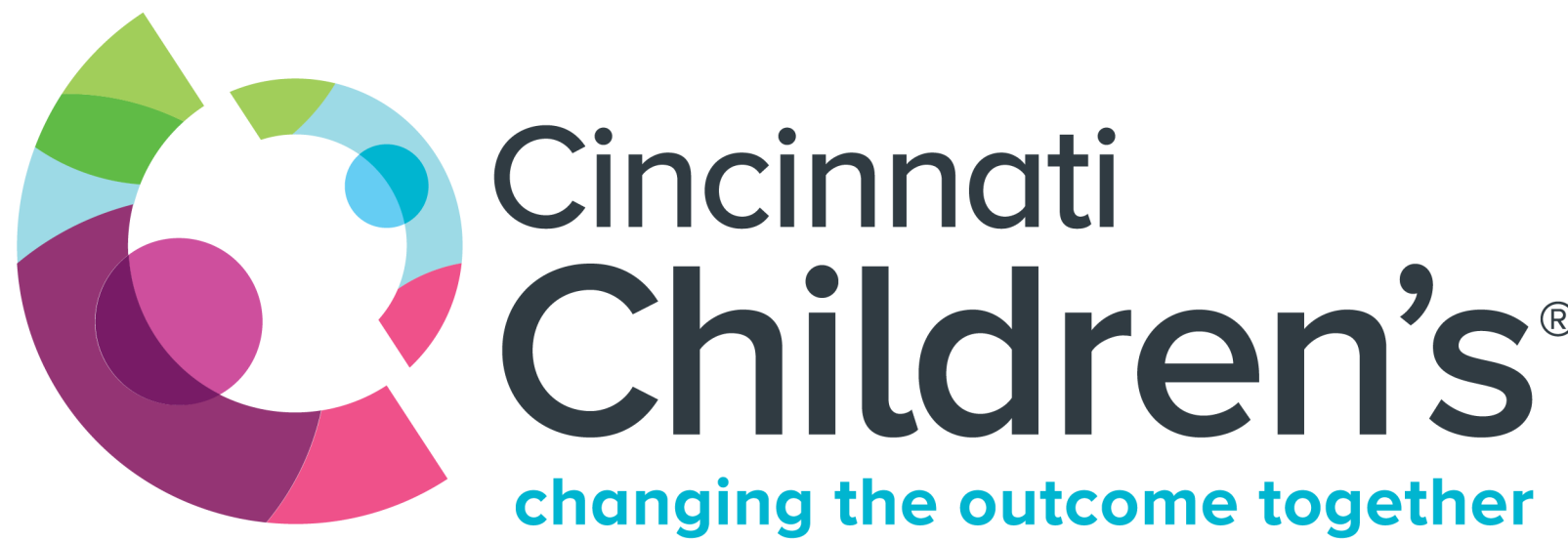# Impact of Telehealth Care on Patient and Family Experience for Non-Urgent Complaints

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Background

Families seek medical care in pediatric emergency departments (EDs) and urgent cares (UCs) for a variety of non-urgent or emergent reasons. At the start of the COVID-19 pandemic, healthcare organizations rapidly increased access to care via digital solutions for non-acute complaints. Offering telehealth as a care alternative may impact patent and family experience (PFE) for individual patients and families who are seen in the virtual setting.

Objective

To identify any associations between management location (virtual urgent care [VUC], UC, or ED) for non-emergent complaints and PFE.

Methods

Retrospective cohort study of discharge encounters of patients with specific ICD-10 diagnoses (Appendix A) from VUC, five UCs and two EDs between July 1st, 2021, and June 30, 2022, in which a post-visit PFE survey was completed. Descriptive statistics of patient demographics and clinical parameters were generated. Univariate analysis of association between these factors and our key performance indicator (KPI) on the PFE post-visit survey was performed. Multivariable analysis was used to identify independent predictors of KPI.

