## Clinical Focus

# The Role of Speech-Language Pathologists in Expanding Delivery of Teen Online Problem Solving for Adolescents With Acquired Brain Injury: A Quality Improvement Project

Jennifer P. Lundine,[a,b] iD Kerrie Lemons Chitwood,[c] and Shari L. Wade[d,e] iD

[a] Department of Speech and Hearing Science, The Ohio State University, Columbus [b] Division of Clinical Therapies and Inpatient Rehabilitation Program, Nationwide Children's Hospital, Columbus, OH [c] Department of Education and Leadership, California State University, Monterey Bay [d] College of Medicine, University of Cincinnati, OH [e] Division of Rehabilitation Medicine, Cincinnati Children's Hospital Medical Center, OH

A B S T R A C T

**Purpose:** Teen Online Problem Solving (TOPS) is an evidence-based teletherapy program designed to promote neurocognitive, behavioral, and psychosocial recovery following brain injury through family-centered training. To date, TOPS has been primarily administered by neuropsychologists and clinical psychologists. This clinical focus article discusses a quality improvement project to adapt the TOPS training and manual for use by speech-language pathologists (SLPs) and reports feedback from SLPs following TOPS training and after delivering the program with adolescents who experienced neurological insults.
**Method:** SLPs were invited to participate in TOPS training. Trainees were asked to complete posttraining surveys, active therapist questionnaires, and follow-up surveys directed to SLPs who had completed the intervention with at least one patient.
**Results:** To date, a total of 38 SLPs completed TOPS training, 13 have implemented TOPS with at least one adolescent. Eight SLPs and 16 psychologists/trainees responded to follow-up surveys to share their perspectives on the program. Perceptions of clinicians delivering the program did not differ significantly in most respects. SLPs rated the ease of understanding nonverbal communication higher than psychologists. Seven SLPs responded to an SLP-specific survey about their experiences administering TOPS, noting a range of advantages and some limitations in their open-ended responses.
**Conclusion:** Training SLPs to deliver TOPS has the potential to increase service provision to adolescents with acquired brain injury who have cognitive communication difficulties and their families.
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Adolescent acquired brain injury (ABI) presents persistent and pervasive challenges in cognition, behavior, communication, and social relationships (Asarnow et al., 2021; Keenan et al., 2018; Petranovich et al., 2020). ABI is a diagnostic category that includes any injury to the brain after a period of normal development, including both traumatic (e.g., bump or blow to the head) and nontraumatic (e.g., stroke, tumor, and oxygen deprivation) mechanisms. Youth who experience an ABI before adolescence may exhibit emerging difficulties as task demands increase revealing previously undetected consequences of the injury/illness (Catroppa et al., 2012; Petranovich et al., 2020; Winter et al., 2014). Years after injury, families express continued and unmet needs, with the highest rates of unmet needs reported for educational and speech pathology-related services (Fuentes et al., 2018). Consequently, there is considerable unmet need for effective and evidence-based interventions to address predominant

issues such as executive function challenges, common after ABI (Laatsch et al., 2020).

ABI affects the whole family and may result in elevated family burden, psychological distress, and family conflict (Micklewright et al., 2012; Schorr et al., 2020). Parents also express a high rate of need for information and emotional support (Keetley et al., 2019). Importantly, the home environment, family functioning, and parenting practices are strong determinants of child neurobehavioral outcomes (Chavez-Arana et al., 2018; Rashid et al., 2014; Wade et al., 2016), and caregiver training and involvement have been shown to have a positive impact on intervention outcomes for those with ABI (Wade et al., 2017, 2018). Because of the important role of family in long-term recovery from adolescent ABI, it is critical to create evidence-based interventions that incorporate families and support their needs following ABI.

In a recent systematic review for cognitive-focused rehabilitation in children with ABI (Laatsch et al., 2020), family-based, online problem-solving therapy was the only practice standard identified for the specific areas of emotional control, executive functioning, and family-focused interventions. Online therapy delivery offers key advantages for therapists, families, and clients. For example, online therapy may increase access for families who struggle to find services close to their home and address the persistent disruptions families experience to their quality of life and everyday function (Keetley et al., 2019).

