

Impact of Pharmacist-Led Health Initiatives in Rural Alabama

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Abstract

Perry County is a predominantly African American community in rural Alabama. The prevalence of cardiovascular risk factors such as obesity, diabetes, and hypertension is higher than average in the Perry County population. The Cardiovascular Risk Reduction Clinic, a collaboration between Samford University McWhorter School of Pharmacy, Sowing Seeds of Hope, and the Perry County Health Department, partnered with the Perry County Department of Transportation (DOT) to offer DOT employees, mostly African American men, health screenings and education delivered at times and locations convenient to their work schedules. The objective of the present study was to evaluate the impact of a community partnership with pharmacist-led health interventions on modifiable cardiovascular risk factors in participants lacking access to other community health initiatives due to work obligations. This study was a retrospective chart review evaluating changes in blood pressure and body mass index (BMI). Participants included DOT employees 18 years of age and older who participated in at least two health screenings 12 weeks apart. Over the course of the intervention, the average systolic blood pressure decreased by 6 mmHg, and the average diastolic blood pressure decreased by 4 mmHg. The baseline BMI average of 35.1 kg/m² had dropped to 34.5 kg/m² at 12 weeks. Although modest, the reductions in blood pressure and BMI indicate a potential for cardiovascular disease risk reduction. Lessons learned from this pilot project can inform the initiation of similar programs intended to decrease cardiovascular risk. Pharmacist-led interventions combined with community support can lead to positive cardiovascular results among rural communities.

Health disparities, or preventable differences in the burden of disease or opportunities to achieve optimal health, are almost exclusively experienced by underserved communities (Centers for Disease Control and Prevention [CDC], 2020b). In turn, individuals in these communities are at increased risk for and have a higher prevalence of chronic diseases that lead to mortality. Perry County, Alabama, is a prime example of a community plagued by health disparities. It is located in the heart of Alabama's Black Belt region, aptly named because of its dark and fertile soil. The Black Belt region is also home to some of the poorest counties and individuals in the United States. Perry County is a predominantly African American community (about 67%) with a higher prevalence of obesity, diabetes, and hypertension compared to other Alabama counties and the United States. Approximately 10,500 residents reside in Perry County, and unfortunately, the poverty rate is 3 times higher among African Americans than among White Americans in the area (Catlin et al., 2015; Phillips, 2014). It has also been suggested that communities composed

of predominately ethnic minorities, such as Perry County, are disproportionately affected by poverty, and these circumstances lead to increased cardiovascular disease risk as a result of reduced access to health-promoting resources and fewer opportunities to seek and obtain high-quality health care (Mensah, 2018).

One out of every five adults in Perry County has been diagnosed with diabetes (Catlin et al., 2015). In 2014, the county was ranked as one of the worst counties in terms of health outcomes and health factors (65 out of 67 and 66 out of 67, respectively) in Alabama (Alabama Department of Public Health, 2013; Phillips, 2014). One example of poor health outcomes was a 2014 outbreak of tuberculosis (TB) in which more than 30 cases of TB were diagnosed in Marion, the county seat. This infection rate was close to 100 times the national average and also greater than TB rates found in Haiti, Kenya, and India (Equal Justice Initiative, 2017). According to the most recent chronic disease burden evaluation published by the Alabama Department of Public Health, Perry County has the second highest estimated prevalence of obesity in the state (Phillips, 2014).

County residents have a life expectancy 6 years lower than the national average (Catlin et al., 2015). Health disparities are so prevalent in Perry County due to the lack of health care providers, specialists, and health services. The nearest hospitals are located in neighboring Bibb and Dallas counties, both of which are about 30 minutes away, and Perry County only maintains two ambulances for emergency transport. Many residents are under- or uninsured and may not seek health care until it is too late to repair the damage. African American men have been noted to have major delays in seeking preventive treatment (Powell et al., 2019).