Appendix A. Diagnoses and ICD-10 Codes for Patients Included in Study

Primary Diagnosis	ICD-10 Code
Acute cough	R05.1
Acute pharyngitis due to other specified organisms	J02.9
Acute URI	J06.9
Bronchiolitis	J21.9
Close exposure to COVID-19 virus	Z20.822
Common cold	J00
Cough	R05.9
Cough, unspecified type	R05.9
COVID	U07.1
COVID-19	U07.1
Croup	J05.0
Encounter for laboratory testing for COVID-19 virus	Z11.52
Herpangina	B08.5
Influenza	J10.1
Influenza A	J09.X2
Influenza-like illness	J11.1
Influenza-like illness in a pediatric patient	U11.1
Flu-like symptoms	R68.89
Nasal congestion	R09.81
Persistent cough	R05.3
Pharyngitis with viral syndrome	J02.8
Roseola	B09
Subacute cough	R05.2
Upper respiratory tract infection [unspecified type]	J06.9
Viral illness	B97.89
Viral syndrome	B34.9
Viral upper respiratory tract infection	J06.9
Viral URI with cough	J06.9
Viral infection	J06.9
Viral URI	J06.9
Upper respiratory infection with cough and congestion	J06.9
Viral upper respiratory infection	J06.9
Wheezing-associated respiratory infection	J98.8

Results

13,299 patient encounters with relevant ICD-10 diagnoses occurred during the study period, of which 828 (6.2%) had post-visit PFE surveys and were included in the study (Table 1). Of those encounters included, just over half involved patients of the male sex, and the majority identified as white non-Hispanic. Almost half of the encounters occurred in the ED. The five most common diagnoses involved viral infections or exposure to COVID.

Table 1. Comparison of demographic and clinical data for patient encounters with or without post-visit PFE surveys completed

Characteristic	No Survey Completed (N=12471)	Survey Completed (N=828)	Overall (N=13299)
Age at the visit (years, Median [IQR])	2.6 (1.0, 6.6)	2.3 (1.0, 5.3)	2.6 (1.0, 6.5)
Sex (n, %)			
Male	6651 (53.3%)	427 (51.6%)	7078 (53.2%)
Female	5820 (46.7%)	401 (48.4%)	6221 (46.8%)
Race (n, %)			
American Indian and Alaska Native	33 (0.3%)	1 (0.1%)	34 (0.3%)
Asian	534 (4.3%)	34 (4.1%)	568 (4.3%)
Black or African American	3691 (29.7%)	171 (20.8%)	3862 (29.1%)
Middle Eastern	72 (0.6%)	9 (1.1%)	81 (0.6%)
Multiple	600 (4.8%)	31 (3.8%)	631 (4.8%)
Native Hawaiian and Other Pacific Islander	29 (0.2%)	3 (0.4%)	32 (0.2%)
White	6636 (53.4%)	485 (59.0%)	7121 (53.7%)
Other	835 (6.7%)	88 (10.7%)	923 (7.0%)
Missing	41	6	47
Ethnicity (n, %)			
Hispanic	1126 (9.1%)	106 (12.9%)	1232 (9.3%)
Non-Hispanic	11195 (90.1%)	701 (85.3%)	11896 (89.8%)
Patient Refused/Unknown	107 (0.9%)	15 (1.8%)	122 (0.9%)
Missing	43	6	49
Location (n, %)			
VUC	1994 (16.0%)	156 (18.8%)	2150 (16.2%)
UC	4222 (33.9%)	287 (34.7%)	4509 (33.9%)
ED	6255 (50.2%)	385 (46.5%)	6640 (49.9%)
Prescription Written (n, %)			
Yes	5233 (42.0%)	369 (44.6%)	5602 (42.1%)
No	7238 (58.0%)	459 (55.4%)	7697 (57.9%)
Labs Ordered (n, %)			
Yes	7743 (62.1%)	476 (57.5%)	8219 (61.8%)
No	4728 (37.9%)	352 (42.5%)	5080 (38.2%)
Imaging Ordered (n, %)			
Yes	2211 (17.7%)	113 (13.6%)	2324 (17.5%)
No	10260 (82.3%)	715 (86.4%)	10975 (82.5%)
Disposition (n, %)			
Admit	1715 (13.8%)	2 (0.2%)	1717 (12.9%)
Discharge home/No ED transfer	10590 (84.9%)	805 (97.2%)	11395 (85.7%)
Transfer to ED	166 (1.3%)	21 (2.5%)	187 (1.4%)
Revisit within 72 hours[a]			
Yes	1642 (15.5%)	177 (22.0%)	1819 (16.0%)
No	8948 (84.5%)	628 (78.0%)	9576 (84.0%)
Missing[b]	1994	156	2150
Length of stay (minutes)			
N	12471	828	13299
Median (IQR)	149.8 (78.8, 235.5)	138.7 (67.1, 209.5)	148.9 (77.9, 233.9)
Diagnosis [ICD-10] Top 5			
Contact with (and suspected exposure to) COVID [Z20.822]	4903 (39.3%)	310 (37.4%)	5213 (39.2%)
Acute upper respiratory infection, unspecified [J06.9]	1670 (13.4%)	108 (13.0%)	1778 (13.4%)
Nasal congestion [R09.81]	661 (5.3%)	46 (5.6%)	707 (5.3%)
Viral infection [B34.9]	549 (4.4%)	38 (4.6%)	587 (4.4%)
Acute obstructive laryngitis (croup) [J05.0]	439 (3.5%)	58 (7.0%)	497 (3.7%)

