The Estimated Cost of the Provider's Recommended Follow-up Interval Visits on Patients with Controlled Hypertension at Teaching City Hospital

ABSTRACT

THE ESTIMATED COST OF THE PROVIDER'S RECOMMENDED FOLLOW-UP INTERVAL VISITS ON PATIENTS WITH CONTROLLED HYPERTENSION AT TEACHING CITY HOSPITAL

By

AGNESS MCHOME

APRIL 2020

Background:
Although the prevalence, treatment, and control of hypertension are well documented in the US, the medical annually costs of visits associated with controlled hypertension in local institutions and factors affecting the medical costs are not well studied. This study is designed to analyze the annual cost of visits for controlled hypertension treatment in the Primary Care Center at Grady Hospital in 2016-2017.

Methods:
Data (2016-17) were obtained from a retrospective chart review of all subjects with hypertension and diabetics using randomly selected providers in the Primary Care Center at Grady Hospital. Controlled hypertension was defined as all patients with blood pressure <140/90mmhg. Costs of visits were obtained from the. Medicare fee schedule (2016), and published literature. Univariate and multivariate regression analyses were used to determine odds of spending more on hypertension visits. In the multivariate analyses adjustments were made for age, sex, ethnicity, other comorbidities, acute issue, and having diabetics.

Results:
Seven hundred and twenty-five subjects from a sample of 835 were found to have controlled hypertension. Total per-person annual costs of treatment associated with controlled hypertension ranged from $ 102.98 to $411.92 in 2016-2017. Age of the participants, other comorbidities, more than one acute issue and, having diabetes were found to be the reasons for variation in annual costs of visits for hypertensive patients. Controlling for other clinical and demographic characteristics, patient's annual cost of visits differs among provider's level of training(p=0.001).

Conclusion:
Variations in annual costs of visits among several groups of hypertensive patients have been observed. Expansion of preventive services for other health issues that are associated with hypertension may be an effective way to alleviate the economic burden from the individual and national level.

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APPROVAL PAGE

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Author's Statement Page

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LIST OF TABLES

Chapter I-Introduction

1.1 Background

Chronic diseases, such as hypertension, diabetes, and cancer are the primary cause of morbidity, disability, and mortality worldwide. Hypertension causes an estimated 7.5 million deaths, about 12.8% of the total of all deaths globally [1,2]. It can lead to other health conditions and death. Health outcomes of hypertension may include Coronary artery disease, heart attack, congestive heart failure, stroke, kidney damage, vision loss, and erectile dysfunction in males. It is also one of the leading causes of mortality and mortality in the United States. According to the National Vital Statistics 2017 report, there are approximately 67 million adults who have hypertension, and deaths related to hypertension increased by 0.4% from the 2016 rate. [3]. Furthermore, it is estimated that the prevalence of hypertension will increase by more than 9%, or approximately 27 million additional people, from 2010 to 2030 [4]. Hypertension is a crucial public health problem that continues to be on the rise.

Hypertension requires regular long-term follow-up as a standard of medical care. About one-third of the primary care visits per year in the US are for follow up on chronic diseases such as hypertension (HTN) and Diabetic Mellitus (DM) [3]. Current guidelines recommend that patients be followed up within a month when high blood pressure is noted. Also, guidelines recommend follow-up intervals for patients with controlled hypertension be seen for regular follow-up at an interval of 3 to 6 months [5]. However, different literature shows that the intervals between provider-patient encounters are substantially longer than the recommended by guidelines.

The increasing prevalence of hypertension, hypertension follow-up visits, and hypertension-related health conditions continue to drive the cost of treatment upwards. In 2010, the Agency for Healthcare Research and Quality (AHRQ) reported that the direct medical expenditures related to hypertension rose from $42.9 billion nationwide per year to 45 billion

in direct medical costs in 2011 and medical expenditure due to primary care visits was estimated to be a $13.04 billion [6,7]. Increased concern regarding access to care combined with increasing pressure to curb healthcare costs has prompted health professionals to think about how best to manage chronic diseases. Evidence-based follow-up intervals have the potential to reduce healthcare costs per person and improve access without compromising or restricting care.

