Characteristics of Patients Disengaged From Pharmacist-Led Hypertension Management in Primary Care: An Observational Study

Isabel Wedig, PharmD; Anupama Joseph, MD; Tyler Ho, PharmD

ABSTRACT

Introduction: Hypertension is a leading cause of morbidity and mortality worldwide. Although it is often asymptomatic, adequate blood pressure control can help decrease the risk of cardiovascular, renal, and neurologic diseases. Clinical pharmacists can play a critical role in blood pressure management and have been shown to help patients meet their goals. Despite this, patients often disengage from pharmacy services, and reasons for this are not well understood. This study sought to evaluate characteristics of patients who are referred but not engaged in a primary care pharmacy antihypertensive service and explore potential reasons for disengagement.

Methods: Data from the 2023 fiscal year (July 1, 2022 – June 30, 2023) were collected from UW Health's electronic health record. Inclusion criteria were prespecified to include adults referred by their primary care provider to pharmacy services but who did not engage in care. Retrospective chart reviews were performed to gather demographic information on this population, and descriptive statistics were used for data analysis.

Results: Of the 168 individuals who met the inclusion criteria, 66.1% of participants were not currently at their blood pressure goal. The majority of patients did not engage in pharmacist services due to lack of patient interest (n = 114, 67.9%) or being managed by another health care member team (n = 36, 21.4%).

Conclusions: The majority of patients who did not engage with a pharmacist for hypertension medication management despite referral from their primary care provider are not achieving their blood pressure goal.

INTRODUCTION

Hypertension is a significant cause of morbidity and mortality worldwide.[1] It is estimated that hypertension is accountable for about 54% of stroke and 47% of ischemic heart disease cases – 2 of the top 5 leading causes of death in the United States.[2,3] Hypertension is frequently asymptomatic, but it is the most prevalent modifiable risk factor for cardiovascular disease. Adequate blood pressure control can help reduce risks of other diseases, including coronary heart disease, chronic kidney disease, stroke, heart failure, and arrhythmias.[4] There is a lack of consensus on the preferred hypertension goal for patients.[5,6] According to the American College of Cardiology/American Heart Association (ACC/AHA), all patients should have a goal blood pressure of less than 130/80 mmHg.[7] A less restrictive goal of less than 140/90 mmHg, recommended by the American Academy of Family Physicians, is also seen commonly in practice. Similarly, several factors contribute to uncontrolled blood pressure, including competing comorbidities, lack of understanding of hypertension, stress, food/housing insecurity, financial or transportation barriers, poor diet, and sedentary lifestyle.[8] A multifaceted approach addressing both pharmacologic and nonpharmacologic factors have the opportunity to improve hypertension control rates.

Incorporating pharmacists into the interdisciplinary workflow can help ease the burden on primary care providers while increasing patient health care access.[1] Additionally, a survey of 114 primary care providers found that they see a positive clini-

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cal impact and found no increase in workload when working with clinical pharmacists.[9] Pharmacists also can serve a critical role helping patients reach their specific blood pressure goals.[10-12] Matsumoto et al reported that in patients who had scheduled follow-up with a pharmacist, significant reductions in systolic blood pressure were seen compared to those with as-needed pharmacist follow-up (mean differences in systolic blood pressure: -8.89 mmHg in the scheduled group vs -3.23 mmHg in the as-needed group).[10] Similar outcomes were seen in patients who were managed by community pharmacists who provided medication education, medication management, and regular manual blood pressure measurements and who contacted primary care physicians through the electronic health record about blood pressure readings above goal. In patients who initially had uncontrolled or borderline blood pressure (blood pressure goal < 140/90 mmHg) reductions of 10.40 and 4.17 mmHg, respectively, were seen, and these reductions were continued or stabilized after the first year following enrollment.[11] According to Hartkopf et al, primary care pharmacists helped 74.2% of patients reach their blood pressure goal (< 140/90 mmHg) versus 41.5% of patients who were not managed by a pharmacist.[12]

At our study site, which is a large academic medical center in the upper Midwest, primary care pharmacists serve a variety of disease states, such as hypertension, diabetes, and hyperlipidemia. Working under detailed and specific delegation protocols for each disease state, pharmacists are independently responsible for medication titration and prescribing, vital sign monitoring, laboratory test ordering and assessment, and medication and lifestyle education. At the study site primary care clinics, patients can be referred to pharmacists for follow-up as deemed appropriate by the clinician. Once referred, patients will have an individual appointment with a pharmacist either in person, by telephone, or via a video visit. Appointments are scheduled as 30- or 60-minute blocks as selected by the pharmacist team. Each visit includes obtaining an accurate medication list, reviewing pertinent laboratory tests and vital signs, providing lifestyle recommendations, and adjusting medications as needed. Patients are then followed by the pharmacist team until either the patient meets their personal health goal(s) and/or specific clinical outcomes are met for each comorbidity/disease state. Despite the positive disease- and patient-oriented outcomes seen with pharmacist interventions, patients do not always accept referral to a pharmacist for medication management services. Therefore, this study sought to evaluate the demographics of those patients who were referred but did not engage in primary care pharmacy antihypertensive services and to explore reasons for disengagement.

