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Original Study

Establishing a Hypertension Referral Program for Uninsured Patients to a Student-Run Free Clinic

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Abstract

Introduction: Hypertension disproportionately impacts uninsured populations. Medical students from the University of South Dakota Sanford School of Medicine initiated weekly blood pressure (BP) screenings at The Banquet, a free meal service, finding that guests rarely followed up with primary care despite hypertensive readings. This project established a referral pathway to the Coyote Clinic, a student-run free clinic, alongside a volunteer outreach program.
Methods: Medical students performed weekly BP screenings during Banquet mealtimes from August 2021 through December 2022. Basic patient information and BP readings were recorded. Eligible, uninsured patients without primary care providers (PCPs) were referred to the Coyote Clinic. Patients were provided educational materials on hypertension and accessing the clinic. Volunteers completed pre- and post-surveys at one year of service assessing comfort level counseling guests, hypertension understanding, and program perception. Volunteers completed pre- and post-surveys assessing comfort level counseling guests and program perception. Descriptive statistics summarized the data.
Results: Ninety-six BP readings were recorded from 85 guests, with an average BP of 132/83 mmHg, and 63 guests meeting criteria for Stage 1 hypertension or higher. Forty-two guests were without health insurance and 47 guests without a PCP. Findings revealed 28 hypertensive guests were eligible for referral, with 4 guests agreeing to referral. Another 4 eligible guests agreed to referral for a different ailment. Volunteers reported increased comfort counseling patients and greater understanding of the barriers faced by uninsured persons after volunteering.
Conclusions: This study shows that such a referral infrastructure can successfully connect hypertensive patients to a student-run free clinic with the potential to provide significant benefit to patients, otherwise lacking care, for a low cost in resources. Future directions include tracking the number of patients who attend their referral appointment and receive medical treatment, integrating additional preventive health screenings, and involving more organizations affiliated with the target population.

Introduction

Hypertension is among the top five leading causes of mortality worldwide and is an important risk factor for cardiovascular disease. High blood pressure is the underlying cause of 51% of deaths due to stroke and 45% of deaths due to ischemic heart disease.[1] Uncontrolled hypertension can lead to a variety of other health complications, including chronic kidney disease, vision loss, sexual dysfunction, and heart failure. Due to the dangerous, downstream effects uncontrolled blood pressure can assert, it is imperative to maintain tight control.

An important consideration in management of hypertension is insurance coverage, as it leads to a higher likelihood of diagnosis and treatment. When compared to patients without insurance, patients with Medicaid are more likely to be diagnosed with high blood pressure.[2] Moreover,

hypertension in patients with health insurance, whether public or private, is more likely to be controlled than in patients without health insurance.[2,3] According to the Healthy People 2020 initiative, 55.3% of patients with public insurance have controlled hypertension and 50.0% with private insurance have controlled hypertension, but only 30.9% of individuals without health insurance have adequate blood pressure control.[4] Similarly, hypertensive Medicaid patients that experience a lapse in coverage demonstrate, on average, a 10 mmHg increase in diastolic blood pressure.[5]

Student-run free health clinics may aid in increasing the number of patients with controlled hypertension. Students at the East Harlem Health Outreach Partnership (EHHOP), a student-run clinic affiliated with Mount Sinai School of Medicine, found that there was no significant difference in outcomes for patients treated for hypertension at their clinic compared to those treated under Medicare or Medicaid.[6] This suggests that, when appropriate processes are in place, student-run free health clinics can be a valuable asset for communities in controlling the blood pressure of uninsured hypertensive patients.

The Coyote Clinic is a free, student-run health clinic that provides medical care to uninsured and underinsured community members in Sioux Falls, South Dakota through a weekly internal medicine clinic.[7] The clinic offers medications free-of-charge to patients through a medication assistance program and is suited to offer appropriate follow-up care to patients requiring medication management and lifestyle change.