Teen Online Problem Solving (TOPS), also known as Online Family Problem Solving and Counselor Assisted Problem Solving, is an evidence-based teletherapy program designed to promote neurocognitive, behavioral, and psychosocial recovery following brain injury through family-centered training in problem-solving, self-monitoring/self-regulation, and communication skills. The program, initially designed as an intervention following traumatic brain injury (TBI; Wade et al., 2006), has recently expanded its coverage to include adolescents with any type of ABI. Adolescents with ABI and their families complete 10 core modules and have an opportunity to complete additional supplemental learning modules and then meet with a therapist via videoconference to implement the skills and to address challenges facing the adolescent. The online learning modules present didactic information, videos of adolescents with ABI talking about how brain injury/diagnosis has affected their life, videos modeling skill implementation, and practice exercises to promote understanding and mastery. Using a problem-solving wizard, adolescents, parents, and the therapist work through a five-step (ABCDE) problem-solving process in which they identify the **A**im they want to address, **B**rainstorm potential solutions, **C**hoose the solution most likely to be both achievable and successful, develop a step-by-step plan to **D**o it, and finally **E**valuate their success in carrying out the plan and improving the situation. This interactive, five-step "online wizard" integrated into the website provides a common platform that is accessible to both the adolescent/family and the interventionists to track progress.

The TOPS program is supported by an extensive research base. Five randomized controlled trials and an individual participant data meta-analysis provide evidence of its efficacy in improving executive function and externalizing behaviors, social competence, and everyday functioning (e.g., Tlustos et al., 2016; Wade et al., 2015; Wade, Fisher, et al., 2019). Furthermore, recent systematic review and evidence-based guidelines identified TOPS as a practice standard for addressing executive functioning and behavioral challenges in adolescents with ABI (Laatsch et al., 2020).

The TOPS program is currently implemented by practitioners at 12 children's hospitals, two pediatric rehabilitation centers, and one adult rehabilitation center in the United States and Canada. However, implementation efforts have been hindered by a lack of professionals trained to address executive function and behavioral health challenges in the context of a neurological injury or illness. Pediatricians surveyed about their ability to provide appropriate care and long-term monitoring for children with mild TBI reported difficulties referring children to other appropriate providers (e.g., specifically pediatric trained neuropsychologists) due to lack of availability and long wait times (Keenan et al., 2017).

Speech-language pathologists (SLPs) may be an ideal professional to help fill this gap. According to the American Speech-Language-Hearing Association (ASHA), "speech-language pathologists...play a key role in the screening, assessment, and treatment of children and adolescents with TBI" (ASHA, n.d.). SLPs have specific training and education required to serve adolescents with ABI, including an understanding of the neurological bases of behavior, cognition, and language. SLPs understand how changes to cognition can impact communication and social functioning and are equipped to provide intervention in these areas. SLPs are trained in rehabilitation strategies to support individuals' cognitive-communication abilities across the life span. Furthermore, SLPs are trained to work collaboratively with caregivers and families, which is an essential component of delivering the TOPS intervention.

Additionally, for youth with ABI, in recognition of findings of unmet needs specific to areas within their scope of practice, SLPs trained to provide TOPS may provide expanded treatment opportunities for adolescents with executive function deficits resulting from an ABI.

SLPs may be more available and accessible in both educational and outpatient settings (ASHA, 2018) compared with school psychologists (Jimerson et al., 2009) and neuropsychologists who specialize in pediatrics (Baron et al., 2011).

The overarching objective of this clinical focus article is to summarize a clinical quality improvement project regarding the TOPS program. Our overarching programmatic objective was to determine whether the TOPS training and manual could successfully be adapted to support program use by SLPs. We examined feedback by active TOPS clinicians and SLPs specifically to evaluate this objective. This clinical focus article discusses the process of adapting the TOPS training and manual for use by SLPs and reports feedback from SLPs following the TOPS training and after delivering the program. We consider the clinical implications of expanding an evidence-based program such as TOPS for delivery by SLPs.