METHODS

Setting and Study Design

This retrospective study was performed at the University of Wisconsin Hospital and Clinics (UW Health). UW Health is a

Figure 1. Inclusion and Exclusion Criteria Flow Chart

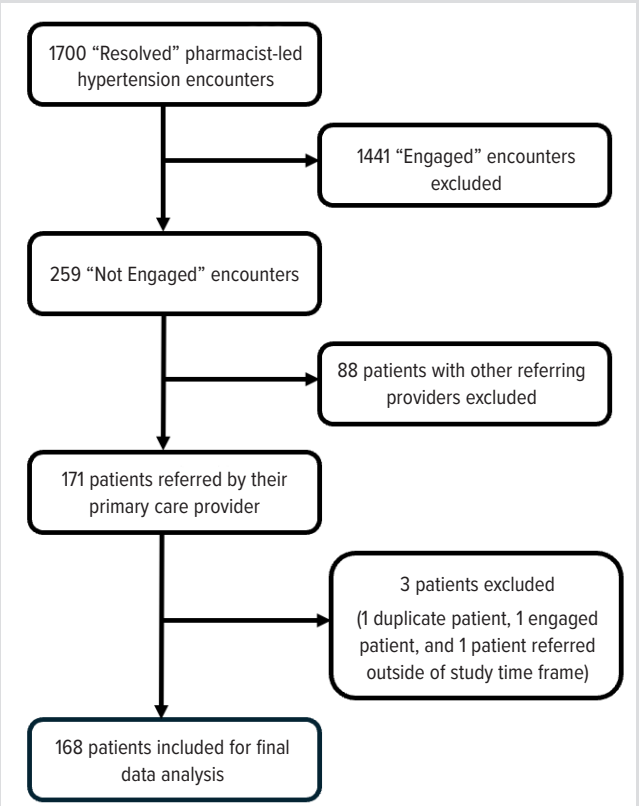
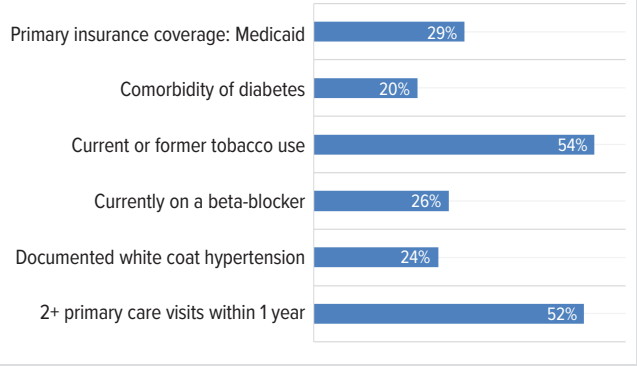


Table 1. Patient Characteristics

Age (average)	56 years (range 25 – 93 years); 56 ± 14 years
Sex	
Male	92 (54.8%)
Female	76 (45.2%)
Race	
White	126 (75%)
Black	27 (16.1%)
Asian	10 (6%)
American Indian or Alaska Native	1 (0.6%)
Native Hawaiian/Other Pacific Islander	1 (0.6%)
Other	1 (0.6%)
No response	2 (1.2%)
Ethnicity	
Non-Hispanic	152 (90.5%)
Hispanic	14 (8.3%)
No response	2 (1.2%)
Body mass index (average)	32.72 kg/m^2 (range 17.56 – 76.82 kg/m^2; 32.7 ± 9 kg/m^2)
Primary insurance	
Medicare	49 (29.2%)
Medicaid	49 (29.2%)
Commercial	53 (31.5%)
No insurance	17 (10.1%)
Documented "white coat hypertension"	40 (23.8%)
No. of primary care visits within 1 year from referral date	Average 2 visits per year (range 0 – 7 visits per year; 2.3 ± 3.5 visits)
Average no. of blood pressure medications per patient	1.8 (range 0 – 5; 1.8 ± 1.1)

Figure 2. Patient Characteristics – Unique Characteristics



Data help illustrate that patients referred to pharmacists also may benefit from services such as diabetes management, tobacco cessation, and more.

large, academic medical center located in Madison, Wisconsin, serving more than 800 000 patients each year across its 6 hospitals and more than 90 outpatient sites. This study was classified as exempt by the University of Wisconsin-Madison Institutional Review Board.

