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The Association between Self-Reported Medication Adherence Scores and Systolic Blood Pressure Control: A SPRINT Baseline Data Study

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Abstract

We examined baseline data from the Systolic Blood Pressure Intervention Trial (SPRINT) to investigate whether medication adherence, measured by the Morisky Medication Adherence Scale (MMAS-8), was associated with systolic blood pressure (SBP), and whether MMAS-8 score and number of antihypertensive medications interacted in influencing SBP. 8,435 SPRINT participants were included: 21.2% had low adherence (MMAS-8: <6); 40.0% had medium adherence (6 to <8); and 38.8% had high adherence (8). SBP was <140 mmHg in 54.6%; 140 – 160 mmHg in 36.6%; and >160 mmHg in 8.8%. In multivariable regression, medium vs. low adherence weakly associated with lower SBP (OR: 1.17, CI: 1.04, 1.31). SPRINT eligibility criteria should be considered when interpreting results. Efforts to understand and enhance adherence are crucial to improve population health and using self-report instruments might be considered for predicting treatment adherence and response in future efficacy trials and for identifying patients for adherence support in clinical practice.

Keywords

Medication adherence; MMAS-8; systolic blood pressure; hypertension; clinical trial

INTRODUCTION

Medication non-adherence is a common problem and is one of the contributing factors to inadequate blood pressure control.[1-5] A recent review of non-adherence also underscored the link to complications of hypertension and suggested routine screening.[6] In addition, low medication adherence has been shown to be associated with adverse safety events.[7] Several factors can influence patient medication adherence, such as complexity of regimen including number of medications; lack of knowledge about the disease; and medication side effects, including their impact on quality of life.[8]

The 8-item Morisky Medication Adherence Scale (MMAS-8) is an 8 question self-reported instrument that has proven to be a valid and reliable assessment tool for adherence. It provides information about situational factors that may act as barriers to medication adherence. Items on the scale reflect potential etiologies for non-adherent behavior, such as side effects and forgetfulness, with scores indicating low, medium or high adherence.[9] The Systolic Blood Pressure Intervention Trial (SPRINT) included administration of the MMAS-8 at the baseline visit, and at the 12-month and 48-month followup.[10] We performed a cross-sectional analysis of the SPRINT baseline data to investigate whether participants' baseline MMAS-8 scores are associated with baseline systolic blood pressure (SBP) control prior to intervention, whether there is internal consistency of this association across groups defined by gender, ethnicity, and the SPRINT subgroups [chronic kidney disease (CKD) and Senior (≥75 year-old)], and whether there is an interaction between MMAS-8 score and number of antihypertensive medications in predicting SBP control.

METHODS

We conducted a cross-sectional examination of the SPRINT baseline data. The trial design has been described previously.[10] In brief, SPRINT is a multicenter, randomized, controlled trial that compared cardiovascular outcomes, including myocardial infarction, acute coronary syndrome, stroke, heart failure, and cardiovascular death between groups with two different systolic blood pressure (SBP) goals: <120 versus <140 mm Hg. All participants were aged 50 years or older with SBP ≥ 130 mm Hg and with or at increased risk for cardiovascular disease (CVD). A full list of exclusion criteria has been published[10]; major exclusions included diabetes mellitus, 24-hour urine protein ≥ 1g/day, previous stroke, and adherence concerns. There were also specific inclusion criteria for SBP linked to the number of anti-hypertensive medications a participant was taking at baseline: 130-150 mmHg on 4 medications, 130-160 mmHg on 3 medications, 130-170 mmHg on 2 medications, and 130-180 mmHg on zero or 1 medication; patients on more than 4 antihypertensives were excluded.

Sample Population

We included in the analysis all participants enrolled in the SPRINT trial with the following available baseline data: demographics, comorbidities, Morisky Medication Adherence Scale (MMAS-8) score, number of medications at start of trial (baseline visit), and SBP. We excluded participants who were not taking any BP medications at baseline and those who had a missing or incomplete baseline MMAS-8.

