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COVID-19, Telehealth, and Pediatric Integrated Primary Care: Disparities in Service Use

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Abstract

Objective The coronavirus disease 2019 pandemic (COVID-19) may increase pediatric mental health needs due to its social, economic, and public health threats, especially among Black, Indigenous, and People of Color and those served within disadvantaged communities. COVID-19 protocols have resulted in increased provision of telehealth in integrated primary care (IPC) but little is known about pediatric telehealth IPC utilization during the pandemic for diverse and traditionally underserved groups. **Methods** A comparative study was conducted to explore variability between in-person (pre-COVID-19; $n = 106$) and telehealth (mid-COVID-19; $n = 120$) IPC consultation utilization among children 1–19 years old served through a large, inner-city primary care clinic. Logistic regression modeling was used to examine the association between service delivery modality (i.e., in-person vs. telehealth) and attendance, referral concerns, and several sociodemographic variables. **Results** Service delivery modality and attendance, referral concerns, and race/ethnicity were significantly associated. The odds of non-attendance were greater for children scheduled for telehealth, the odds of children with internalizing problems being scheduled for telehealth were greater than those with externalizing problems, and the odds of Black children being scheduled for telehealth were less compared to White children. **Conclusion** Though telehealth has helped provide IPC continuity during COVID-19, findings from this study show troubling preliminary data regarding reduced attendance, increased internalizing concerns, and disparities in scheduling for Black patients. Specific actions to monitor and address these early but alarming indications of telehealth and Covid-19 related behavioral health disparities are discussed.

Key words: adolescents; anxiety; behavior problems; COVID-19; depression; evidence-based practice; health disparities and inequities; healthcare services and utilization; patient/provider communication; preschool children; primary care; public health; race/ethnicity; school-age children; stress.

Introduction

Behavioral health needs among United States (U.S.) children (including adolescents) represent a long-standing public health concern (Perou et al., 2013; Whitney & Peterson, 2019). Growing research shows that the coronavirus disease 2019 pandemic (hereafter referred to as COVID-19) may worsen and increase mental health needs among children due to its social, economic, and public health threats (Golberstein et al., 2020; Marques de Miranda et al., 2020). The impact is likely to be heightened among underserved groups, including Black, Indigenous, and People of Color (BIPOC) and those served within disadvantaged communities such as the inner-city, who have been more vulnerable to the negative impact of COVID-19 due to systemic inequalities (McNeely et al., 2020; Nuñez, 2020; Riley et al., 2020; Valenzuela et al., 2020).

A growing strategy to increase mental health care access for children is providing behavioral health services through integrated primary care (IPC; Chakawa et al., 2020; Schlesinger, 2017; Zima & Wissow, 2019). In response to COVID-19, the provision of IPC in many settings changed to a telehealth modality due to several factors (e.g., limited clinic space due to physical distancing protocols, work and/or school closures, and public health directives to shelter in place). Telehealth includes the provision of medical and behavioral/mental health services through remote modalities, such as video, phone, and email technologies (Koonin et al., 2020; Tuckson et al., 2017).

Telehealth can be used to provide effective, value-added behavioral health services and may increase access to care, especially in rural communities (Bashshur et al., 2016; Myers & Lieberman, 2013). However, the utilization and reach of telehealth in addressing behavioral health disparities have been understudied (Ralston et al., 2019), especially among sociodemographically diverse children in urban areas. Thus, it is unclear whether telehealth improves access to care compared to in-person service delivery. Given projections that increased provision of telehealth behavioral health services will likely continue post-pandemic (Wosik et al., 2020), expeditious research in this area is crucial.

The Critical Need for IPC During COVID-19 Despite Barriers to Service Delivery

In painful irony, the long-standing call for increasing access to child mental health services through IPC is now juxtaposed against increased logistical challenges to accessing care due to COVID-19. In the IPC setting, the medical provider is the first point of contact to address behavioral health needs and to connect patients to needed services amidst mounting logistical and perceptual barriers. Pre-pandemic, IPC often involved in-clinic warm hand-offs via live paging or scheduled joint visits between a primary care provider (PCP) and a behavioral health specialist who diagnosed, treated, or referred to additional resources (Chakawa et al., 2020; Germán et al., 2017). Mid-pandemic as physical distancing protocols proved essential to mitigate coronavirus spread, clinic space limits reduced the number of staff and children onsite. As a result, children may have been more frequently scheduled to see a medical provider other than their PCP who knew them well.

Despite these limitations, current evidence suggests that increased IPC access presents unique opportunities as the first line of defense for mental health needs experienced during the pandemic, particularly given the disruption/reduction in school-based behavioral services caused by COVID-19 protocols (see Golberstein et al., 2020). In response to COVID-19 adaptations (e.g., variable school modality, social distancing, quarantining and/or isolation, and screening/testing), presenting behavioral health concerns varied as children struggled to adjust to the multiple layers of change and loss of resources (Fegert et al., 2020). Research shows that social restrictions for disease containment impact the mental health of children as evidenced by increased internalizing symptoms, including depression and anxiety, during and up to 9 years after periods of forced isolation (Loades et al., 2020). Global research shows increased internalizing symptoms among children since the emergence of COVID-19 (Duan et al., 2020; Marques de Miranda et al., 2020; Orgilés et al., 2020). Drawing from these studies, it is likely that internalizing symptoms may increase during COVID-19 and persist among pediatric primary care children (Nouri et al., 2020), warranting specialty behavioral health provider diagnosis and intervention for these symptoms that are more likely to go unnoticed compared to others, such as externalizing behaviors (e.g., distractibility, hyperactivity, defiance).

