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Factors Associated with Incomplete Telemedicine Visits at an Virtual Urgent Care Center

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Abstract. Virtual care utilization has exponentially grown since the onset of the pandemic. However, unknown are the factors associated with incomplete virtual care visits. The purpose of this study is to investigate the factors associated with telemedicine call drops. We utilized an on-demand virtual urgent care service to examine the differences between completed and uncompleted visits. We conducted a cross-sectional study of 22,721 telemedicine encounters. We found that older adults were associated with higher rates of completing telemedicine visits, with higher odds with telephone visits. This study adds new knowledge about the factors that may lead to unsuccessful virtual care visits, which is of interest to policy makers.

Keywords. Telemedicine, Barriers, Successful, Patients

1. Introduction

Virtual urgent care (VUC) can improve overall patient outcomes and access to affordable urgent care simultaneously [1,2]. Patients in the United States spend an average of two hours for a 20- minute in-person clinician office visit [3]. Past research has shown the disparities of adoption of technology and broadband in elderly patients, racial/ethnic minority groups and those with lower socioeconomic level [4,5]. Patients who are older adults, and non-English speaking adults have limited access to telemedicine [6].

Identifying and investigating the factors that contribute to fruitful delivery of virtual urgent care and issues patients face during their VUC visit is essential to address accessibility issues and build a sustainable virtual care environment. This study compares the patient and visit characteristics of patients who completed telemedicine encounters (telephone or video) for virtual urgent care with those who scheduled but did not complete telemedicine visit. The purpose of this study is to identify and understand factors associated with incomplete telemedicine visits.

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2. Methods

This cross-sectional study was carried out in the United States to determine the characteristics associated with unfinished telemedicine visits despite appointments being made through the virtual urgent care system of Southeastern Medical Center. This virtual care service connects patients with a board-certified clinician by phone or video and offers urgent care through telemedicine. All patients over the age of 2 who visit VUC can receive services, regardless of their demographics or insurance status. The virtual care service provides on-demand healthcare services 24 hours a day, seven days a week. Through the portal, patients have the independence to choose to be seen instantly or to schedule a visit at a later day. Patients may opt to be seen immediately or later via the portal. Patients chose the preferred physician by phone or video call. This feature is particularly important to accommodate personal preferences with regards to access to technology, privacy, security, and convenience. Data was collected through the VUC web portal, imported into a business intelligence server that was HIPAA-compliant, and then processed in MS Excel using functions for extraction, cleaning, and wrangling. The study period covered 22749 patient encounters across 5 years between January, 2018 and January 2023. Our dataset included patient age, gender, visit date and time, encounter duration (Phone/ Video), wait time, prior visits, repeat visits, insurance status, encounter medium, and call status (calls missed, cancelled, and completed). This study was reviewed and certified as exempt by the University of North Carolina at Chapel Hill IRB. We removed 28 test users and other missing data encounters to examine 22,721 patient interactions for analysis purposes. The binary outcome variable "Call Status" was 0 for "call dropped" (CD), which included patient-cancelled and missed calls. and missed by the patient. and 1 for 'call completed' (CC) visits. We further re-coded our predictor variables - age, gender, previous visits, repeat visits, insurance status, and encounter medium for ease of analysis. Descriptive statistics were used to describe patient characteristic demographics, and to estimate choice of medium for different age group population. Binary logistic regression model was applied to investigate potential factors associated with Incomplete Telemedicine visits. The odds ratio was calculated and recorded with corresponding 95% CI (Confidence Interval). Statistical analyses were performed using IBM SPSS version 29.0. All statistical testing was 2-tailed, with $P < 0.05$ designated as statistically significant.

3. Results

Out of the total 22,721 encounters, 20,883 (91.9%) were completed, and 1838 (8.1%) were dropped. The average previous visits in the CD and CC group are 0.55 (±1.545), and 0.81(±1.976) respectively. Of the entire study population, 13,060 (57.5%) were insured patients, 16,576 (73%) were females, and 11,286 (49.7%) were of age 35-64 years, and most chose (78.5%) telephone as the preferred medium, Table 1. Patients in the 18-34 years of age category showed a significant increase in the call-drop category (34.3%) compared to completed calls (37.4%). Similarly, wait time between 1-5 minutes showed a significant increase in call drops (48.8%) compared to completed calls (30.3%).

Table 1. Summary of patient demographics for Call – Dropped and Call- Completed groups.

