Adoption of Telehealth by Pediatric Physical Therapists During COVID-19: A Survey Study

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Purpose: To describe the characteristics of pediatric physical therapy telehealth practice during COVID-19.

Methods: An anonymous, online survey was distributed to pediatric physical therapists (PTs) in the United States who transitioned to telehealth during COVID-19.

Results: Two hundred five respondents completed all quantitative questions. Ninety-six percent reported never providing telehealth previously and only 14.6% had formal training. More than 35% reported 76% to 100% of their caseload transitioned to telehealth. Most respondents perceived that telehealth was somewhat or very effective for caregivers (90.3%) and children (77.1%) and felt somewhat or very confident providing telehealth (73.2%). However, those practicing in school-based settings rated perceived effectiveness and confidence lower than PTs in other settings. Ultimately, 76.1% of respondents would consider providing telehealth in the future.

Conclusion: The forced transition of pediatric PTs to the telehealth model during the COVID-19 pandemic resulted in positive experiences for many, supporting wider adoption in the future. (*Pediatr Phys Ther* 2021;33:237-244)

Key words: COVID-19, pediatric physical therapy, telehealth

INTRODUCTION AND PURPOSE

COVID-19, which began as a cluster of respiratory cases in Wuhan, China, quickly spread across the globe with the United States declaring a state of emergency on March 13, 2020. The World Health Organization reported more than 1 million worldwide cases of the virus by April 4, 2020.^{1,2} As this global pandemic quickly evolved, the Centers for Disease Control and Prevention recommended that health care providers adopt procedures to limit contact and risk of virus spread, including telehealth.³ By March 2020, telehealth encounters in medicine increased by as much as 154% from the previous year.⁴ Simi-

larly, the American Physical Therapy Association's (APTA) board of directors encouraged physical therapists (PTs) to "use their professional judgment to determine when, where and how to provide care with the understanding this is not the optimal environment for care, for anyone involved."⁵ Many PTs chose telehealth to continue providing care while decreasing in-person interactions with the goal of limiting spread of the virus. Forty-five percent of PTs reported providing live video visits during the pandemic compared with 2% previously.⁶

The APTA defines telehealth as "the use of electronic information and telecommunication technologies to remotely provide health care information and services."⁷ Telehealth has been a slowly emerging service delivery model in physical therapy, and the evidence to support its use in physical therapy has been limited.⁸ Current evidence suggests that telehealth in physical therapy is feasible and at least equally effective to standard care for postoperative patients.⁹ In addition, a 2017 systematic review and meta-analysis found real-time telehealth services for musculoskeletal conditions to be comparable with the standard of in-person physical therapy services, and a combined model of in-person and telehealth services may be optimal.¹⁰ Prior to the pandemic, there was less research evidence to support the use of telehealth in pediatric physical therapy.

As pediatric PTs worked to provide necessary services to children and caregivers, the telehealth model was particularly valuable for mitigating risk in this population due to the number of individuals usually present during sessions (eg, therapist, caregivers, other family members, children). However, the ease

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of telehealth adoption in pediatric physical therapy may vary with the nature and focus of the wide spectrum of settings in which pediatric treatment occurs. Early intervention (EI) services are often family-centered, focused on family goals, and provided in the natural environment.¹¹ Comparatively, school-based services are centered around ensuring the child's success in the school environment and provided in the school setting without caregivers present.¹² The outpatient (OP) service model often combines family-centered and child-centered care, depending on the individual needs and preferences of the child and their family.

A study investigating telehealth in Colorado's early intervention program found telehealth supports the use of family coaching to develop caregiver skill by supporting caregivers to interact with their children rather than observing the therapist.¹³ In the school-based setting, anecdotal evidence suggests that PTs perceived that telehealth during COVID-19 provided insight into family dynamics and opened a better line of communication with parents.¹⁴ However, PTs also encountered the task of adapting school-based goals to fit the home environment, which was often a challenge due to families' resources and space being different from school spaces.¹⁴ In the OP pediatric rehabilitation setting, a survey of patient satisfaction with virtual visits during the COVID-19 pandemic found that telehealth was useful in "providing structure to the pediatric patients with behavioral issues."¹⁵ A participant of the same study explained that therapy via telehealth may be more individualized because the resources each family has at home are used during sessions, potentially assisting with carryover. This suggests that more research is needed to inform best practices for effective telehealth service delivery.

