HbA_{1c} Change in Patients With and Without Gaps in Pharmacist Visits at a Safety-Net Resident Physician Primary Care Clinic

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Objective: The objective of this study is to describe HbA_{1c} changes in patients who maintained continuous pharmacist care vs patients who had a gap in pharmacist care of 3 months or longer.

Methods: This retrospective study was conducted from October 1, 2018, to September 30, 2019. Electronic health record data from an academic-affiliated, safety-net resident physician primary care clinic were collected to observe HbA_{1c} changes between patients with continuous pharmacist care and patients who had a gap of 3 months or longer in pharmacist care. A total of 189 patients met the inclusion criteria and were divided into 2 groups: those with continuous care and those with gaps in care. Data were analyzed using the Mann-Whitney test for continuous variables and the χ^2 (or Fisher exact) test for categorical variables. The differences-in-differences model was used to compare the changes in HbA_{1c} between the 2 groups.

Results: There was no significant difference in changes in HbA_{1c} between the continuous care group and the gaps in care group, although the mean magnitude of HbA_{1c} changes was numerically greater in the continuous care group (-1.48% vs -0.97%). Overall, both groups showed improvement in their HbA_{1c} levels and had similar numbers of primary care physician visits and acute care utilizations, while the gaps in care group had longer duration with pharmacists and between the adjacent pharmacist visits.

Conclusion: Maintaining continuous, regular visits with a pharmacist at a safety-net resident physician primary care clinic did not show a significant difference in HbA_{1c} changes compared to having gaps in pharmacist care. Future studies on socioeconomic and behavioral burden on HbA_{1c} improvement and on pharmacist visits in these populations should be explored.

Keywords: clinical pharmacist; diabetes management; continuous visit; primary care clinic.

Pharmacists have unique skills in identifying and resolving problems related to the safety and efficacy of drug therapy while addressing medication adherence and access for patients. Their expertise is especially important to meet the care needs of a growing population with chronic conditions amidst a primary care physician shortage.[1] As health care systems move toward value-based care, emphasis on improvement in quality and health measures have become central in care delivery. Pharmacists have been integrated into team-based care in primary care settings, but the value-based shift has opened more opportunities for pharmacists to address unmet quality standards.[2-5]

Many studies have reported that the integration of pharmacists into team-based care improves health outcomes and reduces overall health care costs.[6-9] Specifically, when pharmacists were added to primary care teams to provide diabetes management, hemoglobin HbA_{1c} levels were reduced compared to teams without pharmacists.[10-13] Offering pharmacist visits as often as every 2 weeks to 3 months, with each patient having an average of 4.7 visits, resulted in improved therapeutic outcomes.[3,7] During visits, pharmacists address the need for additional drug therapy, deprescribe unnecessary therapy, correct insufficient doses or durations, and switch patients to more cost-efficient drug therapy.[9] Likewise, patients who visit pharmacists in addition to seeing their primary care physician can have medication-related concerns resolved and improve their therapeutic outcomes.[10,11]

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Not much is known about the magnitude of HbA_{1c} change based on the regularity of pharmacist visits. Although pharmacists offer follow-up appointments in reasonable time intervals, patients do not keep every appointment for a variety of reasons, including forgetfulness, personal issues, and a lack of transportation.[14] Such missed appointments can negatively impact health outcomes.[14-16] The purpose of this study is to describe HbA_{1c} changes in patients who maintained continuous, regular pharmacist visits without a 3-month gap and in patients who had history of inconsistent pharmacist visits with a gap of 3 months or longer. Furthermore, this study describes the frequency of health care utilization for these 2 groups.

Methods

Setting

The Internal Medicine resident physician primary care clinic is 1 of 2 adult primary care clinics at an academic, urban, public medical center. It is in the heart of East Los Angeles, where predominantly Spanish-speaking and minority populations reside. The clinic has approximately 19000 empaneled patients and is the largest resident primary care clinic in the public health system. The clinical pharmacy service addresses unmet quality standards, specifically HbA_{1c}. The clinical pharmacists are co-located and collaborate with resident physicians, attending physicians, care managers, nurses, social workers, and community health workers at the clinic. They operate under collaborative practice agreements with prescriptive authority, except for controlled substances, specialty drugs, and antipsychotic medications.