Predictor Variable: Medication Adherence

Medication adherence was measured using the validated 8-item Morisky Medication Adherence Scale (MMAS-8), which is a self-reported questionnaire intended to measure medication adherence by providing information about behavioral and psychological factors that may act as barriers to medication adherence (Appendix). Items on the scale reflect potential reasons for non-adherent behavior, such as side effects, forgetfulness, and inconvenience. In the present study, participants were asked about medication adherence to anti-hypertensive agents prior to the SPRINT trial randomization. The MMAS-8 is scored as an ordinal measure with scores ranging from 0 to 8. It is categorized with a score of <6 indicating “low adherence”, 6 to <8 “medium adherence,” and 8 “high adherence” based on previously published definitions.[9]

Primary Outcome: Systolic Blood Pressure Control

The primary outcome of interest was SBP control at baseline. Analyses were performed with SBP control as an ordinal categorical variable: SBP <140 mm Hg (controlled), SBP 140-160 mm Hg, and SBP >160 mm Hg based on current guidelines.[11-13] As outlined in the SPRINT design, all blood pressure data were collected using an OMRON blood pressure cuff (Model 907XL, Omron Healthcare, Lake Forest, IL), by trained research coordinators. Three blood pressures were collected after the participant was sitting quietly alone and unobserved for 5 minutes and were averaged.[10]

Covariates

Covariates were selected *a priori* on the basis of clinical significance and included gender, race, ethnicity, age (≥75 years old versus <75 years old), education level, and comorbidities that might affect either SBP or its management: atrial fibrillation/flutter; heart attack; congestive heart failure; peripheral vascular disease; total number of comorbidities; number of hypertension medications; CVD history; CKD; and tobacco use.

Statistical Analysis

Descriptive statistics for the sample were presented as frequencies and percentages or means and standard deviations. Participant characteristics were reported for the three levels of the MMAS-8: low, medium, and high – using the Chi-square or Fisher's Exact test for categorical variables and analysis of variance for continuous variables. Participant characteristics were similarly reported for the three levels of SBP control, along with their bivariate associations. Unadjusted and adjusted analyses using ordinal logistic regression models were used to produce odds ratios, 95% confidence intervals, and p-values, describing the relationship between MMAS-8 score category and SBP control. The score test for the proportional odds assumption was non-significant, indicating that the ordinal logistic model was appropriate.

In addition, interaction effects between number of medications, senior subgroup (≥75 years vs <75 years), race/ethnicity, and CKD, each with MMAS-8 score, on SBP control as the outcome were assessed using the Wald Chi-square test. As none of the interaction effects reached a level of statistical significance ($p < 0.1$), all interaction terms were removed and the final adjusted model included only main effects. All analyses were performed using SAS version 9.4 (Cary, NC), and a 2 sided p-value of <0.05 was considered statistically significant.

RESULTS

There were 8,435 participants who met criteria for inclusion from the SPRINT trial database, from a total 9,361 included in the SPRINT trial. Of the 926 (9.9%) excluded individuals, 861 were not taking any BP medication at baseline and the remainder, 65, had a missing or incomplete baseline MMAS-8.

Low Adherence was observed in 21.2% of participants (N=1788), while 40.0% (N=3372) had Medium Adherence and 38.8% (N=3275) had High Adherence. Participants were predominantly male (63.4%), less than age 75 years (71.1%), Non-Hispanic White (56.8%), and with at least some post high school education (73.9%) (Table 1). Higher adherence was more common among men, participants aged ≥ 75 years, and those with higher levels of education, atrial fibrillation, CVD, and CKD. Higher adherence was less common among African Americans and current cigarette smokers. Participants who reported higher adherence reported a greater number of physical comorbidities, and a lower number of mental health comorbidities. The number of blood pressure lowering medications was not associated with adherence (Table 1).

Blood pressure was controlled (baseline SBP < 140 mmHg) in 54.6% of participants (N=4,606); 36.6% (N=3,087) had baseline SBP 140 –160 mmHg; and 8.8% (N=742) had SBP > 160 mmHg (Table 2). Blood pressure control was more common among those reporting higher adherence and those taking more blood pressure lowering medications. Blood pressure control was also more common among men, those with greater education, and with history of heart attack. Participants with controlled blood pressure reported a greater number of mental health comorbidities (Table 2).

Baseline blood pressure lowering medication use in the 8435 participants prescribed at least one antihypertensive medication, overall and by adherence status, may be found in Table S1. The number of other concurrent medications (non-antihypertensive) was also assessed by adherence status: Overall (3.65 ± 2.7), Low (3.25 ± 2.7); Medium (3.74 ± 2.8); High (3.79 ± 2.8) ($p<.0001$).