The quick transition to telehealth during the COVID-19 pandemic thrust many PTs and families into uncharted territory. The overall goal of this survey study was to describe the experience of pediatric PTs providing telehealth services during the COVID-19 pandemic. The research questions addressed included the following: (1) How did pediatric PTs transitioning from in-person to telehealth services during the COVID-19 pandemic describe the demographics and other characteristics of their telehealth physical therapy practice? (2) How did pediatric PTs perceive the effectiveness of telehealth services for children and their caregivers? (3) What was the PTs' confidence in providing telehealth services?

METHODS

Recruitment

The university institutional review board provided approval for this cross-sectional survey study. We used snowball sampling to recruit pediatric PTs providing telehealth services during the COVID-19 pandemic. Recruitment materials, which included an open invitation to complete our anonymous survey, were distributed to pediatric PTs in the United States through personal and professional connections of researchers, social media (eg, Facebook posts), and APTA Academy of Pediatrics emails. Inclusion criteria were as follows: (1) PTs providing telehealth in a pediatric setting in the United States for at least 2 weeks

during the COVID-19 pandemic; (2) services provided were synchronous or real-time; (3) the PTs previous practice was not primarily telehealth; and (4) PTs were English speaking. Respondents accessed the survey online through an anonymous link or QR code. An introduction to the survey provided information about the survey purpose, provided a working definition of telehealth and inclusion criteria, and assured prospective respondents that their participation was voluntary.

Instrumentation

We developed this survey using the Qualtrics online survey platform (Qualtrics, Provo, Utah). The survey was informed by a literature review, researchers' pediatric expertise, and recent telehealth experience. Three pediatric PTs from different practice settings and states piloted the survey. We made edits related to content and item wording based on their feedback. The survey consisted of 41 questions. The survey was available from May 20, 2020, to June 30, 2020. Multiple choice or Likert-scale questions included 12 questions related to demographic and practice setting information; 12 questions regarding telehealth practice; and 8 Likert-scale questions regarding respondents' perceptions of factors influencing the effectiveness of their telehealth services. In addition, nine open-ended questions included 4 asking for more information regarding a forced choice response and 5 regarding barriers, facilitators, and factors influencing effectiveness; conditions best or least suited to telehealth services; and the PTs likelihood to provide telehealth services after the pandemic. Because of the volume of data generated from this survey, questions were grouped into 4 categories for analysis: (1) questions related to demographic descriptions of the respondents; (2) questions providing a description of the characteristics of pediatric PTs' telehealth practice; (3) questions regarding factors, facilitators, and barriers related to the effectiveness of telehealth practice; and (4) questions regarding respondents' willingness to continue telehealth after the COVID-19 pandemic ends. This article focuses on the second category, a description of pediatric PT telehealth practice during the COVID-19 pandemic. The survey is available in Supplemental Digital Content, available at: <http://links.lww.com/PPT/A323>.

Data Analysis

We analyzed the survey data using IBM SPSS 26 (IBM, Armonk, New York). We calculated percentages to describe responses to individual questions and χ^2 test and Cramer's V to investigate associations between responses. Akoglu's suggested interpretations of Cramer's V greater than 0.25 as a very strong correlation and Cramer's V greater than 0.15 as a strong correlation were used in interpretation.¹⁶

RESULTS

Survey Respondents

Two hundred five respondents completed all quantitative questions. Respondent demographics are shown in Table 1. Information about respondents' practice settings by US region is shown in Figure 1.

TABLE 1
Respondent Demographics (N = 205)