The patient population was identified through the Pharmacists in Primary Care program monitoring electronic database of hypertension patients from fiscal year (FY) 2023 (July 1, 2022 – June 30, 2023). The population was generated from the 11 primary care clinics where pharmacists are embedded into the workflow at the study site. Patients were included if referred by their primary care provider for pharmacist-led hypertension management. The pharmacy encounter needed to be marked as "resolved" to be included, meaning that the patient was no longer being contacted for engagement. Inclusion criteria were met if patients did not engage with this pharmacy service for reasons such as patient declined offer, lack of patient-perceived benefit, or lack of response to attempted contact. Per workflow, patients were contacted 3 times by phone with voicemail and sent a letter with no response before resolving.

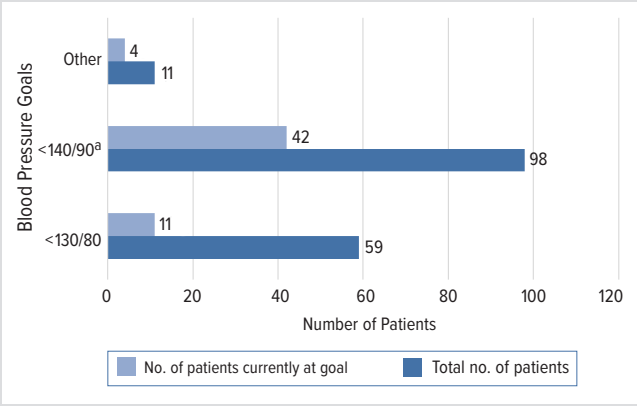
Data Sources and Statistical Analysis

An internal analytics platform was utilized to generate a report of patients. Additionally, the electronic health record was used to gather pre-specified, deidentified information: patient demographics (eg, sex, age, self-identified race, self-identified ethnicity, body mass index), comorbidities (diabetes, coronary artery disease, history of myocardial infarction, chronic kidney disease), patient health concerns (tobacco and contraceptive use), clinical details, and medication information via chart review. Patient-specific blood pressure goals were set by the patient's referring clinician. Clinic blood pressure readings were utilized to determine if a patient was or was not meeting their blood pressure goal. Chart reviews were completed by the primary author to gather data and assess trends. Descriptive statistics were used to analyze the data. An exploratory analysis was performed after initial data collection to further explore themes of the patient population.

Table 2. Blood Pressure Characteristics

Blood pressure goal, n (%)	
<130/80 mmHg	59 (35.1%)
<140/90 mmHg	98 (58.3%)
Other goal	11 (6.5%)
Average initial systolic blood pressure	154 ± 18 mmHg
Average initial diastolic blood pressure	92 ± 13 mmHg
Average systolic blood pressure when episode of care resolved	147 ± 19 mmHg
Average diastolic blood pressure when episode of care resolved	88 ± 12 mmHg
Average current systolic blood pressure	143 ± 21 mmHg
Average current diastolic blood pressure	86 ± 14 mmHg

Figure 3. Blood Pressure Goal Breakdown



[a]Goal set by the American Academy of Family Physicians.

RESULTS

A total of 168 patients referred by their primary care provider had resolved pharmacist encounters during FY 2023 (Figure 1). Table 1 summarizes the included patients' demographic information. Participants' average age was 56 years old; the majority identified as male (n = 92, 54.8%); 126 (75%) self-identified as White, 27 (16%) self-identified as Black; and 15 (8.3%) self-identified as Hispanic ethnicity. Forty-nine patients (29.2%) were insured by Medicaid and 17 (10.1%) had no insurance (Figure 2). Patient-specific blood pressure goals varied between those included. The blood pressure goal of less than 140/90 mmHg was most common for patients (n = 98, 58.3%) (Table 2). However, despite this less stringent blood pressure goal, 42 patients (42.9%) patients who have a blood pressure goal of less than 140/90 mmHg were not at their goal (Figure 3). This is similar to the findings of the entire patient population, as 111 (66.1%) participants were not currently at their blood pressure goal, despite being seen an average of 2 times by their primary care provider within 1 year of the referral date. Barriers to patient engagement included lack of patient interest (n = 114, 67.9%) or another health care member managing the patient's hypertension (n = 36, 21.4%) (Table 3).