Role of IPC and Telehealth in Access to Care During the Pandemic

Over the past two decades, provision of telehealth IPC grew and demonstrated equivalent efficacy as in-person visits (Bashshur et al., 2016; Myers & Lieberman, 2013; Ralston et al., 2019). Data show that at the end of the first quarter of 2020 (the emergence stage of COVID-19 in the U.S.) there was a 154% national increase in telehealth compared to the first quarter of 2019, though use among pediatric populations showed a slower rate of uptake (Koonin et al., 2020). Policy changes by commercial and government payors during the COVID-19 emergency response allowed for telehealth to be reimbursed similarly to in-person visits, making it a viable option for IPC (Kichloo et al., 2020; Latifi & Doarn, 2020). Since then, the transition to telehealth IPC progressed with unprecedented speed to meet patient care needs, while also limiting physical contact and mitigating clinic space limitations (Monaghesh & Hajizadeh, 2020; Wosik et al., 2020). However, researchers recommend investigating when, under what circumstances, and for whom telehealth may best serve (Comer & Myers, 2016).

Sociodemographic Considerations

Access to IPC for diverse and traditionally underserved groups presents additional layers of complexity and purpose when striving to meet behavioral health needs. Telehealth initiatives highlight the opportunity to practically meet behavioral health needs for underserved groups (Hills & Hills, 2019; Ralston et al., 2019), especially for pediatric patients during COVID-19 when access to other resources is limited (Fiks et al., 2020; Monaghesh & Hajizadeh, 2020; Stancin, 2020). Limited data exist on telehealth IPC in urban settings and it is unclear whether this service option is well-attended in comparison to in-person IPC.

While some research has shown that telehealth in IPC may increase access to care by addressing logistical barriers (e.g., decreasing missed work or school, reducing traveling costs or limitations) faced by traditionally underserved groups (Nelson et al., 2017), other disparities may become more pronounced with telehealth for those with limited resources (Hsing et al., 2020). Community survey data show that most families in the U.S. report ownership of at least one smart device (Jeong et al., 2018), suggesting that most families could potentially access telehealth services. However, recent health-focused research shows that families from lower socioeconomic status (SES) groups have lower rates of internet access and usage, smartphone ownership, and digital literacy (Nouri et al., 2020). This highlights disparities in digital connectivity, and thus, less access to telehealth. Primary care research shows evidence of BIPOC utilizing telehealth at a lower rate during COVID-19 compared to in-person visits prior to the pandemic (Nouri et al., 2020; Wood et al., 2020).

It is not yet clear how other sociodemographic factors (such as language/English proficiency, age, or sex) relate to disparities in care during COVID-19, particularly in relation to increased telehealth use. Less technologically savvy caregivers or those with limited English proficiency may have challenges implementing telehealth use instructions and/or prompts, especially if limited language options are provided. Recent large-scale health access research among adults demonstrates a significant 'digital divide' in that patients with limited English proficiency are less likely to use telehealth (Rodriguez et al., 2021). Also, because younger children may have more difficulty focusing or engaging during virtual visits compared to older children (Dueweke et al., 2020), family utilization of telehealth IPC compared to in-person services may vary based on age. To our knowledge, pediatric research on telehealth IPC based on sex has not yet been conducted.

More than ever, information is needed on using available technology to facilitate access to IPC in a culturally inclusive way without adding additional burden to families and stretched health systems (Hoffmann et al., 2020; Nuñez, 2020; Rohilla et al., 2020). To date, most pediatric telehealth research has focused on where and how to provide telehealth but has not compared how access to care may vary between in-person and telehealth IPC for children from diverse backgrounds. Because COVID-19 is estimated to have negative long-lasting impacts for children (Fegert et al., 2020), it is paramount to better understand ways to optimize utilization of telehealth IPC among diverse, often underserved groups.

The Current Study

The current study examines whether scheduled in-person (pre-COVID-19) and telehealth (mid-COVID-19) IPC consultation differs based on attendance, referral concerns, or sociodemographic characteristics (including SES, race/ethnicity, language, age, and sex) while controlling for variance associated with staffing and scheduling. We hypothesize that attendance will not vary when comparing scheduled in-person and telehealth visits. For telehealth visits, we hypothesize that there will be a significant increase in internalizing issues compared to other referral concerns and BIPOC children will have significantly fewer scheduled visits than White children. Specific hypotheses about the other sociodemographic variables are not made *a priori* due to particularly limited existing research in this area.

Methods

Participants

A two-group comparative design was used. The first group included 106 children scheduled for in-person IPC consultation between April 2019 and October 2019 (prior to the COVID-19 pandemic in the U.S.) and 120 children scheduled for telehealth between April 2020 and October 2020 (mid-COVID-19). The total sample ($N = 226$) was drawn from a large, inner-city pediatric primary care clinic (medical home) within a large, regional children's hospital located in a moderate-sized metropolitan city in the Midwest U.S. Currently, the primary care clinic serves an ~95% Medicaid patient population from diverse backgrounds (84% BIPOC and 23% from limited English proficient families) who face a variety of psychosocial, cultural, and socioeconomic challenges. Children within the current study were 1–19 years old ($M = 8.04$, $SD = 4.30$) and from diverse racial/ethnic groups (e.g., Black, White, Hispanic, Asian, Native American, Multiracial [e.g., Black/White, Black/Asian, Hispanic/White, Pacific Islander/White]).