## Method

Data collected as part of this project represent quality improvement and was determined exempt from institutional review board review. In Summer 2020, we received additional funding from the Patient Centered Outcomes Research Institute (PCORI) to extend the delivery of TOPS to SLPs. Toward this end, we established a working group of one psychologist and three SLPs to examine the TOPS program, therapist manual, and training (described in greater detail below), and to identify any aspects that might be outside the SLP's scope and/or might require adaptation. The working group included professionals who each had at least 5 years of experience working with adolescents with ABI in their related fields. This process resulted in an updated manual making clearer linkages to common cognitive and social communication challenges following ABI throughout the manual and training.

### Participants

Implementation leaders at each site reached out to SLPs involved in rehabilitation and neuro-oncology to inform them about the training. Those interested were invited to participate in the training, free of charge, and received access to the TOPS program website, therapist manual, and TOPS training website prior to the training. We surveyed SLPs after completing TOPS training and again after they completed TOPS with at least one patient. Additional information regarding participant characteristics is reported below in relation to the survey results.

### TOPS Training

The TOPS training consisted of two 4-hr blocks of live presentation and interaction via videoconference. The first half-day of training provided didactic background information regarding the rationale and evidence base, introduction to the website platform and online program, and review of the modules on Staying Positive and Problem-Solving. The training leader demonstrated via role-play how to support the patient and family in developing a plan to address a teen or family-identified aim by working through the steps of problem solving (Aim, Brainstorm, Choose, Do it, Evaluate) with participant volunteers, using the problem-solving portion of the website. Participants were then broken into small groups to role-play the problem-solving process with coaching from the training leader. The second half-day of training covered specific module content, including training around self-monitoring/inhibition, emotion regulation, verbal and nonverbal communication, and problem solving in social situations. The training also reviewed the supplemental sessions and discussed when and for whom they might be appropriate. An hour-long panel discussion of therapists who are actively using TOPS provided attendees with an opportunity to ask questions and hear from experts about working with different types of families and troubleshooting challenges. Once SLPs had been trained and began delivering the program, an effort was made to include at least one as part of the active therapist panel.

The TOPS training website provides therapists-in-training and active therapists with additional resources to support program delivery. These included recordings of training content, an example of a complete TOPS session with an actual patient and their parent, and webinars around specific topics including considerations for SLPs delivering the program. Additionally, bimonthly calls provide an opportunity for therapists who are actively delivering the program to obtain feedback on questions or clinical challenges from the program developer and other active therapists. The call format allows participating therapists to share insights and pose dilemmas in an "all teach-all learn" format (Nembhard, 2012).

### Surveys

After delivering the program to one or more patients, clinicians (including psychologists, psychology trainees, social workers, and SLPs) were invited to complete the active therapist survey. These questionnaires were administered between July and December 2021. To better understand the unique experiences of SLPs delivering the program, we developed and administered an SLP follow-up survey beginning in March 2022 to SLPs who

delivered the TOPS program to least one teen (SLP follow-up survey). Links to electronic surveys were sent via e-mail, and clinicians were informed that their responses were voluntary and confidential (i.e., responses could not be linked to their name). The active therapist survey and SLP survey are included in Supplemental Materials S1 and S2, respectively.

## Active Therapist Questionnaire

Active therapists were asked to complete a survey about their experiences using the program and how it compared with other interventions/treatments they used prior to TOPS. This questionnaire was adapted from a previous questionnaire (Wade, Raj, et al., 2019) and included both Likert and open-ended questions. Items, rated on 5-point Likert scales, were grouped into therapist's experience, perceived patient/family experience, and adherence/technical challenges. Items pertaining to the therapist's experience establishing and maintaining rapport, understanding family dynamics, and reading nonverbal communication were rated from "very difficult" to "very easy." Items focusing on the adolescent's and family's engagement, understanding, and follow-through with homework were rated on a scale ranging from "very poor" to "very good." Finally, ratings on items pertaining to scheduling, disruptions, and technical difficulties ranged from "very uncommon" to "very common."