Pharmacist visit

Patients are primarily referred by resident physicians to clinical pharmacists when their HbA_{1c} level is above 8% for an extended period, when poor adherence and low health literacy are evident regardless of HbA_{1c} level, or when a complex medication regimen requires comprehensive medication review and reconciliation. The referral occurs through warm handoff by resident physicians as well as clinic nurses, and it is embedded in the clinic flow. Patients continue their visits with resident physicians for issues other than their referral to clinical pharmacists. The visits with pharmacists are appointment-based, occur independently from resident physician visits, and continue until the patient's HbA_{1c} level or adherence is optimized. Clinical pharmacists continue to follow up with patients who may have reached their target HbA_{1c} level but still are deemed unstable due to inconsistency in their self-management and medication adherence.

After the desirable HbA_{1c} target is achieved along with full adherence to medications and self-management, clinical pharmacists will hand off patients back to resident physicians. At each visit, pharmacists perform a comprehensive medication assessment and reconciliation that includes adjusting medication therapy, placing orders for necessary laboratory tests and prescriptions, and assessing medication adherence. They also evaluate patients' signs and symptoms for hyperglycemic complications, hypoglycemia, and other potential treatment-related adverse events. These are all within the pharmacist's scope of practice in comprehensive medication management. Patient education is provided with the teach-back method and includes lifestyle modifications and medication counseling (**Table 1**). Pharmacists offer face-to-face visits as frequently as every 1 to 2 weeks to every 4 to 6 weeks, depending on the level of complexity and the severity of a patient's conditions and medications. For patients whose HbA_{1c} has reached the target range but have not been deemed stable, pharmacists continue to check in with them every 2 months. Phone visits are also utilized as an additional care delivery method for patients having difficulty showing up for face-to-face visits or needing quick assessment of medication adherence and responses to changes in drug treatment in between the face-to-face visits. The maximal interval between pharmacist visits is offered no longer than every 8 weeks. Patients are contacted via phone or mail by the nursing staff to reschedule if they miss their appointments with pharmacists. Every pharmacy visit is documented in the patient's electronic medical record.

Study design

This is a retrospective study describing the HbA_{1c} changes in a patient group that maintained pharmacist visits, with each interval less than 3 months, and in another group, who had a history of a 3-month or longer gap between pharmacist visits. The data were obtained from patients' electronic medical records during the

Table 1. **Pharmacist Activities During Each Visit**

Clinical activities	Every patient	If applicable
Symptom assessment	Symptoms of hyperglycemia/hypoglycemia, symptoms related to peripheral neuropathy	Orthopnea, dyspnea on exertion, dizziness, chest pain, edema, palpitations, headache
Evaluation	BP, weight, renal function, blood glucose, HbA_{1c}, electrolytes, albuminuria, lipid panel	Thyroid function tests, iron panel, CBC
Medication review	Reconcile patient's medications with medications changed at last visit with any provider; determine clinical appropriateness and safety for each drug therapy; identify barriers to medication adherence or acquisition	
New orders and medication optimization	Order laboratory tests; initiate/change/discontinue drug treatments related to main chronic disease conditions	Contact patient's primary physician or specialists for further evaluation or action if outside of collaborative practice agreement
Patient education	Provide education on medications, disease state, self-management strategies, lifestyle modification	
Documentation	Document SOAP/progress note within 24 hours of the visit	

BP, blood pressure; CBC, complete blood cell count; HbA_{1c}, glycosylated hemoglobin; SOAP, subjective, objective, assessment, and plan.

study period of October 1, 2018, and September 30, 2019, and collected using a HIPAA-compliant, electronic data storage website, REDCap. The institutional review board approval was obtained under HS-19-00929. Patients 18 years and older who were referred by primary care resident physicians for diabetes management, and had 2 or more visits with a pharmacist within the study period, were included. Patients were excluded if they had only 1 HbA_{1c} drawn during the study period, were referred to a pharmacist for reasons other than diabetes management, were concurrently managed by an endocrinologist, had only 1 visit with a pharmacist, or had no visits with their primary care resident physician for over a year. The patients were then divided into 2 groups: continuous care cohort (CCC) and gap in care cohort (GCC). Both face-to-face and phone visits were counted as pharmacist visits for each group.