Procedures

This study was approved by the health system's Institutional Review Board. Data gathering involved a retrospective review of the electronic medical record, which included mass data retrieval. All data files were stored in Health Insurance Portability and Accountability Act (HIPAA) compliant institutional databases and then deidentified for data processing. Data on the target variables (see Measures section below) were gathered for the full sample.

Pre- and mid-COVID-19, children were referred for IPC consultation by (a) PCPs placing a referral or (b) their caregiver requesting a primary care visit for a behavioral health concern. There was increased use of call center scheduling mid-COVID-19 instead of in-person scheduling compared to pre-COVID-19. Children who received IPC consultation pre-COVID-19 were seen in-person, while mid-COVID-19 they were seen by telehealth for joint visits with a PCP and a Psychology Provider. Visits were scheduled for 30 min, with 15 min between each consultation to communicate recommendations and manage care. Expanded details on the IPC consultation model can be found in previous work by Chakawa et al. (2020), including information on the collaborative care model that is embedded in the consultation model to co-manage diagnostic impressions, treatment needs, and treatment progress.

The overall number of IPC consultation visits that could be scheduled was greater mid-COVID-19 (~5 half-day clinics most weeks) compared to pre-COVID-19 (~3–5 half-day clinics most weeks). Children who received IPC consultation mid-COVID-19 were scheduled for audio-visual telehealth visits using Microsoft Teams, the HIPAA compliant platform available in the hospital system. Caregivers were emailed instructions (English, Spanish, Somali, Burmese, or Vietnamese options) in advance of the visit on how to connect to the appointment and asked to connect 10 min in advance to give time to problem solve.

Collaborative care to manage scheduling and communicate about presenting concerns, diagnostic impressions, and intervention recommendations was conducted through messaging between providers and nursing through the telehealth platform or through the medical record. Like pre-COVID-19 IPC consultation visits, a nurse facilitated the pre-visit portion of the mid-COVID-19 visits which usually occurred 5–10 min prior to the appointment start time. This included calling families by phone if they had not connected to the telehealth platform by the appointment start time and, if necessary, helping problem-solve barriers to connecting (e.g., difficulties downloading the telehealth app or finding the electronic message with the appointment link). On the few occasions that technological issues persisted after problem-solving efforts, visits were conducted by telephone/audio-only versus audio-visual.

Variables

The *service delivery modality* variable was used to distinguish scheduled IPC visits delivered in-person (coded as 0) or by telehealth (coded as 1).

The *attendance* variable (0 = attended and 1 = did not attend) was used to assess whether children presented for scheduled IPC visits.

The *referral concern* variable was used to measure primary concerns that precipitated requests for IPC consultation. Referral concerns included externalizing issues (e.g., defiance, distractibility, hyperactivity), internalizing issues (e.g., anxiety, depression), developmental delay (e.g., ASD, speech, learning, intellectual delay), medical concerns (e.g., pill swallowing, sleep), obsessive/habitual behavior (e.g., OCD, excoriation, trichotillomania), feeding/elimination, and trauma/adjustment. Final categorization of this variable for the primary analyses was 0 = "externalizing," 1 = "internalizing," and 2 = "other" (including developmental delay, medical concern, obsessive/habitual behavior, feeding/elimination, trauma/adjustment).

The sociodemographic variables included: *health insurance type* (as a proxy for SES), *race/ethnicity, language* for health care needs (flexibly provided through telehealth interpretation options), *age* (by year), and *sex* (male or female). To address low group frequency counts and to foster meaningful data comparisons, *health insurance type* was dichotomized (0 = "Medicaid/Self-Pay" and 1 = "Private") since at the medical home "self-pay" children typically are without private insurance coverage (traditionally reflective of family employment or wealth differences) and are likely to receive financial assistance from the hospital to subsidize or cover medical bills, similar to coverage considerations for children with Medicaid. The *language* variable was dichotomized into the following categories: 0 = English proficiency and 1 = limited English proficiency (including preferred languages of Spanish, Arabic, Persian, and Farsi). Given the small subsample sizes for the Asian, Native American, and Multiracial groups, these less represented BIPOC groups were collapsed into an overall "Other" category, resulting in a four-category *race/ethnicity* variable: 0 = "White," 1 = "Black," 2 = "Hispanic," and 3 = "Other". *Age* was dichotomized (0 = "pre-school age" and 1 = "school age and older") for some analyses to capture developmental considerations that may relate to telehealth attendance.

The *PCP for visit control variable* was used to assess whether a patient was scheduled to see their assigned PCP (i.e., physician/nurse practitioner), a familiar PCP (seen at preceding visit or several times in the past year), an unfamiliar PCP (someone they had never or rarely seen), or if they did not have an assigned or often seen PCP. The final categorization of this variable was 0 = "assigned OR familiar PCP" and 1 = "unfamiliar PCP OR has no assigned PCP." PCP for visit was controlled for in case this clinic logistical factor related to variability (e.g., differential likelihood in scheduling based on preference in provider) that could confound findings for the primary variables.

The *appointment type control variable* was used to measure if the scheduled joint PCP and Psychology Provider visit was the first scheduled IPC consultation or if it was a follow-up IPC consultation. Appointment type was coded dichotomously (0 = "initial consultation" and 1 = "follow-up consultation"). This variable was controlled for to address potential variability (e.g., differential likelihood in scheduling based on prior IPC consultation experience) that could confound the results.

