Provider Perspectives in Serving Children Who Are Deaf or Hard of Hearing and Their Families using Tele-Intervention

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Abstract

Purpose: In the second of a two-part survey series, this cross-sectional survey study explored professionals' perceptions of tele-intervention (TI) services for young children who are deaf or hard of hearing. Using Likert rating scales and open-ended questions, the survey queried professional's confidence in providing TI services, including their views and recommendations. Data were collected March 2020 to May 2020, not realizing the survey release would coincide with the Covid-19 pandemic and the influx of unexpected virtual services. For this reason, data were stratified between those who had been providing TI services for more than versus less than three months. Responses for in-person providers were also evaluated for additional context.

Method: Responses from 123 participants who provided TI and 21 participants who provided in-person services ($N = 144$) were analyzed using descriptive statistics. Cronbach's alpha showed high internal consistency for all Likert scales; items of each subscale were sum-scored to examine relationships across queried areas of service delivery.

Results: Provider perceptions of TI services were largely favorable. However, providers with more than three months' experience were significantly more confident in coaching and supporting parents through TI, including more overall favorable views of a TI delivery than providers with less than three months of TI experience. There were no differences in provider confidence in coaching and supporting parents between providers with more than three months' TI experience using TI delivery and in-person providers using in-person delivery.

Conclusions: Experienced providers reported confidence in service delivery and positive views of the TI model. Programs seeking to implement virtual services should consider TI training, with a commitment to TI longevity to improve provider efficacy and confidence in TI services.

Keywords: tele-intervention, deaf or hard of hearing, early intervention, family-centered care

Acronyms: ASL = American Sign Language; DHH = deaf or hard of hearing; LSL = Listening and Spoken Language; TI = tele-intervention

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The successful implementation of newborn hearing screening programs in the United States has facilitated timely diagnosis of hearing loss and referral to early intervention services for families of children who are deaf or hard of hearing (DHH). Children who are DHH (approximately 6,500 infants diagnosed annually in the United States) have better outcomes when families have access to timely and appropriate services to facilitate their child's language and cognitive development (Centers for Disease Control and Prevention, 2017; Ching et al., 2017; Decker & Vallotton, 2016; Yoshinaga-Itano et al., 2017).

Parents[1] of children who are DHH may wish for their child to develop and use Listening and Spoken Language (LSL), American Sign Language (ASL), or a combination of both. Development of the child's first language is best supported by a provider who has skills and expertise to facilitate parents' priorities for their child and family.

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[1]The definition of parents, caregivers, and families encompasses a rich variety of circumstances, cultures, and individual details. To improve readability, the term *parents* is used throughout the article, but is inclusive of all caregivers and family constructs.

The Supplement to the Joint Committee on Infant Hearing (JCIH) reported early intervention services provided by professionals who have expertise in working with young children who are DHH yields the best outcomes for children and their families (JCIH, 2013). However, a shortage of qualified professionals with specialized skills to work with young children who are DHH and their families has been documented (JCIH, 2013; Martin-Prudent et al., 2016; Nelson et al., 2014). This has resulted in some families' inability to access services with a provider with LSL or ASL expertise or to receive the optimal frequency of sessions. These concerns impact timely implementation of intervention goals and language targets (Blaiser et al., 2013; Cole et al., 2019; Houston, 2011; Houston & Stredler-Brown, 2012; McCarthy et al., 2010, 2012, 2019).

In an increasingly technology-rich world, virtual services offer a valuable option for parents to engage in EI services with providers who have expertise aligned with the language priorities for their child and family. Referred to as tele-intervention (TI), virtual services can offer increased convenience, accessibility, and frequency of services, while also decreasing travel time, costs, and the impact of geographical barriers (Behl et al., 2017; Blaiser et al., 2013; Hailey et al., 2002). Other terms for TI services include tele-therapy, tele-practice, tele-services, telehealth, and tele-education. In this virtual model, video conferencing technology is used to deliver services by linking professionals and families regardless of their respective locations as long as they have access to the internet and to a computer with a camera. Child outcomes have been found to be similar when services are provided using TI or in person (e.g., Behl et al., 2017; Chen & Liu, 2017; Havenga et al., 2017; McCarthy et al., 2019, 2020).

As the implementation of TI increases for young children who are DHH and their families, it is important to consider the perspectives of providers who use this mode of service delivery. Professionals who partner with families and children who are DHH include specially-trained providers such as teachers of the deaf, early interventionists, speech-language pathologists, and Deaf mentors (hereafter referred to as *providers*). Although studies have explored the efficacy of TI services to child and family outcomes, few studies have explored the parent and the provider perceptions of TI services. It is central to a family-centered model of care for parents to feel supported in the goals and priorities they have for their children and to gain confidence in implementing goals using evidence-based strategies within their daily routines. Similarly, providers can be more effective when they have the training and support needed for effective TI service implementation. The purpose of this survey study was to learn more about the perceptions and feedback of professionals who provide TI services to support the speech and/or language development of children who are DHH, including their confidence in their ability to coach parents, their ability to support the development and needs of the children and families they serve, their opportunity to establish a parent-professional partnership using a TI model of delivery, and their general satisfaction ratings. Professionals who

provide in-person services were invited to participate in the survey to garner additional perspectives and context in service delivery experiences. The survey also queried perceptions of parents who received in-person services or a combination of both in-person and TI. Survey findings from parents are reported in a companion article.