Table 3. Pharmacy Referral Clinical Details

	n (%)
Reasons for referral decline[a]	
Clinic goals met	8 (4.8)
Patient-stated goals met	3 (1.8)
Provider-stated goals met	3 (1.8)
Change in patient medical status	2 (1.2)
Lack of patient interest	114 (67.9)
Patient barriers	1 (0.6)
Another health care member now managing patient	36 (21.4)
Medication discontinued	0 (0)
Patient expired	0 (0)
Other	2 (1.2)
No. of patients who reported vitals[b]	
Within 1 month of referral date	10 (6)
Within 6 months of referral date	10 (6)
UW Health outpatient pharmacy patients	9 (5.4)
Adherence packaging	1 (0.6)

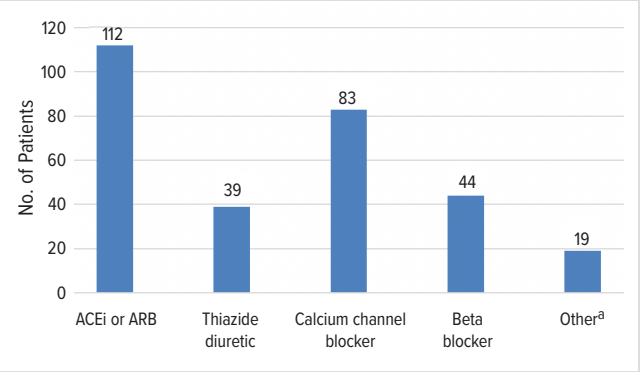
[a]One patient provided 2 reasons: clinical goals met and patient-stated goals met.
[b]Patients who recorded their blood pressure within 1 month differed from those who recorded at-home blood pressures within 6 months.

Patients were taking an average of 2 blood pressure medications (range 0-5). Angiotensin-converting enzyme inhibitors (ACEi) and angiotensin II receptor blockers (ARB) were prescribed most often, with 112 (66.7%) patients being on one of these two medications. Other frequently prescribed medications included calcium channel blockers (n = 83, 49.4%), beta-blockers (n = 44, 26.2%,), and thiazide diuretics (n = 39, 23.3%), as shown in Figure 4. Nineteen patients (11.3%) patients were on "other" medications for blood pressure control, including furosemide and spironolactone.

Exploratory Analysis

An exploratory analysis was conducted to evaluate how frequently patients with selected comorbidities were prescribed guideline-based medications (Table 4). This was done specifically to evaluate how frequently patients with type 2 diabetes and chronic kidney disease were prescribed ACEi or ARB therapy and how often patients with a history of myocardial infarction were on a beta blocker. The analysis found 33 patients (19.6%) had comorbid type 2 diabetes. Of those patients, 23 (69.7%) were not at their blood pressure goal. Furthermore, 4 (12.1%) patients with diabetes were not on an ACEi or ARB. The analysis also found that 50% (n = 10) of patients with chronic kidney disease were not on an ACEi or ARB. The study population included 9 (5.4%) patients who had a history of prior myocardial infarction, and 4 (44.4%) of these patients were not on a beta-blocker. Forty (23.8%) patients had documented white coat hypertension and 29 (70%) were not at their blood pressure goal. Eleven (6.5%) patients were not on any medications for blood pressure management, including 8 patients (72.7%) who were not at their blood pressure goal.

Figure 4. Blood Pressure Medicine Breakdown



Abbreviations: ACEi, angiotensin-converting enzyme inhibitor; ARB, angiotensin II receptor blocker.
[a]The most commonly prescribed "other" medications included furosemide or spironolactone; however, the specific indication of each medication on a patient's list was not assessed.

Table 4. Patient Comorbidities and Health Concerns

	n (%)
Diabetes	33 (19.6)
Coronary artery disease	13 (7.7)
History of myocardial infarction	9 (5.4)
Chronic kidney disease	20 (11.9)
Tobacco use	
Never used	77 (45.8)
Former use	62 (36.9)
Current use	29 (17.3)
Contraceptives	11 (6.5)

DISCUSSION

As inadequate blood pressure control can lead to cardiovascular, renal, and neurologic diseases, it is vitally important to achieve blood pressure goals in hypertension, the most prevalent modifiable risk factor. Pharmacists can play a key role in providing medication management to help patients achieve their clinical goal. The present study showed that the majority of this patient population had blood pressure goals that align with recommendations from the American Academy of Family Physicians (<140/90 mmHg). There were instances when "other goal" was selected by clinicians; this often included less than 135/85 mmHg (the middle of the 2 major blood pressure goals) or less than 150/90 mmHg, which was typically reserved for elderly patients. Despite less stringent blood pressure goals than recommended by the ACC/AHA guidelines, patients were still not meeting their blood pressure goals. The group of patients referred for pharmacist intervention (management) but who declined were seen, on average, twice a year by their primary care provider.