One preventive outreach effort of the clinic has been established at the Banquet, a non-profit organization that serves meals at two locations in Sioux Falls to community members experiencing food insecurity.[8] A group of medical students offers weekly blood pressure screenings to Banquet guests at both locations. Although medical student screeners often recommend the Coyote Clinic as an option for healthcare to Banquet guests, there is no formal referral process in place to ensure patients follow-up on positive hypertensive screenings at our clinic. Failure to follow-up by hypertensive Banquet guests could be due to a variety of factors, including: (1) lack of understanding surrounding the risks of uncontrolled hypertension, (2) lack of awareness of Coyote Clinic services and access to transportation, and (3) unfamiliarity with how to engage with the broader healthcare system. This project seeks to address these possible underpinnings to improve long-term blood pressure control in a patient population that has been shown to have under-diagnosed and under-treated hypertension.

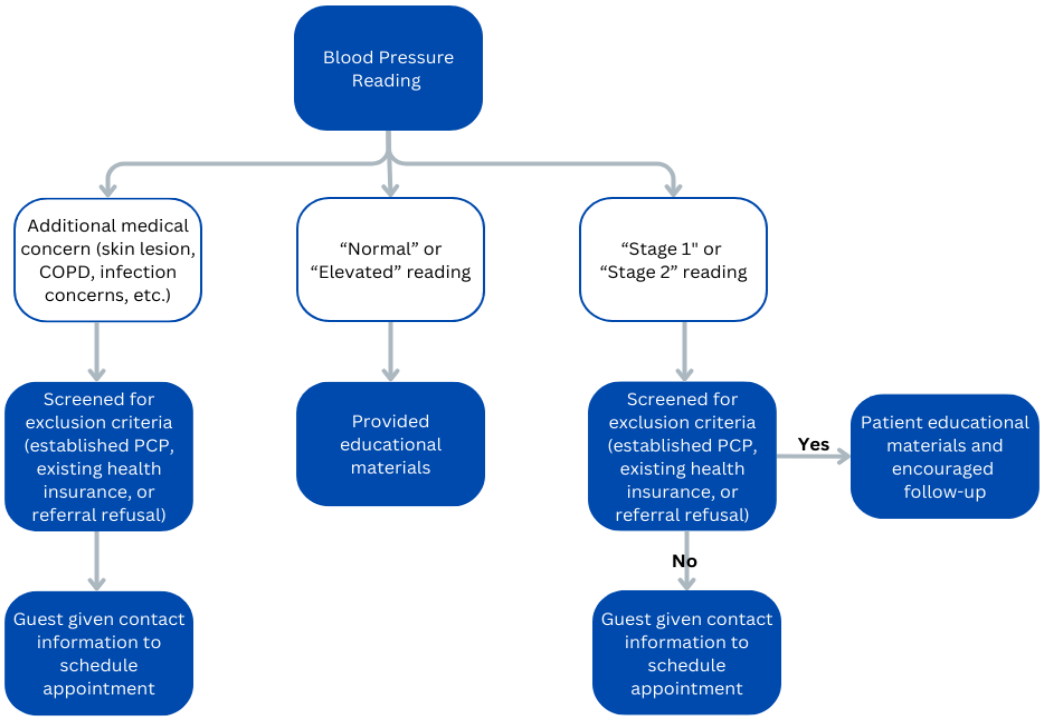
Methods

Blood pressure screening stations were established near the Banquet's meal distribution windows and screening was offered to all guests from August 2021 through December 2022. Demographic data was not collected. Blood pressures were measured manually by second and third-year medical students in accordance with American Heart Association and American Stroke Association (AHA/ASA) guidelines.[9,10] Guests could opt to have their blood pressure measured on multiple occasions. Guests with a systolic blood pressure ≥130 mmHg and/or a diastolic pressure ≥80 mmHg were considered to have screened positive for hypertension. "Stage 1" hypertension was defined as systolic blood pressure 130-139 mmHg and or a diastolic pressure 80-89 mmHg. "Stage 2" hypertension was defined as systolic blood pressure ≥140 mmHg and/or a diastolic pressure ≥90 mmHg. These values are in accordance with the most recent AHA/ASA guidelines.