Hypertension is even more prevalent in high- risk populations (i.e., low- income patients, African Americans etc.) who tend to receive care at Primary health care centers [8]. Although trends in prevalence, treatment, and control of hypertension have been documented, costs associated with visits for hypertensive patients at primary care centers have not yet been evaluated. Thus, this project was serving as formative research to ascertain valid policy measures that will help develop local guidelines for recommended follow-up for patients with controlled hypertension in the primary care center for potential reduction of follow-up frequency, which will subsequently reduce the costs of treatment without compromising the outcome.

1.2 Research Aim

This main research objective is to estimate the costs of treatment for follow up visits for controlled hypertensive patients at the Primary Care Center at Grady. In order to achieve that broader objective, the researcher applied a retrospective chart review of all encounters for hypertensive of the randomly selected providers at the Primary Care Center at Grady Hospital from July 1St 2016 through June 30, 2017. Other specific objectives are:

- To estimate the annual cost of visits for recommended follow-up by providers for controlled HTN at the Primary Care Center at Grady.
- To investigate whether the annual costs of visits for controlled HTN differ among faculty and postgraduate resident students.
- To investigate factors that are associated with the difference in annual costs of visits treatment for controlled HTN

Chapter II-Literature Review

Hypertension defined

The 2016 American College of Cardiology/American Heart Association (ACC/AHA) Guideline for diagnosis and management of hypertension in adults provided updated blood pressure thresholds for defining hypertension and for the initiation of and goals of pharmacologic treatment of hypertension [9] This guideline, redefined hypertension as systolic BP ≥140 mm Hg or diastolic BP ≥90 mm Hg. The guideline further explains that the 2016 Guideline for High Blood Pressure in Adults Normal BP is defined as <120-129/<80-84 mm Hg; high normal BP 130-139/<85-89 mm Hg; hypertension grade 1 is 140-159/90-99-mm Hg, and hypertension grade 2 (moderate) 2 is ≥160-179/100-109 ≥9 mm Hg; grade 3 (severe) hypertension ≥180 and or ≥110 mmHg and Isolated systolic hypertension >140 and <90. These recommendations were based mainly on observational data reporting a linear association between BP and coronary heart disease, stroke, and death, even with BP levels as low as 120-129/80-89 mm Hg, [10,11,12] as well as the Systolic Blood Pressure Intervention Trial (SPRINT) which reported a reduction in major cardiovascular events with an intensive systolic BP target less than 120 mm Hg compared with less than 140 mm Hg.

CAUSES OF HYPERTENSION:

Genetic predisposition:

Genes likely play some role in high blood pressure, heart disease, and other related conditions. However, it is also likely that people with a family history of high blood pressure share typical environments and other potential factors that increase their risk. A combination of hereditary and unhealthy lifestyle may increase the risk of hypertension. [13]. CDC's Office of Public Health Genomics, Surgeon General, and other federal agencies developed a web-based tool to help families learn about their risk for hypertension that can run in families.

Environmental Risk Factors:

Various environmental exposures, like diet, physical activity, and alcohol consumption, influence high blood pressure. Many dietary components have been associated with high Blood pressure [14,15]. Other factors are diet-related associated with high blood pressure, including overweight and obesity, excess sodium intake, insufficient intake of potassium, calcium, magnesium, protein fiber, and fish fats. A combination of poor diet, physical inactivity, and alcohol intake is the underlying cause of a large proportion of hypertension.

Childhood Risk Factors and Hypertension Tracking.

Studies investigating the association between childhood high blood pressure and adult high blood pressure showed a correlation in the prediction of hypertension in adulthood [16]. With the inclusion of genetic factors and childhood obesity, premature birth has been associated with hypertension in adulthood, affecting mostly women [17,18,19]. Children with cardiovascular disease risk factors like high blood pressure, obesity, and diabetes, are more likely to have heart disease and stroke as adults.