Data Analytical Strategy

Descriptive analyses were used to explore category frequencies for the main variables. For the primary analysis, binomial logistic regression was conducted to examine the association between the output variable *service delivery modality* (i.e., in-person vs. telehealth IPC consultation visits) and the attendance, referral concern, and sociodemographic variables while controlling for PCP for visit and appointment type.

Propensity score matching was used to evaluate the marginal effect of *service delivery modality* on *attendance*. Propensity scores were matched in a 1:1 ratio by the nearest neighbor method (Matched Sample 1). We assessed the balance using a unified approach to measuring effect size (i.e., standardized mean differences [*SMD*], also known as Cohen's *d*; Yang & Dalton, 2012). The least balanced covariates remained unbalanced in Matched Sample 1. We identified the best subset (Matched Sample 2) from Matched Sample 1 by grid search with 0.01 increment over the entire propensity score range that led to the most balanced sample with as many retained observations as possible. After that, attendance was regressed on service delivery modality using logistic regression, controlling all the matching variables using Matched Sample 2. The marginal modality effect was estimated by the odds ratio that contrasted the average potential attendance from in-person vs. telehealth visits. The 95% confidence interval (CI) for the marginal effect was constructed by the bias-corrected accelerated method using 3,999 replicates of nonparametric block (matched pairs) bootstrap. Fisher's exact test was used in follow-up analyses to explore variability in rescheduled in-person and telehealth visits.

Descriptive statistic exploration (including for the follow-up analyses) and the logistic regression analysis for the overall sample were conducted using the *Statistical Package for the Social Sciences (SPSS), Version 24* (IBM Corp, 2016). All other analyses, including determining the *SMD* values, the descriptive statistics for the matched sample, and propensity score matching were conducted in the *R, Version 4.0.2* programming language using the *MatchIt* package (Version 4.1.0; Ho et al., 2011; R Core Team, 2020) and the *boot* package (Version 1.3-25; Canty & Ripley, 2020; Davison & Hinkley, 1997). A *p*-value of $\leq .05$ was used to determine statistical significance. The following criteria was used to interpret the *SMD* effect sizes: negligible $\leq .19$, small = 0.2–0.49, medium = 0.5–0.79, and large ≥ 0.8 (Cohen, 1988; Lakens, 2013).

Results

Descriptive Statistics

The preliminary descriptive data representing the study primary variables and sociodemographic characteristics showed several noteworthy patterns (see Table I). Several variables showed small effects based on group differences between service delivery modality (i.e., in-person vs. telehealth IPC consultation visits). These included attendance (*SMD* = 0.41), primary referral reasons (*SMD* = 0.25), race/ethnicity (*SMD* = 0.30), and PCP for visit (SMD = 0.46). The other variables (insurance type, language, age, sex, and appointment type) showed differences with weaker than small or negligible effects (*SMD* < 0.2). Compared to children scheduled for IPC consultation in-person, children scheduled for telehealth had (a) reduced rates of attendance, (b) increased proportion of internalizing concerns (though externalizing issues remained the most common referral concern), (c) increased proportion of Medicaid representation, (d) reduced proportion of BIPOC (most notably Black children), (e) increased proportion of English as the preferred language, and (f) increased proportion of school age and older children (6–19 years old), specifically 63.2% for in-person and 67.5% for telehealth.

Primary Data Analysis

Overall Sample

A binomial logistic regression model was used to examine variability for in-person and telehealth IPC consultation utilization for the initial visits scheduled. The Hosmer–Lemeshow test was not statistically significant ($\chi^2[8] = 11.883$, $p = .157$), demonstrating goodness-of-fit. The omnibus test of model coefficients was significant ($\chi^2[12] = 39.702$, $p < .001$), indicating improvement in model accuracy with the included input variables. The model correctly classified 66.8% of cases and explained 21.5% of the variance (per Nagelkerke R^2) between the variables.

Table I. *Sample Demographics and Key Variables for the Overall Sample and by Service Modality*

Variables	Full sample	In-person (pre-COVID-19)	Telehealth (mid-COVID-19)	*p*	*SMD*
Attendance, *n* (%)				<.01	0.41
Attended	184 (81.4)	95 (89.6)	89 (74.2)		
Did not attend	42 (18.6)	11 (10.4)	31 (25.8)		
Primary referral concern, *n* (%)				.19	0.25
Externalizing (inattention and disruptive behaviors)	121 (53.5)	62 (58.5)	59 (49.2)		
Internalizing (anxiety, depression)	62 (27.4)	23 (21.7)	39 (32.5)		
Other	43 (19.0)	21 (19.8)	22 (18.3)		
Health insurance type, *n* (%)				.69	0.08
Medicaid/self-pay	191 (84.5)	88 (83.0)	103 (85.8)		
Private	35 (15.5)	18 (17.0)	17 (14.2)		
Race/ethnicity, *n* (%)				.18	0.30
Black	68 (30.1)	37 (34.9)	31 (25.8)		
White	66 (29.2)	24 (22.6)	42 (35.0)		
Hispanic	65 (28.8)	33 (31.1)	32 (26.7)		
Other	27 (11.9)	12 (11.3)	15 (12.5)		
Language for healthcare needs, *n* (%)				.43	0.13
English	185 (81.9)	84 (79.2)	101 (84.2)		
Other language	41 (18.1)	22 (20.8)	19 (15.8)		
Sex, *n* (%)				.66	0.08
Female	83 (36.7)	41 (38.7)	42 (35.0)		
Male	143 (63.3)	65 (61.3)	78 (65.0)		
Age, *n* (%)				.59	0.09
Pre-school age	78 (34.5)	39 (36.8)	39 (32.5)		
School age	148 (65.5)	67 (63.2)	81 (67.5)		
Age (continuous, *Median* (*IQR*))	8.0 (5.0, 11.0)	7.0 (4.0, 10.0)	8.0 (5.0, 11.0)	.24	0.16
Primary care provider for visit, *n* (%)				<.01	0.46
Assigned/familiar PCP	99 (43.8)	59 (55.7)	40 (33.3)		
No assigned PCP/unfamiliar PCP	127 (56.2)	47 (44.3)	80 (66.7)		
Appointment type, *n* (%)				.95	0.04
Initial consultation	199 (88.1)	94 (88.7)	105 (87.5)		
Joint follow-up consultation	27 (11.9)	12 (11.3)	15 (12.5)		