Sowing Seeds of Hope (SSOH) was founded in 2000 as a faith-based nonprofit organization to improve quality of life, address poverty, and help combat the growing health crisis plaguing Perry County. SSOH strives to enhance housing, health care, tourism, recreation, and social agricultural markets throughout the county (Jones & Ford, n.d.). It has offered numerous services to county residents, such as diabetes clinics, vision screenings, health fairs, weight loss and nutrition assistance, and housing assistance through its self-help housing program. In 2004, the Cardiovascular Risk Reduction Clinic (CRRC) was developed as a collaboration between the Perry County Health Department, SSOH, and Samford University's McWhorter School of Pharmacy (SUMSOP; Alabama Department of Public Health, 2013). Samford University was originally founded as Howard College in Marion, and it has long partnered with SSOH to maintain its historical ties to its founding community. Different student organizations from SUMSOP were involved in providing monthly health screenings with different churches, participating in the Obama Day Health Fair in the fall, and organizing a family fun day with local schools. Samford University and SUMSOP have worked collaboratively on different projects for more than 15 years, including the establishment of the CRRC. Although there is no longer a faculty member in Perry County, Samford University and SUMSOP remain committed to their work in the Black Belt; they have organized music programs to help provide instruments to the local high school, created a podcast focusing on the music of the area, and studied the landfill located in Perry County's Uniontown.

The CRRC was a weekly clinic held on Wednesday afternoons from 2:00 to 4:30 p.m. CST at the Perry County Health Department. The CRRC offered free health screenings and medication therapy management to the

community. Patients were counseled on their measurements and offered medication and lifestyle counseling, and their results were shared with their primary care providers. Pharmacists' involvement in the management of cardiovascular risk factors has been proven to lower blood pressure and cholesterol (Barragan et al., 2017; P. Z. Murphy et al., 2016; Tsuyuki et al., 2016). In addition to helping hundreds of Perry County residents become aware of and lower their cardiovascular disease risk, the CRRC has served as a model of collaboration between schools of pharmacy and their local partners. The establishment of the CRRC in partnership with SSOH and the Perry County Health Department was a key factor in helping SUMSOP establish one of the first accredited rural pharmacy residency programs in the United States.

While it is true that pharmacists' traditional responsibilities lie in medication distribution, pharmacists also play a vital role in clinical, patient-centered collaborative care. The CRRC strived for collaborative interprofessional practice by engaging a board certified ambulatory care pharmacist, local nurses and nursing students, and senior pharmacy students in patient care. The goal of the CRRC was to provide health care access to the community by assessing patients' cardiovascular disease risk, evaluating their medication regimen, and optimizing therapeutic outcomes.

Although the CRRC routinely reached out to the community, individuals who worked during the day, including the employees of the Perry County Department of Transportation (DOT), had a difficult time attending the clinic due to its hours. Located in Marion, Alabama, the Perry County DOT was composed of 28 men and women who served the community by "facilitating economic and social development" (ALDOT Organization Information, n.d.). The hours of operation for the Perry County DOT were 6:00 a.m. to 4:30 p.m. Monday through Thursday. At the time of this study, 82% ($n = 23$) of the employees were men and 89% ($n = 25$) of employees identified as African American.

Literature Review

Research has shown that African Americans, particularly men, have difficulty finding time to schedule doctor's appointments due to a multitude of reasons, one of which is work. Some have gone so far as to call the lack of health-seeking behaviors among African American men a health crisis (Plowden & Miller, 2000). Morbidity and mortality are highest among

Black men compared to any other racial group, and cardiovascular disease is the number one killer of African Americans in the world (Guyl et al., 2001; Jones & Ford, n.d.; National Center for Health Statistics, 2017; Plowden & Miller, 2000; Scott, 2013). Between 2018 and 2019, African Americans were 60% more likely to develop diabetes and approximately 30% more likely to die of cardiovascular disease than people of other ethnicities (AHRQ, 2020; USDHHS, n.d.).

Key risk factors for cardiovascular disease include obesity, hypertension, hyperlipidemia, and diabetes. Obesity, defined as the accumulation of excessive fat that may impair health, is associated with reduced quality of life, coronary heart disease, hypertension, and an increased risk of premature death (Jordan & Harmon, 2015; Pan et al., 2009). Over 20% of individuals 20 years and older in Perry County are obese (Catlin et al., 2015). According to the CDC (2020a), African American men disproportionately suffer from hypertension compared to men of other races. Perry County has one of the highest rates of hypertension in Alabama, which increases the risks of stroke and cardiovascular disease for its residents (Phillips, 2014). While proper diet, weight, and blood pressure control are important for everyone, they could be the difference between life and death in this rural, predominately African American community.

Workplace initiatives to promote health have led to numerous positive health outcomes. Health disparities in the workplace are steadily becoming more common. Almost 50% of Americans have one chronic condition, and nearly 50% of this subpopulation has multiple chronic conditions (Ward & Schiller, 2013). A study funded by the Association of State and Territorial Chronic Disease Program Directors found that well-designed health programs in the workplace could lead to long-term health and productivity improvements (Hymel et al., 2011). Utilizing the workplace as an avenue to achieve optimal health care could lead to a massive impact in Perry County and surrounding Black Belt counties that have limited access to health care and community screening events.

