Healthcare Quality for Acute Illness during the COVID-19 Pandemic: A Multisite Qualitative Analysis

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Abstract
Introduction: The coronavirus disease 2019 (COVID-19) pandemic incited substantial changes to acute care delivery, including the rapid scale-up of telehealth and numerous changes to in-person care. This study explored health system changes associated with the COVID-19 pandemic and their influences on pediatric acute care delivery and quality of care. Methods: We conducted 38 semistructured interviews May–November 2020 with families and clinicians from 3 US regions, eliciting their perspectives and experiences regarding changes to acute care delivery during the pandemic. Interviews were analyzed using a general inductive approach to identify relationships between clinical care infrastructure, care processes, and healthcare quality. Results: Emerging knowledge of COVID-19 epidemiology and associated restrictions influenced care-seeking behaviors and clinical infrastructure and processes. Infrastructure changes included the closure of some clinics, limited “sick visit” hours and locations, and increased resources for telehealth. Modified care processes included the assignment of clinicians to specific roles, limitations on sibling attendance, increased referrals to other clinics, and iterative development of procedures and protocols. Although intended to increase safety, these changes appear to have decreased access, timeliness, and equity of care. High-quality care was supported by telephone triage processes, in-person visits following initial assessments by telehealth, and identification of diagnoses and populations best-suited to telehealth versus in-person care. Conclusions: Changes in acute care delivery during the COVID-19 pandemic may have negatively impacted healthcare quality in some domains. Implementation of pediatric-specific guidelines and decision aids describing diagnoses, populations, and procedures best-suited to telehealth may improve the quality of acute care delivery. (Pediatr Qual Saf 2021;6:e476; doi: 10.1097/pq9.0000000000000476; Published online September 24, 2021.)

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic has resulted in an unprecedented transformation of healthcare delivery in the United States. Following the State of Emergency declaration in March 2020, emergency department (ED) visits and inpatient volumes decreased markedly, particularly for children.1–4 National shortages of personal protective equipment, as well as uncertainty regarding the severity and transmissibility of COVID-19, led to cancelations of elective procedures, restrictions in clinic and hospital admittance, and limitations on sibling presence during appointments and hospital visits.5–7 One of the most marked changes in healthcare delivery was the rapid transition to telehealth for ambulatory care.8,9 These changes occurred with an overarching goal of protecting health and safety, yet the resulting consequences on healthcare quality are poorly understood. Among adults, an international study of more than 200 primary care practices found substantial...
decreases in the quality of care for health screening and patient follow-up during the pandemic.10 In the realm of well-child care, COVID-19 health system changes have been associated with decreased immunization rates and delays in preventative care.11,12 However, few studies have examined how COVID-19 has impacted healthcare quality for children experiencing acute illnesses. Therefore, we conducted a qualitative study to explore how health system changes associated with the COVID-19 pandemic have influenced pediatric acute care delivery and quality of care.

METHODS

Study Design

Due to limited knowledge of the implications of health system changes on healthcare quality, we used qualitative methodology to investigate the perspectives of parents and clinicians, adhering to the Standards for Reporting Qualitative Research.13 This study was conducted in the context of an ongoing multisite clinical trial comparing the effectiveness of direct admission to admission through EDs for children hospitalized with common pediatric illnesses. In this study, 70 referring primary care and urgent care pediatric practices across 3 health systems collaborate to evaluate hospital admission processes and outcomes. For this qualitative analysis, we defined acute care to include primary care, urgent care, ED care, and inpatient hospitalizations for self-limited acute illnesses. Semistructured interviews were conducted from May to November 2020 across 3 health systems in the Northeast, Midwest, and West Coast of the United States.

Institutional review board approval was provided by Dartmouth College, with all implementation sites ceding review to this IRB.

Study Population and Sampling Plan

We used a purposeful sampling approach to attain the perspectives and experiences of clinicians and parents of children hospitalized with acute illnesses.14 Clinicians were recruited from the above-described 70 primary or urgent care practices and three hospitals. We sought participants with varied clinical roles, including primary care providers (PCPs), urgent care clinicians, inpatient nurses, and pediatric hospitalists. Parents were eligible if they had a child hospitalized with an acute illness such as pneumonia, skin and soft-tissue infections, or dehydration (excluding COVID-19), if they were English-speaking, and if their child’s usual source of care was one of the above-described primary care practices. Parents were purposefully sampled to reflect direct and ED portals of admission and varied reasons for hospitalization.