Patients in the "normal" or "elevated" categories, as defined by the AHA/ASA, were informed of the health benefits associated with maintaining normal blood pressure and a healthy lifestyle. Patients whose readings existed within the Stage 1, or Stage 2 hypertension categories were given an educational handout containing information regarding the danger of uncontrolled hypertension (Figure 1). The handout included both written and visual information to aid those with low English and/or health literacy. The handout also displayed a map, marking where the Coyote Clinic is located (Appendix B).

If the patient already had a primary care provider (PCP) or health insurance, they were excluded

Figure 1. Schematic outlining study methodology



COPD: chronic obstructive pulmonary disease; PCP: primary care provider

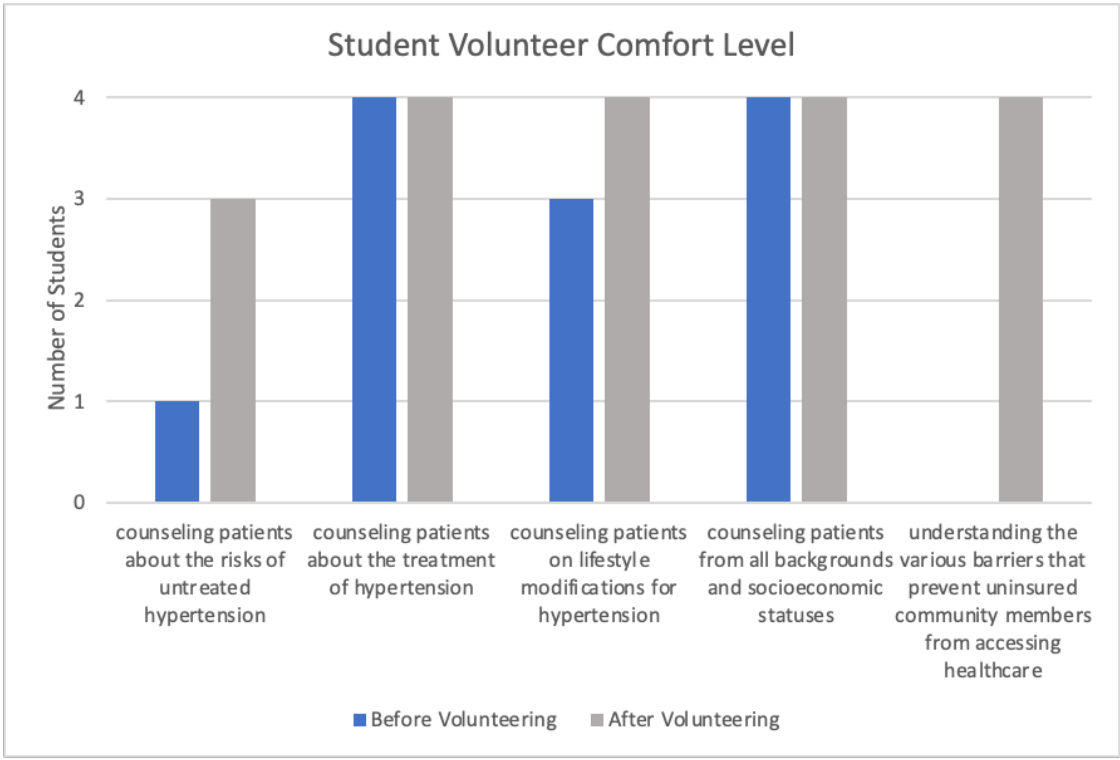
from referral and encouraged to follow up for further management at their healthcare clinic. Patients who remained eligible and willing to be referred were given contact information for Coyote Clinic and encouraged to schedule an appointment by phone or in person. Patient information and blood pressure were recorded in Research Electronic Data Capture (REDCap) (Vanderbilt University, Nashville, TN), deidentified and analyzed in Microsoft Excel (version 16.0, Microsoft Corporation, Redmond, WA).