Notes. $N = 226$. IQR = interquartile range; SMD = standardized mean difference (measure of effect size).

When accounting for all input variables (including the control variables), significant associations were found for attendance, referral concern, and race/ethnicity (see Table II). The odds of not attending IPC consultation were 4.05 times greater than the odds of attending IPC consultation for children scheduled for telehealth relative to in-person visits. The odds of children with internalizing problems being scheduled for telehealth were 2.78 times greater than those with externalizing problems compared to in-person visits. The odds of Black children having scheduled IPC consultation by telehealth were 0.35 times less than the odds of White children having scheduled telehealth compared to in-person visits. No other significant racial/ethnic differences were found. The other main variables (health insurance type, language, sex, and age) were not significantly associated with service delivery modality.

Matched Sample

After the initial propensity score matching, Matched Sample 1 showed remaining imbalance as bad as *SMD* = 0.37. Other matching methods (full, optimal, genetic, exact, coarsened exact matching, subclass) were explored without and with discarding observations out of the range of propensity score common support, but none led to satisfactory balance. The exact and the coarsened exact matching methods matched only 42 and 55 observations with the largest *SMD* ranging from 0.19 to 0.27 among all covariates, respectively. The other methods were able to retain more than 200 observations but the largest *SMD* ranged from 0.32 to 0.46.

Matched Sample 2 identified by the grid search retained $N = 121$ observations (see Table III). With the improved balance in covariates, attendance was regressed on service delivery modality using propensity score matching within a binomial logistic regression to control for all the matched variables (see Table IV). The marginal odds in favor of attendance among telehealth was 5.0 (95% CI = 1.6–16.8) as compared to in-person visits, indicating that telehealth visits were significantly less attended than in-person visits among the matched sample. Specifically, for the matched sample the odds of not attending IPC consultation were 6.85 times greater relative to in-person visits (see Table IV).

Table II. *Logistic Regression Model Examining Variability in Scheduled In-Person (Pre-COVID-19) and Telehealth (Mid-COVID-19) Integrated Behavioral Health Consultation*

Variables	*B (S.E.)*	*p*	Odds ratio (95% CI)
Attendance	1.398 (0.427)	.001	4.048 (1.754, 9.343)
Primary referral concern			
Externalizing vs. internalizing	1.021 (0.430)	.018	2.776 (1.194, 6.453)
Externalizing vs. other	0.217 (0.399)	.587	1.242 (0.569, 2.713)
Health insurance type	0.520 (0.419)	.215	1.681 (0.740, 3.822)
Race/ethnicity			
White vs. Black	−1.048 (0.396)	.008	0.351 (0.161, 0.763)
White vs. Hispanic	−0.808 (0.500)	.106	0.446 (0.167, 1.188)
White vs. Other	−0.570 (0.507)	.260	0.565 (0.209, 1.526)
Language	−0.368 (0.513)	.473	0.692 (0.253, 1.890)
Age	0.218 (0.357)	.541	1.224 (0.618, 2.506)
Sex	−0.445 (0.332)	.180	0.641 (0.334, 1.228)
Primary care provider for visit	1.145 (0.308)	.000	3.143 (1.718, 5.752)
Appointment type	0.701 (0.477)	.142	2.015 (0.791, 5.131)

Notes. $N = 226$. Reference category is "0" for all variables. Attendance is coded as 0 = "attended" and 1 = "did not attend." Primary referral concern is coded as 0 = "externalizing," 1 = "internalizing," and 2 = "other" (including developmental delay, medical concern, obsessive/habitual behavior, feeding/elimination problem, trauma/adjustment). Health insurance type is coded as 0 = "Medicaid/self-pay" and 1 = "commercial." Race/ethnicity is coded as 0 = "White," 1 = "Black," 3 = "Hispanic," and 3 = "other" (including Asian and multiracial). Language is coded as 0 = "English proficiency" and 1 = "limited English proficiency." Sex is coded as 0 = "male" and 1 = "female." Age is coded as 0 = "pre-school age" and 1 = "school age and older." The control variable 'primary care provider' for visit is coded as 0 = "saw assigned or familiar PCP" and 1 = "unfamiliar PCP OR does not have assigned PCP." The other control variable, appointment type, is coded as 0 = "initial joint consult" and 1 = "follow-up joint consult." The dependent variable service delivery modality is coded as 0 = "in-person (pre-COVID-19)" and 1 = "telehealth (mid-COVID-19)."

Follow-up Analyses with the Overall Sample

Follow-up analyses among the overall sample showed that of the 11 scheduled in-person visits that were not attended, three (27.3%) were rescheduled but only one (33.3%) of these was attended. Of the 31 telehealth visits that were not attended, 10 (32.3%) were rescheduled and six (60%) of these were attended. The result of the Fisher's exact test comparing the frequencies for rescheduled visits based on attendance was not statistically significant ($p = .559$).