Outcomes

The primary outcome was the change in HbA_{1c} from baseline between the 2 groups. Baseline HbA_{1c} was considered as the HbA_{1c} value obtained within 3 months prior to, or within 1 month, of the first visit with the pharmacist during the study period. The final HbA_{1c} was considered the value measured within 1 month of, or 3 months after, the patient's last visit with the pharmacist during the study period.

Several subgroup analyses were conducted to examine the relationship between HbA_{1c} and each group. Among patients whose baseline HbA_{1c} was ≥8%, we looked at the percentage of patients reaching HbA_{1c} <8%, the percentage of patients showing any level of improvement in HbA_{1c}, and the change in HbA_{1c} for each group. We also looked at the percentage of patients with baseline HbA_{1c} <8% maintaining the level throughout the study period and the change in HbA_{1c} for each group. Additionally, we looked at health care utilization, which included pharmacist visits, primary care physician visits, emergency room and urgent care visits, and hospitalizations for each group. The latter 3 types of utilization were grouped as acute care utilization and further analyzed for visit reasons, which were subsequently categorized as diabetes related and non-diabetes related. The diabetes related reasons linking to acute care utilization were defined as any episodes related to hypoglycemia, diabetic ketoacidosis (DKA), hyperosmolar hyperglycemic state (HHS), foot ulcers, retinopathy, and osteomyelitis infection. All other reasons leading to acute care utilization were categorized as non-diabetes related.

Statistical analysis

Descriptive analyses were conducted using the Mann-Whitney test for continuous data and χ^2 (or Fisher exact) test for categorical data. A basic difference-in-

Table 2. **Patient Demographics**

Demographic	Overall N = 189	CCC N = 132	GCC N = 57	*P* value
Age, y				.39
Mean ± SD	56.8 ± 9.8	56.5 ± 9.6	57.6 ± 10.3	
Median	58.0	58.0	59.0	
Range	23-77	29-74	23-77	
Sex, n (%)				.22
Female	110 (58.2)	73 (55.3)	37 (64.9)	
Ethnicity, n (%)				.16
Hispanic	151 (79.9)	109 (82.6)	42 (73.7)	
Non-Hispanic	38 (20.1)	23 (17.4)	15 (26.3)	
Type of primary insurance, n (%)				.74
Medicaid	135 (71.4)	93 (70.4)	42 (73.7)	
Medicare or both Medicaid & Medicare	25 (13.2)	17 (12.9)	8 (14.0)	
Self-pay	29 (15.4)	22 (16.7)	7 (12.3)	
Primary language, n (%)				.92
Spanish	137 (72.5)	96 (72.7)	41 (71.9)	
English	44 (23.3)	30 (22.7)	14 (24.6)	
Other language	8 (4.2)	6 (4.6)	2 (3.5)	
Smoking status, n (%)	N = 169	N = 116	N = 53	.95
Current	14 (8.3)	10 (8.6)	4 (7.5)	
Past	30 (17.7)	20 (17.2)	10 (18.9)	
Never	125 (74.0)	86 (74.2)	39 (73.6)	
Baseline HbA_{1c}, n (%)				.56
HbA_{1c} ≥8%	165 (87.3)	114 (86.4)	51 (89.5)	
HbA_{1c} <8%	24 (12.7)	18 (13.6)	6 (10.5)	
Baseline SBP				.06
Mean ± SD	129.0 ± 15.9	127.3 ± 15.5	132.8 ± 16.3	
Median	128.0	126.0	131.0	
Range	94-188	94-170	108-188	
Baseline DBP				.45
Mean ± SD	68.0 ± 11.1	67.6 ± 11.6	68.9 ± 9.8	
Median	68.0	68.0	70.0	
Range	40-98	40-98	50-91	
Comorbidities, n (%)				
Diabetes	189 (100)			
Hypertension	149 (78.8)	99 (75.0)	50 (87.7)	.05
Lipid Disorders	85 (45.0)	53 (40.2)	32 (56.1)	.04
Clinical ASCVD	62 (32.8)	45 (34.1)	17 (29.8)	.57
Heart Failure	9 (4.8)	7 (5.3)	2 (3.5)	.72
CKD Stage 3-5	23 (12.2)	15 (11.4)	8 (14.0)	.61
Number of days between first and last PharmD visit				<.001
Mean ± SD	249 ± 115.5	217 ± 105.3	325 ± 102.3	
Median	224	203	340	
Range	38-520	38-484	84-520	