Procedures

Research team members at each site invited clinicians to participate and approached parents during their child’s hospitalization to request their participation. Interviews were conducted by phone, video conference, or in-person, complying with each hospital’s COVID-19 research protocol. Each participant received a $50 gift card.

We developed semistructured interview guides for parents, outpatient-based clinicians, and inpatient-based clinicians. We modified the guides prospectively based on the results of iterative data analysis and changing COVID-19 trends. Table 1, Supplemental Digital Content 1, http://links.lww.com/PQ9/A314, summarizes areas of interview inquiry for the 3 target populations. Interview questions inquired about changes to acute care delivery during the pandemic, resources needed to conduct telehealth, limitations, and opportunities of virtual visits, protocols and procedures related to COVID-19, and perceived implications of these changes on healthcare quality. The interview guide was piloted and modified before initial use. Consent was obtained at the beginning of each interview, including permission to audiorecord. Recordings were transcribed by a professional transcription service and verified for accuracy. Interviews were continued until data saturation was achieved. At that time, the research team agreed that the same codes were being observed repeatedly in the data, and recruitment of both parents and clinicians was ceased.15

Analysis

A 5-member research team, comprised 2 clinician-researchers (J.K.L. and C.E.M.), a parent consultant (C.A.S.), a research scientist (K.C.A.), and a qualitative methodologist (A.R.S.) conducted the analysis using a general inductive approach rooted in grounded theory.16 Interviews with clinicians and parents were analyzed concurrently, and emerging concepts were summarized in a jointly developed codebook and coding framework, adding concepts as needed. The same codebook was used to develop a conceptual model informed by multistakeholder perspectives for both parent and clinician interviews. After identifying initial concepts, we recognized parallels between our findings and the quality of care framework developed by Coyle and Battles17, which expands on Donabedian’s structure-process-outcome model to incorporate the “antecedents” of medical care (see Table 2, Supplemental Digital Content 2, http://links.lww.com/PQ9/A315 for definitions and adaptations). We also noted that participants’ descriptions of healthcare quality aligned with the Institute of Medicine’s quality of care domains.18 We, therefore, used these models to guide our subsequent analysis.

Three full interviews and selected text from five interviews were triple-coded by three members of the research team (A.R.S., C.A.S., and K.C.A.). Disagreements were resolved through in-depth discussions and revisions of the concepts, corresponding codes, and definitions. Following codebook finalization, these 3 research team members coded all transcripts using Dedoose.19 Through an iterative process of axial coding,20 emergent themes and domains were summarized in a conceptual model. For
validity, we member-checked our findings with a 12-member multistakeholder advisory board of parents and healthcare providers upon completion of analysis. This advisory board was convened to provide diverse perspectives on our direct admission study design and findings; advisory board members were not interview participants.

RESULTS

We conducted 38 interviews across 3 healthcare systems. Approximately two-thirds of participants were clinicians, and one-third were parents of children with acute illnesses (Table 1).

Figure 1 illustrates the conceptual model resulting from our analyses, summarizing the relationships between four major themes that mapped to Coyle’s framework: (1) emerging understanding of COVID-19 epidemiology and changes to clinical care infrastructure and processes of healthcare delivery; (2) modified processes of healthcare delivery (process); and (4) quality of care (outcomes).

| Healthcare Provider Characteristics (n = 26) | n (%) or Median [Interquartile Range] |
|--------------------------------------------|---------------------------------------|
| Health system affiliation                  |                                       |
| Site A                                      | 9 (35%)                               |
| Site B                                      | 8 (31%)                               |
| Site C                                      | 9 (35%)                               |
| Age (y)                                     | 40 [36–52]                            |
| Gender, % female                            | 15 (58%)                              |
| Race/ethnicity                              |                                       |
| Non-Hispanic Asian                          | 3 (12%)                               |
| Non-Hispanic White                          | 19 (73%)                              |
| Other                                        | 2 (8%)                                |
| Years in practice                           | 10 [5–17]                             |
| Primary professional role                   |                                       |
| Inpatient nurse                             | 1 (4%)                                |
| Pediatric hospitalist                       | 8 (31%)                               |
| Primary care provider                       | 16 (62%)                              |
| Urgent care pediatricist                    | 1 (4%)                                |