Demographic	Number of Respondents (%)
Region of the United States (Q3)	Northeast: 63 (30.7) Southeast: 42 (20.5) Midwest: 50 (24.4) West: 34 (16.6) Southwest: 16 (7.8)
Practice area (Q4)	Urban: 40 (19.5) Suburban: 102 (49.8) Rural: 25 (12.2) Multiple areas: 38 (18.5)
Highest education (Q8)	Bachelor's degree: 35 (17.1) Master's degree: 42 (20.5) Doctorate of physical therapy: 125 (61.0) Academic doctorate: 3 (1.5)
Years as a PT (Q9)	0-5: 57 (27.8) 5-10: 30 (14.6) 10-15: 26 (12.7) 15-20: 22 (10.7) 20+: 70 (34.1)
Years as a pediatric PT (Q10)	0-5: 67 (32.7) 5-10: 41 (20.0) 10-15: 22 (10.7) 15-20: 23 (11.2) 20+: 52 (25.4)
Employment status (Q2)	Full time: 151 (73.7) Part time: 49 (23.9) prn: 5 (2.4)
Practice setting (Q1): n = 205/total number of practice settings reported (278 settings reported by n = 205 respondents)	Outpatient hospital-based pediatrics: 33 (16.1)/42 Outpatient private clinic pediatrics: 36 (17.6)/73 Early intervention: 31 (15.1)/82 School-based: 39 (19.0)/68 Other: 7 (3.4)/13 Multiple settings: 59 (28.8) (Other = pediatric acute care, OP neuro clinic, OP nonprofit organization, home health, preschool evaluations, aquatics, pediatric long-term care, daycare/homes/preschools, NICU)

Abbreviations: NICU, neonatal intensive care unit; OP, outpatient; PT, physical therapist.

Prior Training and Experience

Ninety-six percent of respondents reported never providing telehealth services prior to the COVID-19 pandemic and 14.6% reported receiving formal training in telehealth services. Thirty respondents reported receiving training, some from multiple sources. Twenty-eight respondents reported receiving training through their employer or EI program, 8 attended other continuing education courses or webinars, 4 specifically reported accessing APTA resources, and 2 reported performing other online research independently.

Platforms

Zoom was the most commonly used telehealth platform, with 68.3% of respondents using it at least some of the time. Several other platforms were also listed (Table 2). Overall, the majority of respondents reported being *somewhat satisfied* with

their telehealth platform (64.9%), followed by *extremely satisfied* (17.1%), *neutral* (9.8%), *somewhat dissatisfied* (5.9%), and *extremely dissatisfied* (2.4%). Of the 47 respondents exclusively using the Zoom platform, 38.3% reported being *extremely satisfied*, 53.2% *somewhat satisfied*, 6.4% *neutral*, and 2.1% *somewhat dissatisfied*.

Telehealth Practice

Figure 2 provides a summary of pediatric telehealth practice during the COVID-19 pandemic. Most respondents reported completing 3 to 5 telehealth visits daily (51.2%), followed by 0 to 2 visits daily (28.3%). Almost 36% of respondents reported that 76% or more of their caseload transitioned to telehealth, followed by 25.9% reporting 51% to 75%, 20.6% reporting 25% to 50%, 11.7% reporting 11% to 25%, and 6.3% reporting 0% to 10% of their caseload. Most respondents did not concurrently provide in-person visits during this time period (68.8%). The effect of shifting to telehealth services on cancellation rate varied among respondents with 26.3% reporting it *increased slightly*, 21.5% reporting it *increased a lot*, 21.5% reporting *no change*, 22.9% reporting it *decreased slightly*, and 7.8% reporting it *decreased a lot*. Only 2.4% of respondents reported obtaining a temporary license to provide telehealth services across a state line.

Forty-two percent of respondents reported spending the majority of their work time with children, followed by caregivers (23.4%), scheduling (17.6%), documenting (11.7%), reimbursement activities (4.4%), and other activities (0.5%). Of the 60 respondents describing other activities, the most common responses were planning or preparation activities (42%) and accessing telehealth resources (18.3%).

Perceived Effectiveness and Confidence

The majority of respondents perceived telehealth services as effective for caregivers with 60.5% rating telehealth as *somewhat effective* and 29.8% as *very effective*, followed by 8.3% *neutral*, and 1.0% reporting that telehealth was *not effective*, and 0.5% reporting it was *not at all effective*. The response was similar for perceived effectiveness for children with 61.5% rating telehealth as *somewhat effective* and 15.6% rating it as *very effective* with only 15.6% being *neutral* and 7.3% rating it as *not effective*. Most respondents reported feeling *somewhat confident* in their ability to provide effective PT through telehealth (57.6%) with 15.6% feeling *very confident*, 15.6% *neutral*, 10.7% *not confident*, and 0.5% *not confident at all*. Ultimately, 76.1% of respondents would consider continuing to provide telehealth services after the COVID-19 pandemic.