HYPERTENSION AND CARDIOVASCULAR RISKS;

Hypertension has been associated with the risk factor for premature cardiovascular diseases [20], such as myocardial infarction and cerebrovascular diseases such as ischemic or hemorrhagic stroke. In addition to that, hypertension may lead to kidneys and eye complications. A cohort study of consisted of 1,316,363 participants, with 36,784,850 blood-pressure measurements examining the effects of systolic blood pressure and diastolic blood pressure independently found that high risk of myocardial infarction, ischemic stroke, or hemorrhagic stroke in both the lowest and highest deciles was high in diastolic blood pressure [21]. Although it has been proven that though systolic blood pressure indeed had a more

significant effect, systolic and diastolic blood pressures, each independently influenced cardiovascular outcomes, and therefore diastolic blood pressure ought not to be ignored.

HYPERTENSION STATISTICS IN THE US:

A cross-sectional study of a national representative sample of the noninstitutionalized civilian US population from the National Health and Nutrition Examination Survey (NHANES) 1999–2016 conducted by the National Center for Health Statistics (NCHS) of the US Centers for Disease Control and Prevention found that the total burden of hypertension has consistently increased [22]. However, the same report showed that there had been an improvement in hypertension prevalence from 1999 to 2016 among individuals aged ≥60 years, but not among other age groups. According to CDC, about half of adults in the United States (108 million, or 45%) have hypertension defined as a systolic blood pressure ≥ 130 mm Hg or a diastolic blood pressure ≥ 80 mm Hg or are taking medication for hypertension [23]. Additionally, in 2017 hypertension contributes to nearly half of million deaths in the United States.

HYPERTENSION MANAGEMENT AND TREATMENT:

The US Preventive Services Task Force and the American Academy of Family Physicians' hypertension screening are highly recommended to adults of age 18 and above to ensure a thorough insight into the health of even the most seemingly well individual [24]. When diagnosed with high blood pressure, a change of lifestyle is highly recommended; otherwise, drug therapy is needed. First-line medications used in the treatment of hypertension include diuretics, angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs), beta-blockers, and calcium channel blockers (CCBs) [25]. Some patients will require two or more antihypertensive medications to achieve their BP targets. In newly diagnosed patients with BP>20/10 mm Hg above goal [,26], antihypertensives or a combination

hypertensive may be added immediately. It is recommended that for side effects minimization, a second drug with a complementary mechanism of action should be added before the initial drug is used in the maximum recommended dosing.

HYPERTENSION TREATMENT COSTS.

In 2010, about 58.6 million persons or 25.1 percent of adults age 18 and older were treated for hypertension. Direct medical spending to treat hypertension totaled $42.9 billion in 2010, with almost half ($20.4 billion) in the form of prescription medications. Annual expenditures for those treated for hypertension averaged $733 per adult in 2010. [7]. The burden of treatment for people with hypertension also exceeds those without the disease. It was estimated that US adults with hypertension spend around $2000 more than those without hypertension [29]. Proper action to curb the costs should be taken to reduce public burden.

HYPERTENSION TREATMENT AT THE PRIMARY CARE CENTER AT GRADY

The Primary Care Center at Grady is the largest outpatient diabetes center in the Southeast, providing world-class diabetes care and education, one of the hypertensions and diabetics clinic serving the DeKalb and Fulton County residents. Routine medical follow-up for hypertensive patients is one of the services provided by faculties and Postgraduates medical residents, doctors in training for General Medicine. Estimating what might cost the patient to maintain their blood pressure level is essential for the policymaking and other public institutions. Could potentially benefit from having a target number of visits.