Method

A cross-sectional survey was developed to explore the perceptions of professionals who provided TI services and/or in-person services to children who are DHH and their families. The Utah State University Institutional Review Board approved the survey study and there were no financial or other conflicts of interest.

Survey Instrument and Dissemination

An electronic survey using the Qualtrics platform was distributed to professionals who provide services to children who are DHH. Respondents who identified as both a professional in the field as well as a parent of a child who is DHH had the option of completing the survey two times—once as a professional and once as a parent.

Survey participants were recruited using several dissemination methods. An email flyer describing the survey was sent to the marketing and communication representatives at OPTION Schools, Inc., and to the American Speech and Hearing Association with a request to disseminate the survey link to their professional membership. Additionally, flyers were handed out at the March 2020 annual Early Hearing Detection and Intervention national conference. The survey was posted on the infanthearing.org and heartolearn.org websites that provide resources for parents of children who are DHH and professionals who serve them.

Results

The electronic survey software recorded 206 initial survey activations for questions specific to professionals. Of those, 62 activations contained no data or responses to only the first question. These unusable responses were omitted from analysis, resulting in 144 survey participants. Of the 144 survey participants, 85% ($n = 123$) reported they provided TI services and 15% ($n = 21$) reported they provided in-person services.

Of the 123 participants who provided TI services, data were further stratified by those who had been providing TI services for more than three months (34%; $n = 42$) with those who had been providing TI services for less than three months (66%; $n = 81$). The data analysis decision to stratify between more than or less than three months of TI experience was made due to the timing of the survey release with the Covid-19 pandemic. The survey was released in early March 2020, not realizing the following months of data collection (March 2020–May 2020) would be during a large-scale pandemic and the resulting influx of emergency virtual services. Although unintentional, this timing offered an intriguing opportunity to explore perceptions of professionals who unexpectedly shifted into virtual service delivery as compared with professionals

who had been providing TI within an established TI program prior to the onset of the Covid-19 pandemic. Participant responses for TI and in-person services are reported, as well as the stratified TI data for respondents with more than or less than three months of TI service delivery experience.

In addition to reporting descriptive statistics, the internal consistency of the Likert scales that queried professionals' confidence ratings was evaluated using Cronbach's alpha and items were sum-scored to create a continuous outcome. Independent sample *t*-tests were used to examine the confidence based on providing in-person versus TI-services, if the length of time (coded as TI provider for more than three months or less than three months) affected confidence levels.

Participant Demographics

The majority of survey respondents were female (96%, *n* = 138) and Caucasian (88%, *n* = 127) with a broad representation across age groups. Heavier geographic representation was seen for the West and Midwest than the Eastern area of the United States. Forty-three percent (*n* = 62) served families primarily in urban regions, 41% (*n* = 59) served families in both urban and rural regions, and 16% (*n* = 23) served families primarily in rural regions. See Table 1 for all demographic data.

Professionals' Confidence in TI and In-Person Service Delivery

The survey queried professionals' confidence in (a) effectively coaching parents during the session, (b) helping parents to promote optimal language development in their child who is DHH, (c) building positive relationships with parents, (d) supporting parents in creating an effective learning environment, (e) supporting parents in using and troubleshooting their child's hearing technology, and (f) facilitating management of child behaviors during the session. Response options were *very confident, mostly confident, somewhat confident*, and *not confident*.

As shown in Figure 1, the percentage of respondents providing TI (*n* = 123) who were *very confident* in these topic areas ranged from 57% (*n* = 70) to 18% (*n* = 22). The topic with the highest number of *very confident* respondents was the ability to develop a positive relationship with the families they serve. The topic with the lowest number of *very confident* respondents was supporting parents in managing child behaviors during the session with a TI mode of delivery.

The percentage of respondents providing in-person services (*n* = 21) who were *very confident* in these topic areas ranged from 81% (*n* = 17) to 33% (*n* = 7). The topic with the highest number of *very confident* respondents was the ability to develop positive relationships with the families they served and the lowest percentage of respondents who were *very confident* was effectively supporting parents in using or troubleshooting their child's hearing technology. See Figure 1 for all confidence ratings for professionals who provided TI services or in-person services.

Table 1
*Participant Demographics (*n *= 144)*

Gender		
Female	96%	(*n* = 138)
Male	1%	(*n* = 2)
Prefer not to answer	3%	(*n* = 4)
Age		
Under 20 years	0%	(*n* = 0)
20—29 years	16%	(*n* = 23)
30—39 years	26%	(*n* = 38)
40—49 years	26%	(*n* = 37)
50—59 years	20%	(*n* = 29)
60+ years	11%	(*n* = 16)
Prefer not to answer	1%	(*n* = 1)
Ethnicity		
African American	1%	(*n* = 2)
Hispanic or Latino	5%	(*n* = 7)
White	88%	(*n* = 127)
Other not listed	1%	(*n* = 1)
Prefer not to answer	5%	(*n* = 7)
Geographic Region		
West	33%	(*n* = 48)
Mid-West	34%	(*n* = 49)
South and South-East	19%	(*n* = 27)
East and North-East	11%	(*n* = 16)
U.S. Territory or Outside United States	3%	(*n* = 4)
Service Delivery Region		
Urban	43%	(*n* = 62)
Rural	16%	(*n* = 23)
Mix of Both	41%	(*n* = 59)

Data were then stratified according to those who had been providing TI services for more than or less than three months. Of 42 participants who had been providing TI services for more than three months, those who were *very confident* ranged from 74% (*n* = 31) to 33% (*n* = 14) across topic areas. Of 81 participants who had provided TI services for less than three months, those who were *very confident* ranged from 48% (*n* = 39) to 10% (*n* = 8) across topic areas. The topic showing the strongest provider confidence for both groups was building positive relationships with parents and families. The topic area with the lowest percentage of provider confidence for both groups was managing child behaviors. See Figure 2 for all confidence ratings for TI providers stratified by those who had been providing services for more than or less than three months.