When considering PT confidence providing telehealth services, there was a strong correlation between confidence and previous training with 93.3% of those with previous training feeling *very confident* or *somewhat confident*. In addition, there was a very strong correlation between confidence and perceived effectiveness of telehealth for children and caregivers. There was also a very strong correlation between confidence and consideration to continue telehealth services after the pandemic. Almost 83% of those reporting feeling *very* or *somewhat confident*

Fig. 1. Respondents' practice settings by US region.

responded that they would consider continuing telehealth after the pandemic while 72.7% of those reporting that they would not continue telehealth responded that they were *not confident*. Cramer's V and P values for these analyses are shown in Table 3.

Practice Settings

Recognizing many pediatric PTs concurrently practice in multiple practice settings, respondents had the option to identify multiple practice settings on the survey. To reduce the bias introduced by multiple settings, we conducted a subgroup analysis of those respondents reporting only 1 practice setting (n = 146). Table 4 provides demographic data related to setting subgroups.

TABLE 2
Telehealth Platforms Used

Platform	Count
Zoom	140
Telephone calls	62
Facetime/videochat	61
Microsoft Teams	14
Google Meet	11
Webex	10
Social Media	7
Theraplatform	6
Jabber	5
Skype	5
GoToMeeting	4
Clocktree.com	2
Others: Amwell, Doxy, Duo, HD Meeting, Lifesize, Hospital Telehealth Platform, Texting, Vidyo	1

There were regional differences with the majority of respondents working exclusively in OP hospital settings in the Midwest (51.5%). Almost 39% of those working in EI and 56.4% of those working in school-based settings were in the Northeast. For all settings, the majority of respondents had attained a doctor of physical therapy degree. The majority of respondents working in OP private clinics had 0 to 5 years of experience as both a PT (44.4%) and working in pediatrics (44.4%). The majority of respondents working in EI settings had more than 20 years of experience as a PT (41.9%) and in pediatrics (35.5%). The majority of respondents working in school settings had 20+ years of experience as a PT (46.2%). However, the years working as a pediatric PT were more varied with 33.3% of those in school settings having 0 to 5 years of experience in pediatrics and 28.2% having 20+ years of experience in pediatrics. Respondents working in EI had the highest incidence of previous telehealth experience (16.1%) and training (29%) of all practice settings.

There was a strong correlation between practice setting and perceived effectiveness for caregivers with 97% of those working in OP hospital clinics, 94.4% in OP private clinics, 100% in EI, 74.4% in schools, and 71.5% in other settings rating telehealth *very* or *somewhat effective* for caregivers. There was also a very strong correlation between practice setting and perceived effectiveness for children with 87.9% in OP hospital clinics, 88.9% in OP private clinics, 87.1% in EI, 43.6% in schools, and 71.5% in other settings reporting that telehealth was *very* or *somewhat effective* for children. There was a strong correlation between practice setting and confidence with 78.8% of respondents working in OP hospital clinics, 80.6% in OP private clinics, 83.9% in EI, 38.5% in schools, and 85.7% in other settings reporting that they felt *very* or *somewhat confident* in their

Fig. 2. Pediatric physical therapy telehealth practice during COVID-19.

ability to provide effective telehealth services. Ultimately, practice setting was strongly correlated with willingness to consider continuing to provide telehealth after the COVID-19 pandemic ends, with 81.8% of those working in OP hospital settings, 80.6% in OP private clinics, 80.6% in EI, and 43.6% working in school settings stating that they would consider continuing. This information is graphed in Figure 3.

DISCUSSION

An August 2020 report from the APTA described the effect of the COVID-19 pandemic on general PT practice including decreased hours worked, decreased caseload as a result of fewer physician referrals and direct access admissions, decreased weekly income, and for some a loss of employment.⁶ In response to these challenges, PTs across the United States

transitioned to providing telehealth services; the experiences of our respondents mirrored those of this broader survey. Prior to the pandemic, 98% of US PTs had never provided telehealth services and by July 2020, 47% were performing “live consults.”⁶ For these PTs, 45% treated 1 to 5 patients per week via live video consult and the majority used Zoom (45%) as their main platform. Our pediatric PT respondents reported similar experiences.