This study found that the major reason for disengagement from clinical pharmacy hypertension services was lack of patient interest, seen in over half of the patient population. One proposed reason for this is the misconception of the role of phar-

macists. Additionally, patients may or may not understand the training required to become a pharmacist or know the level of knowledge, skill, and expertise that pharmacists have regarding hypertension management. Furthermore, it is unknown to the authors if/how the referral to a pharmacist was brought up by health care providers. By ensuring the referring clinician optimally set expectations and defined pharmacist roles, patient understanding and participation may be improved. However, other barriers, such as lack of patient time, could also be confounding the results. To improve participation, aligning pharmacy visits on the same day as other appointments and/or having telehealth options could influence more patients to engage in pharmacy services. Evaluating the impact of patient perception of pharmacist roles and responsibilities via qualitative interviews, surveys, and focus group discussions will be a next step in addressing this further.

The Centers for Disease Control and Prevention and the Centers for Medicare and Medicaid Services have created a national initiative known as the Million Hearts Initiative to prevent 1 million heart attacks and strokes within 5 years.[13] This aims for 80% of US adults with hypertension to achieve blood pressure control with a blood pressure less than 140/90 mmHg. Yet, the rates of blood pressure control in this study were low, with only 33.9% (n = 57) patients at their blood pressure goal. This study noted that most patients are on blood pressure medications, and of those patients, the majority are prescribed first-line therapy options, such as ACEi/ARB, calcium channel blockers, and thiazide diuretics.[6,7] Per the 2017 ACC/AHA Hypertension Guidelines, secondary agents for hypertension management include loop diuretics, potassium-sparing diuretics, aldosterone antagonist diuretics, beta-blockers, direct renin inhibitors, alpha-1 blockers, central alpha-2 agonists, and direct vasodilators.[7] There were more patients on beta-blockers (n = 44, 26.2%) than expected in this patient population, as these are not first-line therapy recommendations. Beta-blockers have other indications for patients with comorbidities including history of myocardial infarction, atrial fibrillation, or history of hyperkalemia. Beta-blockers require less laboratory monitoring compared to ACEi/ARB or thiazides. This could influence practice patterns for patients with poor adherence to obtaining follow-up labs. The exploratory analysis showed that for patients with type 2 diabetes and/or chronic kidney disease, many currently are not on recommended therapy of an ACEi or ARB.

Limitations

In evaluating the demographics of disengaged patients, 27 (16%) self-identified as Black, 49 (29.2%) were insured by Medicaid, and 17 (10.1%) had no insurance. Although this study evaluated the demographic and insurance status of disengaged patients, these percentages are higher than seen in our site's city population (6.7% Black, 11.4% Medicaid insurance, 5.5% uninsured). An important future direction in this research is to compare demographic and comorbidity data from patients who engage with pharmacy services versus those who do not, to identify and target hypertension management in potentially vulnerable patient populations.

Clinic-reported blood pressure measurements were used to determine if a patient was or was not meeting their blood pressure goal. These measurements typically are performed using an automatic blood pressure cuff versus a manual reading for standardization. However, improper blood pressure measurement technique could confound results. One potential next step is to complete a qualitative study in which medical assistants, licensed practical nurses, and registered nurses who may by checking blood pressures are interviewed about technique and protocols they follow for elevated readings or other scenarios in order to improve standardization.

Another limitation of this study is that patient medication adherence was not assessed. Lack of adherence to medications would be a large contributing factor to inadequate blood pressure control. One future direction would be to evaluate medication adherence as a contributing factor to blood pressure not at goal and to assess if referrals to internal pharmacies or for pill packaging services improves adherence. Additionally, indications for each antihypertensive medication were not evaluated. Further analysis is needed to evaluate indication-based prescribing frequency in patients with hypertension in our study to better target blood pressure control to help achieve the Million Hearts Initiative.

CONCLUSIONS

The purpose of this initial retrospective study was to determine the primary reason for disengagement or declined referral from a primary care pharmacy antihypertensive service to guide future interventions. The results show the majority of patients who were referred but not engaged in pharmacy services are not meeting their blood pressure goal. The primary reason identified for disengagement was lack of patient interest. Targeting this patient population would allow for overall better blood pressure control for patients within the health system. Qualitative methods or differential recruiting strategies could help explore patients' perceptions of the pharmacy role and understand why pharmacy services were declined. Further study of this patient group is needed to allow them the same potential for improved outcomes seen with pharmacist interventions.

Funding/Support: None declared.

Financial Disclosures: None declared.

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