CCC continuous care cohort; CKD stage 5, includes end-stage renal disease and hemodialysis; Clinical ASCVD, includes history of myocardial infarction, stroke or cerebrovascular accident, coronary artery disease, peripheral artery disease; DBP, diastolic blood pressure; GCC, gap in cohort; HbA_{1c}, glycosylated hemoglobin (%); SBP, systolic blood pressure.

differences (D-I-D) method was used to compare the changes of HbA_{1c} between the CCC and GCC over 2 time points: baseline and final measurements. The repeated measures ANOVA was used for analyzing D-I-D. $P < .05$ was considered significant. Statistical analyses were performed using SAS version 9.4 (SAS Institute, Cary, NC).

Results

Baseline data

A total of 1272 patients were identified within the study period, and 189 met the study inclusion criteria. The CCC included 132 patients, the GCC 57. The mean age of patients in both groups was similar at 57 years old ($P = .39$). Most patients had Medicaid as their primary insurance. About one-third of patients in each group experienced clinical atherosclerotic cardiovascular disease, and about 12% overall had chronic kidney disease stage 3 and higher. The average number of days that patients were under pharmacist care during the study period was longer in the GCC compared to the CCC, and it was statistically significant ($P < .001$) (**Table 2**). The mean ± SD baseline HbA_{1c} for the CCC and GCC was 10.0% ± 2.0% and 9.9% ± 1.7%, respectively, and the difference was not statistically significant ($P = .93$). About 86% of patients in the CCC and 90% in the GCC had a baseline HbA_{1c} of ≥8%.

HbA_{1c}

The mean change in HbA_{1c} between the 2 groups was not statistically significant (-1.5% ± 2.0% in the CCC vs -1.0% ± 2.1% in the GCC, $P = .36$) (**Table 3**). However, an absolute mean HbA_{1c} reduction of 1.3% was observed in both groups combined at the end of the study. **Figure 1** shows a D-I-D model of the 2 groups. Based on the output, the P value of .11 on the interaction term (time*group) indicates that the D-I-D in HbA_{1c} change from baseline to final between the CCC and GCC is not statistically different. However, the magnitude of the difference calculated from the LSMEANS results showed a trend. The HbA_{1c} from baseline to final measurement of patients in the GCC declined by 0.97 percentage points (from 9.94% to 8.97%), while those in the CCC saw their HbA_{1c} decline by 1.48 percentage points (from 9.96% to 8.48%), for a D-I-D of 0.51. In other words, those in the GCC had an HbA_{1c} that decreased by 0.51% less than that of patients in the CCC, suggesting that the CCC shows a steeper line declining from baseline to final HbA_{1c} compared to the GCC, whose line declines less sharply.

In the subgroup analysis of patients whose baseline HbA_{1c} was ≥8%, about 42% in the CCC and 37% in the GCC achieved an HbA_{1c} <8% ($P = .56$) (**Table 4**). Approximately 83% of patients in the CCC had some degree of HbA_{1c} improvement—the final HbA_{1c} was lower than their baseline HbA_{1c}—whereas this was observed in about 75% of patients in the GCC ($P = .19$). Of patients whose baseline HbA_{1c} was <8%, there was no significant difference in proportion of patients maintaining an HbA_{1c} <8% between the groups ($P = .57$), although some increases in HbA_{1c} and HbA_{1c} changes were observed in the GCC (**Table 5**).

Health care utilization

Patients in the CCC visited pharmacists 5 times on average over 12 months, whereas patients in the GCC had an average of 6 visits (5 ± 2.6 in the CCC vs 6 ± 2.6 in the GCC, $P = .01$) (**Table 6**). The mean length between any 2 adjacent visits was significantly different, averaging about 33 days in the CCC compared to 64 days in the GCC (33.2 ± 10 in the CCC vs 63.7 ± 39.4 in the GCC, $P < .001$). As shown in **Figure 2**, the GCC shows wider ranges between any adjacent pharmacy visits throughout until the 10th visit. Both groups had a similar number of visits with primary care physicians during the same time period (4.6 ± 1.86 in the CCC vs 4.3 ± 2.51 in the GCC, $P = .44$). About 30% of patients in the CCC and 47% in the GCC had at least 1 visit to the emergency room or urgent care or had at least 1 hospital admission, for a total of 124 acute care utilizations between the 2 groups combined. Only a small fraction of acute care visits with or without hospitalizations were related to diabetes and its complications (23.1% in the CCC vs 22.0% in the GCC).