Community engagement has also been a staple in racial and ethnic minority communities, especially African American communities, with a number of programs focusing on African American men. Several published studies have outlined the success of barbershop initiatives to educate Black men about hypertension and cardiovascular disease reduction (Hess et al.,

2007; Luque et al., 2014; A. B. Murphy et al., 2017; Victor et al., 2019). Barbershops and hair salons have historically served as places where African Americans can talk openly and honestly about community issues, including health promotion and the lack of health concern.

Several studies based on community engagement partnerships between health professionals and barbershops have described the success of these collaborations and shown positive changes in health-promoting behaviors among participants, including increased knowledge about lifestyle modifications to reduce cardiovascular risk, particularly hypertension. These studies further underscore the need for community-engaged health education programs presented in convenient locations with culturally appropriate outreach efforts (Hess et al., 2007; Luque et al., 2014; Victor et al., 2019). In the Sustainability of Blood Pressure Reduction in Black Barbershops trial, investigators found that “community-based trials aimed at chronic disease management can be successful in reaching traditionally hard-to-reach, high-risk populations,” and pharmacist-led interventions led to greater blood pressure reductions but are “underutilized in chronic disease management” (Victor et al., 2019).

Emerging evidence strongly suggests that in order to influence health-seeking behaviors of African American men in medically underserved communities, these men must be connected to previously untapped health resources. Such resources may be brought in by academic, health system, and community partnerships. The community-centered approach empowers individuals and the greater community to improve health by creating new leaders in population health outreach and expands the community’s capacity to tackle important public health issues (Releford et al., 2010). Community-based participatory research conducted collaboratively with academic institutions has continued to grow over the years and has proven successful beyond issues of cardiovascular disease to include increasing prostate and colorectal cancer awareness and screening among African American men (Mensah, 2018; Releford et al., 2010). Much of the community-based participatory research focusing on African American men has been conducted in urban barbershops, and the role of community collaboration coupled with pharmacists’ interaction has not been well studied in rural areas.

Objective

The purpose of this study was to evaluate the effectiveness of a pharmacist-led health initiative in collaboration with a local community partner in reaching working class individuals in rural Alabama. Specifically, this retrospective chart review evaluated whether a pilot program aimed at increasing health awareness and improving cardiovascular risk factors resulted in better control of obesity and blood pressure in participants. As noted, obesity and hypertension are two modifiable risk factors directly related to cardiovascular risk. Thus, the primary endpoints measured in this study were reductions in blood pressure and weight/body mass index (BMI). We also sought to explore the initiative's impact on health behaviors and the lessons learned when establishing a local workplace initiative through a partnership between an academic institution and a community partner.

This pilot program was established as a collaboration between the Perry County DOT, SSOH, and SUMSOP using the school's local faculty member as an extension of the CRRC. These organizations sought to develop a pilot program aimed at increasing health awareness and improving cardiovascular risk factors among Perry County DOT workers who could not attend the regularly scheduled weekly CRRC. Researchers chose to evaluate whether DOT workers, mostly African American men, had a decrease in weight/BMI and/or blood pressure at the end of the study period.

This project was designed to offer similar services to those offered during the CRRC but to engage and target working African American men who were underrepresented in clinic patients. The SSOH director was concerned about the number of middle-aged men experiencing health issues such as heart attacks and strokes. However, these men were not utilizing the free CRRC resource because of their commitments to work during the day. It was mutually agreed upon that this project would help a group of men become more aware of their cardiovascular risks and offer screenings and education to help lower their risk. The intervention was offered during the workday to allow implementation by SUMSOP students during their slated time at the Perry County Health Department without interfering with their work schedules or other outreach efforts conducted on the weekends.

The community partners were instrumental in establishing the date, time, and location of

the health screenings to ensure they would be conducive to participants' schedules. The SSOH executive director worked with the city of Marion to secure the use of a building near the courthouse that was easily accessible and had a quiet space where screenings could be held. Both the DOT director and SSOH executive director were directly responsible for recruiting and encouraging the participation of DOT employees due to their personal relationships with them. The participants were allowed to leave early on screening days as an incentive from the DOT director. SUMSOP faculty and students were responsible for implementing the program and providing funding for materials. This project was conducted pre-COVID-19, before social distancing restrictions were put in place.

