail, she said the curriculum looked really good and she wanted to set up an appointment to discuss components to add to the curriculum.¹⁰ One component she wanted to edit and add was a cultural activity from the CDC training manual. This activity originally focuses on heart attacks in the community, but she requested the topic change to high blood pressure. This activity involves generating a discussion with CHAs about how their community members feel about high blood pressure and how they may prevent high blood pressure in the community. Another component she wanted to incorporate was a motivational interviewing (MI) overview. MI was developed by Stephen Rollnick, Ph.D and William R. Miller, Ph.D and evolves from the client-centered counseling approach from psychologist Carl Rogers and is considered a method of communication rather than a set of techniques.¹⁷ MI helps resolve ambivalence about health behavior change and has been widely used in different clinical conditions such as substance abuse and dietary adherence. Also, it has been proposed as a method to improve modifiable risk factors for patients with heart disease, such as high blood pressure. Some guiding principles for MI include expressing empathy, developing discrepancy, rolling with resistance, and supporting self-efficacy. Expressing empathy involves reflective listening and acceptance. Developing discrepancy involves the client being motivated to change based on perceived discrepancy between present behavior and important personal goals. Rolling with resistance means avoiding arguing for change and making the client the primary source in finding solutions to barriers to accomplish goals. Supporting self-efficacy involves the health care professional supporting one's belief in the ability to change. I also included some general open-ended MI questions such as, "What changes have you made as a result of your blood pressure" and "How do you feel about

these changes?”. The health coach team leader wants CHAs to use MI in their role play activity. I completed objective one, but did not complete the other objectives under the third goal.

I did not complete objectives two, three, and four under goal three. The Capstone Development Guide mentions concrete suggestions should be made for follow-up by future students if a goal and/or objective is not attainable. I spoke with the health coach team leader about this concern and she mentioned she will have another upcoming public health student to evaluate the curriculum. The student may come from the University of South Carolina in Columbia or Columbia College, which are local institutions with public health programs. The students may approach the campaign to offer assistance or the director may seek students by networking with the institutions’ department chair. Also, another student from Kaplan University living in or in close proximity to Columbia or another city involved with the campaign may take the initiative to offer assistance for his/her capstone project.

I went through various steps to develop the educational curriculum about hypertension. I interviewed the health coach team leader over the CHAs, conducted a literature, and consulted the CDC for the community health advocate sourcebook. The health coach team leader wants a curriculum for second level CHAs to speak to groups about hypertension. The literature review gives evidence that nutritional habits and regular exercise can help lower blood pressure. Also, the sourcebook is a framework for the curriculum. This curriculum contributes to my knowledge of public health practice and helps make application.

Personal assessment

This project has contributed to my understanding of public health practice for health communication and education. The health communication and education outcome involves designing effective health education materials for health communication in culturally diverse communities.¹⁸ The process of attending a Healthy Columbia meeting, collaborating with the health coach team leader, and creating a curriculum for CHAs helped me experience just one aspect of public health practice. It helped me better understand that the curriculum is a glimpse of the big picture in designing public health programs. I believe the discipline-specific and four cross-cutting competencies were appropriate in designing the health education curriculum for community health advocates about hypertension.

One discipline competency included is epidemiology.

The two cross-cutting competencies are:

1. Describe hypertension as a health problem in terms of magnitude, person, time and place and
2. Draw appropriate inferences from epidemiologic reports.

For instance, there are more Blacks with emergency (ER) visits than Whites and this curriculum will help CHAs address the needed lifestyle changes to reduce the total number of ER visits.⁸ This project achieves these competencies by educating CHAs about updated information regarding Richland County’s demographics and prevalence of hypertension. In Richland County, there were a total of 1,067 ER visits for hypertension with Black people making up 858 visits and White people making up 185 visits in 2010.¹⁶ Also, Black people in rural and urban settings are more likely to report being instructed to take actions to control blood pressure by reducing salt

and alcohol intake along with changing eating habits and exercising in comparison to White urban and White rural groups. Black people who were advised to alter actions to manage blood pressure were at least two times more likely to exercise and six times more likely to reduce alcohol use when advised. In addition, Black people were 38 times more likely to take hypertension medications when advised than those who did not receive advice. One may observe Black people are more likely to take prevention measures that may suggest they should demonstrate better control over their blood pressure than their White counterparts. However, studies continue to report poor blood pressure management among Black people. It is possible that some Black people in studies are more likely to report appropriate blood pressure control measures than are actually being completed. This information helped me draw an inference that some Black individuals may need additional support in managing their blood pressure to implement prevention measures. Also, this information helped me draw appropriate inferences that some Blacks are more likely to have high blood pressure and an educational curriculum will help CHAs appeal to Blacks as one of their target audiences and provide any additional needed support.⁷

The other discipline competency is social and behavioral sciences. I identified social and behavioral factors that contribute to hypertension.

The two cross-cutting competencies for social and behavioral sciences are:

1. To identify the causes of social and behavioral factors that affect health of individuals and populations and
2. Describe steps and procedures for the planning, implementation, and evaluation of public health programs, policies, and interventions.