Discussion

This is a real-world study that describes HbA_{1c} changes in patients who maintained pharmacy visits regularly and in those who had a history of a 3-month or longer gap in pharmacy visits. Although the study did not show statis-

Table 3. **Comparison of HbA_{1c}**

HbA_{1c}	Overall N = 189	CCC N = 132	GCC N = 57	*P* value
Baseline HbA_{1c}				.93
Mean ± SD	10.0 ± 1.9	10.0 ± 2.0	9.9 ± 1.7	
Median	9.7	9.7	9.8	
Range	6.0-16.0	6.0-16.0	7.3-15.6	
Final HbA_{1c}				.13
Mean ± SD	8.6 ± 1.8	8.5 ± 1.8	9.0 ± 2.0	
Median	8.3	8.2	8.5	
Range	5.5-15.2	5.9-15.1	5.5-15.2	
Change in HbA_{1c}				.36
Mean ± SD	-1.3 ± 2.0	-1.5 ± 2.0	-1.0 ± 2.1	
Median	-1.0	-1.1	-0.9	
Range	-8.9-3.9	-8.9-2.0	-5.2-3.9	
Baseline $HbA_{1c} \geq 8$, n (%)	165 (87.3)	114 (86.4)	51 (89.5)	.56
Achieved Goal Final $HbA_{1c} < 8$, n (%)	86 (45.5)	63 (47.7)	23 (40.4)	.35

CCC, continuous care cohort; GCC, gap in care cohort; HbA_{1c}, glycosylated hemoglobin (%).