Methods

Literature pertaining to the study was obtained through searches of PubMed and Ovid-IPA from the period of inception (1966 and 1964 respectively) through May 2022. Free text terms included cardiovascular disease, African American men, pharmacist, men, Perry County, Alabama, pharmacist intervention, and prevention of cardiovascular disease. Medical Subject Heading (MeSH) terms included Perry County, pharmacist, intervention, African American, and cardiovascular. Inclusion criteria were limited to human, clinical trials, and articles written in English.

This CRRC extension project included developing a 12-week pilot program to increase health awareness, decrease DOT employees' cardiovascular risk factors, and assess feasibility and utilization of the program. The pilot program was conducted at a location adjacent to the Perry County DOT office, and screening visits were not scheduled on Wednesdays to avoid interfering with the regular CRRC clinic. This project was approved by the Samford University Institutional Review Board. The goals of the initiative are presented in Table 1.

The initiative was designed by a senior pharmacy student from SUMSOP as part of an Ambulatory Care Advanced Practice Pharmacy Experience (APPE) project. All students completing this type of APPE were required to complete a project, and this one spanned three different cohorts of students rotating with a pharmacist preceptor during month-long blocks. Participants were scheduled to have two "screening" clinic dates 12 weeks apart to measure changes in blood pressure, cholesterol, and hemoglobin

Table 1. CRRC-DOT Initiative Goals

Goals of the CRRC-DOT Initiative	
1.	Monitor and record blood pressure readings every 2 weeks.
2.	Monitor blood glucose readings every 2 weeks.
3.	Monitor blood cholesterol readings at the beginning and end of the 12-week period.
4.	Assess and educate patients on disease states.
5.	Increase patients’ medication adherence.
6.	Encourage patients to schedule yearly checkups.

A1C. The 12-week interval between the initial and final clinic date was chosen because of the American Diabetes Association’s recommendation to reevaluate hemoglobin A1C (a 3-month average of blood glucose) after 12 weeks. An additional clinic date was added after the initiation of the program for patients who had missed a previous screening. The data from this additional screening were not included in the calculations for this study if the individuals attending the clinic had a gap greater than 12 weeks between their initial and final screenings. Participants were offered biweekly blood pressure, blood glucose, and weight screenings along with health discussions and the opportunity to attend the weekly CRRC on Wednesday afternoons.

Several incentives were provided to patients participating in the program. All participants were allowed to leave work early on screening days. There was a prize raffle at each clinic visit and health topic discussion. Raffle prizes included gift cards for \$15, \$25, and \$50. Healthy snack options, such as fruit, were also available at screening visits. Raffle prizes, snacks, and health screening supplies were provided under a continuing education grant awarded to the pharmacist faculty member from the Samford University provost’s office.

Pharmacy students prepared electronic medical charts for the 28 DOT employees who attended the screenings. Collected data were used to determine the effect of pharmacist and

student pharmacist education, counseling, and interventions on health outcomes. Data collected included age, gender, race, marital status, education, employment status, insurance status, family history, diagnosis of hypertension and/or diabetes, along with the number of servings of fruit and vegetables eaten daily or weekly. These charts were evaluated to assess an improvement in BMI and blood pressure.

Blood pressure goals and classifications were based on the Eighth Joint National Committee (JNC 8) guidelines (Armstrong & Joint National Committee, 2014). At the time of the study, hypertension was considered systolic blood pressure greater than 139 mmHg or diastolic blood pressure greater than 89 mmHg. Using this guideline, most adults with a diagnosis of hypertension were treated to a goal blood pressure of less than 140/90 mmHg. (See Table 2.)

Participants were considered to be normal weight, overweight, or obese according to the World Health Organization’s BMI recommendations based on height and weight (Jordan & Harmon, 2015; Pan et al., 2009). BMI classifications can be found in Table 3.