Chapter III-Methodology

3.1 Data Source and Sample:

A retrospective chart review of all encounters for hypertension and diabetic Mellitus of the randomly selected providers in the Primary Care Center at Grady Hospital from July 1St 2016 through June 30, 2017, was obtained to explore the cost of provider's recommended follow-up interval on patients with Hypertension at the Primary Care Center. Providers were randomly selected from the three clinics and Faculty practice from the Emory Primary Health primary that runs on Mondays, Wednesdays, Thursdays, and Fridays. Information on all patient's visits, patients' blood pressure level, provider's level of postgraduate training, and other demographic characteristics were obtained from the outpatient return visits at the Primary Care Center at Grady. The cost of visits was determined using the 2016 Medicare fee schedule. A comparison was made from the extracted literature form other similar studies. Patients with uncontrolled blood pressure will be excluded from the study (>140/90mmhg) and not well-documented were excluded because they need more frequent follow-up and will potentially engender reverse causality.

3:2 Eligibility Criteria:

All hypertensive patients with controlled blood pressure (< 140/90mmhg) who attended the Primary Care Center at Grady for the period of July 1St 2016, through June 30, 2017, for follow-up.

3:3 Dependent and primary independent variables.

The dependent variable of this study was the cost of a visit for controlled hypertension determined by using the 2016 Medicare fee schedule from the Center for Medicare and Medical Aid physician fee schedule. .The primary independent variable was providers' level of training: divided into Postgraduate Students Year 1 (PGY 1), year 2 (PGY 2), year 3 (PGY 3), and Faculty (PGY 4). In order to examine the unbiased association between the estimated cost of hypertension treatment and the provider's level of training, the following covariates were included in this study.

- Age was reported as the age in years of the participants at the time of the study. Subjects were distributed into five age categories: <40, 41 -50, 51-60, 61-70, 71 and above.

- The gender of the research participants was disaggregated as self-reported at the time of the hospital visit and was recorded as either male or female.

- Ethnicity/Race was coded into four categories: 1) African American 2) Caucasian 3) Hispanics 4) Others. The "Hispanic" category combined Mexican American and other Hispanic populations as one group, while the "Other" category combined multi-racial and other populations into one group.

- Insurance status of the participants was reported as Centers for Medicare and Medicaid Services (CMS), private, others or none. Insurance information of the participants was self-reported during their visits and obtained from a retrospective study from July 1, 2016, through June 30, 2017.

- Other patient's medical conditions including diabetes, BMI, other comorbidities, acute issues at the time of the visit, systolic and diastolic blood pressure, and whether the patient had both hypertension and diabetes was incorporated in the study because they may influence overall health cost of treatment by adding up numbers of hospital visits.

3.4: Statistical Analysis

Statistical Analysis System SAS® (SAS Institute Inc, Cary, NC, USA) software program version 9.4 was used for all data analyses. In the descriptive analysis, the frequency and means procedure was performed to provide the distribution of various demographic and clinical characteristics of the independent variables and covariates. Means procedure was used to calculate the annual range cost of hypertension visits.

The univariate statistical analysis procedure was used to determine factors that are associated with the difference in annual costs of visits treatment for controlled HTN at the Primary Care Center at Grady. Multivariate logistic regression analysis was performed, and the Wald test was used at an alpha level of 0.05 to determine if there is a significant difference in costs of treatment annually for controlled hypertensive patients when visiting either postgraduate medical residents or Faculty members at 95% Confidence interval (CI) controlling for other demographic and clinical characteristics of the patients.

Chapter IV-Results

4.1: Descriptive Statistics

Descriptive statistics were used to analyze participant characteristics of the sample population. The basic demographic and clinical characteristics of the sample population with controlled hypertension are shown in Table 1. Between July 1, 2016, through June 30, 2017, a total of 835 respondents, of whom 725 (86.83 %) had controlled hypertension, attended the Primary Care Center at Grady. In the Sample, 489 (67%) of participants were female, while 236 (32.5%) of the remaining individuals were male. Black individuals accounted for 89.9% (N=652) of the cases, versus 3.9% of Caucasians, and 4.8% (N=35) were Hispanic. Among controlled hypertensive patients, 75.9 % (N=550) had diabetes compared to 24.1% (N=175) of those who did not have diabetes. Total per-person annual costs of visits associated with controlled hypertension ranged from $ 102.98 to $ 411.92 between 2016-2017.

