



Examining Factors Impacting Encounter Lengths and Missed Appointments at a Student-Run Free Clinic: A Retrospective Analysis

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Abstract

Background: St. Vincent's Clinic (SVC) is a free, student-run clinic affiliated with the University of Texas Medical Branch that has been an invaluable resource in providing free healthcare services to marginalized populations in Galveston, Texas. The clinic offers a wide variety of specialty services along with free resources such as transportation and medication assistance, telehealth options, and interpreter services. Despite these resources, the clinic has faced challenges with consistently high no-show rates and long encounter lengths, impacting overall efficiency and patient care. We aimed to explore factors that may contribute to these challenges and uncover opportunities to improve patient satisfaction and optimize clinic efficiency.

Methods: A retrospective chart review was conducted on all patients seen at SVC across all specialty clinics between March 2021 and March 2023. Patient demographics, appointment status, encounter length, language spoken, department specialty, and appointment modality were recorded. A series of statistical analyses were conducted on collected variables, including chi-square analysis, unpaired t-tests, and single-factor analysis of variance (ANOVA) tests, to assess significant associations.

Results: The average encounter length varies significantly across different spoken languages and specialty clinics, but no significance was observed between different appointment modalities. The no-show rates were significantly different depending on the appointment modality, specialty clinic, and patient language spoken. Notably, while the encounter length was significantly shorter for English-speaking patients, Spanish-speaking patients had a lower no-show rate and were more likely to keep scheduled appointments.

Conclusions: Language barriers and specialty clinic types can impact the encounter lengths and no-show rates, highlighting the need for targeted interventions such as proper resource allocation. Limitations include potential data discrepancies from factors such as human error or variations in documenting appointments. Future research should explore patient perspectives and experiences to improve patient satisfaction and overall optimize clinic operations.

Introduction

The United States currently faces a significant issue with approximately 27.5 million individuals lacking health insurance coverage.¹ This is a very large vulnerable population that encounters many obstacles when attempting to access healthcare. As a result, uninsured individuals

often receive lower-quality care, resulting in deteriorating health outcomes and an elevated risk of premature death.² To address this pressing problem, free clinics have emerged as a vital resource for underserved and uninsured communities since the 1970s, catering to the healthcare needs of over 1.8 million individuals each year.³ By bridging the gap in health coverage, these clinics

play a crucial role in ensuring that a substantial number of people receive the necessary care they require.

St. Vincent's Clinic (SVC) is a free, student-run clinic affiliated with the University of Texas Medical Branch located in a low-income area of Galveston, Texas. The clinic was opened in 1969 and has been in continuous operation since. It has been an invaluable resource in providing free healthcare services to disadvantaged and uninsured individuals who live in Galveston County, Texas, and the surrounding Gulf Coast.

The clinic offers an array of specialties, including General Medicine, Psychiatry, Dermatology, Obstetrics and Gynecology (OB/GYN), Neurology, and Surgery. In addition, the clinic offers many free services, such as transportation and medication assistance, telehealth options, and live interpreter services. However, despite these services, the clinic has faced challenges with consistently high no-show rates and long encounter lengths, impacting clinic efficiency and patient care. Missed appointments, or no-shows, not only have administrative and financial repercussions but also result in gaps in patient care, which can be detrimental to the management of chronic conditions and patient outcomes.⁴ Additionally, a consistently high no-show rate reduces access to care for patients looking to establish care with the clinic. Long encounter lengths, on the other hand, can cause scheduling delays and decrease patient satisfaction.⁵

Moreover, there remains a scarcity of research that examines the intricate factors contributing to persistently high no-show rates and extended encounter lengths within student-run clinics. While some literature explores patient no-show rates and clinic efficiency within healthcare settings, these often do not specifically pertain to the distinct challenges encountered by student-run clinics. For instance, some studies have investigated the impact of interventions, such as setting time limits and implementing checklists, on encounter length while some explored different barriers to appointment attendance. However, limited existing research was done to investigate the interplay of language barriers, specialty clinics, and appointment modalities with encounter length, as well as their association with no-show rates.

In light of these challenges, this study aimed to cover gaps in the literature by exploring various factors from language barriers to different types of clinics to appointment modalities that may contribute to high no-show rates and long encounter lengths, ultimately uncovering opportunities to improve patient satisfaction and optimize clinic efficiency.

Methods

Study Design

This study was exempted from the University of Texas Medical Branch, Institutional Review Board. The data collected for this study did not include any potentially identifying patient information and patient privacy and confidentiality were respected throughout this process.