Screenings

During the initial screening, each pilot program participant signed a HIPAA consent form that stated that the patient data would not be shared and would only be used for the

Table 2. JNC 8 Blood Pressure Classification

Blood Pressure Classification	Systolic Blood Pressure (mmHg)	Diastolic Blood Pressure (mmHg)
Normal	< 120	and < 80
Pre-hypertension	120–139	or 80–89
Stage 1 hypertension	140–159	or 90–99
Stage 2 hypertension	≥ 160	or ≥ 100

Table 3. BMI Classifications; Adapted from the World Health Organization

Classification	BMI (kg/m ²)
Underweight	< 18.5
Normal	18.5–24.9
Overweight	25.0–29.9
Obese	≥ 30.0
Obesity I	30–34.9
Obesity II	35.0–39.9
Obesity III	≥ 40.0

purpose of this study and potential subsequent research. Each participant was given a questionnaire to obtain baseline characteristics. The questionnaire included a demographics section that asked participants to provide their name, date of birth, race, gender, and phone number. Participants also provided information about their alcohol consumption, tobacco use, caffeine use, exercise frequency outside of work, and the number of times per week they ate fruits, vegetables, and fried foods. The last portion of the questionnaire asked the patients to note any personal or family history of stroke, diabetes, hypertension, heart attack, and any type of cancer. The initial health screening served to obtain baseline measurements.

Pharmacy students, the pharmacist faculty member, and the registered nurse who served as the SSOH director and Perry County healthcare coordinator screened participants for weight, height, hemoglobin A1C, blood glucose, blood pressure, BMI, ideal body weight, and cholesterol. Participants were advised about the numerous opportunities available to supplement the clinic sessions, such as the weekly CRRC and biweekly health discussions with weight, blood glucose, and blood pressure screenings. The biweekly health discussions included topics such as hypertension in African American men, stroke and heart disease, mental health, healthy eating, and diabetes.

The proposed final screening date was to be held 12 weeks after the initial screening to evaluate changes from baseline. Each participant received follow-up counseling, and their final weight, height, hemoglobin A1C, blood glucose, blood pressure, BMI, ideal body weight, and cholesterol were measured. As previously mentioned, an additional health screening was added to obtain

the final measurements from those who missed a previous screening or started the program after the initial date.

Patient Characteristics

All participants included in the study were at least 18 years old or older and were employees of the Perry County DOT. Employees who failed to attend two health screenings 12 weeks apart were excluded from the study. Any data collected outside of the 12-week window would have led to biased results that would not allow us to accurately compare changes from BMI and blood pressure baselines to previously mentioned guidelines. Patients were also excluded from the study if they failed to have their BMI and blood pressure evaluated. Fifteen participants met inclusion criteria for this study.

Results

Patient demographics of the study population are depicted in Table 4. The study population was 80% male and 87% African American. At baseline, 60% of participants had a diagnosis of hypertension, and 40% had a diagnosis of diabetes. Six patients (40%) had both hypertension and diabetes. Family histories of hypertension, diabetes, and myocardial infarction were also relatively high, at 60%, 40%, and 27%, respectively.

Outcomes data were collected from all participants who met the inclusion criteria. The paired sample student *t* test was used to measure significant differences in BMI, systolic blood pressure, and diastolic blood pressure of the study population from baseline to the 12-week follow-up point. At baseline, the mean BMI was 35.1 kg/m², and the mean blood pressure was 147/92 mmHg.

Data collected in reference to BMI was not statistically significant. Mean BMI decreased from 35.1 kg/m² at baseline to 34.5 kg/m² at the end of the study period (*p* = 0.125). Most of the participants lost weight during the study period, with 10 of the 15 patients losing a total of 87 pounds. The net weight loss across the entire group was 65.6 pounds. Evaluations of blood pressure led to similar findings. Although not statistically significant, participants' blood pressure was lower at the end of the study period. The average systolic blood pressure (Figure 1) was reduced by 6 points to 141 mmHg (*p* = 0.17). The average diastolic blood pressure (Figure 2) was reduced by 4 points to 88 mmHg (*p* = 0.09).

Table 4. Patient Demographics

Baseline Characteristics	Original Patient Population N = 28 (%)	Study Population N = 15 (%)
Median age in years	54.4	54.7
Female	5 (18%)	3 (20%)
Male	23 (82%)	12 (80%)
African American	25 (89%)	13 (87%)
Caucasian	3 (11%)	2 (13%)
Obese	21 (75%)	13 (87%)
History of hypertension	15 (54%)	9 (60%)
Family history of hypertension	17 (61%)	8 (53%)
History of diabetes	11 (39%)	6 (40%)
Family history of diabetes	16 (54%)	9 (60%)
Combination of hypertension and diabetes	10 (36%)	6 (40%)
Hyperlipidemia	9 (32%)	4 (27%)
Family history of stroke	5 (17.9%)	2 (13%)
Family history of myocardial infarction	6 (21%)	4 (27%)
Alcohol use	14 (50%)	7 (47%)
Tobacco use*	8 (29%)	3 (20%)
* Tobacco use indicates any history of using tobacco, including those who had quit.		