Characteristic		Call-Dropped, n (%)	Call–Completed n (%)	p - value of χ^2
Age	<18 years	209 (11.4%)	2036 (9.7%)	<0.001
	18 – 34 years	630 (34.3%)	7816 (37.4%)	
	35-64 years	912 (49.6%)	10374 (49.7%)	
	≥ 65 years	87 (4.7%)	657 (3.1%)	
Wait time	0 min.	597 (32.5%)	4032 (19.3%)	<0.001
	1-5 min	557 (30.3%)	9554 (45.8%)	
	6-20 min	292 (15.9%)	4254 (20.4%)	
	≥ 21 min	292 (15.9%)	3043 (14.6%)	
Gender	Female	1275 (69.4%)	15301 (73.3%)	<0.001
	Male	556 (30.3%)	5538 (26.5%)	
	Non-Binary	7 (0.4%)	44 (0.2%)	
Medium	Telephone	1193 (64.9%)	16645 (79.7%)	<0.001
	Video	645 (35.1%)	4238 (20.3%)	
Insurance Coverage				
	Insured	1260 (68.6%)	11800 (56.5%)	<0.001
	Uninsured	578 (31.4%)	9083 (43.5%)	

Significant increase among females in call drops (73.3%) compared to completed calls (69.4%). Call drops had a significant increase in uninsured patients (43.5%) compared to completed visits (31.4%). The proportion of call dropped were significantly higher among virtual visits utilizing video calls (P-value<0.001). Among completed visits, 80% of the calls were telephone calls compared to 20% for video calls. Among uncompleted visits, 65% of the calls were telephone calls compared to 35% for video calls.

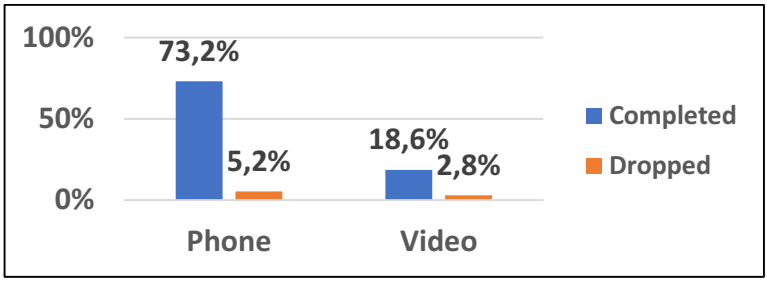

Figure 1. Proportion of completed and dropped virtual care by communication medium (Phone vs. Video)

The factors that were statistically significant predictors of completed call status are shown in Table 2. Compared to patients using Video as the preferred medium, the ones who used Phone associated with completing the telemedicine (OR:2.16; p-value: <0.001;95% CI: 1.94 - 2.4). Uninsured patients, patients with prior visits, patients with wait time of 1-5 minutes, those with wait time 6-20 min , patients who are 19-34 years old (OR :1.52, p-value: <0.001,95% CI :1.196 -1.945), and those aged 35-64years old (OR: 1.336, p-value: 0.018, 95% CI : 1.052 - 1.698) were seen to have more odds of completing the telemedicine visit. Meanwhile, patients had no wait time (0 min) were found to be negatively associated with completing the visit (OR: 0.864, p-value: 0.038, 95% CI: 0.753 - 0.992).

Table 2. Factors associated with telemedicine visit status: Binary Logistic Regression result:

Patient characteristic	OR (95% CI)	p- value
Prior visits	1.037 (1.003-1.072)	0.035*
Wait time – 0 min	0.864 (0.753-0.992)	0.038*
Wait time – 1-5 min	2.303 (2.007-2.643)	<0.001*

Wait time 6-20 min	1.971 (1.679-2.314)	<0.001*
Medium Used - Phone	2.164 (1.947-2.405)	<0.001*
Uninsured	1.507 (1.355-1.676)	<0.001*
Age <18 years	1.283 (0.976- 1.686)	0.074
Age 18-34 years	1.525 (1.196-1.945)	<0.001*
Age 35 – 64 years	1.336 (1.052-1.698)	0.018*
Female	1.712 (0.760-3.854)	0.194
Male	1.641 (0.727-3.704)	0.233

4. Discussion

This study examines the patient and visit characteristics as predictors for telemedicine call status. Older age was independently associated with completing the VUC visits, with higher odds when the 'phone' was used as a medium. This is in line with the research suggesting older adults have a low rate of technological adaptation and use relatively less video services [7]. We report that prior virtual care visits were a significant predictor of virtual call drop. This is explainable since previous virtual care experience may enable better management of expectation of patients especially with regards to wait time and the quality of video call. We also found that the wait-time of 0 minutes was substantially related to incomplete VUC visits, this was because more than half of the incomplete visits in our study were calls missed by the patients.

This study had several limitations. This is a single-site study although it is a state-wide service. Also, we were not able to account for the exact reasons for the call drops. For video calls, we could not identify if the reason for an unsuccessful encounter was internet connection issues at the patient or provider end. Future studies should use geospatial analysis to investigate neighborhood characteristics to better understand the internet speed used at the patient's end. The impact of waiting periods on patient outcomes and potential countermeasures in telemedicine setting need more study. This study adds new knowledge about the factors that may lead to unsuccessful virtual care visits, which is of interest to policy makers.

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