In unadjusted analysis, there was a statistically significant association between better adherence and better blood pressure control (Table 2). With multivariable adjustment, this relationship persisted. Compared to participants with Low Adherence, those with Medium but not High Adherence were more likely to have SBP <140 mmHg (OR: 1.17, 95% CI: 1.04, 1.31 and 1.10, CI: 0.98, 1.24, respectively, Table 3). Women, Seniors, and participants with less education or a history of heart failure had less well controlled blood pressure. Participants taking more blood pressure lowering medications, and those with a history of heart attack or more mental health comorbidities had better blood pressure control.

The interaction between the MMAS-8 adherence levels and the number of blood pressure lowering medications on SBP control was assessed and found to be non-significant ($p=0.3220$). Interaction effects of MMAS levels of adherence with gender, age (Senior subgroup), race/ethnicity, and chronic kidney disease were tested. None reached significance at $p<0.05$ (interaction p-values ranging from 0.10 to 0.66).

DISCUSSION

The aim of this study was to determine whether medication adherence as measured by MMAS-8 scores at baseline was associated with baseline SBP control and whether there was internal consistency of this association across groups defined by gender, race/ethnicity, and the SPRINT subgroups: CKD and Senior (age ≥ 75 years). A second aim was to evaluate whether there was a significant interaction between MMAS-8 scores and number of antihypertensive medications in their associations with SBP control. We hypothesized that there would be a significant association between adherence and SBP control, and that in patients taking a greater number of antihypertensive medications, the MMAS-8 score might be less strongly associated with SBP control. Whereas we observed associations between blood pressure control and both adherence and the number of blood pressure lowering medications, the hypothesized interaction was not observed. This finding is in contrast to studies that have found worse adherence and resultant blood pressure control in those taking greater numbers of medications.[6, 14]

Assessment of medication adherence is difficult. Direct methods include urine and blood assays of medication metabolites, as well as physical observation. The former method is limited due to availability, cost constraints, and protocol issues making it impractical in long-term studies as well as clinical practice, while the latter may be prohibitively time and cost intensive.[15-17] Indirect methods include self-report, pill counts, prescription refill rates, and electronic monitoring – all of which require time and resources.[18-20] Of the aforementioned, self-reporting is the most convenient, and therefore most commonly used method. The MMAS-8 has been deemed valid as an assessment tool which is focused on behavioral determinants of adherence to antihypertensive regimens, and is a commonly utilized instrument.[21-24] It is a parsimonious set of items which measure both unintentional and intentional reasons for non-adherence. In addition, a recent study examining the validity and reliability of antihypertensive adherence questionnaires deemed the MMAS-8 to be the most effective in terms of "sensitivity, specificity, positive predictive value, and negative predictive value, while maintaining acceptable validity and reliability".[21] The latter was defined with use of Cronbach's alpha, a frequently used estimate of the reliability of questionnaires, with "excellent" results defined by a value of ≥ 0.9, "good" $0.9 > \alpha \geq 0.8$, "acceptable" $0.8 > \alpha \geq 0.7$, and $0.5 > \alpha$ "unacceptable".[25] For the MMAS-8, Cronbach's alpha was calculated to be 0.83.[21]

We found that better medication adherence as measured by MMAS-8 was weakly associated with better baseline SBP control prior to intervention in SPRINT. Better blood pressure control was more common in the Medium Adherence group but was only marginally more common in the High Adherence group than in the Low Adherence group. There was no significant interaction between MMAS-8 and gender, race/ethnicity, and the SPRINT subgroups: CKD and Senior (age $\geq$ 75 years), in associations with SBP control. In addition, there was no significant interaction between MMAS-8 and the number of antihypertensive medications in their associations with SBP control. Regarding the latter finding, it is important to consider the following factors. Patients selected for participation in SPRINT did not represent a random sample with respect to SBP and anti-hypertensive medications. Whereas the baseline SBP values were not constrained in SPRINT, the eligibility criterion for SBP at screening was 130 to 180. Furthermore, those with higher baseline BP were excluded unless the number of antihypertensive medications being taken at the time of screening was relatively low. Those with SBP between 170 and 180 mm Hg could have been taking only 1 hypertension medication, those between 160-170 mm Hg up to 2 medications, and those between 150-160 mm Hg up to 3 medications; while those with SBP between 130-150 mm Hg could have been taking up to 4 hypertension medications. [10] Also excluded were those with history of poor adherence with medications or clinic visits, and those with medical, psychiatric or behavioral factors that in the opinion of the principal investigator might interfere with study participation or ability to adhere to the intervention program. Taken together, such conditions could be expected to weaken the ability to observe a relationship between medication adherence, number of antihypertensive medications, and SBP control in SPRINT. Nevertheless, these results add to the understanding of antihypertensive medication adherence and its link to SBP control.