Figure 1
*Provider Perceptions of Coaching and Support: Tele-Intervention (TI) All Data (*n = 123*), In-Person (*n = 21*)*
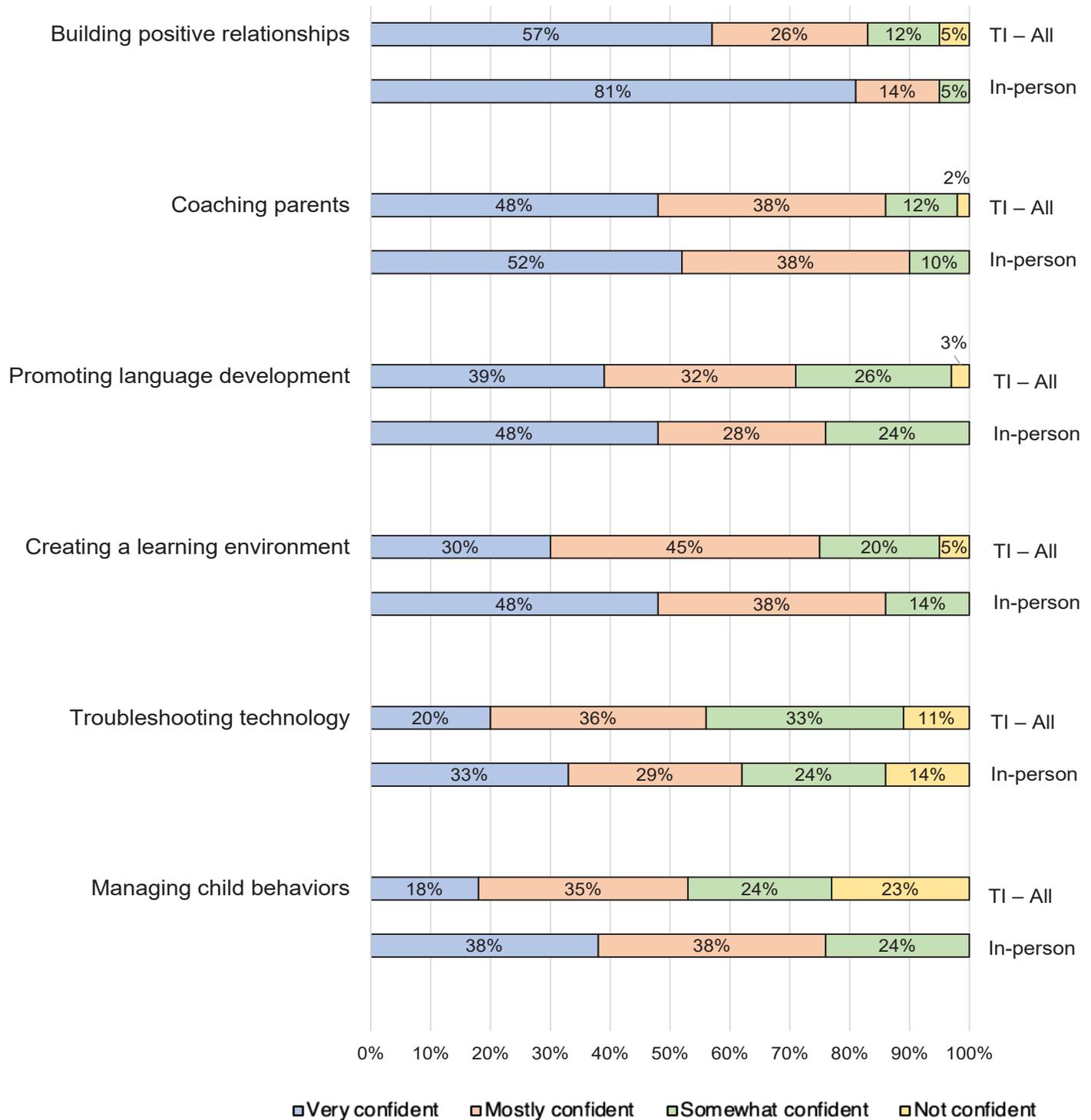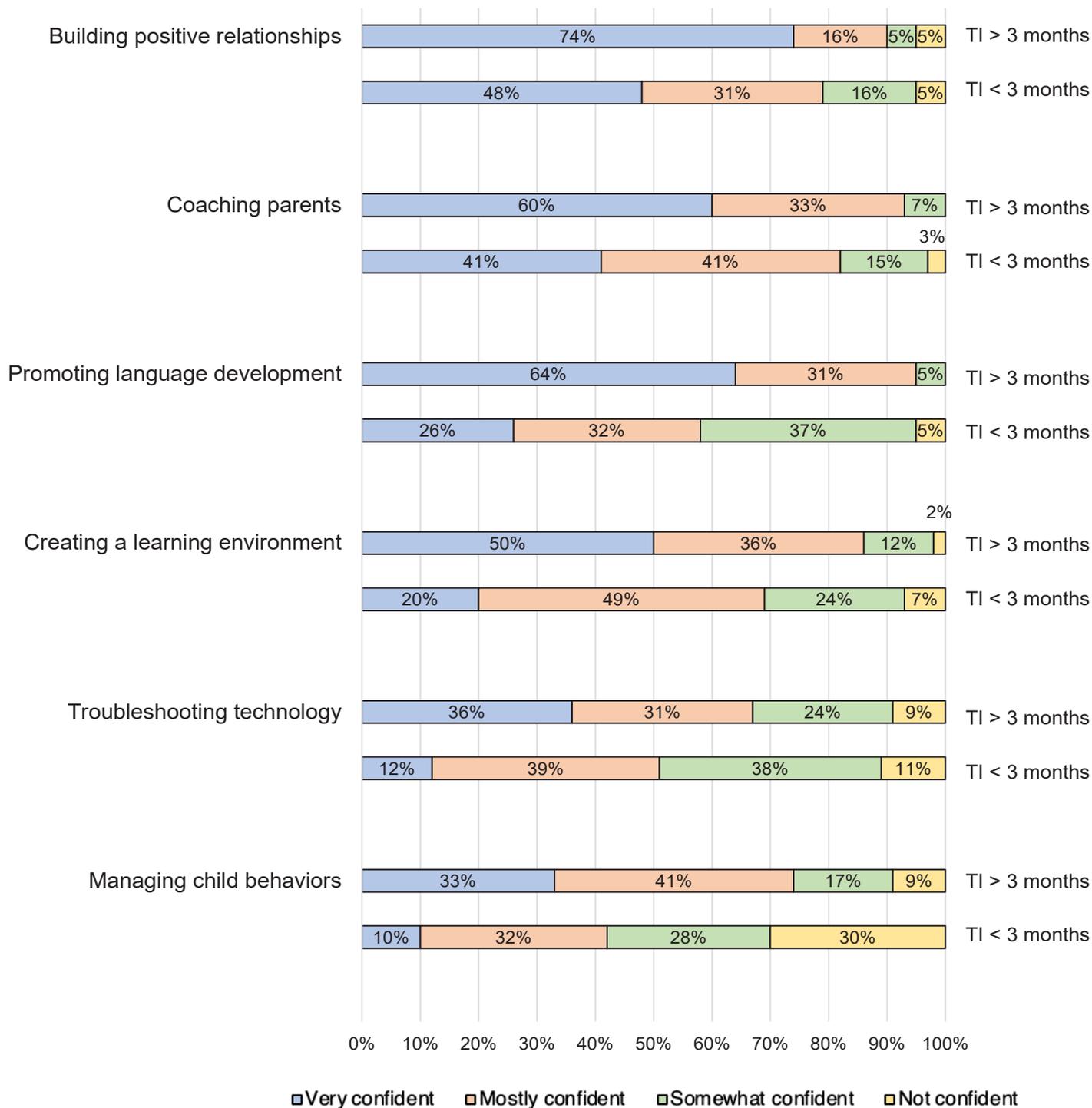