Some behavioral factors that affect hypertension are dietary habits exercise and lack of exercise and the curriculum will educate CHAs about how these behavioral factors will help lower blood pressure. One dietary habit is a high salt intake.³ The high-salt diets increase superoxide production that interacts with nitric oxide to form peroxynitrite, which reduces nitric oxide. The decrease of nitric oxide is implicated in the pathology of hypertension. A high amount of salt is found in many processed foods such as frozen foods and snacks, which are easily accessible for individuals that perceive they have no time to prepare meals at home. Also, some people may feel they do not have enough time for exercise because they may think a 30minute single session is needed to accomplish heart health when instead they may find it more doable to exercise 10minutes three times a day. There is also a factor that determines a high amount of non-emergency ER utilization. One factor is lack of access to a primary care physician due to no insurance. The Healthy Columbia campaign wants to increase access to primary care physicians and it may require a longer time frame to see outcomes. For instance, the patient behavior may take a while to change and the primary care has to be accessible for a significant time period before chronic conditions are well managed to the point where the patient breaks the cycle of recurring emergent health.¹⁹ I determine the curriculum achieves describing the steps and procedures for the program planning by discussing a brief needs assessment with the health coach team leader to identify any potential deficiencies in CHAs’ knowledge before training. A survey can help identify educational gaps between current and desired knowledge. Also, I will use learning objectives to determine curriculum content and teaching strategies. The curriculum content involves how nutrition

and exercise helps manage blood pressure. The teaching strategies involve lecture and using the curriculum as a basis for group activities such as discussions and role play between CHAs and organizations.²⁰ I will implement the curriculum by assisting the health coach team leader in identifying instructors with appropriate knowledge and skill background and incorporating the curriculum into a one day workshop.²⁰ Also, implementation will involve inviting trained health personnel such as nurses to speak to participants about hypertension. The curriculum evaluation will entail receiving feedback from workshop participants through discussion and surveys on all aspects of the course to improve the curriculum for the next set of participants.

Conclusions and recommendations

This MPH candidate designed a health education curriculum for community health care advocates of the Healthy Columbia campaign in Richland County of Columbia, South Carolina to identify and prevent health risks of hypertension. South Carolina had the 8th highest stroke death rate in 2006 and the Healthy Columbia campaign in South Carolina aims to reduce stroke by managing blood pressure. High blood pressure or hypertension is a major risk factor for stroke. The Healthy Columbia campaign goal is to reduce high-non ER utilization and high hospitalization rates in the 29203 zip code located in Richland County due to uninsured individuals with chronic diseases. The MPH candidate collaborated with the health coach team leader over the CHAs to find an opportunity to contribute to the campaign's efforts.

The curriculum development for the level two CHAs was feasible within the allotted time frame due to the resource inventory. The MPH candidate used peer-reviewed journals, an interview, along with government websites as supporting evidence for the need to address hypertension in the community through community health advocates. The CHAs like CHWs focus on prevention and act as liaisons to coordinate care in underserved populations. The CHAs use community outreach, health education, and information about and referral to appropriate health care and community programs to improve quality of services and avoid duplicating services. CHAs will help community members manage blood pressure through education about nutrition and exercise. For example, using the DASH eating plan along with lowering sodium intake contributes to lowering blood pressure. Aerobic exercise decreases blood pressure through a reduction in systemic vascular resistance. One study suggests that short exercise sessions as little as 10minutes can produce PEH. Also, exercising infractions multiple times a day yield benefits similar to single session exercise²¹ the MPH candidate used the CDC's community health worker training manual served as a framework in creating the hypertension curriculum for the Healthy Columbia campaign.

The sourcebook is a comprehensive guide and most of the needed educational information for individuals with high blood pressure was included. The curriculum outline includes an overview of blood pressure, high blood pressure causes, along with how high blood pressure is prevented and controlled, along with taking blood pressure medicine. The MPH candidate added information regarding how one can lower blood pressure with exercise by exercising as little as 10minutes for three sessions over the course of a day. Also, a few statistics were added, such as the state having a prevalence of 34.5% for hypertension and Richland County having a prevalence of 19.5% for hypertension. The sourcebook mentions how Black people develop high pressure more often than Whites and it tends to occur at an earlier age. One detail added was that Black people are more sensitive to salt

than other ethnic groups. This can help CHAs make Black community members more aware that lowering sodium intake will have a major impact in managing their blood pressure. The curriculum is developed, but some objectives were not completed. The second, third, and fourth objectives under goal three were not completed. The Capstone Development Guide mentions concrete suggestions should be made for follow-up by future students if a goal and/or objective is not attainable. The health coach team leader will have another upcoming public health student to evaluate the curriculum. The student may come from the University of South Carolina in Columbia or Columbia College, which are local institutions with public health programs.²² The students may approach the campaign to offer assistance or the health coach team leader may seek students by networking with the institutions' department chair. Also, another student from Kaplan University living in or in close proximity to Columbia may approach the campaign to offer assistance for his/her capstone project. There are some recommendations for the health coach team leader and upcoming public health students as they move forward in completing the remaining objectives.

The remaining objectives involve developing pre-survey and post-survey tools to evaluate individuals' knowledge about risks of hypertension, presenting the curriculum to a sample population, and evaluating survey tools to implement changes needed to improve the curriculum. The students and the team leader may find tools on government websites, such as the National Heart, Lung, and Blood institute or CDC. For instance, a Behavioral Risk Factor Surveillance System Questionnaire (BRFSS) can be located on the CDC website and includes section questions about hypertension awareness that can be combined with questions regarding actions to control high blood pressure to gauge CHA volunteers' awareness and lifestyle changes needed to lower high blood pressure. Also, surveys may be used from peer-reviewed journals. The sample population should come from community members that want to or already volunteer as a CHA. They may come from local neighborhoods, academic institutions, and/or faith-community groups and include individuals with hypertension or individuals that know someone with hypertension. A sample population will help implement needed changes to improve the curriculum through survey tools' evaluation. The curriculum about hypertension will help CHAs educate community members on how to manage hypertension, reduce the risk of stroke, reduce ER visits, and further the efforts of the Healthy Columbia campaign.

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None.

Conflict of interest

The author declares no conflict of interest.

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