Discussion

While the data were not statistically significant, the reductions in blood pressure and BMI in the study population indicated a positive impact on the participants enrolled in this collaborative intervention between SSOH and SUMSOP. We used the JNC 8 hypertension guidelines to evaluate if patients were meeting their blood pressure goal of less than 140/90 (Armstrong & Joint National Committee, 2014; Benjamin et al., 2017; Greer et al., 2016; Merai et al., 2016). The JNC 8 guidelines also have the same goals for individuals with chronic disease states such as diabetes. At the completion of the study, 33.3% of participants were meeting the hypertension goal. Blood pressure decreased among participants overall despite the final average being above the specified goal.

There was weight loss in 67% of participants, with an overall reduction of 67 pounds. Although there was a small 0.6 kg/m² reduction in BMI, it was a positive measure in this population over a short timeframe. This reduction is equivalent to a reduction from morbidly obese to obese in three months in a population with multiple cardiovascular disease risk factors. With these considerations in mind, it is evident that the education and screening efforts played a role in the BMI and blood pressure improvements within this community. This pilot program’s aim was to evaluate if scheduled screening opportunities (blood pressure, blood glucose, cholesterol, and weight) would improve the cardiovascular risk profile of African American men in a rural community. While the measured parameters yielded modest reductions, there were several lessons learned that could impact similar projects in the future.

Figure 1. Systolic Blood Pressure From Baseline to Follow-Up

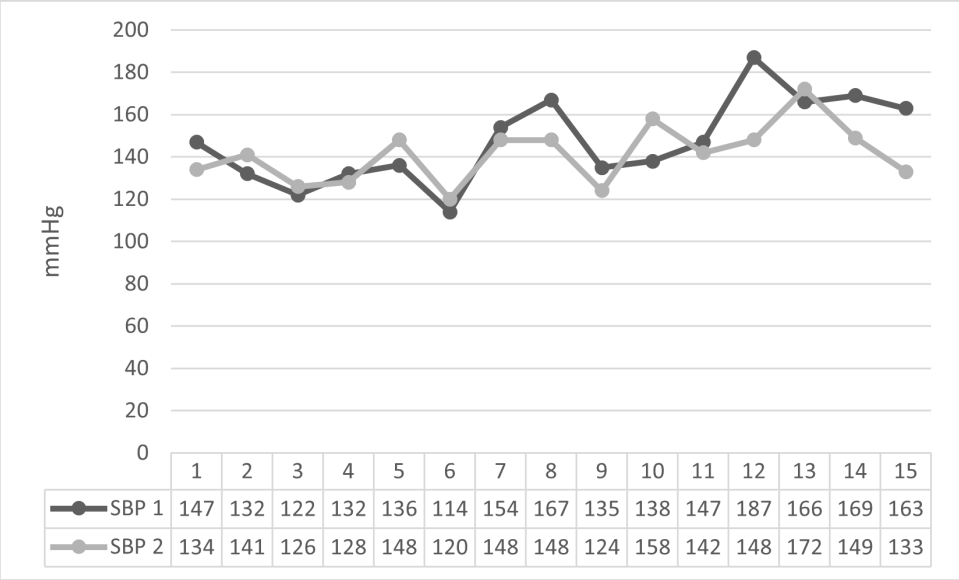
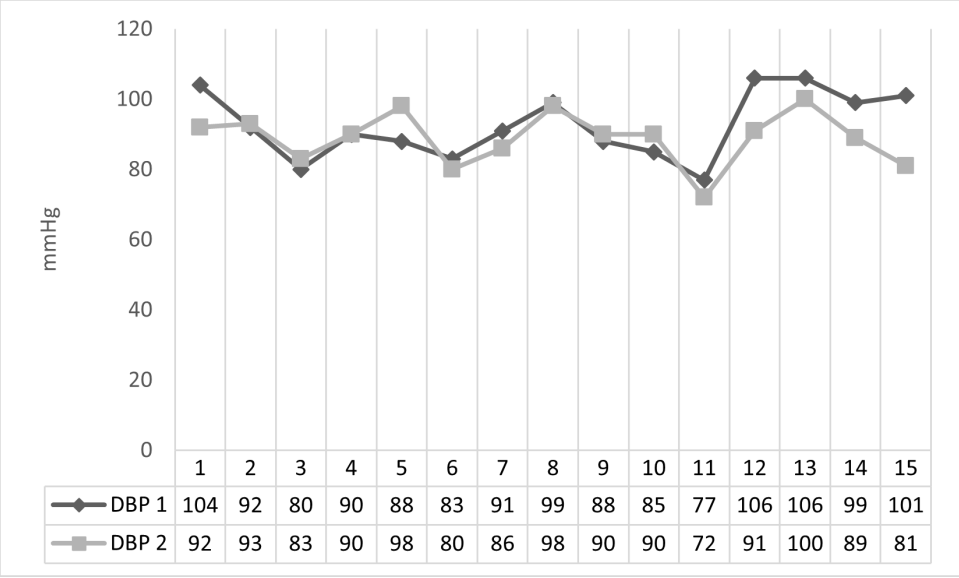