Certain limitations are notable. SPRINT was a randomized, controlled, open-label trial conducted at 102 sites throughout the U.S. and Puerto Rico.[10] This large diverse cohort of

9,361 individuals includes 36% female and 42% non-white, which is enriched with 2636 participants aged ≥75 years and 2646 with CKD. SPRINT was not designed to test the relationship between medication adherence and BP control. Inclusion and exclusion criteria identified a trial population to ensure adequate event rates for statistical power, provide maximum generalizability, safety, and protocol implementation; these eligibility requirements facilitated a population at high risk for the major trial endpoints. Also excluded were patients with diabetes, polycystic kidney disease, stroke, proteinuria in excess of 1g/day, eGFR <20 mL/min/1.73m^2, any organ transplant, those in nursing homes, those with clinical diagnosis of dementia at baseline, those with secondary hypertension, and baseline standing orthostatic hypotension of concern (one minute standing BP <110). Generalizability is compromised with respect to these excluded groups. Another limitation relates to use of survey data. Even though, as noted previously, the MMAS-8 has been judged valid and reliable, nevertheless, relevant factors that may influence the accuracy of the MMAS-8 include individuals' tendencies for recall bias, overestimation of adherence, and pursuit of socially acceptable responses.[9] It should be noted that the current study reflects baseline data collected prior to the SPRINT trial randomization. Thus, the closer personal attention and motivation that are intrinsic to participation in research would not have influenced these results. Options for monitoring medication adherence, including drug serum and urine metabolite levels, physical observation, electronic monitoring, pill counting, and pharmacy fill rates, are cumbersome and otherwise fraught with their own weaknesses.[6] We are aware that use of multiple measures of adherence may enhance validity; however, we judged that we did not have the resources required to incorporate other assessments of adherence at baseline in SPRINT. Selection bias must be considered, insofar as those individuals with history of poor adherence with medications or clinic visits, and those with medical, psychiatric or behavioral factors that in the opinion of the principal investigator might interfere with study participation or ability to adhere to the intervention program were excluded from participating in this trial. The latter would tend to constrain our variance in adherence, decreasing the likelihood of detecting associations. Finally, we noted that selection criteria for SPRINT did not allow for a representative population with respect to numbers of antihypertensive medications and SBP, a condition that could be expected to weaken the ability to detect a relationship between SBP control, number of antihypertensive medications, and medication adherence at baseline.

Higher medication adherence, assessed by MMAS-8, was weakly associated with better SBP control in SPRINT. SPRINT eligibility criteria should be considered when interpreting these findings: individuals with SBP <130 were excluded; likewise, the high end of the SBP range was constrained differentially by the number of baseline medications. These trial features restricted the range of SBP observed, reducing variation and hence power to detect an association of adherence with SBP control. Assessment of adherence is challenging in research and practice settings; nevertheless, we believe that efforts to understand and enhance adherence are critical to improve population health; use of parsimonious self-report instruments such as the MMAS-8 might be considered for predicting treatment adherence and response in future efficacy trials and for identifying patients for adherence support in clinical practice.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Appendix

Appendix 1

Morisky Medication Adherence Scale as Included in the Sprint Trial.

Question	Response Options
1. Do you sometimes forget to take your high blood pressure pills?	Yes
	No
2. Over the past 2 weeks, were there any days when you did not take your high blood pressure medicine?	Yes
	No
3. Have you ever cut back or stopped taking your medication without telling your doctor because you felt worse when you took it?	Yes
	No
4. When you travel or leave home, do you sometimes forget to bring along your medications?	Yes
	No

Question	Response Options
5. Did you take your high blood pressure medicine yesterday?	Yes
	No
6. When you feel like your blood pressure is under control, do you sometimes stop taking your medicine?	Yes
	No
7. Do you ever feel hassled about sticking to your blood pressure treatment plan?	Yes
	No
8. How often do you have difficulty remembering to take all your blood pressure medication?	Never
	Almost Never
	Sometimes
	Quite Often
	Always

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Highlights

- Medication adherence was measured at baseline in SPRINT.
- Twenty-one percent had low, 40% had medium, and 39% had high adherence.
- Systolic blood pressure was <140 in 55%, 140–160 in 37%, and >160 in 9%.
- Baseline adherence and systolic blood pressure were weakly associated.
- No interaction between adherence and number of antihypertensive meds on systolic blood pressure control.

