Effectiveness of a telephone outreach intervention on visit adherence in patients with uncontrolled cardiovascular risks.

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Abstract

Purpose: To determine the effectiveness of a telephone outreach intervention on visit adherence in patients with uncontrolled cardiovascular risk factors.

Methods: A telephone outreach intervention designed to effect clinic visit adherence was conducted on patients with uncontrolled cardiovascular risks. The patient sample was drawn from adults ≥ 18 years of age who had received primary care from the University Internal Medicine (UIM) primary care clinic at the Medical University of South Carolina (MUSC) between 01/01/2014 and 02/30/2017. Patients were selected for a telephone outreach if they had three cardiovascular risk diagnoses, a current UIM primary care provider, at least one of their most recent lab values over goal: HbA1C ≥ 8%, systolic BP ≥ 140 or LDL ≥ 130, and no documented UIM visit within the previous 3 months. Barriers to visit completion were identified, and visit completion status was determined 3 months after the phone call intervention.

Results: Of the 556 patients receiving the intervention, 393 patients completed an ambulatory clinic visit within 3 months. The majority (84.7%) of the patients with the completed visit had Medicare or Medicaid funding and the mean age of visit completers was 65 years. 72.8% of African-American for consistency patients and 58.0% Caucasian patients completed their visits. The main barriers to visit completion included transportation, funding issues and work conflicts with clinic appointments.

Conclusion: Our findings indicate that a phone call outreach intervention effectively influenced primary care visit completion rates in a group of patients with uncontrolled cardiovascular risk factors. Transportation, funding issues and work schedule issues were the main barriers to visit completion. African-American for consistency patients had a higher percentage of visit adherence than Caucasian patients.

Keywords: Hypertension, outreach, visit adherence, cardiovascular risk, internal medicine.

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Introduction

Hypertension, diabetes and hypercholesterolemia are important risk factors for the development of cardiovascular disease [1]. Hypertension and diabetes are more common among non-Hispanic African-Americans than non-Hispanic white Americans (42.5% vs 29.1% and 14.6% vs 9.9% respectively), and non-Hispanic African-Americans are more likely to have all three risk factors of hypertension, diabetes and hypercholesterolemia than non-Hispanic white Americans (4.6% vs 2.5%) [2]. Hypertension is known to be a major factor for cardiovascular disease (CVD) and mortality disparities from CVD are seen between non-Hispanic African-Americans and other ethnic groups [3]. Non-Hispanic African-Americans experience greater difficulty in controlling cardiovascular risk factors when compared to other Americans [4] and have comparatively greater difficulty with primary care visit adherence [5].

Controlling blood pressure, cholesterol and blood sugar levels should result in a significant reduction in cardiovascular events [6]. Regular primary care visits are useful for medication titration, early detection of complications, and increasing patient engagement through patient education, and have been associated with better control of cardiovascular risk factors [7]. A Cochrane review concluded that a systematic, practice-based approach to hypertension care, including regular office visits utilizing vigorous, stepwise protocols for antihypertensive medication regimens, significantly reduced blood pressure and all-cause mortality [8,9]. However, in South Carolina adherence to primary care visits is suboptimal among many patients with cardiovascular risks.

Our project evaluates the effectiveness of a telephone outreach intervention on visit adherence in patients with uncontrolled cardiovascular risks. We aimed to identify culture specific barriers to visit completion among non-Hispanic white and African-American for consistency patients. We selected three cardiovascular risk factors readily treated and monitored in primary care visits: glycosylated Hemoglobin (HbA1C), low-density lipoprotein (LDL) and blood pressure.

Methods

Population

University Internal Medicine (UIM) is the largest primary care provider on the Medical University of South Carolina (MUSC)

campus, and the site for both a faculty practice and Internal Medicine residency training in outpatient Internal Medicine. UIM has been continuously certified as a Level 3 PCMH since October 2011, is responsible for on-going primary care for approximately 10,000 patients, and staffed by 14 full and part-time faculty, 100 Internal Medicine residents, 3 PharmD's, 8 RNs, 12 LPN/CMAs, and 2 clinical support staff. UIM clinicians and staff average over 150 patient care visits per day, manage up to 1500 patient communications per week, and manage post-hospital care for about 200 patients per month.