[a] The variable is based on cases where the disposition is "Discharge home/No ED transfer".
[b] The missing data is attributed to VUC not having time to provider data.
PFE = Patient Family Experience

Table 2 presents the univariate analysis comparing the KPI response on the post-visit PFE survey with patient demographics or specific clinical aspects of the encounter. Patients and families seen in the VUC responded more positively to the KPI question as compared to those seen in UC or ED. Hispanic ethnicity was also associated with a more positive response to the KPI question on the post-visit PFE survey. Regarding the encounter, shorter time to provider and length of stay and non-revisit within 72 hours of the index visit were associated with more positive responses to the KPI question on the post-visit PFE survey.

Table 2. KPI on post-visit PFE survey for various demographic and clinical parameters of patient encounters resulting in discharge

Demographic/clinical aspect	How would you rate our facility (Mean (SD), N)				P-value[c]
	VUC	UC	ED	Overall	
Location	8.9 (2.5), 147	8.8 (2.3), 287	8.2 (2.9), 371	8.5 (2.6), 805	0.0081
Sex					0.7349
Male	9.0 (2.3), 67	8.8 (2.3), 135	8.3 (2.9), 213	8.6 (2.6), 415	
Female	8.8 (2.6), 80	8.7 (2.4), 152	8.2 (2.9), 158	8.5 (2.7), 390	
Race					0.3178
American Indian and Alaska Native		9.0 (), 1		9.0 (), 1	
Asian	8.5 (0.7), 2	7.7 (2.5), 18	8.8 (2.7), 14	8.2 (2.5), 34	
Black or African American	7.4 (4.3), 16	9.3 (1.8), 76	8.2 (2.7), 76	8.6 (2.6), 168	
Middle Eastern		9.0 (), 1	8.3 (3.4), 8	8.3 (3.2), 9	
Multiple		9.6 (0.6), 15	8.2 (2.8), 16	8.9 (2.1), 31	
Native Hawaiian and Other Pacific Islander		6.0 (2.8), 2	10.0 (), 1	7.3 (3.1), 3	
White	9.1 (2.0), 115	8.4 (2.6), 136	8.0 (3.0), 216	8.4 (2.7), 467	
Other	8.6 (3.5), 8	9.3 (1.9), 38	9.2 (2.3), 40	9.2 (2.2), 86	
Ethnicity					0.0146
Hispanic	9.2 (1.8), 5	9.1 (2.2), 49	9.2 (2.4), 50	9.2 (2.3), 104	
Non-Hispanic	8.8 (2.5), 127	8.7 (2.3), 234	8.1 (2.9), 319	8.4 (2.7), 680	
Patient Refused/Unknown	8.8 (3.3), 9	10.0 (0.0), 4	9.0 (1.4), 2	9.1 (2.6), 15	
Prescription Written					0.1349
Yes	9.0 (2.3), 68	8.9 (2.1), 151	8.4 (2.7), 145	8.7 (2.4), 364	
No	8.8 (2.6), 79	8.6 (2.5), 136	8.2 (3.0), 226	8.4 (2.8), 441	
Labs Ordered					0.6437
Yes	9.0 (2.4), 63	8.8 (2.4), 172	8.2 (2.9), 227	8.5 (2.7), 462	
No	8.8 (2.5), 84	8.8 (2.2), 115	8.3 (2.9), 144	8.6 (2.6), 343	
Imaging Ordered					0.9572
Yes		8.4 (3.0), 27	8.6 (2.9), 74	8.5 (2.9), 101	
No	8.9 (2.5), 147	8.8 (2.2), 260	8.2 (2.9), 297	8.5 (2.6), 704	
Revisit within 72 hours					<.0001
Yes	2.0 (3.5), 3	8.0 (2.9), 58	7.8 (3.1), 116	7.8 (3.1), 177	
No	9.0 (2.2), 144	9.0 (2.1), 229	8.5 (2.8), 255	8.8 (2.4), 628	
Time to provider (minutes)[d]		-0.00	-0.26	-0.18	<.0001
Length of stay (minutes)[d]	0.04	-0.17	-0.15	-0.16	<.0001