The four medical students who conducted the weekly screenings were surveyed before and after completing the yearlong volunteer program. Students were asked to report on a Likert scale their comfort level educating patients about the risks of untreated hypertension, treatment of hypertension, and lifestyle modifications for hypertension. Students were also surveyed using a Likert scale on their comfort level counseling patients from all backgrounds and socioeconomic statuses and their understanding of the various barriers that prevent uninsured community members from accessing healthcare. Students also completed a seven-question objective quiz assessing their knowledge of blood pressure screening (Appendix A).

Results

There were 96 total blood pressures recorded from 85 guests. Guests could opt to have their blood pressure recorded on more than one occasion, leading to the variation between total blood pressures and total guests. The average measured blood pressure was 132/83 mmHg; and 63 (74%) of those screened met the criteria for Stage 1 hypertension or higher. Forty-two guests were without health insurance and 47 guests were without a primary care physician. Findings from this study revealed that 28 guests who met criteria for Stage 1 hypertension or higher were considered eligible for referral and 4 guests agreed to referral to Coyote Clinic for medical treatment. Four guests who

Figure 2. Student volunteers who responded "somewhat comfortable" or "very comfortable" to Likert scale survey questions assessing their comfort level with interacting with Banquet guests (n=4)



were eligible for referral asked to be referred to Coyote Clinic for a medical reason unrelated to hypertension.

After volunteering, all 4 medical students volunteers reported feeling "somewhat comfortable" or "very comfortable" with counseling patients about the risks of untreated hypertension, treatment of hypertension, and lifestyle modifications for hypertension. All volunteers expressed feeling "somewhat comfortable" or "very comfortable" with counseling patients from all backgrounds and socioeconomic statuses and understanding the various barriers that prevent uninsured community members from accessing healthcare (Figure 2). On the objective portion of the survey, the average score on the BP screening exam was 78.6% before the program and 100% after the program. Significance was not achieved due to the limited number of volunteers and survey responses; however, we intend to continue evaluating our annual volunteer cohorts.

Discussion

In previous years, students from the University of South Dakota Sanford School of Medicine have regularly screened blood pressures and blood glucose levels for local citizens who receive meals at the Banquet. Readings were recorded and shared with the patients with the goal of providing patients an opportunity to monitor their own health. The project outlined above, which began as an idea to further maximize the benefit of this pre-existing screening process, was designed to not only inform patients of their results but to provide an action plan to manage their hypertension. That plan centered around a referral program that directly connects patients to a resource, the Coyote Clinic, that is located in the downtown area near one of the Banquet locations. As such, our primary goals were to identify uninsured patients who do not have a PCP and screen positive for hypertension and refer them to free, accessible clinic, provide basic patient education regarding the effects of

hypertension, and encourage follow-up appointments either with our clinic or the patients' current PCPs. Our secondary goal was to create and implement a regular volunteer program for medical students and assess volunteer comfort with counseling and interacting with Banquet guests.

Outcomes and Interpretation

Almost three quarters (74.0%) of those who chose to have their blood pressure measured screened positive for Stage 1 hypertension or higher. Though this data may overrepresent the true average of patrons with hypertension--as some of those patients were likely following up on previous high readings, it does highlight the importance of a novel referral program that connects patients with an affordable healthcare option for treating and controlling their hypertension. A total of 8 patients who remained eligible after the exclusion criteria were referred to the Coyote Clinic. A handout was provided to all patients that included both patient education about hypertension and general information about the Coyote Clinic (Appendix B).

With the referral protocol now established, screening events require only two to three students to volunteer for roughly two hours at a time on a weekly basis. Following the initial investment in equipment, the continued monetary requirement for the outreach program is minimal. As such, the program has the potential to provide significant benefit to patients who would otherwise face a lack of access to care for a relatively low cost of resources. Additionally, this program serves as an opportunity for medical student volunteers to increase their comfort level with counseling patients on the risks of hypertension and better understand the barriers underserved populations face.