| Parent characteristics (n = 12)             |                                       |
| Health system affiliation                  |                                       |
| Site A                                      | 6 (50%)                               |
| Site B                                      | 2 (17%)                               |
| Site C                                      | 4 (33%)                               |
| Age (y)                                     | 32.5 [34.5–39]                        |
| Gender, % female                            | 10 (83%)                              |
| Educational attainment                      |                                       |
| High school completion                      | 4 (33%)                               |
| Some college                                | 4 (33%)                               |
| College degree                              | 4 (33%)                               |
| Marital status                              |                                       |
| Single                                      | 6 (50%)                               |
| Married                                     | 6 (50%)                               |
| Race/ethnicity                              |                                       |
| Non-Hispanic Asian                          | 1 (8%)                                |
| Non-Hispanic Black                          | 3 (25%)                               |
| Non-Hispanic Native American                | 1 (8%)                                |
| Non-Hispanic White                          | 7 (58%)                               |

| Child characteristics (n = 12)               |                                       |
| Age (y)                                     | 5 [0–11]                              |
| Admitting diagnosis                         |                                       |
| Encopresis                                  | 1 (8%)                                |
| Fever or viral infection                    | 3 (25%)                               |
| Gastroenteritis                             | 1 (8%)                                |
| Hyperbilirubinemia                          | 3 (25%)                               |
| Pneumonia                                   | 1 (8%)                                |
| Skin and soft-tissue infection              | 1 (8%)                                |
| UTI/pyelonephritis                          | 2 (17%)                               |
| Gender, % female                            | 6 (50%)                               |
| Primary payer                               |                                       |
| Medicaid                                    | 9 (75%)                               |
| Private                                     | 3 (25%)                               |
someone can see the child in person and do what we can’t do over video” (ID108, Site A). One of the most striking findings was the variation across clinics. For example, one clinician reported sending all pediatric patients with respiratory symptoms to a respiratory clinic without pediatricians, in contrast to another clinician who reported no changes other than the addition of telehealth visits.

Of all of the changes in acute care delivery described in this study, the transition to telehealth had the most significant impact on processes of care, with one clinician asserting that telehealth “completely changed the way we practice.” Clinicians described associated changes to their clinical roles, with one participant reporting, “We have a sick doc every day of the week, there’s a virtual doc” (ID111, Site B). The inability to conduct a thorough physical examination was the most frequently reported challenge associated with telehealth for acute illnesses. Clinicians noted the benefits of triage protocols to inform decisions about seeing a child in-person or via telehealth and of telehealth for initial assessments, informing decisions about whether to bring the child into the clinic or refer to urgent care clinics or EDs as needed.

**Fig. 1.** The conceptual model illustrates the relationships between emerging knowledge of COVID-19 epidemiology and changes to clinical care infrastructure, processes, and quality of care outcomes.

**Association of Changes to Clinical Care Infrastructure and Processes with Quality of Care**

Clinicians and parents described how COVID-19-related changes to clinic infrastructure and processes of acute care delivery influenced quality of care, resulting in tradeoffs between patient safety and other healthcare quality domains, including access, timeliness, effectiveness, equity, and patient-centeredness. These tradeoffs and unintended consequences are summarized with representative quotes in Table 2. Clinicians and parents also described how care processes enhanced healthcare quality (Table 3), providing convenience for families while minimizing COVID-19 exposure.

Within the realm of patient and provider safety, clinicians described using telehealth and new clinic procedures to minimize patient and family exposure to COVID-19 at the cost of healthcare quality in other realms. This change was articulated by 1 PCP who stated, “Telehealth is good for some things and not for others... I feel like it’s sometimes made me feel like I’m practicing not as good medicine” (ID125, Site B). One clinician described a partner who experienced a near-miss because it was impossible to perform a physical exam on an adolescent with...
And then having that super easy walk-in clinic, too. Site B). The reduction or elimination of walk-in hours and getting in on the same day. I definitely took that for granted. It’s made it quite difficult…just not being able to okay, you’re not feeling good’…well, [now] we wait four days… It’s frustrating. Any time we think about, ‘oh, our primary care is [client name] and they have like six clinics within our area that we can go to, right? And so I was shocked when she told me that I couldn’t get in on the same day…she was having such a hard time finding anything within the same week…So there was absolutely no way we could see her primary care doctor at all, and we had to wait from Tuesday to Saturday to make an appointment…” [ID 207, Site B, parent]

“1 think a lot of parents have utilized our virtual option [for acute care], and they’ve really appreciated it for certain things. So they’re utilizing that. And I guess the flip side is they don’t like the fact that they can’t go to their regular pediatrician if we determine…that the patient should be seen in clinic, they don’t appreciate the fact that they have to go to urgent care and they can’t see their regular pediatrician.” [ID 125, Site B, Primary care pediatrician]