Open-ended questions asked about the greatest advantages and disadvantages of the program, qualities of families and those who might be less likely to benefit, and common challenges in program delivery as well as strategies to address those challenges. We reviewed and collated responses to questions to assess SLPs' perceptions of TOPS training and implementation.

## SLP Follow-Up Survey

SLPs who completed delivery of the TOPS program to one or more families were asked to complete an additional survey regarding their experiences delivering the program. Demographic questions pertaining to the SLP included level of training, years practicing, and years working with pediatric brain injury. Demographic questions pertaining to their caseload included patient diagnoses and delivery modality.

To gauge the SLPs' comfort in delivering TOPS, questions related to working with pediatric brain injury, involving families with the program, and using the program with patients. SLPs rated these questions from "not at all comfortable" to "extremely comfortable." Open-ended questions also asked how to improve the SLPs' comfort level with TOPS delivery for those that selected "a little" or "not at all comfortable." Other questions asked what additional training would be helpful for them, as well as what additional training they recommended for other SLPs before delivering the program. SLPs could choose from the following options: brain injuries, emotion regulation, behavior management, anger management, dealing with psychiatric crises, or other. Open-ended responses were prompted for those who selected "other." Additional open-ended questions asked about the benefits and challenges of SLPs providing intervention services for adolescents with brain injury using TOPS. Finally, the statements, "I will use TOPS again," and "After using the program, I feel more comfortable with the program scope and content," ranged from "strongly disagree" to "strongly agree."

## Analysis

Quantitative results from the posttraining, active therapist, and SLP follow-up survey were analyzed descriptively for purposes of this project. Responses to open-ended questions were collated, and a simple, conventional qualitative content analysis approach (Hsieh & Shannon, 2005) was used to find and summarize common themes across respondents. Responses were collected and collated by a program coordinator for this project, and the first and third authors then reviewed and sorted comments. These three individuals resolved any disagreements via consensus. To account for any potential bias, all quotes are reported and shared as stated by respondents.

# Results

## Active Therapist Questionnaire Results

A total of 38 SLPs completed the day-long training, and, as of this publication, 13 delivered the program as part of their clinical practice. Eight SLPs and 16 psychologists or psychology trainees completed surveys after delivering the TOPS program to at least one adolescent. As reported in Table 1, perceptions of SLPs and psychologists/trainees delivering the program did not differ in most respects. However, SLPs rated the ease of understanding nonverbal communication higher than psychologists (SLP $M = 4.5$, $SD = 0.53$ vs. psychologist $M = 3.56$, $SD = 0.92$) and there were trends for differences in ratings of ease of establishing rapport and family motivation (see Table 1). Specifically, SLPs' ratings of the ease of establishing rapport tended to be higher than those of psychologists/trainees, whereas psychologists'/trainees' ratings of family motivation were marginally higher than those of SLPs.

SLP respondents noted a range of advantages and some limitations in their open-ended responses (see Table 2). Advantages included the accessibility and practicality of the online format and learning modules and the program's

**Table 1.** Likert ratings[a] (mean, mode) of perceptions of ease of use, progress, and engagement by therapist specialization after completing Teen Online Problem Solving (TOPS) with at least one adolescent with brain injury.

| Question | SLP (*n* = 8)<br>*M* (mode) | Psychologist/trainee (*n* = 16)<br>*M* (mode) |
|---|---|---|
| Establishing rapport | 4.8 (5) | 4.2 (4) |
| Maintaining rapport | 4.3 (4) | 4.1 (4) |
| Reading nonverbal communication | 4.5 (3) | 3.6 (3) |
| Understanding family dynamics | 4.4 (4) | 3.8 (4) |
| Understanding the home environment | 3.9 (4) | 3.8 (4) |
| Family comprehension | 3.9 (4) | 3.9 (4) |
| Child engagement | 4.1 (3) | 3.6 (4) |
| Parent engagement | 3.4 (4) | 3.9 (4) |
| Therapist engagement | 4.6 (5) | 4.5 (4) |
| Weekly progress | 3.4 (4) | 3.7 (4) |
| Family motivation | 3.3 (4) | 4.0 (4) |

*Note.* SLP = speech-language pathologist.