The internal consistency of the confidence scales were evaluated using Cronbach's alpha. The confidence scale reached an alpha of .87 so the items were sum-scored to create a continuous outcome. Independent sample *t*-tests were used to examine the confidence based on providing in-person versus TI-services, as well as if the length of time (coded as less than three months or more than three months) affected confidence levels. The results showed a significant difference in confidence of providers who provided in-person services ($M = 19.71$) compared to TI services ($M = 17.85$), such that those who provided in person services felt more confident than those who provided TI services ($t = 2.18$, $p = 0.04$). There was a significant difference in providers who provided services for more than three months ($M = 19.67$) compared to providers who provided services for less than three months ($M = 17.14$), such that those who provided services for more than three months felt more confident than those who provided services for less than three months ($t = -3.44$, $p < .001$).

Figure 2

Provider Perceptions of Coaching and Support: TI > 3 Months (n = 42), TI < 3 months (n = 81)

Building positive relationships
- TI > 3 months: 74% | 16% | 5% | 5%
- TI < 3 months: 48% | 31% | 16% | 5%

Coaching parents
- TI > 3 months: 60% | 33% | 7%
- TI < 3 months: 41% | 41% | 15% | 3%

Promoting language development
- TI > 3 months: 64% | 31% | 5%
- TI < 3 months: 26% | 32% | 37% | 5%

Creating a learning environment
- TI > 3 months: 50% | 36% | 12% | 2%
- TI < 3 months: 20% | 49% | 24% | 7%

Troubleshooting technology
- TI > 3 months: 36% | 31% | 24% | 9%
- TI < 3 months: 12% | 39% | 38% | 11%

Managing child behaviors
- TI > 3 months: 33% | 41% | 17% | 9%
- TI < 3 months: 10% | 32% | 28% | 30%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

□ Very confident   □ Mostly confident   □ Somewhat confident   □ Not confident

Note. TI = tele-intervention

Because there was a significant difference in provider confidence for study participants who had been providing TI for more than three months with those who had been providing services for less than three months, and a significant difference in the confidence of the full data set of TI participants compared with participants who provided in-person services, additional analyses were completed to determine if there was difference in confidence between TI participants with more than three months' experience and participants who provided in-person services. Due to a high Cronbach's alpha of .85, the items were sum-scored to create a continuous outcome. Independent sample t-tests were used to examine the confidence of the providers based on providing services in person compared to those who provided TI services for more than three months. The results showed there was not a significant difference in confidence for providers who provided TI services for more than three months ($M = 19.95$)

compared to those who provided in-person services (M = 19.71), such that those who provided TI services for more than three months had the same amount of confidence as those who provided in-person services (t = -0.25, p = .81).

