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Predictors of Patient Retention at a Student-Run Free Clinic

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Abstract

Background: Studies of patient retention at student-run free clinics (SRFCs) are lacking. We determined variables associated with clinic retention at Equal Access Birmingham (EAB), an urban SRFC that aims to provide acute care for clients with transitory health needs and longitudinal care for patients with chronic diseases.
Methods: We retrospectively analyzed EAB patient data from March 1, 2013 to July 1, 2015, including demographic, social, medical history, and clinical care variables. The primary outcome was retention in care, defined as attendance at a follow-up appointment 6 to 12 months after the initial new patient visit. Potential predictors of retention were examined using stepwise multivariate logistic regression.
Results: Patient retention rate was 25.2%. Positive predictors of retention included receipt of medication at the initial visit (odds ratio [OR] 15.40, 95% confidence interval [CI] 1.56-152.82), more kept appointments within 6 months of initial visit (OR 2.00, 95% CI 1.51-2.66), and longer time to follow-up (OR 1.14, 95% CI 1.04-1.26). Negative predictors included receiving only acute care at initial visit (OR 0.10, 95% CI 0.01-0.95), any appointment no-shows (OR 0.33, 95% CI 0.13-0.86), and cancellations (OR 0.29, 95% CI 0.09-0.87) within 6 months of an initial visit.
Conclusion: This study is one of the first to analyze predictors of patient retention at a SRFC. Although we analyze a relatively small sample size in a single SRFC, our results inform strategies to better retain SRFC patients who have high rates of chronic illness and are vulnerable to loss to follow-up.

Introduction

The number of student-run free clinics (SRFCs) has increased over the past two decades. Currently there are more than 100 active clinics based at medical schools across the US.[1] Equal Access Birmingham (EAB) is a SRFC affiliated with the University of Alabama at Birmingham School of Medicine (UABSOM). The clinic opened in late 2012 and provides free healthcare including routine clinic visits, laboratory diagnostics, mental health services, physical therapy, social work, and free medications to the uninsured and underinsured in the heart of downtown Birmingham, Alabama. Clinic operations are directed by UABSOM students, and the clinic is staffed by medical and other health professions students with on-site faculty oversight. The primary aims of EAB are to provide acute care for clients with transitory health needs and to provide longitudinal care for patients with chronic diseases.

Studies have shown that keeping clinic appointments and retention in care correlate with good health outcomes in persons living with chronic diseases.[2-4] Retention in care encourages compliance and allows for adjustments in medications and medical decision-making. However, the free care offered through SRFCs is not enough to ensure that patients keep their follow-up appointments and are retained in care. SRFC clients remain particularly vulnerable to loss to follow-up.[5] We noticed in our own clinic that patient retention was poor and were concerned that this might impact the optimum care we can provide to our community. As a result, we sought solutions to improve patient retention at our

SRFC. Although patient- and clinic-level variables correlating with retention in care have been studied in diverse healthcare settings, studies of predictors of clinic retention at SRFCs are lacking.[2,5-9] The purpose of this study was to determine variables associated with retention in care for patients receiving care at EAB. We expected to find that patients of low income or without insurance and requiring medications to treat chronic conditions would be most likely to be retained in care.

Methods

Study Design and Participants

We retrospectively analyzed a convenience sample of patients receiving care at EAB's Sunday afternoon clinic between March 1, 2013 and July 1, 2015. All new patients presenting to the weekly Sunday clinic complete an intake questionnaire with staff assistance that captures both demographic and health information including history of pre-existing physical and mental health conditions. A physician-supervised student team then evaluates new patients. Medical students see the patient first then report to the physician who also performs his or her own evaluation. Laboratory specimens are collected, medications are prescribed and provided to the patient from the on-site dispensary free of charge, and, if needed, follow-up is scheduled. Full history including past medical history, physical examination, assessment, and plan (including medications prescribed) are captured in the electronic medical record (EMR) (Practice Fusion™). Follow-up is also scheduled through the EMR and the patient is made aware of any follow-up appointment before leaving the clinic. We included data from patients eighteen years of age or older at the time of their initial clinic visit and with at least one follow-up visit scheduled within six months of their initial visit. This study was approved by the University of Alabama Institutional Review Board.