[a]Likert rating scale: 1 = *very difficult/poor/uncommon*, 2 = *difficult/poor/uncommon*, 3 = *neutral*, 4 = *easy/good/common*, 5 = *very easy/good/common*, 6 = *not applicable/not enough experience to comment*.

relevance and correspondence with ongoing treatment objectives. However, SLPs noted that not all content was relevant for their patients or in the optimal order given a patient's specific concerns, and some content was not applicable to patients from different cultures or families with fewer resources. Relatedly, SLPs recommended additional examples/scenarios reflecting varying levels of functioning, as well as broader diversity of adolescent-related video examples. One noted that the website could be difficult for patients with language and reading challenges, and another noted that the program required critical thinking on the family's part and that made it difficult for them to follow through. Finally, one respondent found the online format challenging for establishing rapport.

SLPs reported that characteristics of those patients and families most likely to benefit from TOPS included those with good family dynamics including a positive parent–child relationship, the potential for increased adolescent self-awareness and metacognition, family awareness and acceptance of the child's changed abilities and challenges, and the time and resources to participate regularly. Therapists noted that working with families after some time had passed (months to a year) was preferable, as was having patients with few mental health concerns. Notably, one therapist indicated that "Anyone who has executive function issues including autism, ADHD, TBI, cancer, etc." could benefit from TOPS.

Characteristics of adolescents who SLPs believed may be less likely to benefit from TOPS contrasted those noted for who were most likely to benefit. Specifically, being too soon in recovery or unable to acknowledge that challenges may be long term, lack of parental time to support and scaffold the child's use of strategies, and low levels of self-awareness were noted as hindrances, as were

chaotic home lives, low literacy levels, and lack of follow through and investment. Getting the teen to buy in to the program/process was also seen as a potential challenge, although therapists noted that when teens were able to see their own progress, it served as a counter to this barrier.

SLPs generated suggested changes to the program including providing ongoing support around implementing the strategies that were trained after the program is complete; greater, up-front psychoeducation to parents about how the program will benefit their child; and some opportunities for in-person interactions. One therapist noted the value of delivering TOPS to established patients who already had an existing relationship with the SLP and therefore were more likely to trust that they could benefit from the program. Some SLPs noted existing parts of the program as beneficial including text or e-mail reminders and a written workbook for parents. Modifying the language used to fit the individual's reading level and individual circumstances was suggested to mitigate some barriers mentioned above.

### Responses to the SLP-Specific Questionnaire

Seven master's-level SLPs completed a survey specific to SLP experiences with the program after delivering the program to one (*n* = 3) or more than one (*n* = 4) patient. Five of seven respondents had 5 or more years of experience in the field, and six of seven had been working with pediatric brain injuries for more than a year. All respondents indicated that they would use the program again, and six of seven agreed or strongly agreed that they felt comfortable with the program scope and content after delivering it to a patient. With respect to the family-centered focus of TOPS, three respondents were somewhat comfortable and four were very (*n* = 3) or extremely (*n* = 1)

**Table 2.** Teen Online Problem Solving (TOPS)–trained speech-language pathologists' (SLPs) responses to open-ended survey prompts.