“t’s a lot harder to incorporate interpreters, so…families might identify that as a potential barrier that they don’t feel comfortable using an interpreter over the phone or that they might not be willing to disclose that they want to use an interpreter, so then you have subquality visits because the family’s not using an interpreter when they should be. The dissemination of information in that we’re doing telehealth can be disproportionately sent to some patients versus others…” [ID 124, Site C, Hospitalist]

“I think they were just more concerned of, ‘Oh, it’s COVID, Oh, it’s COVID’ without actually checking over everything and making sure she had other signs…I just think that they were overlooking some things, because they potentially just wanted it to be COVID-19 and just be done with it and just try to treat COVID” [ID 210, Site A, parent]

“If you want a physical exam, if they’re under three or four, it’s just crazy. The parent is trying to hold the kid and just try to treat COVID” [ID 210, Site A, parent]

“I think that I’m more likely to make assumptions that I wouldn’t necessarily make. For example, a kid who sounds like they have an otitis media, an ear infection, who I normally would not prescribe antibiotics without actually looking in the ear. If everything else sounds like it fits, I might prescribe antibiotics without actually having the patient come in. That’s just an example. So in some ways I worry that we’re providing not as good medicine, because we’re trying to minimize interaction and risk from COVID.” [ID 114, Site A, Primary care pediatrician]

“You might be a little more prone to order a chest x-ray, for example, if you can’t really do a lung examination.” [ID 113, Site C, Primary care pediatrician]

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Table 3. Processes Identified as Facilitators of High-quality Acute Care Delivery via Telehealth

| Emergent Theme | Representative Quote |
|----------------|----------------------|
| Safety: Acute care visits by telehealth protect against exposure to COVID-19 | “I’m all for telehealth. I don’t have to leave my house.” [ID 209, Site C, parent] |
| Access, Timeliness, and Efficiency: Telehealth enables efficient and timely access to care, with reduced waiting times and elimination of travel | “I don’t have to leave the home, especially with what’s going on here, around with COVID. It wasn’t that long of a visit, no wait time. That’s a big plus for me. I didn’t have to wait. We got online right when they were getting online, so. The wait time was-- no wait time and I don’t have to leave the house. I think that’s two big pluses.” [ID 209, Site C, parent] |
| “For many disease processes, it’s very useful. It’s very convenient for families, oftentimes, just because they don’t have to take as much time out of their day to do the visit. There’s not a commute. There’s not a sitting in the waiting room and registering and then sitting in the exam room waiting for the doctor and all those steps. So it takes out a lot of the inefficiencies in the process of seeing your doctor.” [ID 113, Site C, Primary care pediatrician] |
| Effective Care Delivery: Telehealth may be most effective when provided through the medical home with a disclosure that it may be followed by an in-person visit. Protocols and decision aids regarding populations and diagnoses best-suited to telehealth enhance effectiveness of care delivery. | “At the beginning of the visit, we make a disclosure. We will try our best to provide the care, confidential care, during this visit, and at any point, if the parent or the provider think that we care not able to provide the care we need, then I might ask you to come to the clinic. I will set up an appointment, or I might ask you to go to the urgent care. And parents understand that…” [ID 116, Site C, Primary care pediatrician] |
| “Our clinic is really good at triaging, by the time they get on my schedule as a telehealth visit most of the ones that really need to be seen in person have already been triaged and told to be seen in person. So I would say probably 80% of the telehealth visits I do we’re able to come to a satisfactory conclusion. Maybe 20% I feel like this person needs to be seen in clinic…” [ID 125, Site B, Primary care pediatrician] |
| “Things like feeding adjustments, G-tube-- adjusting their feeds, talking about constipation, things like that are very good for telehealth. Rashes, skin infections, stuff like that we can treat by looking at it, right?” [ID 105, Site A, Hospitalist] |
| “if you don’t have a smartphone, which not everyone does, then you can’t even get access to the telehealth visits. So I imagine there are lots of challenges for lots of people based on the technology required.” [ID 122, Site A, Hospitalist] |
| “Our families are still reporting that they feel very listened to. And that the connection with their provider is just as strong if not stronger via telehealth…the provider is looking directly at them…they’re not distracted by other things that are going on in the room.” [Member checking group] |

heightened concerns for COVID-19 infection may have led healthcare providers to “overlook some things.”

In the equity domain, clinicians and parents reported that some parents were unable to benefit from the convenience of telehealth due to limited Wi-Fi availability, internet connectivity challenges, limited phone storage space, challenges accessing interpreter services, and inequitable distribution of information about clinic procedures during the COVID-19 pandemic. As one PCP stated, “Some families who have a hard time with...resources...they don’t have the computer, or they don’t have the internet connection, or they don’t have sort of the technical know-how to get things set up” (ID 125, Site B). In the most extreme cases, clinicians reported that families might be unable to use telehealth at all, resulting in an access disparity. Clinicians described challenges associated with using interpreters via telehealth and raised questions about their abilities to effectively counsel families and assess parental understanding when teaching was done via telehealth.