Outcome

The primary outcome was patient retention in care. Retention in care was defined as attendance at a follow-up appointment six to twelve months after the patient's initial visit, a definition that was chosen from studies of retention in care of human immunodeficiency virus (HIV)-infected persons for two reasons.[10] First, our focus is to understand retention in care in persons with chronic diseases, and HIV represents a chronic disease requiring frequent follow-up. Second, HIV-infected populations experience barriers to retention in care that we felt would mirror those observed in persons receiving care at a SRFC.[11,12]

Independent Variables

Variables of interest were chosen based on demonstrated relevance to retention in primary care and availability in the patient record.[6,7,13] Demographic variables included age, race, gender, marital status, education, housing, employment, and income source. Health-related variables included having current health insurance, having a primary care physician, having a pre-existing medical or mental health condition, and current drug or alcohol use. Access to telephone or email was also included as an independent variable since appointment reminders have been shown to increase kept appointments.[14]

Visit-specific variables included the type of problem(s) addressed at the initial visit and the type of care provided at that visit. These were categorized as acute or chronic. Acute problems were defined as those present for less than or equal to three weeks, with an expectation of complete recovery and the need for no or minimal follow-up. Chronic problems were defined as those present for greater than or equal to three weeks and with the need for long-term management. Types of care were also defined as acute (i.e. one-time treatment) or chronic (i.e. long-term treatment requiring clinical follow-up, prescription renewal, or laboratory monitoring). Patients presenting with both acute and chronic problems or receiving both acute and chronic care were assigned to the chronic groups. Dispensing of medications (or written prescription), need for laboratory tests and their collection, and the need for follow-up were also evaluated. Finally, visit history, including time to first follow-up appointment, number of kept, cancelled, and no-show appointments in the first six months of care, was evaluated to understand the relationship between short-term engagement in care and retention in care.

Statistical Analysis

Stata, Version 14.1 (StataCorp, College Station, Texas) was used for data analysis. Predictors were examined using multivariate logistic regression, with previously defined retention in clinic as the criterion. Predictors (Table 1) were entered into the model in stepwise fashion, with forward entry of predictors in order of magnitude of univariate association, and retention of variables with coefficient p-values less than 0.20. Predictors with coefficient p-values that rose above 0.30 with each added variable were removed via backward elimination. Odds ratios (OR) with p-values <0.05 were considered significant when identifying independent predictors of retention in care (Table 3).

Results

Population Characteristics

A total of 340 patients were seen at EAB for new visits between March 2013 and July 2015, and 230 patients were scheduled for follow-up. The mean age of patients scheduled for follow-up was 47 years (standard deviation [SD] 10.92) (Table 1). The majority of patients at our clinic were non-white (63.5%), married (77.4%), had a high school education or equivalent (70.9%), were unemployed (77.4%), and had no household income (57.6%). Having a primary care doctor (18.7%) or health insurance was uncommon (12.6%). Housing was reported by 60% of patients. Pre-existing medical (83.0%) and mental health (38.3%) conditions were commonly reported. Of the study population, 58 of 230 patients (25.2%) were retained in care six to twelve months after their initial visit.

Predictors of Retention in Care

Univariate analysis showed several potential predictors of retention, including age, preexisting medical condition, acute presenting problem, acute care provided, and number of appointments within six months (Table 2). Stepwise regression multivariate analysis (Table 3) showed positive predictors of retention to include medications given at the initial visit (OR 15.4, 95% confidence interval [CI] 1.56-152.82), total number of appointments scheduled within six months of the initial appointment (OR 2.00, 95% CI 1.51-2.66), and time (in weeks) to first follow-up visit following the initial visit (OR 1.14, 95% CI 1.04-1.26). Negative predictors of retention in care included acute care provided at the initial visit (OR 0.10, 95% CI 0.01-0.95), any appointment no-shows within six months of a patient's initial appointment (OR 0.33, 95% CI 0.13-0.86), and any appointment cancellation within six months of the initial appointment (OR 0.29, 95% CI 0.09-0.87).