Providers' Views of Tele-Intervention Services

The survey queried the 123 respondents who provided TI services on their perceptions of TI delivery as compared with traditional in-person delivery in areas of effectiveness, convenience, provider skill, frequency of visits, and the ability to promote confidence in parents. Response options were *definitely yes, probably yes, probably no, definitely no,* and *not sure.* As shown in Figure 3, the majority of respondents indicated *definitely yes* or *probably yes* that TI services were analogous to in-person services in each inquiry area. For example, 94% (n = 115) of respondents reported *definitely yes* or *probably yes* that TI facilitated services with providers who had specialized skills or expertise, and 87% (n = 107) and 70% (n = 85) reported *definitely yes* or *probably yes* that TI services were as convenient and effective, respectively, as in-person services. Further, 80% (n = 98) of respondents reported *definitely yes or probably yes* that the TI model offered services more frequently than would be available with in-person services and 85% (104) of respondents believed TI could effectively promote confidence in parents to facilitate their child's language and communication development. Also shown in Figure 3, stratified data showed views of providers with more than three months of TI experience were descriptively more favorable than those with less than three months of TI experience. The internal consistency of the scale was evaluated using Cronbach's alpha. The scale reached an alpha of .80 so the items were sum-scored to create a continuous outcome. Independent sample *t*-tests were used to examine the scale based on providing TI services for less than three months or more than three months. The results showed a significant difference in favorability for participants who provided TI services for more than three months (M = 22.19) compared to those who provided services for less than three months (M = 20.05), such that those who provided TI services for more than three months reported higher favorability ratings than those who provided services for less than three months (t = -3.17, p < .01).

In response to the question "How do you feel about providing TI services?" 28% (n = 34) and 47% (n = 58) of respondents reported feeling *very positive* or *mostly positive.* When stratified according to more than or less than three months' experience, 58% of 42 respondents with more than three months of TI experience (n = 24) reported feeling *very positive* and 38% (n = 16) reported feeling *mostly positive* about providing TI services. In contrast, just 12% of 81 respondents with less than three months of TI experience (n = 10) reported feeling *very positive* and 52% (n = 42) reported feeling *mostly positive* about providing TI services. See Figure 4 for all percentages.

Open-Ended Responses

Seventeen (12%) of 144 respondents provided an open-ended comment. Although the relatively small number of comments were not conducive to a meaningful content analysis, they were reflective of various nuances related to TI service delivery and more than half of the comments made an explicit reference to the Covid-19 pandemic and the unexpected shift to virtual services. For example, representative participant responses included:
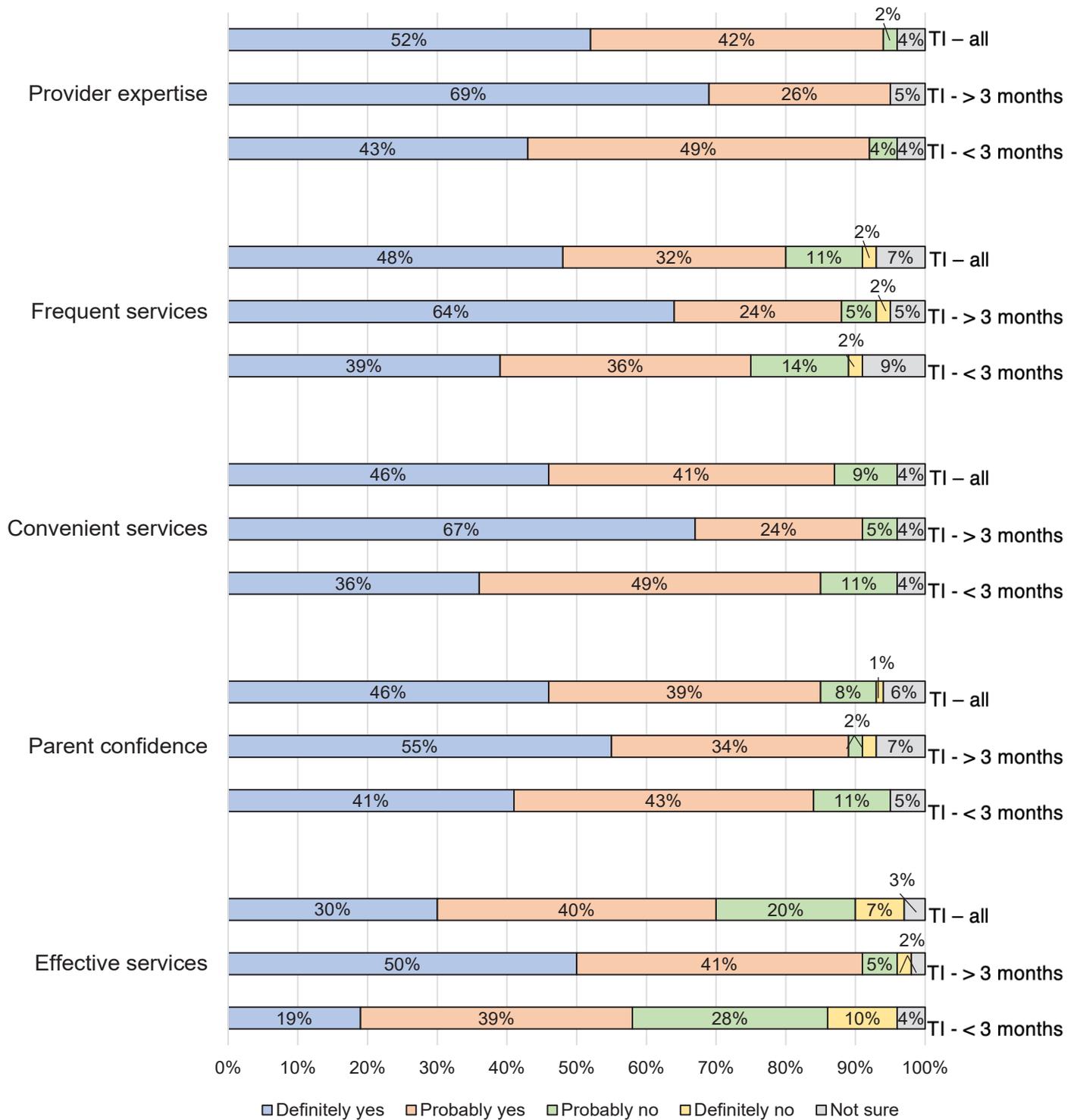
- *I definitely see the value in Tele-intervention. It's just been a challenge having been thrust into it. With proper preparation, materials, etc.,*