Table 1

Baseline Demographic and Personal Characteristics and their Association with the Morisky Medication Adherence Scale - mean ± SD or frequency (col %)

Characteristic	Overall n=8435	Low Adherence n=1788 (21.2%)	Medium Adherence n=3372 (40%)	High Adherence n=3275 (38.8%)	p-value *
Gender					0.021
Female	3086	704 (39.4)	1215 (36)	1167 (35.6)	
Male	5349	1084 (60.6)	2157 (64)	2108 (64.4)	
Age					<.0001
≥ 75 (Senior)	2430	346 (19.4)	994 (29.5)	1090 (33.3)	
< 75	6005	1442 (80.6)	2378 (70.5)	2185 (66.7)	
Race/Ethnicity					<.0001
Non-Hispanic White	4799	723 (40.4)	1997 (59.2)	2079 (63.5)	
Black/African American	2574	816 (45.6)	988 (29.3)	770 (23.5)	
Hispanic	910	209 (11.7)	325 (9.6)	376 (11.5)	
Other	152	40 (2.2)	62 (1.8)	50 (1.5)	
Education					<.0001
Less than High School	817	214 (12)	327 (9.7)	276 (8.4)	
High School Graduate/GED	1383	317 (17.7)	540 (16)	526 (16.1)	
Post High School	2988	690 (38.6)	1185 (35.1)	1113 (34)	
College Degree	3246	567 (31.7)	1320 (39.1)	1359 (41.5)	
Atrial Fibrillation/Flutter (vs no)	719	117 (6.5)	283 (8.4)	319 (9.7)	0.0005
Heart Attack (vs no)	727	136 (7.6)	313 (9.3)	278 (8.5)	0.12
Congestive Heart Failure (vs no)	316	77 (4.3)	121 (3.6)	118 (3.6)	0.37
Peripheral Vascular Disease (vs no)	463	103 (5.8)	204 (6)	156 (4.8)	0.059
Number of Comorbidities					
Physical (out of 38)	4.5 ± 2.6	4.31 ± 2.6	4.55 ± 2.7	4.56 ± 2.6	0.0042
Mental (out of 6)	0.4 ± 0.8	0.55 ± 1.0	0.38 ± 0.8	0.34 ± 0.7	<.0001
Number of HTN Medications					0.60
1	2673	587 (32.8)	1050 (31.1)	1036 (31.6)	
2	3255	693 (38.8)	1302 (38.6)	1260 (38.5)	
>2	2405	484 (27.1)	979 (29)	942 (28.8)	
CVD History (vs no)	1781	343 (19.2)	753 (22.3)	685 (20.9)	0.029
Chronic Kidney Disease (vs no)	2514	449 (25.1)	1044 (31)	1021 (31.2)	<.0001
Tobacco use					<.0001
Never/Former	7378	1425 (79.7)	2995 (88.8)	2958 (90.3)	
Current	1050	360 (20.1)	376 (11.2)	314 (9.6)	

* P-value from Chi Square test or Fisher's Exact Test for categorical variables and simple logistic regression for continuous variables

Table 2

Baseline Demographic and Personal Characteristics and their Association with Systolic Blood Pressure - mean ± SD or frequency (row %)