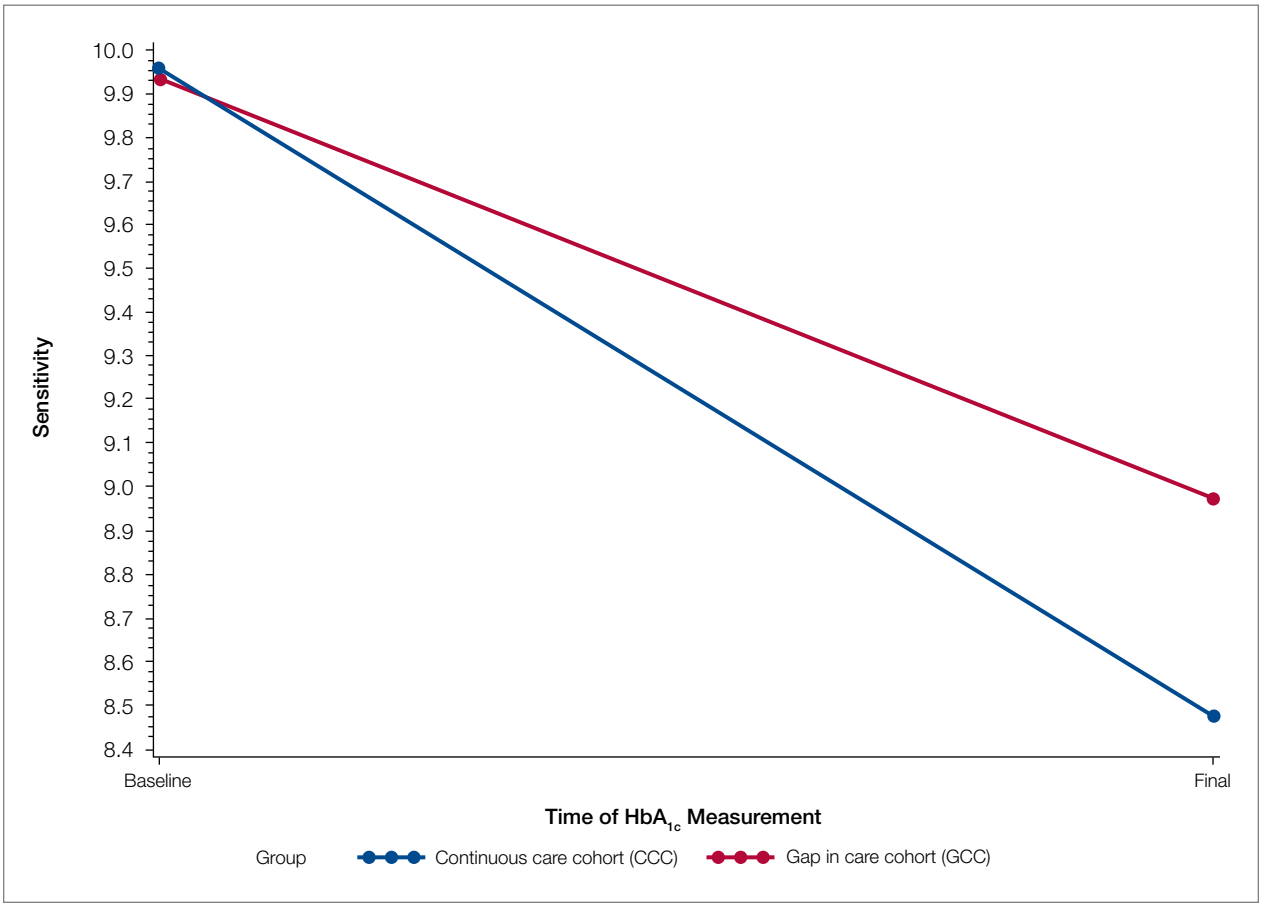

Figure 1. HbA_{1c} improvement over time.

Table 4. **Subgroup Comparison of Patients with Baseline HbA_{1c} ≥8%**

HbA_{1c}	Overall N = 165	(CCC) N = 114	(GCC) N = 51	*P* value
Baseline HbA_{1c}				.70
Mean ± SD	10.3 ± 1.7	10.4 ± 1.8	10.2 ± 1.6	
Median	9.9	10.0	9.9	
Range	8.0-16.0	8.0-16.0	8.0-15.6	
Final HbA_{1c}				.29
Mean ± SD	8.8 ± 1.9	8.7 ± 1.8	9.1 ± 2.0	
Median	8.5	8.4	8.5	
Range	5.5-15.2	5.9-15.1	5.5-15.2	
Change in HbA_{1c}				.32
Mean ± SD	-1.52 ± 2.0	-1.69 ± 2.0	-1.15 ± 2.0	
Median	-1.20	-1.25	-1.00	
Range	-8.9-3.5	-8.9-2.0	-5.2-3.5	
Achieved Goal Final HbA_{1c} <8	67 (40.6)	48 (42.1)	19 (37.2)	.56
Improved HbA_{1c} *	133 (80.6)	95 (83.3)	38 (74.5)	.19

CCC, continuous care cohort; GCC, gap in care cohort; HbA_{1c}, glycosylated hemoglobin (%).
*Final HbA_{1c} < Baseline HbA_{1c}

tically significant differences in HbA_{1c} reduction between the 2 groups, pharmacists' care, overall, provided mean HbA_{1c} reductions of 1.3%. This result is consistent with those from multiple previous studies.[10-13] It is worth noting that the final HbA_{1c} was numerically lower in patients who followed up with pharmacists regularly than in patients with gaps in visits, with a difference of about 0.5 percentage points. This difference is considered clinically significant,[17] and potentially could be even greater if the study duration was longer, as depicted by the slope of HbA_{1c} reductions in the D-I-D model (Figure 1).

Previous studies have shown that pharmacist visits are conducted in shorter intervals than primary care physician visits to provide closer follow-up and to resolve any medication-related problems that may hinder therapeutic outcome improvements.[3-4,7-9] Increasing access via pharmacists is particularly important in this clinic, where resident physician continuity and access is challenging. The pharmacist-driven program described in this study does not deviate from the norm, and this study confirms that pharmacist care, regardless of gaps in pharmacist visits, may still be beneficial.