Figure 2. Diastolic Blood Pressure From Baseline to Follow-Up



Limitations

This study had some limitations. First, the small sample size prevents drawing concrete conclusions and determining statistical significance. We began with 28 participants, but only 15 had complete before and after data to be compared at the conclusion of the study. This loss to follow-up was concerning to the investigators, as we were unable to ascertain whether the interventions were helpful for those participants. Second, the intervention lacked a control group, which limited our ability to infer whether the interventions were

actually responsible for the noted reductions in blood pressure and weight. Another limitation was funding. While useful to the community, this was a pilot study over a short timeframe. Extending the study would prove valuable for the community at large, but funding was unavailable.

Implications for Practice

Collaboration Lessons. We learned that when working with community partners, it is imperative to utilize and strengthen established, trusted relationships. The senior pharmacy student

initially called the DOT director to pitch the program and gain support, but because the director was not familiar with the student, he was hesitant to commit. We gained support from a well-known community figure in the Perry County healthcare coordinator who was able to lend credibility to the project. Her endorsement and support of the project was vital to its success. She was present at the screenings, which helped students build rapport with community members through association, and she was able to provide useful health information about several participants that may not have been revealed without her assistance.

We also learned that when developing programs, you may have to meet and provide services outside standard working hours and use a more neutral/central location to lessen the burden on attendees. The director of the DOT did not want his staff leaving in the middle of day, but he allowed those participating in the screenings to leave after they received their information and counseling. This was an incentive for workers because we often finished 30 to 45 minutes before the end of workers' regular shift, which gave them an early weekend release. We also held the screening in a location in the heart of the city and closer to the DOT depot instead of requiring participants to drive a further distance to the health department. This not only kept participants from having to leave work too early but also made the program more visible to the community. On several occasions, we had people who were not a part of the DOT program ask for a blood pressure check, and they received the same lifestyle and medication adherence counseling provided to the DOT participants. Several DOT participants also began utilizing the CRRC on Wednesdays once they became aware of the services and the benefits of frequent monitoring of blood pressure and weight. While the community partners were not directly involved in the data analysis, both the DOT director and SSOH staff were instrumental in encouraging the men who participated in the study to continue visiting the CRRC to have their blood pressure and weight monitored. The community partners also commented about the return on investment related to allowing participants to leave work early. The hour invested in the program provided education and improved health without impacting the amount of work that was done during the day.

Lifestyle Lessons. Participants were given the opportunity to share how their dietary and exercise habits changed over the course of the program. Participants reported eating more fruits

and vegetables at the close of the program than when they started the program. While some had difficulty adopting the healthy plate method, most reported reducing their intake of fried foods and carbohydrates and could describe the difference between starchy and nonstarchy vegetables. The plate method of education also made participants more aware of serving sizes, and they reported eating less, which correlated to the group's overall weight loss.

Not all the lifestyle lessons were centered around food, however. Participants were able to understand blood pressure goals and were provided talking points to discuss with their primary care providers. Participants reported asking for their *exact* blood pressure numbers instead of settling for "your blood pressure is good today" when they went to see their primary care providers.

Students also reported that the program helped them become more comfortable measuring and assessing manual blood pressure readings and providing counseling to patients. Programs such as this can be a great asset to the community and student learners by giving more opportunities for counseling and disease state management to both groups.

Leadership Lessons. The collaboration between an academic primary investigator and a community investigator promoted equity in leadership and decision-making. This also provided an opportunity for continuation if the academic partner was no longer available. Under the direction and leadership of the SSOH director, who is also a nurse, community volunteers could be utilized to continue providing the screenings. As a registered nurse, the community partner could provide education and counseling to patients as well as direct them to follow up with their primary care physician if their screening parameters implied elevated cardiovascular risk.