Discussion

The multifactorial, ever-changing stressors during the COVID-19 pandemic have increased the behavioral health needs of children (Golberstein et al., 2020; Marques de Miranda et al., 2020; Valenzuela et al., 2020). The current study shows evidence of how telehealth has helped provide continuity of IPC during the pandemic but also reveals troubling preliminary data regarding reduced attendance, increased internalizing concerns, and disparities in service utilization for BIPOC.

Telehealth and Access to Behavioral Health Care During the COVID-19 Pandemic

Contrary to our hypothesis, attendance rates for telehealth IPC visits were significantly less than attendance rates for in-person visits among our urban, inner-city pediatric primary care clinic population. The odds of non-attendance were nearly four times greater than attendance for telehealth visits among the overall sample, even while accounting for several other variables (including familiarity with PCP and whether an initial or follow-up appointment was scheduled). Even among the matched sample, differences in attendance remained significant. While it may be that other factors associated with COVID-19 (e.g., demands related to childcare, work, or illness) contributed to reduced attendance, the magnitude of this effect warrants serious consideration and mitigation of barriers to attendance in order to facilitate access to care.

COVID-19 presents several unique challenges for families seeking care through telehealth, including technology demands, logistics of scheduling an appointment with a PCP and behavioral health provider, and possible depersonalization of virtual versus in-person "warm handoffs." Some families are more likely to lack consistent internet connectivity or a device to access the audio-visual platform for the visits, or to have technological difficulties connecting to the appointments, and distractions in the home environment that contribute to less effective visits. These factors may relate to families' willingness to utilize telehealth services and contribute to variability in the quality of care that children receive.

To remedy these technological concerns, it would be beneficial to offer a telehealth platform that can easily be accessed through various modalities (e.g., email, text message) and across devices (e.g., phones, laptops/desktop computers, and tablets). As done for the sample in this study, organizations should offer technology support to families prior to and during

Table III. Demographics and Key Variables for the Matched Sample Overall and by Service Modality.

Variables	Full matched sample	In-person (pre-COVID-19)	Telehealth (mid-COVID-19)	*p*	*SMD*
Attendance *n* (%)				.01	0.56
Attended	100 (82.6)	54 (93.1)	46 (73.0)		
Did not attend	21 (17.4)	4 (6.9)	17 (27.0)		
Primary referral concern, *n* (%)				.73	0.14
Externalizing (inattention and disruptive behaviors)	67 (55.4)	32 (55.2)	35 (55.6)		
Internalizing (anxiety, depression)	30 (24.8)	13 (22.4)	17 (26.9)		
Other	24 (19.8)	13 (22.4)	11 (17.5)		
Health insurance type, *n* (%)				.95	0.06
Medicaid/self-pay	103 (85.1)	50 (86.2)	53 (84.1)		
Private	18 (14.9)	8 (13.8)	10 (15.9)		
Race/Ethnicity, *n* (%)				.96	0.10
Black	37 (30.6)	18 (31.0)	19 (30.2)		
White	34 (28.1)	15 (25.9)	19 (30.2)		
Hispanic	32 (26.4)	16 (27.6)	16 (25.4)		
Other	18 (14.9)	9 (15.5)	9 (14.3)		
Language for healthcare needs, *n* (%)				.66	0.13
English	103 (85.1)	48 (82.8)	55 (87.3)		
Other language	18 (14.9)	10 (17.2)	8 (12.7)		
Sex				1.00	0.03
Female	51 (42.1)	24 (41.4)	27 (42.9)		
Male	70 (57.9)	34 (58.6)	36 (57.1)		
Age (categorical, *n* (%))				.99	0.04
Pre-school age	47 (38.8)	22 (37.9)	25 (39.7)		
School Age	74 (61.2)	36 (62.1)	38 (60.3)		
Age (continuous, *Median* (*IQR*))	7.0 (4.0, 11.0)	7.0 (4.0, 10.0)	7.0 (5.0, 11.0)	.46	0.14
Primary care provider for visit, *n* (%)				1.00	0.02
Assigned/familiar PCP	41 (33.9)	20 (34.5)	21 (33.3)		
No assigned PCP/unfamiliar PCP	80 (66.2)	38 (65.5)	42 (66.7)		
Appointment type, *n* (%)				.70	0.12
Initial consultation	106 (87.6)	52 (89.7)	54 (85.7)		
Joint follow-up consultation	15 (12.4)	6 (10.3)	9 (14.3)		

Notes. $N = 121$. IQR = interquartile range; SMD = standardized mean difference (a measure of effect).

visits to improve the ability to access timely care. However, additional effort may be needed to ensure that technical support is provided at an appropriate literacy level and in the family's primary language, and to help families obtain smart devices or internet options at reduced costs through local community organizations. Because of these barriers, some children or caregivers may prefer and/or be better served by attending in-person hybrid visits instead of telehealth IPC, requiring in-clinic care staff to facilitate connecting the family in the clinic to the behavioral health provider remotely using a clinic tablet or computer. While audio-visual telehealth visits may be preferable or ideal, in some cases fully in-person or audio-only visits may be necessary.