| Survey prompts | Responses |
|---|---|
| Advantages of TOPS | • Online format, telepractice, ability to provide via multidisciplines, seeing other families/teens who have struggled<br><br>• It's so practical. I appreciate that it can serve almost any patient in any situation. It fits very well with what I was already doing, just with more support, resources, and information!<br><br>• Ability to provide standardized, evidence-based care to families in their home<br><br>• Love the online format and the lessons. They are easy to follow.<br><br>• Providing the adolescent and family with information and tools they can learn to use on their own.<br><br>• Practicality/application of material relevancy, goal setting/accountability |
| Disadvantages of TOPS | • Lack of flexibility, lots of the content may be irrelevant or not in an order most optimal for treatment, difficult for those with language and reading challenges, not as individualized to tailor specifically to needs of patient as other forms of cognitive rehabilitation<br><br>• Information and/or format is *not always* applicable to various cultures or families with few resources<br><br>• It takes a lot of critical thinking on the family's part. Sometimes it takes a lot of work on my part to keep them on track because they're buried in frustration and poor follow through in the past. I feel like I'm constantly scaling it back from what they would like to see long term.<br><br>• Highly structured and not all material applies to every patient<br><br>• Rapport building with an online format, need for more varied examples with different levels of functioning and cultural diversity |
| Who is most likely to benefit from TOPS? | • Good family dynamics and relationship between child and family, family able to provide optimal support and be involved in order to work together, child has self-awareness of own deficits or at least be able to increase self-awareness, family has been able to reach a place of acceptance and readiness to view child's abilities and challenges as requiring compensation—not just "will get better," child/family have strong communication skills (underlying ability to comprehend content, not "talk to each other")<br><br>• Those with parents with time and resources to participate regularly Those are a few months post injury with good self-awareness Those with few mental health concerns<br><br>• Motivated. Self-interested. Somewhat self-aware of their strengths and weaknesses as individuals and as families.<br><br>• At least one-year post TBI and the most important pre-req is good metacognition<br><br>• Anyone who has executive function issues including autism, ADHD, TBI, cancer, etc.<br><br>• Families who are motivated and have the resources to participate.<br><br>• Those with solid family involvement those with good understanding of the child's impairments those with good self-awareness/insight |
| Who is less likely to benefit from TOPS? | • Too early in recovery and not able to process that deficits may be long lasting—may not emotionally be able to commit to process. Parents do not have time/readiness to provide the necessary scaffolding and prompts/cues to support the child's use of strategies (if needed). Child with little self-awareness and inflexible thinking<br><br>• Those who have chaotic homes lives, those with poor insight, those with parents who do not follow through with scheduling, who may not be fully invested, etc.<br><br>• Families who say their committed but aren't as demonstrated by lack of follow through at home or through general attendance.<br><br>• patients with reduced awareness and insight<br><br>• Families that have poor attendance, follow through, etc.<br><br>• Getting the teen to buy in to the program/process. Seeing progress helps with this.<br><br>• Low literacy level |

*(table continues)*

**Table 2.** (Continued).

| Survey prompts | Responses |
|---|---|
| What would make the program better? | • Family identified that they understood the basic model of problem solving- but felt a much greater need to be support in developing the actual strategies, well after TOPS was ended. They didn't feel they had the knowledge or resources to come up with their own strategies even though they knew the process. |
| | • I find full delivery of this program via Telehealth to be challenging. I think it's harder to establish rapport and to understand the full picture of what's going on in the family through the screen. |
| | • I think really educating the parents and helping them see how we are truly building skills from the bottom up (since their kids already struggle with executive function which is the foundation) is really important. I also feel like having established care and trusted rapport with the families I've enrolled so far, has helped them trust me and trust the program because I believe it's good for their kid. In a couple sessions they start to see it and it's just affirming! |
| | • Text reminders or auto-reminders to patients and families would be helpful |
| | • Parents have benefited from written parent guide |
| | • Modifying the language used to fit the individual's reading level and individual circumstances |

*Note.* TBI = traumatic brain injury; ADHD = attention-deficit/hyperactivity disorder.

comfortable with engaging families and the adolescent. Of note, all respondents indicated that they routinely involved families in their treatment of pediatric brain injuries. Most respondents (5/7, 71%) reported feeling somewhat comfortable delivering TOPS to adolescents with brain injuries, with two indicating greater levels of comfort.