- *I think it would be great.I see a huge variety of skills in delivering telehealth among service providers. One family receives a much different service than another in bias, technical skills, and deaf ed supports.*

- *I have had success with tele-intervention but more success with in person services to families.*

- *I have been doing this since the COVID-19 pandemic, but after this I want to keep it part of my regular practice.*

- *Tele-intervention has been found to be very beneficial for most families in our state and now our Part C coordinator is advocating to continue.*

Discussion

Although the primary purpose of the present study was to explore parent and provider perceptions of TI services, the intersect of the Covid-19 pandemic and the survey release offered a unique opportunity to evaluate perceptions with an atypically large data set of TI providers for the DHH who had less than three months' experience as compared with perceptions of more experienced providers. Because the survey was developed and approved prior to the realization of the scope of the pandemic impact, the survey did not query if the provider was employed in an established TI program and trained in TI delivery or if the virtual services were unexpected and due to the pandemic response. However, with the data collection period occurring simultaneously with school closures due to the pandemic, March 2020 through May 2020, and the large number of respondents with less than three months of experience as compared with the number of respondents with more than three months of experience, it is reasonable to assume a large majority likely were unprepared for the virtual model. As educational professionals faced a sudden and unexpected need to provide virtual services, it became clear not all professional and parent experiences were the same. These potential disparities have prompted local and national inquiry to identify procedures and resources that could facilitate effective and equitable large-scale virtual or hybrid service delivery should the need continue or arise again in the future. As a survey study, it was not possible, nor consistent, with the study design to obtain narrative details of each participant's TI services. However, survey findings demonstrated providers with at least three

months' experience and/or who provided services within an established TI program, as opposed to inexperienced providers or those delivering unexpected TI services, made a difference to provider confidence and perception of the efficacy of TI. Providers seeking to begin or increase their TI services, but who feel ambivalence in the efficacy of the delivery model or unsure of their own expertise, may consider the overall positive study findings of participants with experience in the TI model. To facilitate confidence and

effectiveness, providers may also consider seeking advanced training to increase knowledge and skills in TI delivery. Study findings also highlighted a range of service delivery implications worthy of consideration for both TI and in-person providers of all experience levels. These service delivery implications included establishing the parent-professional partnership, using a parent coaching model, guiding goal-oriented services, supporting hearing technology, and facilitating positive session management strategies.