Use of telehealth will likely continue throughout the COVID-19 pandemic and beyond given its prior use and recent positive acceptability by many patients and health care providers (Koonin et al., 2020; Wosik et al, 2020; Zhou et al., 2020) and as primary care clinics implement strategies for effective physical distancing while also striving to maximize access to care. Telehealth demonstrates promise in increasing access to behavioral health services, but it should be provided accounting for the aforementioned barriers and with actionable steps to address them. Otherwise, there is risk of further perpetuating unmet mental health needs, especially for vulnerable and traditionally underserved populations.

Impact of the COVID-19 Pandemic on Behavioral Health and Responsive Pediatric Care

Consistent with our hypothesis, there was a significant increase in internalizing issues for telehealth visits (which were conducted during the pandemic) compared to other referral concerns. The pattern of behavioral health concerns emerging as a result of the pandemic are likely due to a combination of stressors (Fegert et al., 2020). Children have spent increased time at home completing school virtually (often with limited adult support and/or structure) and with limited school-based or extracurricular activity due to closures and physical distancing protocols. Other children have experienced exposure to repetitive news stories with graphic images of hospitals and ill patients, graphs outlining infection and death rates, sustained

Table IV. *Logistic Regression Model Examining Variability in Attendance for Scheduled In-Person (Pre-COVID-19) and Telehealth (Mid-COVID-19) Integrated Behavioral Health Consultation*

Variables	*B (S.E.)*	*p*	Odds Ratio (95% CI)
Service delivery modality	1.92 (0.67)	.004	6.85 (2.02, 29.46)
Primary referral concern			
Externalizing vs. internalizing	0.50 (1.27)	.696	1.64 (0.13, 20.42)
Externalizing vs. other	−1.22 (0.96)	.205	0.30 (0.03, 1.64)
Health insurance type	−0.08 (1.01)	.935	0.92 (0.10, 6.34)
Race/Ethnicity			
White vs. Black	1.42 (0.89)	.111	4.14 (0.75, 25.90)
White vs. Hispanic	1.32 (1.13)	.241	3.75 (0.40, 35.89)
White vs. Other	−0.61 (1.02)	.551	0.55 (0.06, 3.69)
Language	−1.39 (1.28)	.279	0.25 (0.02, 2.89)
Sex	0.73 (0.79)	.355	2.08 (0.45, 10.42)
Age	−0.35 (0.11)	.002	0.71 (0.55, 0.86)
Primary care provider for visit	−0.57 (1.03)	.576	0.56 (0.07, 4.23)
Appointment type	0.47 (1.06)	.660	1.59 (0.19, 13.00)

Notes. $N = 121$. Age is a continuous variable due to model fit needs, but all other variables are categorical. Reference category is "0" for all categorical variables. Service delivery modality is coded as 0 = "in-person (pre-COVID-19)" and 1 = "telehealth (mid-COVID-19)." Primary referral concern is coded as 0 = "externalizing," 1 = "internalizing," and 2 = "other" (including developmental delay, medical concern, obsessive/habitual behavior, feeding/elimination problem, trauma/adjustment). Health insurance type is coded as 0 = "Medicaid/self-pay" and 1 = "commercial." Race/ethnicity is coded as 0 = "White," 1 = "Black," 3 = "Hispanic," and 3 = "other" (including Asian and multiracial). Language is coded as 0 = "English proficiency" and 1 = "limited English proficiency." Sex is coded as 0 = "male" and 1 = "female." The control variable 'primary care provider' for visit is coded as 0 = "saw assigned or familiar PCP" and 1 = "unfamiliar PCP OR does not have assigned PCP." The other control variable, appointment type, is coded as 0 = "initial joint consult" and 1 = "follow-up joint consult." The dependent variable attendance is coded as 0 = "attended" and 1 = "did not attend."

stress of changes in daily routines, increased family financial and/or food insecurity, illness in family and friends, loved ones passing away from the virus, and increased risk of abuse (Courtney et al., 2020). These individual, familial, and societal factors are necessary targets for monitoring and intervention through IPC and engagement of community resources.

It is imperative that responsive behavioral health care be provided to address the mental health impact of the COVID-19 pandemic. Consistent with previous research (Duan et al., 2020; Marques de Miranda et al., 2020; Orgilés et al., 2020), we found that internalizing concerns were more prominent in telehealth visits mid-COVID-19 than pre-COVID-19, although externalizing problems remained the most common referral concern. Internalizing disorders present additional challenges to care, particularly when there are concerns about resultant suicidal behaviors. In IPC, behavioral health providers can fill a needed diagnostic role during COVID-19 as PCPs are faced with determining if presenting concerns are related to an acute stress response to the restrictive measures of the pandemic (e.g., quarantine, lockdown, school closures) or its consequences (e.g., economic losses, illness or sudden death of a family member). Behavioral health providers' expertise can inform recommendations on how to treat these impacts (Rohilla et al., 2020) and develop safety plans as needed, ideally in combination with social services and community supports. Some children may benefit from combined medication management and behavioral intervention, which can be streamlined and carefully monitored through IPC.

Telehealth and Equitable Access to Care for Diverse Sociodemographic Groups

Aligned with our hypothesis, Black children had significantly decreased odds (by 0.35 times) of having scheduled telehealth IPC consultation compared to White children. Hispanic children had even lower odds of scheduled visits compared to White children, but this rate was not statistically significant in the difference between in-person and telehealth modality. Although the racial/ethnic differences were small and only significant for Black children, they reflect concerning patterns observed in other primary care settings (see Nouri et al., 2020; Wood et al., 2020). In our study, the magnitude of these differences could be suppressed due to limited subsample sizes, but it may also be that while disparities are present, they are not extensive. Further research with larger samples is needed to clarify this consideration but the implications are still notable.