Data collection was completed using SVC's in-house electronic medical record (EMR), Epic (2023, Epic Systems Corporation, Verona, WI), to collect information on patient visits. Only appointments under the St. Vincent's Clinic School of Medicine, "STVSOM", department were included in this study. Appointment information between March 2021 to March 2023 was extracted for review, totaling 7235 appointments. The extracted data included the following prevalent variables, such as medical record number (MRN), Sex, Patient Age, Visit Date, Date/Time, Appointment Status, Department Specialty, Preferred Language, Ethnicity, Race, No-show Chance, Check In to Check Out, Check In-Appointment Time, Check In to Room, Room to Check Out, Check Out Time. The data were grouped by language spoken, specialty clinic type, and appointment modality.

Measurement and Calculation

Encounter length was computed by calculating the time elapsed between check-in and check-out for each appointment. We then computed the average encounter length for each category. On the other hand, the rate of missed appointments was calculated by assigning 'missed appointment' a value of 1, 'attended appointments' a value of 0, and calculating the rates in each of the categories analyzed.

A series of statistical analyses were conducted on the data gathered using Jupyter Notebook

Table 1. Comparison of average encounter length between different language spoken by patients, specialty clinics, and appointment modalities

Factor	Encounter length (minutes)	F-value/t-value	p-value
Languages spoken			
Arabic*	179	-	-
Hindi*	149	-	-
Vietnamese*	142	-	-
Spanish	133	t= -3.128†	0.00181
English	126		
Specialty clinics			
Neurology	139	F=79.186‡	<0.001
General medicine	139		
OB/GYN	120		
Psychiatry	105		
Dermatology	101		
Appointment modalities			
In-person	128	t= -.541†	0.589
Telehealth	130		

*indicates small sample size (n<50) for statistical analysis; †indicates independent samples t-test; ‡indicates ANOVA test. OB/GYN: obstetrics and gynecology; ANOVA: analysis of variance.

running Python (3.10.9, The Python Software Foundation, Wilmington, Delaware). The collected data was stratified by variables for subgroup analysis. The association between categorical variables was measured using chi-square analysis. Additionally, unpaired t-tests and single-factor analysis of variance (ANOVA) tests were utilized to assess the associations between categorical and quantitative variables. The significance threshold was set at $p < 0.05$, corresponding to a 95% confidence interval.

Results

Among the different language groups, Spanish-speaking visits had significantly longer average encounter length at 133 minutes compared to English-speaking visits at 126 minutes (t-value=-3.1279, p-value=0.0018) (Table 1). Arabic language groups experienced the longest encounter length at 179 minutes, followed by Hindi at 149 minutes, and Vietnamese at 142 minutes. However, these groups were excluded from statistical analysis due to the small sample size ($n < 50$), but it is essential to note potential trends observed in these groups. These language groups experienced longer encounter lengths,

suggesting that language barriers might play a role. However, these observations warrant further exploration with a larger sample size for conclusive significance.

For different specialty clinics, neurology had the longest average encounter length at 139 minutes, followed closely by the general medicine clinic at 138.5 minutes. Moreover, OB/GYN clinics had an average encounter length of 120 minutes, while psychiatry and dermatology clinics had an average length of 104.5 minutes and 101 minutes, respectively. The statistical analysis revealed a significant difference in encounter length between the encounter length of each specialty clinic (F-value=79.186, p-value<0.001).

However, when comparing the encounter length by appointment modalities, there was no statistically significant difference in encounter length between in-person visits, averaging 128 minutes compared to telemedicine visits with an average of 130 minutes. (t-value=-0.54136, p-value=0.589).

On the other hand, when analyzing the no-show rates among different language groups, English-speaking patients had a no-show rate of 28.42% (5,904 missed appointments out of 20,773), while Spanish-speaking patients had a

Table 2. Comparison of no-show rates between different languages spoken by patients, specialty clinics, and appointment modalities

Factor	No-show rates (%)	p-value
Languages spoken		
Arabic*	30.77	-
Hindi*	3.45	-
Vietnamese*	12.07	-
Spanish	23.05	<0.001†
English	28.42	
Specialty clinics		
Neurology	40.86	
General medicine	35.51	
OB/GYN	36.80	<0.001†
Psychiatry	41.13	
Dermatology	37.38	
Appointment modalities		
In-person	37.10	
Telehealth	16.62	<0.001†

*indicates small sample size ($n < 50$) for statistical analysis; †indicates chi-square analysis.