In the domain of patient- and family-centered care, participants most frequently described the convenience of telehealth, with one clinician noting that there is “no greater stress than getting a kid into the clinic.” In some cases, parents reported discomfort with telehealth stating, “But it was scary to have to deal with it at home, feeling more alone, not having that kind of touch, face-to-face, in-person time with a provider” (ID211, Site A). Several parents raised concerns about the policies at clinics and hospitals that limited sibling attendance, causing them to delay care and receive less family support while inpatient (representative quotes provided in Table 2).

**DISCUSSION**

Through qualitative analysis of interviews with parents and clinicians across three healthcare systems in the United States, we characterized pediatric acute care delivery changes during the first 9 months of the COVID-19 pandemic and corresponding relationships with healthcare quality. Parents and clinicians described the implications of the rapid scale-up of telehealth, shifts in primary care, and walk-in clinic hours, locations, and clinician roles. Although changes in acute care delivery were intended to improve patient and provider safety, participants described unintended consequences concerning access to usual sources of care, timeliness, and health equity, indicating opportunities for clinical improvements during and beyond the COVID-19 pandemic.

Although the technology for telehealth was widely available before the COVID-19 pandemic, barriers related to clinic infrastructure, payment and reimbursement structures, malpractice policies, and technology requirements limited its widespread implementation.22-25
Before the pandemic, less than 15% of pediatric clinics reported using telehealth.22,23 Telehealth’s rapid scale-up during the early stages of the pandemic enabled participants to identify several best practices specific to pediatric acute care delivery. Participants also identified concerns about antibiotic stewardship and potentially unnecessary diagnostic testing associated with telehealth for some acute illnesses, aligning with two past studies demonstrating increased rates of antibiotic prescribing via virtual encounters relative to in-person visits.26,27 These findings can inform telehealth use during and following the pandemic, building on national guidance from both the American Academy of Pediatrics and Taskforce on Telehealth Policy.28–30

Although telehealth was described as a means of increasing healthcare access, several changes to clinic infrastructure and processes of care related to COVID-19 were described as having the opposite effect, particularly limiting access to families’ usual sources of care. These changes may have substantial impacts on healthcare quality, given evidence that care within a patient-centered medical home is associated with improved health outcomes, parental satisfaction, and decreased healthcare costs.31 Minimizing compartmentalization within practices between clinicians who provide telehealth and in-person encounters may help to overcome this challenge.

Telehealth has been widely advocated as a potential means of improving access to care and health equity by overcoming barriers, including transportation, childcare, and associated costs.32,33 Findings from this study indicate that the rapid scale-up of telehealth has achieved some of this promise, but concerns about equitable healthcare delivery persist. Consistent with pre-COVID-19 literature, families experienced challenges with broadband access, interpreter service availability, and digital literacy.34,35 These findings align with three recent studies demonstrating significantly lower telemedicine utilization among racial-ethnic minority populations during the pandemic.9,36,37 Our conceptual model, considering both structural and procedural factors that impact the quality of care, may be used in future work to inform quality improvement efforts to address inequities.

Strengths of this study include its multisite design and participation of parents and clinicians working in primary care, urgent care, and inpatient settings. Limitations include our exclusion of parents who did not speak English, those whose child did not meet the criteria for hospital admission, and those who could not access the healthcare system. Also, PCPs are overrepresented in our sample. At the same time, parents are underrepresented, which may have resulted in a relatively greater emphasis on primary care health system structure and process changes in our conceptual model. The validity and transferability of this work are supported by consistency in results across our 3 implementation sites, but we acknowledge that qualitative research is, by design, hypothesis-generating. Additional research examining the quality of care in larger samples is needed to confirm the relationships we propose in our conceptual model linking acute care delivery structures and processes with quality of care.

CONCLUSIONS

Pediatric acute care delivery has changed substantially during the COVID-19 pandemic. Although changes were made to improve safety for families and clinicians, they appear to have come at a cost to healthcare access and quality of care. The development and implementation of guidelines and decision aids describing diagnoses and populations best-suited to telehealth and in-person encounters and purposeful use of telehealth for initial assessment and management may improve the quality of acute care delivery. Clinics and hospitals may apply these findings to prioritize improvements in healthcare delivery and correspondingly evaluate health outcomes.

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