Patients selected for a telephone outreach intervention were ≥ 18 years of age and received primary care from the MUSC UIM between 01/01/2014 to 02/30/2017. This study was exploratory, and included a subset of patients from a larger UIM quality project. Those patients with no documented UIM visit within the previous 3 months, the ICD-9CM code diagnoses of Hypertension, Diabetes Mellitus Type 2 and Hyperlipidemia, and at least one of their most recent lab values over goal in the electronic health record (EHR) (HbA1C ≥ 8, systolic BP ≥ 140 or LDL ≥ 130) were eligible for the intervention. This study received exempted IRB approval from MUSC.

Telephone outreach intervention

Of the 854 patients eligible for study inclusion, 556 were ultimately included in the intervention. Of the 298 excluded, 16 were not included due to missing demographics, and 282 were not included because they were no longer patients in the practice.

The goal was for an outreach specialist to telephone each patient, identify the barriers to visit compliance and schedule an appointment for an outpatient visit. A semi-structured telephone survey created in REDCap (Research Electronic Data Capture) was used to identify potential barriers and these were recorded in the patient's EHR (EPIC). The potential barriers assessed included: inadequate funding, transportation, work schedule, childcare issues, lost employment and/or insurance benefit. Additional barriers were recorded in the free text field, and each patient could identify multiple barriers. The outreach specialist utilized motivational interviewing skills, and addressed barriers to visit compliance by engaging community resources to overcome these barriers when possible. The data from the free text field were reviewed to identify other common potential barriers. The EHR was reviewed for outpatient visit completion within 3 months after completion of the telephone intervention as a dichotomous variable (primary outcome measure). Covariates included gender, age, race, marital status, smoking status, public insurance and the distance from the patients' zip code center point to the MUSC healthcare campus. Six types of barriers were coded as indicator variables.

Statistical Analysis: Univariate analysis (means, proportions and p-value) was performed to identify variables associated with the outcome. A multivariable logistic regression model was used to model the outcome of visit completion. To correct for multicollinearity, if two variables exhibited high correlation, one was dropped from the model based on clinical relevance. Backward selection was used to determine variables selected for the models (based on $p \leq 0.05$). SAS 9.3 (SAS Institute Inc., Cary, NC) was used for statistical analyses.

Results

Demographic characteristics of the patients by race, gender and visit completion status are found in Table 1. All interventions were completed by 02/30/2017, and 393 patients out of 556 patients (70.7%) completed their visit within 3 months of the telephone intervention. The mean age of the patients who completed their visit was slightly above that of patients with no visit completion (65.0 vs 61.4 years). The mean distance from the patient's home to the clinic was shorter for patients who completed their visit compared to patients who did not (12.0 vs 12.5 miles). 84.7% of the patients who completed their visits had public insurance (Medicare or Medicaid). Non-hispanic African-American patients were significantly more likely to complete a visit compared to Caucasians.

Barriers to visit adherence by visit completion status are displayed in Table 2, and the barriers to visit completion in patients, by ethnicity, are listed in Table 3. Although no differences between patient ethnicity reached a level of statistical significance in univariate analysis, funding and transportation were the most

Table 1. *Patient Characteristic.*

Barriers	Visit Complete n=393	Visit Incomplete n=163	p-value
Age, Mean ± STD	65.0 ± 12.0	61.4 ± 12.4	0.0008
Male	136 (34.6)	61 (37.4)	0.5272
Race			0.0068
Caucasian	47 (12.0)	34 (20.9)	
African-Americans	346 (88.0)	129 (79.1)	
Unmarried	261 (66.4)	105 (64.4)	0.6516
Public Insurance	333 (84.7)	118 (72.4)	0.0007
Distance, Mean ± STD	12.0 ± 16.0	12.5 ± 14.8	0.1799
Smoker			0.1963
Current	65 (16.5)	20 (12.3)	
Former	135 (34.3)	50 (30.7)	
Never	193 (49.1)	93 (57.1)	

Table 2. *Comparison of Barriers to Visit Adherence.*

Barriers	Visit Complete n=393	Visit Incomplete n=163	p-value
Funding	20 (5.1)	27 (16.6)	<0.0001
Transportation	77 (19.6)	22 (13.5)	0.0872
Work Schedule	36 (9.2)	10 (6.1)	0.2385
Child Care issues	15 (3.8)	5 (3.1)	0.6658
Lost Employment or Health Benefit	9 (2.3)	19 (11.7)	<0.0001
Other	288 (73.3)	116 (71.2)	0.6102