Discussion

SRFCs are designed to provide care for patients with limited access to outpatient clinic resources, and patients who use SRFCs commonly present with uncontrolled chronic illnesses. Understanding the need for frequent follow-up to monitor disease progression, optimize medication regimens, and watch for toxicities, EAB strives to engage its patients with chronic health conditions in longitudinal care. However, retaining patients in care at SRFCs, as evidenced by our retention rate of 25%, is challenging. SRFC patients often face housing and food instability. They lack employment, income, and insurance. They have a high prevalence of mental illness and substance use. These factors have been shown to negatively associate with kept clinic appointments and retention in care in other clinical settings.[6,15-23] We anticipated that they would be negatively associated with retention in care in our population as well. However, these patient-level barriers did not emerge as predictors of retention in care. Rather, factors specific to the visit itself including reason for the visit and receipt of medications and/or prescriptions did. Time to first follow-up and cancellation/no-show behaviors in the first six months of care were also linked to retention in care.

Medication(s) or prescription(s) given at the initial visit was the strongest predictor of retention in care in this study. At EAB most prescriptions are filled in the clinic's dispensary, provided free to patients and given to them at the end of their clinic visit. Prescriptions are written only when a medication or its alternative is not available in the dispensary. Although causality is not established by this study, we surmise that consistent access to free medications is an important driver of retention in care for many of our patients who are uninsured and who do not have access to a healthcare clinic or to prescription medications.

Table 1. Sample Characteristics

	Full Sample n = 230	**Retained in Care** n = 58	**Not Retained** n = 172
Age, years	47.5 (10.9)	50.6 (10.1)	46.4 (11.0)
Race			
White	83 (36.1%)	20 (34.5%)	63 (36.6%)
Other than white	146 (63.5%)	38 (65.5%)	108 (62.8%)
Missing	1 (0.4%)	—	1 (0.6%)
Sex, male	122 (53.0%)	28 (48.3)	94 (54.7%)
Marital status, married	178 (77.4%)	47 (81.0%)	131 (76.2%)
Education			
Less than high school	46 (20.0%)	14 (24.1%)	32 (18.6%)
High school or GED	163 (70.9%)	39 (67.2%)	124 (72.1%)
Missing	21 (9.1%)	5 (8.6%)	16 (9.3%)
Social			
Housing	138 (60.0%)	41 (70.7%)	97 (56.4%)
Employed	52 (22.6%)	14 (24.1%)	38 (22.1%)
Household income	97 (42.2%)	28 (48.3%)	69 (40.1%)
Communication			
Phone number provided	198 (86.1%)	51 (87.9%)	147 (85.5%)
Email address provided	68 (29.6%)	19 (32.8%)	49 (28.5%)
Access to healthcare			
Primary care physician	43 (18.7%)	12 (20.7%)	31 (18.0%)
Health insurance	29 (12.6%)	6 (10.3%)	23 (13.4%)
Medical history			
Pre-existing medical condition	191 (83.0%)	55 (94.8%)	136 (79.1%)
Pre-existing mental health condition	88 (38.3%)	20 (34.5%)	68 (39.5%)
Alcohol use	170 (73.9%)	41 (70.7%)	129 (75.0%)
Drug use	90 (39.1%)	24 (41.4%)	66 (38.4%)
Clinic care			
Acute presenting problem only	47 (20.4%)	6 (10.3%)	41 (23.8%)
Only acute care provided	31 (13.5%)	3 (5.2%)	28 (16.3%)
Received prescription	193 (83.9%)	52 (89.7%)	141 (82.0%)
Labs ordered	86 (37.4%)	19 (32.8%)	67 (39.0%)
Return to clinic requested in note	139 (60.4%)	36 (62.1%)	103 (59.9%)
Follow-up			
Time to first follow-up appointment, weeks	4.3 (3.6)	5.0 (4.0)	4.1 (3.4)
Any cancelled appointment within 6 months	76 (33.0%)	25 (43.1%)	51 (29.7%)
Any no-show within 6 months	165 (71.4%)	36 (62.1%)	129 (75.0%)
Number of appointments within 6 months	3.91 (1.99)	5.23 (2.29)	3.47 (1.68)