Financial Lessons. The academic partner used grant funding to provide screening materials, such as point of care hemoglobin A1C and lipid panel tests, as well as door prizes and snacks. However, similar programs could still be implemented inexpensively. Door prizes could be donated, and instead of hemoglobin A1C tests, screeners could measure blood glucose, noting elevations and recommending that participants follow up with their doctors and incorporate dietary changes. Routine blood pressure, blood glucose, and weight measurements still provide valuable information to participants without the more expensive hemoglobin A1C and cholesterol

point-of-care testing. The ongoing support and counseling present more learning opportunities and accountability for patients.

Time Constraint Lessons. This was designed to be a 12-week pilot program. We were bound by the 12-week screening parameter noted in our IRB application, which caused us to exclude some of our participants because they were unable to attend the last one to two screening events. Nearly half (46%) of the enrolled participants were excluded because they failed to return for their final screening within the 12-week study period or were unable to attend the follow-up screening sessions. While these participants had multiple readings, they did not have two readings that were 12 weeks apart. Allowing more screening opportunities and more screening flexibility would have yielded more data to determine a statistical difference between the baseline and ending results. Had the program been extended beyond the 12-week timeframe, participants would have had more opportunities for counseling, more pronounced changes in their parameters, and a greater reduction in their cardiovascular risk.

The small sample size leaves the data vulnerable to the possibility of a Type II error. Sending more reminders about the screenings and weekly CRRC clinic could have led to an increased sample size. It is important to note that none of the enrolled population attended the regular CRRC clinic on Wednesdays before the pilot study. Once the program ended, the community partner was contacted on several occasions to go to the Perry County DOT office to check the blood pressure and/or blood sugar of some past participants, as these participants now recognized the need for routine monitoring, accountability, and counseling. After evaluating the program, we discovered that excluding the data of participants with a greater than 12-week span between their measurements would not have greatly impacted the difference in measured A1C and cholesterol, which are not presented in this review and could have made the data more robust.

Conclusion

This pilot program increased health awareness within a population that is usually unable to utilize the weekly CRRC due to work obligations. The DOT participants now have a better understanding of their blood pressure readings and when to seek medical attention. They now know more about the warning signs for stroke and heart attack, blood pressure goals, and healthier eating options.

These factors ensured that participants walked away with a better understanding of their health and cardiovascular disease risk factors. Several participants have taken part in attending the weekly CRRC with supervisor approval in order to monitor their blood pressure and blood glucose more closely.

The CRRC, in collaboration with SSOH and SUMSOP, is working hard to diminish the health disparities in Perry County, Alabama. Collaborating with the DOT and community partners afforded some of the hardest working individuals in the community an opportunity to take charge of their health and decrease their modifiable risks for cardiovascular disease by removing the barrier of having to take time off work or travel a great distance to get screened. In summary, although the results were not statistically significant, the small reductions in blood pressure and BMI are a start in lowering cardiovascular risk in the study population. This pilot program was successful and could be continued and potentially expanded to reach more men and women in this rural, predominately African American community.

It is evident that pharmacist-led interventions combined with community partnerships and outreach can lead to positive results and impact the health of rural communities. The community partners saw a need to extend the reach of the CRRC and were instrumental in developing the type of intervention they knew was needed. Instead of creating a totally new program, the academic partner was able to work with community leaders to develop a program to meet their needs and, through grant funding, was able to provide the supplies needed without burden to the community partners. Without the recruitment efforts and location assistance of the community partners, this project would have been difficult to implement, but their personal relationships with the men of the DOT lent credibility to the faculty and students implementing the program. The SSOH director was present at most of the screenings and utilized her nursing background to help with counseling patients. After the project ended, she still committed to going to the DOT office monthly over about six months in order to check blood pressures when needed.

While the program only ran for a short period, it shows how similar projects can be mutually beneficial for patients, the community, and their academic partners. While funding is always an issue, similar projects could be conducted without providing incentives to participants, which

was one of the major costs. Utilizing low cost glucometers and strips, similar interventions could be conducted with a few blood pressure cuffs, a scale, and simple education materials focused on reducing cardiovascular risks.

Further research with a larger population is needed to determine if the results would be statistically significant and if similar projects would be sustainable long-term. Another option would be a follow-up study to determine if participants were still engaging in the lifestyle modifications taught during the pilot program and if they had sustained the weight loss and lowered blood pressure measured during the program.

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