SLPs expressed a need for additional information regarding emotion regulation ($n = 5$), behavior management ($n = 3$), anger management ($n = 3$), and psychiatric crises ($n = 3$). Importantly, almost all respondents (6/7, 86%) expressed a desire for more information on emotion regulation, behavior management, and anger management prior to completing the TOPS training.

Open-ended responses echoed the strengths and challenges identified by the active therapist survey, such as not only their comfort with the program but also reporting needs for additional education in specific areas. Strengths described by SLPs included an excellent system for setting goals and having accountability for achieving them that supports other problem-solving goals addressed in speech therapy. The TOPS program was seen as overlapping with and building on SLP's knowledge of cognitive communication and social pragmatics and use of compensatory strategies. Respondents noted the potential to increase access and offer a research-supported approach that can provide greater structure both within sessions and around home learning and practice. Identified challenges fell into two broad categories: lack of knowledge about psychological issues and family dynamics (noted by two respondents) and patient characteristics (noted by three respondents). The latter included family engagement and motivation, lack of self-awareness, and comorbidities or psychological issues that took precedence over cognitive communication concerns. Relatedly, one respondent noted

that content that was not relevant to the individual's concerns led to diminished engagement.

## Discussion

TOPS is an evidence-based, family-centered program designed to address executive functioning and communication challenges following ABI. Although TOPS has historically been implemented by professionals with a background in psychology, recently, the training was expanded to include SLPs as a quality improvement project, thereby potentially increasing patient access to the program. Initial reports from the first cadre of SLPs trained to deliver TOPS to adolescents with ABI and their families indicate that it is within their scope of practice. TOPS-trained SLPs who implemented the intervention expressed comfort in delivering the program, and they reported the online lessons are practical and easy to follow. The SLPs felt that they were able to build rapport well with their clients and families, but motivating and engaging families was more of a challenge.

The first SLPs to administer TOPS with adolescents who experienced ABI shared helpful insights that will be considered moving forward. Results from the SLP-specific survey indicated a desire for additional information, preferably prior to the TOPS training, around the management of emotion regulation, anger, and behavior problems. Although TOPS was seen within the scope of practice, additional education and training could promote greater overall comfort with the program. Linking SLPs to other service providers (e.g., psychologists and social workers) who could provide added support to families and adolescents with higher levels of emotional challenges is

important moving forward. Future TOPS trainings can incorporate a discussion of professional boundaries wherein professionals can brainstorm situations when it is appropriate to refer to a specific mental health professional and whether there might be adolescents who might be best served by one professional or a combination of clinicians. Given the dearth of mental health professionals with expertise in neurobehavioral challenges, this is likely to remain a challenge for SLPs wishing to deliver TOPS.

Additionally, SLPs reported the set path for implementation (session order) could be a challenge and suggested offering some variability to the sequence as not all content is relevant or needed for all clients. This issue has already been addressed by allowing therapists and patients to prioritize/front load sessions that are most germane to the adolescent's concerns, introducing the steps of problem solving. This flexibility should increase adolescent engagement and motivation. Additional suggestions that the implementation team will consider for future program enhancement and training included providing more diverse vignette/video examples that are relatable to a variety of clients. Table 3 summarizes these findings to detail characteristics of optimal patients, strategies to tailor TOPS to improve successful SLP-delivery, and situations that might warrant outside referrals.

There are several clinically impactful advantages of expanding the delivery of TOPS to SLPs. First, TOPS addresses the critical need to have more providers who can deliver evidence-based care to youth with cognitive-communication and executive function challenges arising from neurological conditions. Therefore, expanding TOPS availability and access through the inclusion of trained SLP providers builds capacity in the field that will enable us to increase the numbers of adolescents with chronic executive function deficits who receive evidence-based treatment. Expanded capacity might, in turn, ease the burden of unmet needs reported by adolescents and families following an ABI (Fuentes et al., 2018; Keenan et al., 2018). Practically, expanding access to the TOPS intervention means that individuals with ABI will have additional strategies and resources to assist with overall health and well-being, academics, relationships, and future employment. Expanding the availability of trained providers is necessary, however, to meet those needs.