[c] The p-values are obtained from univariate ANOVA tests, where each demographic/clinical aspect variable serves as the independent variable and the facility rating score serves as the dependent variable.
[d] Measure represents the Pearson correlation coefficient between the measure and the facility rating score.
KPI = key performance indicator; PFE = patient family experience; VUC = virtual urgent care; UC = urgent care; ED = emergency department

Results from the multivariate analysis are displayed in Table 3. The point estimate represents the effect of the clinical aspect on KPI response in the linear regression model. Overall, there is no difference in KPI response based on encounter location; there is a significant difference when comparing VUC and UC, with patient encounters in the VUC having lower KPI responses on the post-visit PFE survey. Hispanic race, shorter length of stay, and non-revisit within 72 hours of index visit are all independently associated with higher KPI response on the post-visit PFE survey.

Table 3. Multivariable analysis of demographic and clinical aspects and their impact on KPI in post-visit PFE survey of discharged patients

Demographic/clinical aspect	Parameter Estimate	95% CL	P Value	Contrast P-value
Hispanic ethnicity			0.0087	
vs non-Hispanic	0.835	(0.298, 1.371)		0.0023
vs Patient Refused/Unknown	0.453	(-0.966, 1.871)		0.5313
VUC location			0.1225	
vs ED	-0.400	(-1.050, 0.251)		0.2282
vs UC	-0.611	(-1.220, -0.003)		0.0490
Length of stay	-0.004	(-0.006, -0.002)	<.0001	
Revisit within 72 hours				
No vs Yes	0.868	(0.423, 1.313)	0.0001	0.0001

Discussion

In this study, we hypothesized that encounter location (VUC, UC, or PED) might serve as an independent predictor of PFE, as our observations around PFE data had shown higher experience scores within the VUC setting than in our UCs or EDs. Our multivariable model indicated no independent association between location of encounter and the KPI score on the post-visit PFE survey. While there is no independent association between encounter location and experience, results from this study did illustrate several other key points. In our multivariable model, our data suggest that the experience of wait is a key driver in overall experience. This finding is consistent with existing literature[1]. In this study, patients and families who identified as Hispanic race responded more positively to the KPI question in the PFE survey. Prior studies have described the disproportionate "yes-leaning", socially acceptable responses to survey instruments among Hispanic race respondents[2,3]. When reviewing survey responses, clinicians should keep this bias in mind, especially given the frequently reported disparate care for Hispanic patients in the pediatric ED[4,5]. Patients and families with a revisit within 72 hours of their index visit responded more negatively to the KPI question in the PFE survey. Given that survey administration coincided with families pursuing a second visit, perceptions of incomplete care, misdiagnosis, or progression of illness likely impact survey responses. Clear communication around what to expect may help to reduce the impact of revisit on experience through expectation setting.

Conclusion

Encounter location was not found to be independently associated with PFE scores. The interaction between encounter location and length of stay likely drives more positive PFE during telehealth visits. The implementation of a telehealth option for low-acuity illnesses may serve as a viable strategy to improve the experience of patients and families.

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