Table 3. *Barriers to Visit Adherence by Ethnicity.*

Barriers	Caucasians n=81	African Americans n=475	p-value
Funding	5 (6.2)	42 (8.8)	0.4248
Transportation	9 (11.1)	90 (19.0)	0.0884
Work Schedule	9 (11.1)	37 (7.8)	0.3158
Child Care issues	1 (1.2)	19 (4.0)	0.3358
Lost Employment or Health Benefit	3 (3.7)	25 (5.3)	0.7839
Other	64 (79.0)	340 (71.6)	0.1653

Table 4. *Logistic regression model associations with visit completion.*

Barriers	Estimate	P value	Odds Ratio (OR)	Lower OR	Upper OR
Age	0.024	0.0029	1.024	1.008	1.040
African Americans	0.832	0.0012	2.298	1.388	3.805
Barrier_Funding Issue	-1.249	0.0002	0.287	0.150	0.548
Barrier_Lost employment or health benefit	-1.517	0.0004	0.219	0.094	0.510

common barriers that were cited by African-Americans while transportation and work schedule issues were the most common barriers reported by Caucasians (Table 3).

Table 4 shows a reduced logistic regression model association between different barriers and visit completion. After the telephone outreach intervention, African-American patients were 2.3 times more likely to complete the visit than Caucasian patients. Patients with a noted barrier to visit completion of "funding" were 71% less likely to complete a visit, and those with the barrier "lost employment or health benefit" were 78% less likely to complete a clinic visit.

Additional barriers entered as text in the "Other" field included no perceived need for visit, forgetting appointments, appointments for other comorbid conditions, deceased relative, and caring for a sick relative.

Discussion

In this retrospective observational study, we determined that a telephone outreach intervention was associated with ambulatory visit completion in patients with three out-of-control cardiovascular risk factors and no primary care visit in the previous 3 months. In univariate analysis older age, public insurance and non-Hispanic African-American status were associated with visit completion. A higher percentage of non-Hispanic African-American patients (72.8%) completed a clinic visit compared to Caucasians (58.0%); a finding that remained significant after logistic regression modeling. The most common barriers to visit completion were transportation for all ethnic groups, plus funding issues for African-American patients and work schedule conflicts for Caucasians. A variety of other barriers to visit adherence was also identified. There was a highly significant association between the barrier of "lost employment or health benefit" and visit completion by logistic regression, perhaps reflecting issues with access to healthcare in a non-Medicaid expansion state.

Cardiovascular disease remains a major cause of death worldwide, and many studies have demonstrated the relationship between the control of risk factors and the reduction in cardiovascular mortality. Control of cardiovascular risk factors remains suboptimal, and there are demonstrated disparities in control among ethnic groups in the US. Recommendations for reducing disparities for risk factor control emphasize the limited evidence of intervention effectiveness, and the need for a broad partnership among groups involved in the delivery of care [9]. While systems of care are transforming in the US, the office visit remains the mainstay of care delivery for the vast majority of patients, and ethnic differences for visit adherence in patients with cardiovascular risk factors has been documented [8]. Several models of care have been shown to impact visit adherence. These include mobile health clinics and community-based care, behavioral interventions, use of patient navigator, motivational interviewing, and peer support [10]. In a study of self-reported barriers to visit adherence in African-Americans with severe, poorly controlled hypertension, trouble with transportation and feeling that doctor's appointments were not helpful were among the factors identified [11]. As opposed to most studies on visit adherence that demonstrate disparities between non-Hispanic African-Americans and Caucasians, we demonstrated a higher visit completion rate for non-Hispanic African-Americans patients. We postulate that a synchronous telephone intervention by a skilled patient care coordinator allowed for the arrangement of transportation needs and establishment of a personal connection with the patient – both of which may have contributed to improved visit adherence in our study.

Our work has several limitations. The study represents a single site of care and has a small sample size. This resulted in wider confidence intervals and insignificant p values. Power analysis was not performed for this subset of data that was part of a much larger study of cardiovascular risk reduction. A large proportion of patients reported "other" barriers to care indicating a possible need for survey revision in future studies. Further studies should expand the number of patients studied and expand to multiple intervention sites.

Conclusion

In this retrospective observational study, we determined that a telephone outreach intervention was associated with ambulatory visit completion in patients with three out-of-control cardiovascular risk factors. Funding issues and lost employment/ health benefit were the significant barriers to visit completion in a logistic regression model. A telephone intervention that addressed barriers to visit adherence demonstrated an improved visit completion rate that was greatest for non-Hispanic African-Americans patients. Future studies should be done to evaluate the factors that influence the effectiveness of telephone interventions on visit adherence and visit disparity rates for patients with cardiovascular risks.

Disclosure Statement

The authors declare that they have no conflict of interest.

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