Another notable finding from this study was that although the average number of pharmacist visits per patient was significantly different, this difference of 1 visit did not result in a statistically significant improvement in HbA_{1c}. In fact, the average number of pharmacist visits per patient seemed to be within the reported range by Choe et al in a similar setting.[7] Conversely, patients with a history of a gap in pharmacist visits spent longer durations under pharmacist care compared to those who had continuous follow-up. This could mean that it may take longer times or 1 additional visit to achieve similar HbA_{1c} results with continuous pharmacist care. Higher number of visits with pharmacists in the group with the history of gaps between pharmacist visits could have been facilitated by resident physicians, as both groups had a similar number of visits with them. Although this is not conclusive, identifying the optimal number of visits with pharmacists in this underserved population could be beneficial in strategizing pharmacist visits. Acute care utilization was not different between the 2 groups, and most cases that led to acute care utilization were not directly related to diabetes or its complications.

The average HbA_{1c} at the end of the study did not measure <8%, a target that was reached by less than half of patients from each group; however, this study is a snapshot of a series of ongoing clinical pharmacy services. About 25% of our patients started their first visit

Table 5. **Subgroup Comparison of Patients with Baseline HbA_{1c} <8%**

HbA_{1c}	Overall N = 24	(CCC) N = 18	(GCC) N = 6	*P* value
Baseline HbA_{1c}				.11
Mean ± SD	7.4 ± 0.4	7.3 ± 0.5	7.6 ± 0.2	
Median	7.5	7.5	7.7	
Range	6.0-7.9	6.0-7.9	7.3-7.9	
Final HbA_{1c}				.23
Mean ± SD	7.5 ± 1.4	7.2 ± 1.0	8.2 ± 2.0	
Median	7.2	7.0	7.5	
Range	5.9-11.5	5.9-9.7	6.4-11.5	
Change in HbA_{1c}				.58
Mean ± SD	0.05 ± 1.37	-0.13 ± 1.10	0.58 ± 2.0	
Median	-0.10	-0.10	-0.10	
Range	-1.6-3.9	-1.6-1.9	-1.5-3.9	
Achieved Goal Final HbA_{1c} < 8	19 (79.2)	15 (83.3)	4 (66.7)	.57

CCC, continuous care cohort; GCC, gap in care cohort; HbA_{1c}, glycosylated hemoglobin (%).

Table 6. **PharmD Visits Utilization**

Number visits/patient	Overall N = 189	(CCC) N = 131	(GCC) N = 58	*P* value
Total				.01
Mean ± SD	6 ± 2.6	5 ± 2.6	6 ± 2.6	
Median	5	5	6	
Range	1-16	1-16	2-13	
Phone				.56
Mean ± SD	1 ± 1.3	1 ± 1.4	1 ± 1.2	
Median	0	0	0	
Range	0-8	0-8	0-5	
In-person				.004
Mean ± SD	5 ± 2.1	4 ± 2.0	5 ± 2.0	
Median	4	4	5	
Range	1-11	1-11	2-11	
Mean length between any 2 adjacent visits, days				<.001
Mean ± SD	42.4 ± 27.0	33.2 ± 10.0	63.7 ± 39.4	
Median	36.6	32.1	51.0	
Range	7-275	7-62	26-275	

CCC, continuous care cohort; GCC, gap in care cohort.

with a pharmacist less than 6 months from the study end date, and these patients may not have had enough time with pharmacists for their HbA_{1c} to reach below the target goal. In addition, most patients in this clinic were enrolled in public health plans and may carry a significant burden of social and behavioral factors that can affect diabetes management.[18,19] These patients may need longer care by pharmacists along with other integrated services, such as behavioral health and social work, to achieve optimal HbA_{1c} levels.[20]

There are several limitations to this study, including the lack of a propensity matched control group of patients who only had resident physician visits; thus, it is hard to test the true impact of continuous or intermittent phar-