Table 2 shows the demographic and clinical characteristics of the sample population stratified by provider's level of training. Hypertensive patients who were seen by faculty members and postgraduate medical residents had age range 56.3 ± 59.5 for PGY1, 57.7 ± 60.6 for PGY2, 58.8 ± 61.8 for PGY 3, 59.1 ± 60.7 for faculty members. Patients had at least two comorbidities other than diabetes, had diabetics and acute issues. Ethnicity, body mass index, sex, AIC, POCT results, Acute Issues, diastolic, and systolic blood pressure were statistically significant (p= <.0001) across four levels of education.

4.2: Univariate Analysis

Results revealed a statistically significant difference between the annual cost of a visit for controlled hypertension patients and some of the participants' demographic and clinical characteristics (Table 2). Individuals who had diabetes were 2 (5%Cl:1.1-2.3) times more likely to pay more on visits annually when compared to their non-diabetic counterparts. Age (>40 years) showed an increased odd of paying more on visits annually on hypertension management with an odds ratio of 3.1 (95%Cl:1.5-6.2). Other age categories showed a decreased odd of spending more than the national average costs of hypertension treatment. Participants with comorbidities who had controlled hypertension were 3.6(95%CI: 1.5-8.4) times more likely to pay more on visits annually on treatment when compared to the referenced "No" group. When using more than one acute issue as a predictor of paying more on visits annually, individuals who had more than one acute issue had an odds ratio 2.7 (95%Cl:1.9-3.8 and level of training, sex, insurance status did not show any statistical significance.

4.3: Multivariate Analysis

Table 3 shows the multivariable analysis of the association between the participants' characteristics and the annual cost of visits for controlled hypertension treatment. After adjusting for age, gender, insurance status, diabetics, acute issues, comorbidities, and ethnicity, provider level of postgraduate level, PGY 2, showed indication of 2.4 increased odds (95%Cl:1.9-9.0, p=0.001) of the difference in annual costs of visits for controlled HTN among faculty and postgraduate resident students. Comorbidities other than diabetes, odds ratio= 6.0 (95%Cl:1.2-20.1, p=0.0002) showed indication of an increased odds of the difference in annual costs of visits for controlled HTN among faculty and postgraduate resident students when compared to individuals who had no comorbidities. Diabetics, odds ratio= 2.0 (95%Cl:1.1-2.3) showed an indication of an increased odds of the difference in annual costs of visits for

controlled HTN among faculty and postgraduate resident students when compared to their non-diabetic counterparts. Similarly, acute issues OR=6.0 (95%Cl:1.2-20.1, p=0.0002) indicated an increased odd of the difference in annual costs of visits for controlled HTN among faculty and postgraduate resident students when compared to an individual who had no acute issues.

Chapter V-Discussion

5.1: Discussion:

The purpose of this research was to estimate costs of visit for controlled hypertensive patients at the Primary Care Center at Grady using a retrospective chart review of all encounters for hypertensive and diabetic patients of the randomly selected providers in the Primary Care Center at Grady Hospital from July 1St 2016 through June 30, 2017. Overall the results of the study suggest that there is variation in the annual cost of visits for hypertension treatment. Multivariate analysis revealed that they might be visiting the clinic more often due to pre-existing conditions like the presence of other diseases such as diabetes, age, and acute conditions. This study also shows that hypertension-related health costs rise as the age of the person (2.3 (95%Cl:1.5-3.6). Variation in costs of payment was observed between patients who visited providers with different levels of education. The results showed that the annual per-person annual cost of treatment for control hypertension ranged from $102.98 - $411.92.