Significant differences were not observed among the other sociodemographic variables, although descriptive analyses showed a higher proportion of visits among the school age and older children (6–19 years) compared to pre-school age children (0–5 years). While previous research outlines that telehealth engagement may be more challenging for younger children, patterns in the current study may be partially due to the impact of the COVID-19 pandemic on school age children, who experienced abrupt and prolonged disruptions to the traditional academic and socioemotional support opportunities provided through the school environment. The reduced opportunity for school-based behavioral support may also have contributed to an increased pattern of scheduling IPC consultation for school age children. Also, our metropolitan region underwent multiple school modality changes mid-COVID-19 that varied by state/local governance and by school district, such as some schools remaining virtual, while others returned to hybrid/limited capacity or full-time models but then transitioned to virtual for 2 weeks or longer after positive COVID-19 cases. These rapidly evolving learning modes and frequent disruptions in routine for school-aged children may also have contributed to general scheduling pattern shifts, as well as increased internalizing concerns and attendance variability described above.

Prior to COVID-19, there were numerous factors contributing to disparities in access to care for underserved and marginalized groups, including finances, transportation, language barriers, stigma associated with seeking behavioral health services, and difficulty coordinating care with specialty providers (Fegert et al., 2020; McNeely et al., 2020; Riley et al., 2020). While these factors likely persisted into the pandemic, others were introduced or potentiated, including increased logistical demands and exposure risk to COVID-19 for lower-income workers deemed "essential employees" (e.g., childcare and retail workers, housekeepers, and medical assistants; Valenzuela et al., 2020). In addition to the technology support strategies discussed previously, families facing these disparities will likely benefit from flexible scheduling options, including daily consultation offered in morning and afternoon clinics and possibly in clinics with evening hours if adequate support is available (e.g., staff coverage for safety concerns). Possible systemic issues of some children referred for IPC not being reached for scheduling may be addressed by prioritizing time during or immediately after PCP appointments to schedule future IPC visits.

Research shows that Black adults/caregivers express more concerns about telehealth based on privacy, confidentiality, and physical absence of the provider (George et al., 2012). Continuity of providers may promote comfort with IPC and reduce possible stigma associated with meeting new providers to discuss behavioral health concerns by telehealth. While scheduling with one's PCP is not always an option given clinic demands, other strategies can be implemented to provide the best possible care. When scheduling telehealth visits, clinics can organize PCPs or behavioral health providers into smaller care teams who will attempt to follow similar children for chronic concerns. If an unfamiliar PCP is slated to see the patient, familiar PCPs are encouraged to communicate the scheduling and support plan beforehand with the family and to coordinate care with the unfamiliar PCP, as this may help improve patient comfort, satisfaction, acceptability, and attendance for IPC visits. In summary, as we implement new and innovative treatment modalities it is crucial to ensure that groups that were already most at risk for disparities in care do not experience greater marginalization.

Limitations

There are several limitations to consider when interpreting and generalizing the results of this study. First, based on varying clinic referral processes for IPC, it was not possible to track access to care from the point of service referral. Second, programmatic changes in patient scheduling continued to evolve mid-COVID-19 which may have impacted the results, including increased use of a call center instead of in-person scheduling. This made it difficult to ensure that families were scheduled for a follow-up prior to leaving the clinic, increasing the likelihood that they left without scheduling and would need to return to their PCP to continue visits with the behavioral health team. Third, our findings represent preliminary data on telehealth use among sociodemographically diverse patients seen through an inner-city primary care clinic during COVID-19, which introduces a history confound to important data on this underrepresented group in research. Fourth, though meaningful, the results are based on findings from a small sample size and from a population in a specific region, which contributes to potential limitations in generalizability.

Future Directions

Future directions to better assess and address pediatric telehealth IPC access for underserved populations are needed. First, examination of the pathway from initial telehealth IPC consultation referral to scheduling/service utilization is needed to improve understanding of barriers that contribute to gaps in care for this specific service among sociodemographically diverse children. Second, research must clarify how to restructure care systems to mitigate barriers to telehealth visits compared to in-person visits, such as fragmented scheduling processes. This will require comparing provision of in-person visits during the same time period that telehealth visits are delivered. Also, fortifying both telehealth and in-person IPC through the incorporation of culturally responsive care navigators or supports to increase digital health literacy are needed to mitigate barriers, especially with written and verbal support provided in the primary language of patients/caregivers. Third, it will be necessary to continue gathering data on the use of telehealth in IPC as COVID-19 subsides to separate the confound between telehealth and

COVID-19 factors such as increased childcare demands, illness, and work schedules. Fourth, to better understand the magnitude and generalizability of the significant findings within this study, the approach conducted needs to be replicated among larger samples and across regions to represent the diverse cultural groups in the U.S.

Conclusions

This study responds to calls to examine potential disparities in telehealth utilization and to advocate for infrastructure and policies that facilitate equitable telehealth access (Nouri et al., 2020). Our findings show that while telehealth has helped facilitate access to IPC mid-COVID-19 (especially as internalizing concerns have increased), with standard use it may not provide equitable access compared to in-person visits for children in urban pediatric primary care settings. This disparity is evidenced by overall reduced attendance rates and reduced scheduling of telehealth IPC visits for Black children. The responsibility is on clinicians, researchers, and health systems (including administrative and policy leaders, and insurance payors) to monitor and address these early but alarming indications of behavioral health disparities to ensure that disproportionate mental health outcomes are not unduly perpetuated.

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