OB/GYN: obstetrics and gynecology.

lower rate at 23.05% (1,592 missed appointments out of 6,908) (Table 2). A significant difference was observed between these groups (p -value<0.001). The Arabic language group had the highest no-show rates at 30.77% while Hindi and Vietnamese groups had the lowest no-show rates at 3.45% and 12.07% respectively. However, once again, these language groups were excluded from statistical analysis due to small sample size ($n < 50$) but studies with a larger sample size should be further explored for conclusive significance.

For specialty clinics, the no-show rates varied significantly across each specialty with Psychiatry leading at 41.13%, followed by OB/GYN at 40.86%, Neurology at 36.80%, General Medicine at 35.51%, and lastly Dermatology clinic at 37.38% (p -value<0.001).

When comparing the no-show rates among different appointment modalities, the in-person rate was found to be at 37.10% (1,502 missed appointments out of 4,048) compared to telemedicine appointments at a lower rate of 16.62% (56 missed appointments out of 337). The statistical analysis revealed significant differences between these groups (p -value<0.001).

Discussion

To address challenges in long encounter lengths and missed appointments at SVC, we found that language barriers contributed to longer encounters for Spanish-speaking patients. Additionally, telehealth appointments demonstrated promising solutions with significantly lower no-show rates compared to in-person appointments.

The longer encounter length among non-English-speaking patients is likely due to communication barriers and the use of medical interpreter services.⁶ Language barriers lead to miscommunication between the physician and the patient and increase the length of encounters, negatively impacting not only patient satisfaction but also the quality of care.⁶ However, English-speaking patients had higher no-show rates compared to Spanish-speaking patients, indicating possible disparities in commitment, communication, transportation barriers, or socioeconomic constraints. Allocating resources for translation services, providing availability of translators, and developing multilingual health resources can help mitigate language-related challenges.

The type of specialty clinic significantly impacted both encounter length and no-show rates at SVC. The nature of the general medicine and neurology clinics is that they require more extensive workup, including bloodwork and physical exams, as these clinics often deal with more complex cases. To provide medications for our uninsured and low-income patients, medication assistance applications are often completed at their SVC appointments, which prolongs the encounter length. This was reflected in our results showing that general medicine and neurology clinics had the longest encounter length. In contrast, the dermatology clinic had the shortest encounter length, likely due to the nature of the health conditions it addresses.

On the other hand, the psychiatry clinic exhibited the highest no-show rate, which could be attributed to factors such as less urgency in receiving treatment and support or likely due to the demographic characteristics of patients with mental health conditions that should be further explored and addressed.

Moreover, the convenience and accessibility of

telemedicine often eliminate the need for travel and allow more flexibility with family and work obligations.⁷ In a study conducted on a large population in the United States, telemedicine modalities appointments were found to be associated with reduced no-show rates in low-income populations.⁸ Our analysis revealed similar results with in-person visits showing a significantly higher no-show rate compared to telemedicine appointments, while encounter length did not differ significantly between the two modalities. Patient preferences and greater technology adoption in telemedicine could also influence attendance rates. Incorporating telemedicine as a feasible alternative without compromising encounter time can enhance clinic efficiency and reduce no-show rates.⁹ Future research should explore technical difficulties in telemedicine visits and identify strategies to improve its implementation in order to reduce encounter length.

There are some important limitations to our study that should be considered. For example, the analysis of this study only captured appointments in a 24-month period from 2021 which was when the clinic implemented Epic EMR system. Additionally, our measurement of the encounter length is based on the check-in and check-out time recorded on the EMR by student volunteers which can pose potential inconsistencies or discrepancies in the data from factors such as human error or variations in documenting practices.

Moving forward, further research is needed to uncover the underlying causes of the observed differences in order to better develop targeted interventions. End-of-visit surveys could provide valuable insights into patient perspectives and identify areas for improvement. Interventions should focus on optimizing clinic operations, such as enhancing resources, staffing, and scheduling in specialty clinics with notable encounter length variations. Collaboration with Spanish-speaking organizations, developing multilingual health resources, and leveraging specialized medical translation services could also help mitigate language barriers and enhance patient-provider communication.

Conclusion

Our findings showed a 20.48% lower no-show

rate among telehealth encounters compared to in-person appointments which may represent a viable alternative option to increase appointment attendance and follow-up adherence. The lower no-show rates associated with Spanish-speaking compared to English-speaking patients was also another significant finding that warrants further research to explore the underlying causes of these discrepancies. Encounter length varied significantly between the types of clinics and languages spoken by patients. Future studies should consider the correlation between staffing and encounter length to improve clinic scheduling and explore patient satisfaction in association with encounter length through the implementation of end-of-visit surveys.

Disclosures

The authors have no conflicts of interest to disclose.

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