A second clinical impact is that training SLPs to deliver TOPS via the online telehealth platform allows professionals to deliver a systematic virtual intervention to families in rural areas with limited rehabilitative services or those with other factors that make it difficult for them to access therapy services (e.g., transportation). This extension into areas that might lack experienced brain injury providers expands services to individuals who would otherwise go unserved and connects clients to providers with the experience to provide the necessary intervention. In general, there has been an increase in virtual therapies through the COVID-19 pandemic, yet ongoing challenges related to connectivity and interstate service provision must still be addressed at a systemic level (Campbell & Goldstein, 2022). Organizations and initiatives such as the Audiology and Speech-Language Pathology Interstate Compact (https://aslpcompact.com/) are working to begin to address issues such as these, but more work is needed.

SLPs receive foundational knowledge regarding TBI and counseling in their graduate training (ASHA, 2020); however, this alone may not be sufficient to meet the complex mental health needs associated with ABI and

**Table 3.** Integrating Teen Online Problem Solving (TOPS) into speech-language pathologist (SLP) practice: identifying appropriate patients and addressing challenges based on SLP provider experience.

| Characteristics for optimal SLP–TOPS delivery | Strategies to tailor TOPS to improve successful SLP–TOPS delivery | Seek outside referral |
|---|---|---|
| • Adolescents with acquired brain injury | • Adjusting case studies/vignettes to apply to specific client life experiences (e.g., cultural/linguistic diversity) | • Major psychiatric diagnoses |
| • At least one caregiver willing to engage in therapy | • Collaborate with psychology or other mental health professional when needed to support emotional and behavioral regulation | • Significant family dysfunction that impairs ability to participate |
| • Time program delivery to coincide with emerging awareness of deficits | • Use parent to support problem solving and implementation in adolescents with greater cognitive-communication deficits | • Inability to communicate/disorders of consciousness |
| | • Consider modifications to involve caregivers who cannot directly attend therapy sessions (e.g., 5-min touch-base/planning at end of session) | • Younger than 12 years of age |
| | • Collaborate with other key persons to maximize carryover of strategies (e.g., school personnel, community partners) | • Young adult living independently/no caregiver involvement |
| | • Combination of virtual and in-person sessions | |
| | • Include TOPS as an adjunct to other speech/language/cognitive goals in therapy | |

executive function deficits. Specifically, many SLPs have training in addressing executive function challenges but do not have the training and expertise to manage complex mental health needs. ABI can lead to a broad range and severity of potential mental health challenges such as anxiety and depression (Erickson et al., 2010; Narad et al., 2019). In order to meet the diverse needs of clients with ABI, an Interprofessional Collaborative Practice (IPCP) approach is often warranted (Hardin et al., 2021). The interprofessional approach allows for various professionals (e.g., psychologists, counselors, and SLPs) from different perspectives and backgrounds to collaborate and provide quality client and family-centered intervention. As a part of the collaborative model, practitioners need to understand their scope of practice and uphold their ethical obligation and not provide services out of their scope. Therefore, implementing a collaborative approach and knowing when to refer a client to another service provider is imperative.

There are several limitations that must be considered as this work moves forward. This initial exploration of SLPs implementing TOPS included a small number of respondents/trained SLPs; therefore, the input from therapists is limited. There is also a limited number of sites currently implementing TOPS. Continued outreach via professional networks and conferences seeks to introduce TOPS to more SLPs in hopes of expanding the reach of training and care provision.

## Conclusions and Future Directions

Training SLPs to deliver TOPS has the potential to increase service provision to adolescents with ABI who have executive function difficulties and their families. With the availability of appropriately trained SLPs, TOPS intervention will help to meet the unmet needs of young people with ABI to increase their independence and success to achieve their long-term educational, vocational, and social goals.

## Data Availability Statement

The data sets generated during and/or analyzed during this study are available from the corresponding author on reasonable request.

## Acknowledgments

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