Most studies estimating the cost of treatment for hypertensive patients focus on national surveys instead of local institutions. A similar study conducted in 2011 found that the annual recommended care costs for visits were $177 annually, a slight difference from what this study estimated [28]. The difference could be explained by the difference in Medicare and Medicaid charged for visits. Additionally, consistent with findings in this study, the study explained that there was variation in the costs of visits that could be explained by the severity of hypertension

and the presence of other illnesses. Another study focusing on the annual hospital outpatient cost of treatment in 2018 also found that the incremental cost of outpatient treatment was mainly caused by individual comorbid conditions [29]. Additionally, as adults live longer with hypertension, they are likely to be diagnosed with other comorbid illnesses, such as congestive heart failure or renal disease.

5.2: Strengths and Limitations

The study herein provides updated estimates of the costs of visits at the health facility level and demonstrate the reasons for variation in costs of visits. The study used the physician fee schedule search from the Centers for Medicare & Medicaid services for the year 2016 for a more accurate cost of a visit for the Atlanta area. Additionally, the study used actually recommended visits by providers for controlled hypertension patients making an estimation of the cost of treatment more accurate. Despite these notable strengths, we did not have information on medications, emergency visits, inpatient costs, and other services for outpatients' visits for a broader evaluation of costs of treatment

5.3: Implication:

Provider level of training PGY 2, showed an indication of 2.4 increased odds (95%Cl:1.9-9.0, p=0.003) of spending more than the national annual average cost of hypertension management (Table 4). Costs of hypertension treatment vary substantially across patients within each outcome category.

5.4: Conclusion and Future Recommendations:

The ultimate solution to reduced medical care costs in cutting down unnecessary visits to the doctor, especially for people with uncontrolled hypertension. Addressing this problem should be tailored through educating health providers on the importance of reduced unnecessary hospital visits, especially for patients with controlled hypertension and without any other underlying health problems. In order to implement effective hypertension management or behavioral change interventions to keep their blood pressure under control. Understanding these variations in the group of patients who spend more on keeping their blood pressure level under control is of utmost importance. Expansion of preventive and treatment services for other health issues that are associated with hypertension may be an effective way to alleviate the economic burden from the individual and national level It is essential to identify effective interventions and investigate reasons for paying more than the national average cost of hypertension treatment when visiting on PGY 2 providers to improve hypertension and cost-effectively prevent hypertension complications.

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Tables

Table 1: Patients demographics and Clinical Characteristics of Study Population with Controlled Hypertension at Emory Primary Health Center at Grady, 2016-2017

Patients demographics	N (%) 725= (86.8)
Age <40 41-50 51-60 61-70 >70	 35(4.8) 92(12.7) 243(33.5) 235(32.4) 120(16.6)
Sex Female Male	 489(67.5) 236(32.5)
Ethnicity Black Caucasian Hispanic Other	 652(89.9) 28(3.9) 35(4.8) 10(1.4)
Insurance None CMS Private	 223(30.8) 381(52.6) 121(16.7)
Providers Faculty PGY1 PGY2 PGY3	 10 183(32.1) 212(37.2) 175(30.7
Diabetic patients Yes No	 550(75.9) 175(24.1
Comorbidities Yes No Missing	 690(95.2) 21(2.9) 14(1.9)
Cost of treatment	**$102.98 - $ 411.92**

Abbreviations:

PGY 1Postgraduate year 1
PGY 2 Postgraduate year 2
PGY 3 Postgraduate year 3
Bold Annual per person cost of hypertension treatment (range)

Table 2. Basic Clinical and demographic characteristics of the study population:

Variable	***PGY 1 (n=12)***	***PGY 2 (n=12)***	***PGY 3 (n=12)***	***Faculty (n=10)***	***P-value***
Age (years)	56.3 ± 59.5	57.7 ± 60.6	58.8 ± 61.8	59.1 ± 60.7	<.0001
A1C	7.1± 12.1	7.3 ± 7.5	6.9 ± 7.5	5.9 ± 11.3	<.0001
Diabetics	0.7 ± 0.8	0.7 ± 0.8	0.7 ± 0.8	0.7 ± 0.8	<.0001
POCT results	67.3 ± 117.5	78.8 ± 113.9	69.5 ± 108.1	68.5 ± 108.7	<.0001
Comorbidities	1.8 ± 1.9	1.8 ± 1.9	1.8 ± 2.0	1.9 ± 2.0	<.0001
Acute Issues	0.4 ± 0.6	0.3 ± 0.6	0.3 ± 0.5	0.4 ± 0.6	<.0001
Body mass index (kg m-2)	30.2 ± 79.53	27.4 ± 52.3	29 ± 63.3	36.0 ± 55.7	<.0001
Diastolic blood pressure (mmHg)	74.89 ± 78.1	73.4 ± 76.4	74.6± 77.3	74.2± 75.2	<.0001
Diastolic blood pressure (mmHg)	131.4 ± 137.4	130.2 ± 134.1	132 ± 137.2	132.2 ± 134.7	<.0001
Both diabetes and hypertension	0.5 ± 0.8	0.6 ± 0.7	0.5 ± 0.7	0.6 ± 0.7	<.0001

Abbreviations:
A1C Test used to diagnose type2 and 2 diabetics
POCT Point of Care Testing
PGY 1Postigraduate year 1
PGY 2 Postgraduate year 2
PGY 3 Postgraduate year 3

Table 3. Univariable analysis for the costs of visits and other demographic and clinical characteristics for controlled hypertension.

Participants Characteristics	**OR (95% CL)**
Postgraduate year	
PGY1	**4.1(2.7-6.1)**
PGY2	**2.9 (2.0-4.3)**
PGY3	**3.8 (2.6-5.9)**
Faculty	Referent
Age	
<40	**3.1 (1.5-6.2)**
41-50	**3.0 (1.8-4.9)**
51-60	**2.7(1.8-4.0)**
61-70	**2.2(1.5-3.3)**
>71	Referent
Sex	
Female	0.7 (0.5-0.9)
Male	Referent
Insurance Status	
No cover	2.0(1.3-3.0)
CMS	1.0(0.7-1.5)
Private	Referent
Diabetes	
Yes	**2.0 (1.1-2.2)**
No	Referent
Comorbidities	
Yes	**3.6 (1.5-8.4)**
No	Referent
Acute Issues	
Yes	**2.7 (1.9-3.8)**
No	Referent

Abbreviations:
PGY 1Postigraduate year 1
PGY 2 Postgraduate year 2
PGY 3 Postgraduate year 3

Bold indicates that the findings is significant at α=0.05 ($p < .05$)

Table 4: Multivariate analysis for the costs of visits and other demographic and clinical characteristics for controlled hypertension

Independent variables	OR (95% CL)	P-value
Postgraduate year		
PGY1	0.9 (0.9-1.0)	0.7
PGY2	**2.4(1.9-9.0)**	**0.001**
PGY3	0.9(0.7-1.6)	0.2
Faculty	Referent	Referent
Age		
<40	0.3 (0.1-1.3)	0.3
41-50	0.7 (0.4-1.5)	0.2
51-60	0.8 (0.5-1.4)	0.8
61-70	0.9 (1.2-2.6)	0.9
>71	Referent	Referent
Sex		
Female	0.2(1.0-3.0)	0.3
Male	Referent	Referent
Insurance Status		
No cover	0.7(0.5-1.3)	0.2
CMS	0.3 (0.0-2.5)	0.4
Private	Referent	Referent
Diabetes		
Yes	**2.0 (1.1-2.3)**	**0.0003**
No	Referent	Referent
Comorbidities		
Yes	**6.0 (1.2-20.1)**	**0.0002**
No	Referent	Referent
Acute Issues		
Yes	**4.0 (2.0-7.0)**	**0.001**
No	Referent	Referent

Abbreviations:
PGY 1Postigraduate year 1
PGY 2 Postgraduate year 2
PGY 3 Postgraduate year 3

Bold indicates that the findings are significant at $\alpha=0.05$ ($p< .05$)