Values represent mean (standard deviation) or frequency (percentage); GED: General Educational Development certification

Table 2. Univariate Analysis for Predictors of Retention at 6-12 Months

Predictor	OR	95% CI	*p*
Age, years	1.04	1.01 – 1.07	0.014
Race, white	0.90	0.48 – 1.68	0.75
Sex, male	1.29	0.71 – 2.34	0.40
Marital status, married	0.83	0.39 – 1.76	0.62
Education, less than high school	0.72	0.35 – 1.48	0.37
Social			
Housing	1.67	0.87 – 3.18	0.12
Employed	1.11	0.55 – 2.25	0.76
Household income	1.31	0.71 – 2.42	0.39
Communication			
Phone number provided	1.09	0.44 – 2.70	0.85
Email address provided	1.22	0.64 – 2.33	0.54
Access to healthcare			
Primary care physician	1.08	0.51 – 2.29	0.84
Health insurance	0.69	0.27 – 1.80	0.45
Medical history			
Pre-existing medical condition	4.85	1.43 – 16.42	0.01
Pre-existing mental health condition	0.80	0.43 – 1.50	0.49
Alcohol use	0.80	0.41 – 1.56	0.52
Drug use	1.13	0.61 – 2.06	0.71
Clinic care			
Acute presenting problem only	0.37	0.15 – 0.92	0.03
Only acute care provided	0.28	0.08 – 0.96	0.04
Received prescription	1.91	0.75 – 4.83	0.17
Labs ordered	0.76	0.41 – 1.43	0.40
Return to clinic requested in note	1.10	0.59 – 2.02	0.77
Follow-up			
Time to first follow-up appointment, weeks	1.06	0.98 – 1.15	0.12
Any cancelled appointment within 6 months	1.80	0.97 – 3.32	0.06
Any no-show within 6 months	0.72	0.50 – 1.04	0.08
Number of appointments within 6 months	1.52	0.30 – 1.78	<0.001

OR: odds ratio; CI: confidence interval

As well, consistent access to free medications is likely an important driver for retention in care for the underinsured who have access to a healthcare clinic but who cannot afford the cost of prescribed medications.

Although not assessed in this study, transportation is also particularly challenging for patients at our SRFC. Even when patients can see a healthcare provider and receive prescriptions, they are unlikely to get them filled when they have inconsistent or absent access to transportation.[24,25] With a limited number of pharmacies in downtown Birmingham and none within walking distance of EAB, provision of medication ensures access and may also reinforce retention.

Patients receiving only acute care at their initial visit were less likely to be retained in care. Inclusion in this study required that patients have at least one follow-up visit scheduled within six months of their first visit. For those receiving

Table 3. Multivariate Logistic Regression Results for Predictors of Retention at 6-12 Months

Retained Predictor	OR	95% CI	*p*
Number of appointments within 6 months	2.00	1.51 – 2.66	<0.001
Time to first follow-up, weeks	1.14	1.04 – 1.26	0.007
Received prescription	15.40	1.56 – 152.82	0.019
Received only acute care	0.10	0.01 – 0.95	0.045
Any no-shows within first 6 months	0.33	0.13 – 0.86	0.022
Any cancellations within first 6 months	0.29	0.09 – 0.87	0.028
Reported having housing	2.08	0.83 – 5.24	0.119
High school education or GED	0.49	0.19 – 1.23	0.129

OR: odds ratio; CI: confidence interval; GED: General Educational Development certification

acute care only, follow-up may have been requested to ensure resolution of the acute problem. Or for patients with both acute and chronic problems, follow-up may have been requested to address chronic illness after resolution of the acute problem. For the latter group, better communication between clinic staff and patients about their chronic condition, the purpose of follow-up and its benefits to the patient may have led to improved retention.[17,21,22] In line with our findings that receipt of a prescription at the first visit was associated with retention in care, initiating therapy for patient's chronic medical conditions at the same visit where acute issues are addressed may also have benefits on retention.