The majority of our respondents perceived pediatric physical therapy telehealth services to be effective for both children and caregivers. This finding is consistent with a survey finding 90% of individuals of all ages receiving a telehealth visit during the pandemic from occupational therapy, speech therapy, or physical therapy providers being satisfied overall with the visit and 86.8% placing value on having a future telehealth visit.¹⁵ In addition, emerging evidence prior to the pandemic supported physical therapy telehealth in orthopedic as well as pediatric populations.^{9,10,13} The majority of our respondents reported that they would consider continuing with telehealth services after the pandemic. Our results, along with previous and emerging telehealth research during this pandemic, suggest that telehealth is a viable method of service delivery for a variety of patient types, supporting its long-term use. In addition, the APTA has called for providers and policy makers to begin working on long-term strategies to support telehealth in physical therapy.⁶ Information from studies such as this one may provide valuable information to help support strategic planning and decision making.

In a subgroup analysis investigating the relationship of pediatric practice setting to other questions, we found interesting differences, particularly for those practicing in school-based settings. In general, school-based PTs’ perceptions of the effectiveness of telehealth for both caregivers and children and their confidence in their ability to deliver effective telehealth services

TABLE 3

Full Cohort and Subgroup Analyses of Relationships Between Variables

	<i>P</i>	Cramer’s V
Relationships within the full cohort between confidence and training, perceived effectiveness, and willingness to continue (n = 205)		
Previous training	.012	0.25
Perceived effectiveness for children	<.0001	0.54
Perceived effectiveness for caregivers	<.0001	0.59
Willingness to continue postpandemic	<.001	0.45
Relationships within the subgroup analysis between practice setting and confidence, perceived effectiveness, and willingness to continue (n = 146)		
Confidence	.004	0.24
Perceived effectiveness for children	<.0001	0.30
Perceived effectiveness for caregivers	.01	0.23
Willingness to continue postpandemic	.001	0.37

TABLE 4
Setting Subgroup Analysis (N = 146), n (%)

	OP Hospital Clinic (n = 33)	OP Private Clinic (n = 36)	Early Intervention (n = 31)	School-Based (n = 39)	Other (n = 7)
Region (Q3)					
Northeast	7 (21.2)	5 (13.9)	12 (38.7)	22 (56.4)	0
Southeast	3 (9.1)	11 (30.6)	3 (9.7)	6 (15.4)	0
Midwest	17 (51.5)	6 (16.7)	4 (12.9)	7 (17.9)	1 (14.3)
West	4 (12.1)	10 (27.8)	10 (32.3)	3 (7.7)	1 (14.3)
Southwest	2 (6.1)	4 (11.1)	2 (6.5)	1 (2.6)	5 (71.4)
Highest education (Q8)					
Bachelor's degree	4 (12.1)	4 (11.1)	7 (22.6)	8 (20.5)	1 (14.3)
Master's degree	4 (12.1)	4 (11.1)	10 (32.3)	11 (28.2)	0
Doctorate of physical therapy	24 (72.7)	28 (77.8)	14 (45.2)	20 (51.3)	5 (71.4)
Academic doctorate	1 (3.0)	0	0	0	1 (14.3)
Years as PT (Q9)					
0-5 y	7 (21.2)	16 (44.4)	6 (19.4)	7 (17.9)	5 (71.4)
5-10 y	8 (24.2)	5 (13.9)	3 (9.7)	5 (12.8)	0
10-15 y	9 (27.3)	4 (11.1)	5 (16.1)	4 (10.3)	0
15-20 y	3 (9.1)	4 (11.1)	4 (12.9)	5 (12.8)	1 (14.3)
20+ y	6 (18.2)	7 (19.4)	13 (41.9)	18 (46.2)	1 (14.3)
Years as pediatric PT (Q10)					
0-5 y	7 (21.2)	16 (44.4)	8 (25.8)	13 (33.3)	5 (71.4)
5-10 y	12 (36.4)	7 (19.4)	5 (16.1)	6 (15.4)	0
10-15 y	6 (18.2)	2 (5.6)	4 (12.9)	6 (15.4)	0
15-20 y	3 (9.1)	4 (11.1)	3 (9.7)	3 (7.7)	2 (28.6)
20+ y	5 (15.2)	7 (19.4)	11 (35.5)	11 (28.2)	0
Employment status (Q2)					
Full-time	25 (75.8)	28 (77.8)	23 (74.2)	34 (87.2)	
Part-time	8 (24.2)	8 (22.2)	7 (22.6)	5 (12.8)	
prn	0	0	1 (3.2)	0	
Previous telehealth experience (Q11)					
Yes	0	1 (2.8)	5 (16.1)	0	1 (14.3)
Telehealth training (Q12)					
Yes	4 (12.1)	3 (8.3)	9 (29)	0	0

Abbreviations: OP, outpatient; PT, physical therapist.