Figure 4

Provider Responses: "How Do You Feel About Providing Tele-Intervention (TI) Services?" All data (n = 123); TI > 3 Months (n = 42). TI < 3 months (n = 81)
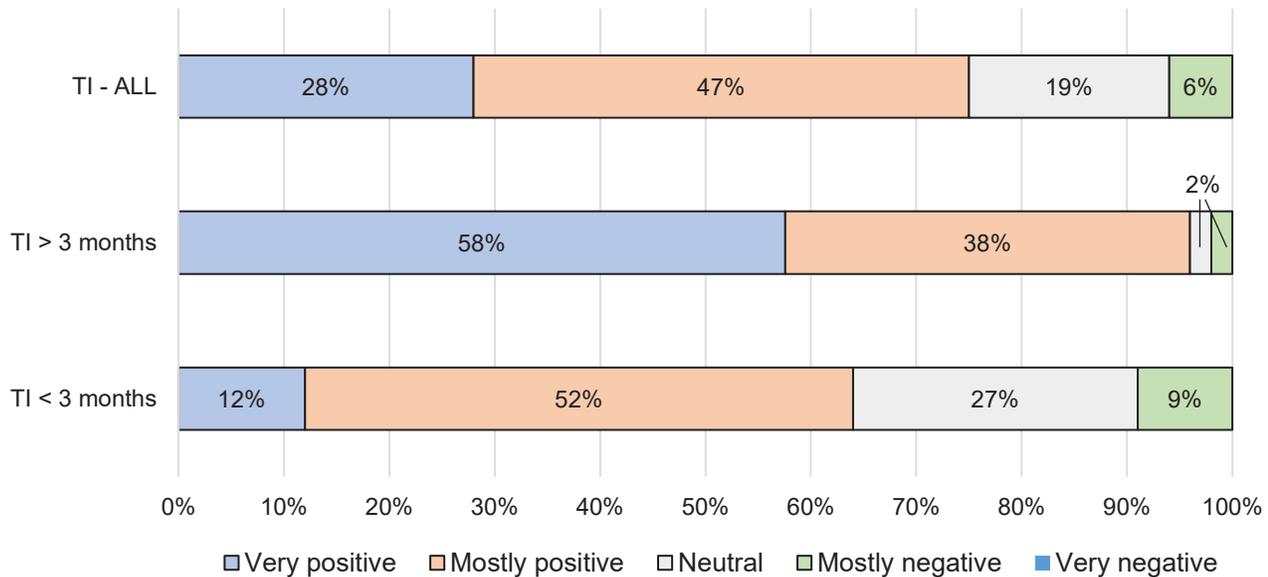
Parent-Professional Partnerships

As emphasized by multiple national organizations; such as Division for Early Childhood (DEC), JCIH, the Alexander Graham Bell Association, and the Early Childhood Technical Assistance Center (ECTA); an essential priority when serving young children who are DHH is establishing a strong connection and partnership with parents, caregivers, and families. This partnership must be founded on trust and respect, guided by the parents' priorities for their child (DesJardin, 2009; DEC, 2014; Moeller et al., 2013). Seventy-four percent of TI providers with more than three months of TI experience and 81% of in-person providers reported they felt *very confident* in the partnerships they had established with the families they served. This finding illustrates the parent partnership priority most providers feel as a foundational component of their services. With just 48% of TI providers with less than three months of TI experience reporting they felt *very confident* in the parent-professional relationship, these findings must be considered in the context of the difficult extraneous circumstances of the Covid-19 pandemic at the time of survey completion and the sudden transition to a virtual service delivery, not a reflection of professional priority nor a question of feasibility with a virtual model of service delivery.

The importance of providers developing a trusting relationship with families was recognized as a priority by the ECTA center, offering resources to all providers regardless of their level of experience. The ECTA center is funded by a cooperative agreement with the Department of Education's Office of Special Education Programs and provides technical assistance to state agencies to develop high quality early intervention and preschool special education systems. In partnership with The Center for IDEA Early Childhood Data Systems (DaSy), the ECTA center developed an interactive, four-part web broadcast series aimed at helping providers to develop trusting relationships with families (ECTA, 2017). In the broadcast series, the ECTA center emphasizes that the parent-professional partnership lays the foundation for achieving the long-term intended outcomes for the children they serve and provides evidence-based information and materials to support practices that develop parent-professional trust. In addition to the recorded series, written materials and resources are provided.

Parent Coaching

Consistent with parent-professional partnership priorities, an effective parent coaching model can provide support and guidance to parents in facilitating their child's language and communication goals across environments and within daily routines. Although TI is particularly conducive to a coaching model since the family and the provider are not in the same physical space, the recommendations of using parent coaching apply equally to both TI and in-person services. With 50–66% of parents reporting the provider *nearly always* coached the parents during an in-person or TI session (see parent survey findings within Nelson et al., 2022 in this monograph) and 52–58% of providers reporting they *nearly always* coached families, this meant more than a third to half of families did not *nearly always* receive parent coaching as a primary component of their services. Furthermore, the definition of what it means to provide or receive parent coaching in actual implementation may not be universally interpreted. Further research to explore detailed intervention methods and activities, how best practice parent coaching recommendations are applied, and documented child language and communication outcomes as a product of specific parent coaching strategies would provide substantial contributions to both TI and in-person service delivery practices.

Goal-Oriented Services

As reported by the ECTA center and the DEC Recommended Practices (2014), families must receive appropriate supports to understand their child's strengths, abilities, and needs to facilitate optimal child outcomes. As parents of children who are DHH assume their role as their child's most important teachers, most rely on the expertise of the provider to guide them in the scope and sequence of language acquisition. Parents may be wholly invested in promoting their child's language growth throughout the day and within all family activities, but cannot be optimally effective if they do not have clarity as to their child's goals, what they are trying to achieve, and why (Kahn et al., 2009; Nelson et al., 2020; Rush & Shelden, 2019). They must feel confident in how to create a learning environment for their child and then recognize when the child is or is not making expected progress. As shown in the Parent survey (Nelson et al., 2022), many parents lacked confidence across these essential service delivery areas. This may be a result of the finding that fewer than half of provider respondents felt *very confident* in guiding language development and in creating a learning environment. Advanced training and supports for providers could facilitate provider confidence and increase parents' knowledge and skills to support optimal child growth and language priorities.