Characteristic	SBP<140 mmHg n=4604 (54.6%)	SBP 140-160 mmHg n=3087 (36.6%)	SBP>160 mmHg n=742 (8.8%)	p-value*
MMAS				0.015
Low Adherence	949 (53.1)	655 (36.6)	184 (10.3)	
Med Adherence	1894 (56.2)	1187 (35.2)	291 (8.6)	
High Adherence	1763 (53.8)	1245 (38.0)	267 (8.2)	
Gender				<.0001
Female	1522 (49.3)	1196 (38.8)	368 (11.9)	
Male	3084 (57.7)	1891 (35.3)	374 (7.0)	
Age				<.0001
≥ 75 (Senior)	1154 (47.5)	1000 (41.2)	276 (11.4)	
< 75	3452 (57.5)	2087 (34.8)	466 (7.8)	
Race/Ethnicity				0.47
Non-Hispanic White	2646 (55.1)	1747 (36.4)	406 (8.5)	
Black/ African American	1408 (54.7)	926 (36.0)	240 (9.3)	
Hispanic	474 (52.1)	356 (39.1)	80 (8.8)	
Other	78 (51.3)	58 (38.2)	16 (10.5)	
Education				0.021
Less than High School	413 (50.6)	311 (38.1)	93 (11.4)	
High School Graduate/GED	754 (54.5)	499 (36.1)	130 (9.4)	
Post High School	1615 (54.1)	1112 (37.2)	261 (8.7)	
College Degree	1824 (56.2)	1164 (35.9)	258 (8.0)	
Atrial Fibrillation/Flutter	386 (53.7)	270 (37.6)	63 (8.8)	0.86
Heart Attack	433 (59.6)	247 (34.0)	47 (6.5)	0.007
Congestive Heart Failure	164 (51.9)	117 (37.0)	35 (11.1)	0.30
Peripheral Vascular Disease	237(51.2)	181 (39.1)	45 (9.7)	0.30
Number of Comorbidities				
Physical (out of 38)	4.48 ± 2.6	4.53 ± 2.7	4.51 ± 2.6	0.54
Mental (out of 6)	0.42 ± 0.9	0.39 ± 0.8	0.31 ± 0.7	0.0002
Number of HTN Medications				0.043
1	1399 (52.3)	1038 (38.9)	236 (8.8)	
2	1826 (56.1)	1146 (35.2)	283 (8.7)	
>2	1326 (55.1)	862 (35.9)	217 (9.0)	
CVD History	999 (56.1)	639 (35.9)	143 (8.0)	0.25
Chronic Kidney Disease	1378 (54.8)	899 (35.8)	237 (9.4)	0.28
Tobacco use				0.90
Never/Former	4030 (54.6)	2702 (36.6)	646 (8.8)	

Characteristic	SBP<140 mmHg n=4604 (54.6%)	SBP 140-160 mmHg n=3087 (36.6%)	SBP>160 mmHg n=742 (8.8%)	p-value*
Current	574 (54.7)	380 (36.2)	96 (9.1)	

*P-value from Chi Square test or Fisher's Exact Test for categorical variables and simple logistic regression for continuous variables

Table 3

The Association between Better Systolic Blood Pressure Control and Medication Adherence While Adjusting for Demographic and Behavioral Risk Factors, Number of Hypertension Medication, and Comorbidities

Characteristic	Adjusted Odds Ratio	95% Confidence Interval	p-value*
MMAS			
Low Adherence	---	---	---
Med Adherence	1.166	(1.04, 1.31)	0.009
High Adherence	1.100	(0.98, 1.24)	0.11
Gender			
Female	0.702	(0.64, 0.77)	<.0001
Male	---	---	---
Age			
≥ 75 (Senior)	0.644	(0.58, 0.71)	<.0001
< 75	---	---	---
Race/Ethnicity			
Non-Hispanic White	---	---	---
Black/African American	1.019	(0.92, 1.13)	0.73
Hispanic	0.926	(0.80, 1.07)	0.31
Other	0.830	(0.60, 1.14)	0.25
Education			
Less than High School	0.816	(0.70, 0.96)	0.012
High School Graduate/GED	0.930	(0.82, 1.06)	0.27
Post High School	0.903	(0.82, 1.00)	0.048
College Degree	---	---	---
Atrial Fibrillation/Flutter	0.998	(0.85, 1.17)	0.98
Heart Attack	1.244	(1.04, 1.49)	0.019
Congestive Heart Failure	0.779	(0.62, 0.98)	0.036
Peripheral Vascular Disease	0.867	(0.71, 1.05)	0.15
Number of Comorbidities			
Physical	1.007	(0.99, 1.03)	0.47
Mental	1.078	(1.02, 1.14)	0.009
Number of Hypertension Medications			
1	---	---	---
2	1.150	(1.04, 1.27)	0.007
>2	1.107	(0.99, 1.24)	0.072
CVD History	1.004	(0.89, 1.14)	0.95
Chronic Kidney Disease	1.095	(0.99, 1.21)	0.067
Tobacco use			
Never/Former	---	---	---

Characteristic	Adjusted Odds Ratio	95% Confidence Interval	p-value*
Current	0.904	(0.79, 1.04)	0.14

* P-value from ordinal logistic regression modeling