Fig. 3. Physical therapist's perception of confidence and effectiveness with COVID-19 telehealth use percentages reflects those responding somewhat or very effective or confident. OP indicates outpatient; PT, physical therapist.

were lower than those working in OP and EI settings. Compared with PTs in other pediatric settings, they were also less willing to consider continuing telehealth services after the end of the pandemic. This finding is likely multifactorial. There may be differences inherent in the nature and underlying goals guiding practice within different settings, which may influence a PT's experience with telehealth, for example, the focus on the family in EI when compared with the focus in schools on the child's functioning in the school environment. In addition, none of our exclusively school-based respondents had had any previous experience providing telehealth services or training whereas at least some respondents working exclusively in EI settings had previous experience with telehealth and some training. Emerging evidence about the use of telehealth in EI, school settings, and OP pediatric settings suggests that telehealth can be feasibly implemented in all of these settings and may provide benefits such as increased flexibility, increased access to providers, and increased caregiver engagement.¹³⁻¹⁵ Our findings suggest that more research needs to be done assessing the use of telehealth specific to different pediatric practice settings and the unique needs of PTs practicing in each setting, particularly in regard to training and support.

Lack of experience and training was not just a concern for school-based PTs. The majority of our respondents had no previous experience providing telehealth services and few had any formal training. A recent systematic review concluded that research evidence regarding telehealth training programs is limited.¹⁷ Amidst the pandemic, many sources for training have emerged including training provided by employers and national organizations such as the APTA.¹⁸ The Commission on Accreditation in Physical Therapy Education has approved telehealth practice as an appropriate clinical education experience for entry-level physical therapist students.¹⁹ As a result, many physical therapist students are being exposed to telehealth in order to complete necessary clinical rotations. Telehealth has been adopted out of necessity during this pandemic but may become more widespread as practitioners and trainees are exposed to this model of service delivery and see potential benefits. Our findings regarding a relationship between previous training and PT confidence and perceptions of telehealth effectiveness suggests that as pediatric physical therapy telehealth becomes more widely accepted, formal training would be beneficial in supporting the skilled adoption of this service delivery model. The ongoing inclusion of telehealth in entry-level physical therapy curricula would help meet this need.

Although telehealth service delivery was initially expanded out of necessity during the COVID-19 pandemic, it is likely that there will be an increased use of this model postpandemic due to the overall positive experiences for PTs, caregivers, and children. Future research should explore child characteristics, which may predict who is most likely to benefit from telehealth. In addition, many PTs expressed the difficulty of assessing pediatric patients without being hands-on and with the limited views available from their video platform. Telehealth-specific assessment tools and outcomes measures need to be developed and validated to support telehealth practice. Further studies exploring dosage and the potential use of telehealth in conjunction with in-person visits may also be valuable. Given our findings of potential differ-

ences among practice settings, research investigating the factors unique to the implementation of telehealth in individual pediatric settings will also be needed to support best practice. Some limitations of this study include that our sample of pediatric PTs was self-selected and may not represent the experiences of all pediatric PTs in the United States, the study was performed relatively early in the pandemic, and there may have been a bias toward PTs who were members of the APTA although we did not collect these data in the survey. We also noted that there were regional differences related to the distribution of respondents from different practice settings which may have influenced our results. Any survey study has limitations inherent in the survey design. This survey had a few questions in which percentage choices overlapped, which may have influenced the response of a small number of respondents.

CONCLUSION

During the COVID-19 pandemic, telehealth services allowed pediatric PTs working in a variety of settings to continue providing important services to children and caregivers. With the widespread adoption of telehealth and the exposure of PTs, trainees, children, and caregivers to this service delivery mode, it is likely that telehealth use will continue as the pandemic ends. The results of this study suggest that telehealth is feasible and perceived to be effective by many pediatric PTs. Future research is needed to help identify best practices in order to support the use of telehealth across practice settings.

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