Time to follow-up appointment also predicts retention in care. Previous studies have reported poor patient retention for patients with greater than or equal to ten weeks between scheduled visits.[15,17] However, we observed that shorter intervals between scheduled visits negatively predicts retention. Healthcare providers in the clinic have suggested that they strategically scheduled short-term interval follow-up for patients who they were concerned would be lost to follow-up, possibly accounting for this finding in the clinic. Further work is needed to determine whether this accounted for this observation or whether other factors are at play.

Consistent with other work in retention in care, we observed a negative correlation between cancellations and no-show appointments with retention in care in our study population.[13,15,17] If a patient cancelled at least once or no-showed to at least one visit in the first six months after the initial visit, she/he was significantly less likely to be retained in care. With the transient nature of the clinic population, it is expected that some patients may move to other cities and access local healthcare resources. As well, some patients may use the clinic as a bridge between providers and/or insurance coverage, not falling out of care but rather engaging (or reengaging) with other healthcare venues. Yet, for the majority of patients cancelling or no-showing appointments, we suspect that they are not receiving care elsewhere and have truly fallen out of care. Qualitative work is underway to investigate why patients no-show and cancel appointments in the first six months of care. Information gained from this qualitative work, in conjunction with our current findings, will be used to identify points for intervention and better patient retention. EAB and other SRFCs may be able to improve patient retention by targeting any patients who no-show or cancel a single appointment. Appointing a student or staff member whose sole purpose is to track these "at risk" patients and seek contact with them, may help improve retention in care and more efficiently allocate limited resources.

We suspect that EAB, as well as SRFCs with similar patient populations and needs, can build on the results of this study. Future studies may help minimize clinic inefficiency and optimize the utilization of limited resources.[26,27] Because many patients miss appointments due to forgetfulness, lack of reason or miscellaneous reasons, systematic reminders either by phone or email are commonly employed methods to reduce missed appointments.[14,15,28,29] Interestingly, we attempt to send appointment reminders to our patients and did not see a difference in retention in care between persons providing telephone numbers and email addresses and those who did not. Others have resorted to double booking based on the predicted nonattendance rate or using a modified advanced access schedule.[18,27] Similar studies can be conducted in the EAB practice in the future to determine if these factors apply to

our population as well and whether these strategies may help improve retention in care.

Our study has a number of limitations. This was a retrospective study, and our patient sample size is relatively small. We rely heavily on medical student and faculty volunteers to staff and serve at EAB. We were unable to control for the effect that variation in providers could have on the patients' inclinations to return to clinic. EAB suffers from a lack of continuity with volunteer medical students and physicians from week to week. Patients typically do not see the same clinic staff at each of their visits, a factor that has been shown to influence missed appointments.[2] Furthermore, variation in the training levels of volunteer providers and longer visits than observed in a traditional primary care setting may have led to loss to follow-up.[2] This study was performed at one SRFC. Expanding this study to include patients receiving care at other SRFCs (with similar care models) would enhance the generalizability of our findings. Despite these limitations, we believe that this study provides important insight into factors potentially important for retention of patients receiving care in SRFCs.

To our knowledge, this is one of the first studies to examine retention rates and predictors of patient retention at a SRFC. Some of the previously reported predictors of retention in care from other healthcare settings were not observed in this SRFC. Rather, visit specific events (i.e. type of care given and receipt of medications) and longer interval to follow-up predicted retention in care. In addition, no-shows and appointment cancellations in the first six months of care predicted poor retention. We believe that the value of this information lies in its ability to inform strategies to better retain in care SRFCs patients, who suffer high rates of chronic illness and are particularly vulnerable to loss to follow-up.

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Disclosures

The authors have no conflicts of interest to disclose.

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