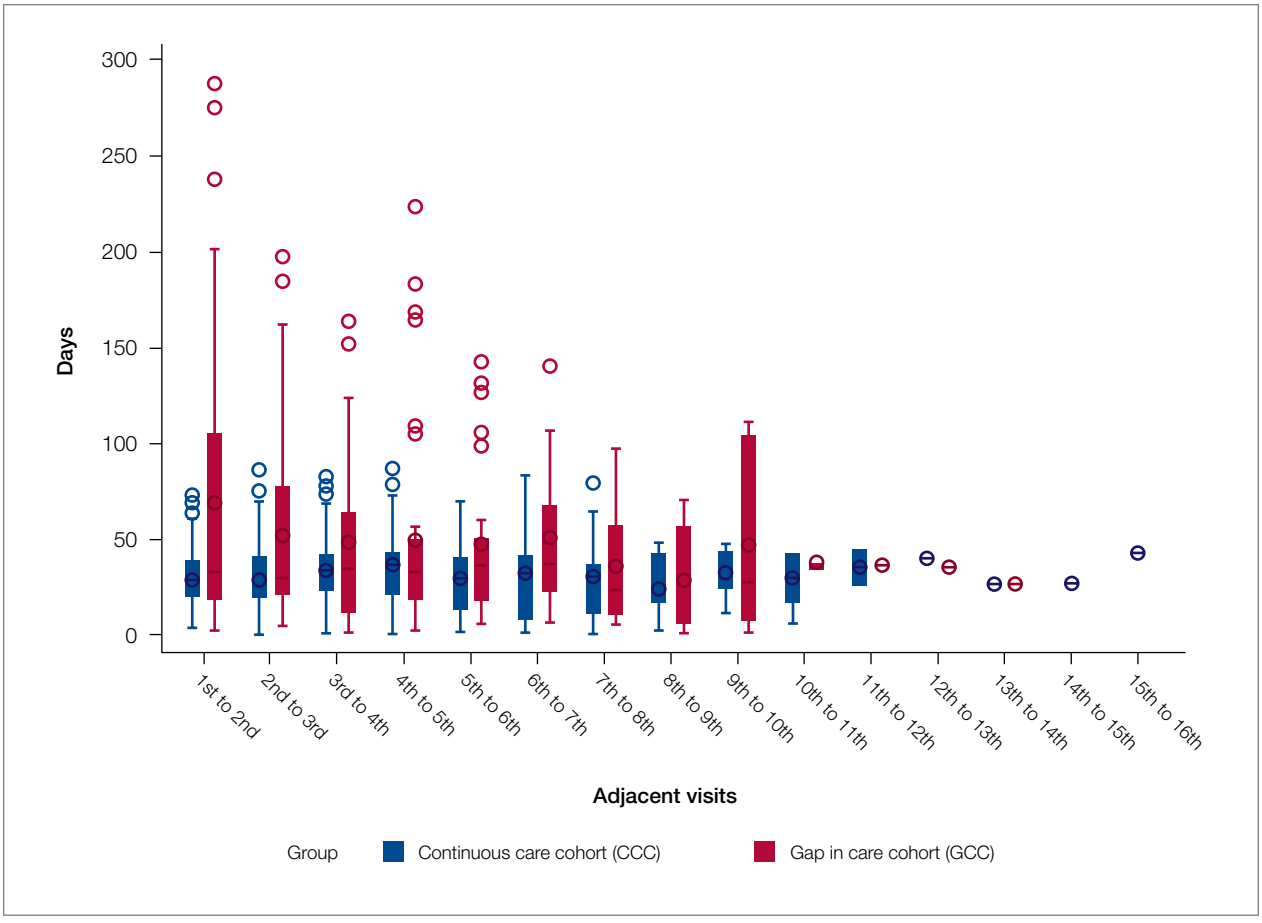

Figure 2. Days between 2 adjacent pharmacist visits.

macist visits on the therapeutic outcomes. The study also does not address potential social, economic, and physical environment factors that might have contributed to pharmacist visits and to overall diabetes care. These factors can negatively impact diabetes control and addressing them could help with an individualized diabetes management approach.[17,18] Additionally, by nature of being a descriptive study, the results may be subject to undetermined confounding factors.

Conclusion

Patients maintaining continuous pharmacist visits do not have statistically significant differences in change in HbA_{1c} compared to patients who had a history of 3-month or longer gaps in pharmacist visits at a resident physician primary care safety-net clinic. However, patients with diabetes will likely derive a benefit in HbA_{1c} reduction regardless of regularity of pharmacist care. This finding still holds true in collaboration with resident physicians who also regularly meet with patients.

The study highlights that it is important to integrate clinical pharmacists into primary care teams for improved therapeutic outcomes. It is our hope that regular visits to pharmacists can be a gateway for behavioral health and social work referrals, thereby addressing pharmacist-identified social barriers. Furthermore, exploration of socioeconomic and behavioral barriers to pharmacist visits is necessary to address and improve the patient experience, health care delivery, and health outcomes.

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