Challenges and Limitations

A challenge related to the project execution included difficulty utilizing the REDCap data collection system, as it was piloted for Coyote Clinic at the Banquet outreach service. When technical difficulties were encountered, volunteers continued to collect blood pressure readings without recording data, limiting data collection during some screening events. Moreover, there were barriers to successful referral after a patient was found to meet all inclusion criteria; most notably, a significant portion of Banquet patrons did not have a phone or mailing address at which they could be reached for scheduling appointments. We have since had medical students coordinate appointments on the patients' behalf to expedite the process.

An important limitation to this study was the possibility that the patients who undergo the screening process are not randomly selected as they choose to have their blood pressure checked. As such, some of the patients who were screened in this study were patients who already had a diagnosis of hypertension and simply wanted to check their current status. Furthermore, the data collection method used does not discriminate between new versus repeat patients. As a result, some data may overestimate the percentage of Banquet guests who have hypertension. Further limitations may include the generalizability of the project to other communities. Successful referral programs in a similar population as described here requires that the organizations (e.g., The Banquet and Coyote Clinic) are in close physical proximity. In communities where such organizations are beyond a reasonable walking distance, further arrangements for travel assistance might be necessary or deem the referral program not feasible. Additionally, the relatively small sample size limits the power of the study and extent to which these results can be generalized. Lastly, as demographic data was not collected, the data is limited in that it cannot be generalized to the United States population or other student-run clinics.

Future Directions

As with any Healthcare Quality and Improvement Partnership project, further improvements can be made after analyzing the outcomes of previous Plan-Do-Study-Act cycles. Noted above are challenges identified during the action phase of this project. In summary, some of the most significant barriers involved are low participant numbers given the exclusion criteria set by the primary aim of

the study and logistical obstacles that could be resolved in future iterations. Another important consideration will be ensuring that appointment times do not conflict with the food disbursement times at the Banquet, as both are held at similar times in the evenings.

The preliminary stages of this project have demonstrated the usefulness of blood pressure screening, as multiple Banquet patrons were ultimately referred and received care at the Coyote Clinic. Acknowledging that this project started from the ground up, there were numerous learning points and improvements made along the way, evolving into what is now a more straightforward and streamlined process. Additionally, although not all patients who were screened for hypertension were referred, all patrons were educated on what hypertension is and the long-term implications of untreated hypertension. As this project continues, it will be advantageous to measure and assess any changes patrons make to their hypertension management after receiving hypertension education. Additionally, we did not track if referred patients successfully attended follow-up clinic visits for hypertension care. In the future, we plan to track follow-up data and assess potential barriers to follow-up.

The long-term outlook of this project is promising, as at the conclusion of our project we were able to refer patients to the Coyote Clinic as well as refine our patient screening and data collection forms. We have trained our next cohort of volunteers who will conduct screenings at the Banquet on a weekly basis, and we have begun to offer blood glucose screenings. In the future, we plan to expand this project to similar establishments in the area, such as the Bishop Dudley Hospitality House and the Union Gospel Mission, two additional nearby organizations that care for disadvantaged community members. Varying the location of the blood pressure screening within proximity to the Coyote Clinic will allow for a larger screening cohort. Furthermore, this same referral framework could be further expanded to include other preventive health screenings. We also plan to survey volunteers in more detail to gain feedback for program improvement and expansion. Ultimately, this project was the first step toward creating an efficient and effective referral process from a community health event to a local student-run free clinic. The demonstrated success provides an example of an initiative that has significant potential for improving both the health and the health literacy of patients in the downtown Sioux Falls community.

Conclusions

This study demonstrates the feasibility of implementing a low-resource hypertension referral program that connects uninsured individuals to a student-run free clinic through community blood pressure screenings. Although referral rates were limited, the program successfully established a structured pathway for connecting individuals with care while enhancing medical student engagement and comfort with underserved communities. With continued refinement, this referral framework has the potential to improve access to preventative care and could be adapted for broader community health initiatives.

Disclosures

The authors have no conflicts of interest to disclose.

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