Hearing Technology

It is common professional knowledge that consistent access to sound through the use of hearing technology is essential to the development of listening and spoken language (Walker et al., 2015). Many children who are developing and using sign language also use hearing technology. As the value of using hearing technology is emphasized to parents, it can provide an added layer of stress if parents are unsure about the day-to-day management of the technology. Provider support within scope of practice to assist parents in managing and troubleshooting their child's hearing technology (e.g., hearing aids, cochlear implants, assistive listening devices) can offer invaluable reassurance and guidance. Supporting families in hearing technology management is a professional development priority providers should consider as fewer than one third of TI and in-person providers reported they felt *very confident* in assisting parents this way. Providers can offer essential support to parents when they understand basic hearing technology function, how to troubleshoot various devices, or when unsure, the resources to find the needed information (Muñoz et al., 2017). Providers should be ready to guide parents in performing daily listening checks, visual inspections of their child's devices, and discussions regarding common device challenges. In a TI session, providers should feel confident in using a variety of virtual tools and resources (e.g., webcams, screen-sharing, simulation videos, online device manuals) to teach and assist parents in troubleshooting their child's hearing devices as issues occur. Although audiologists are central to the child's collaborative team, TI and in-person providers can facilitate ongoing guidance in technology use, including knowing when to consult with or refer parents to their child's audiologist.

Session Management

Parent coaching sessions with young children can be fun, challenging, humorous, and certainly unpredictable, and parents may benefit from productive and non-judgmental discussions regarding ways to support or manage their child's behavior during the sessions. Acknowledging that child behavior may be more challenging when in a virtual session, TI providers can prepare parents by sharing their expectations about a typical session and providing suggestions for managing common challenges. Although challenging behaviors can occur during TI or in-person services despite the best planning, facilitating sessions that involve activities within the families' typical routines can help maintain child engagement and can develop parents' knowledge and confidence in promoting their child's language goals throughout the day. For example, a provider may have planned to suggest using the child's favorite farm toys during the session. Yet upon arriving at the home or connecting virtually, they find the child prefers to stay outside and challenging behaviors are sure to ensue should the provider or parent insist on the child coming inside. Redirecting the session to include digging in the dirt or watering the flowers can minimize difficult behaviors and can model to parents the many activities in which their child's goals can be supported and emphasized. Consistent with a team approach, children who show extreme or alarming behaviors may benefit from an evaluation with a behavior specialist.

Study Limitations

The primary study focus was to explore perceptions of professionals who provide TI services, with responses from professionals who provided in-person services included for context. However, study findings would have been strengthened had there been more responses from professionals who provided in-person services, with greater symmetry in group sizes. Professionals who provided both TI and in-person services had the option of completing the survey twice. Due to survey anonymity, this resulted in the inability to identify the number of survey respondents who may have completed the survey twice and negated the ability to consider disaggregated findings from professionals with this unique view. Although the timing of the survey data collection period directly corresponded with the onset of the Covid-19 pandemic and the discontinuation of many in-person services, it was not possible to conclusively discern if or how the pandemic impacted participant responses. The homogeneity of responses, particularly as related to race and gender, are a potential limitation of the generalizability of results in describing professionals' experiences with TI or in-person services. These findings were consistent with previous and ongoing concerns raised by the U.S. Department of Education (2016) and the over-representation of Caucasian providers relative to the ethnicities and cultures of the children they serve. There are many complexities associated with family-centered services for children who

are DHH and their families and many issues and potential concerns were not addressed in the present study, thus highlighting the need to further explore professionals' experiences and recommendations for both TI and in-person services.

Conclusions

With 95% of respondents who had been providing TI services for more than three months feeling *very* or *mostly positive* about TI services, study findings revealed overall positive professional views of the TI delivery model. The timing of the survey release, and the direct correlation with school closures and the onset of sudden and unexpected virtual service delivery, highlighted many of the challenges professionals faced during this difficult period. Although it was not possible to discern the details and experiences of each study respondent relative to the impact of the pandemic, it was clear that professionals with experience in TI services had more favorable perceptions than those with less experience. Findings also highlighted areas where professionals could increase their knowledge and confidence to better support parents in both TI and in-person settings. For example, providers must be knowledgeable in guiding goal development and helping parents recognize how to promote and implement their child's goals within their family's daily routines. As providers gain skills and knowledge across domains of age-appropriate language developmental milestones, they can demonstrate effective strategies for parents, ensure parents have a strong understanding of their child's goals, and help parents recognize when strategies are working well or when a different approach may be needed. Providers who lack confidence in areas of TI service delivery may benefit from advanced training, which may, in turn, facilitate parents' skills and confidence in optimizing their child's language development. The results of this study are timely given the expanding role TI is playing in the field of Deaf education. Tele-intervention may be an increasingly preferred mode of delivery for families with young children and can serve as a powerful platform to ensure families receive appropriate and timely services from a provider with expertise in their child's first language. The long-term impact of the Covid-19 pandemic to future service delivery patterns is unknown. However, some level of continued TI delivery appears imminent as educational agencies identify options to meet future predictable and unpredictable scenarios. As new circumstances arise and new technologies and platforms emerge, it is important to understand the implications for parents and the range of supports they may require. Providers can have a profound impact on parents' knowledge, confidence, and skill as they promote family engagement and facilitate improved child outcomes.

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