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Return to Learn ECHO: Telementoring for School Personnel to Help Children Return to School and Learning After Mild Traumatic Brain Injury

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Abstract

BACKGROUND: Return to learn (RTL) after mild traumatic brain injury (mTBI) presents unique challenges for school professionals. A multidisciplinary team approach is necessary yet training school professionals is logistically difficult. This paper describes an innovative pilot RTL program and its evaluation.

METHODS: Utilizing the telehealth/telementoring program Project ECHO[®] (Extension for Community Healthcare Outcomes), this study utilized a multidisciplinary team of subject matter experts to deliver five 1-hour sessions across 5 cohorts of school-based professionals (total of 133

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Human Subjects Approval Statement

RTL ECHO was reviewed and granted Exempt status by the AAP Institutional Review Board on 11/20/2018.

participants). The evaluation used a mixed-methods approach of post-session and post-program participant surveys and post-program participant focus groups.

RESULTS: Participants who completed a post-program survey reported statistically significant improvements in essential aspects of RTL knowledge and self-efficacy. This included improvements in how to manage a student with an mTBI (44.8% to 86.9%), benefits of early return to school for students following mTBI (31.8% to 86.9%), and the importance of written RTL policies/procedures (55.1% to 97.1%).

CONCLUSIONS: This study demonstrates that RTL training via a telementoring approach may be a positive and effective way to train school-based professionals and improve knowledge and self-efficacy, especially when attending face-to-face trainings are difficult. This model has the potential to produce programmatic and systematic improvements for RTL education.

Keywords

return to learn; mild traumatic brain injury; project ECHO; telementoring; return to play

Many children who sustain a mild traumatic brain injury (mTBI) experience cognitive symptoms, including difficulty concentrating, following directions, or remembering, as a result of their injury.^{1,2} These symptoms, and the possibility that physical and mental exertion can aggravate symptoms,^{3,4} can consequently have an impact on a student's ability to learn and their performance in the classroom.⁵⁻⁷ Applying academic adjustments and accommodations for students who have sustained a mTBI, or concussion, has received significant attention over the last decade. Guidance from the American Academy of Pediatrics (AAP) and the Centers for Disease Control and Prevention (CDC) initially focused on appropriate return to play (RTP) and activity following an mTBI.^{8,9} However, in 2013, the AAP's Clinical Report on Returning to Learning following a Concussion highlighted the challenges that may exist in supporting students in the academic setting.¹⁰ This report offered recommendations for a multidisciplinary team concept that provides appropriate assistance to the student in the classroom while recovering from mTBI.

Teachers, school nurses, principals, and athletic trainers all report barriers to providing adequate support for students following mTBI.¹¹⁻¹⁴ These barriers include a lack of adequate training or mTBI knowledge, inadequate time to provide the recommended adjustments, lack of communication among members of the school RTL team as well as with health care providers, and lack of awareness of policies and protocols. In one survey, only 22.3% of teachers reported feeling very or extremely confident recognizing the signs and symptoms of mTBI, highlighting the fact that mTBI sometimes is thought of as an "invisible" injury.¹² A study of school principals highlighted only 34% had received specific training on managing students with a mTBI.¹³ Furthermore, another study found that following a mTBI, communication between athletic trainers and school nurses occurred "often" or "always" 65% of the time, while communication between athletic trainers and teachers occurred "often" or "always" only 49% of the time.¹⁴ School protocols for RTL are also lacking. Studies have reported a wide range in the percentage of schools (12-77%) who have an established protocol in place.^{11,14-16}

To support school personnel in improving their understanding of mTBI and to educate about RTL procedure and protocol development, the researchers developed and implemented a pilot Project ECHO® (Extension for Community Health care Outcomes) program focused on RTL following mTBI (RTL ECHO). Project ECHO is an evidence-based telehealth/telementoring program that brings together communities of learners (eg, primary care providers, school administrators, home health aides) in a virtual setting, often in rural and underserved areas, with multidisciplinary subject matter experts.¹⁷ Didactic presentations and case-based discussions between faculty and participants emphasized an “all teach, all learn” approach.

In 2019, a multidisciplinary faculty implemented RTL ECHO from January to March with 3 cohorts and October–December 2019 with 2 additional cohorts. The purpose of the pilot RTL ECHO evaluation was to explore school personnel’s satisfaction, awareness of national guidelines and trainings, knowledge and self-efficacy, peer support, communication and partnerships, outcomes, and suggestions for program improvement. This paper reports on the development of the program and the evaluation that was conducted with the participants.

METHODS

Participants

Recruitment efforts focused on school personnel from all 50 states and the District of Columbia and included public and private elementary, middle, and high schools with a preference for rural communities. ECHO staff shared promotional materials through school-based organizations and the AAP membership; those interested completed an online registration. Cohorts from 24 states participated in the pilot ECHO program (Table 1).

Most enrollees were school nurses/nurse professionals (57%), with the remainder identifying as other school health/health professionals (eg, school psychologists, health aides) (18%), athletic department professionals (10%), teachers/education professionals(4%), administrative professionals (4%), and other (7%).

Instrumentation

The RTL ECHO pilot evaluation incorporated a mixed methods approach, utilizing an attendance tracking database, participant surveys after each ECHO session, a post-program participant survey, and post-program participant focus groups. The post-session surveys were focused on satisfaction with the session and whether the session met objectives and inspired plans for change. The post-program surveys were longer questionnaires to gather participant demographics as well as self-reported, retrospective pre-post changes in knowledge (eg, of the typical TBI recovery process, how to provide appropriate TBI-related monitoring in the educational setting), and self-efficacy (eg, “I am able to communicate with students and families regarding return to school/RTL”). The focus group guide asked participants to reflect on their overall ECHO experience (eg, “In general, how relevant—or not—are the lectures to the issues of greatest interest or challenge regarding children/youth with TBI in your school/district setting?”), how participants used the information learned in the ECHO (eg, “In what ways do you use what you learned from this ECHO clinic with your

students and/or their families?”), and suggestions for improving the curriculum (eg, “What would you change, modify, or add to improve the RTL ECHO clinics?”).

Procedure

AAP convened a group of pediatric mTBI experts and school health experts, including a sports medicine physician, a school/clinical psychologist, a school nurse, and an expert in school-based healthcare to facilitate telehealth educational sessions for school personnel. To ensure fidelity to the ECHO model, RTL ECHO faculty completed an on-site, 2-day training at AAP headquarters focused on Project ECHO implementation. The experts collaborated to develop a curriculum that consisted of 5 presentations, RTL published literature, RTL documents, and a case study template. The experts also served as faculty to the learning sessions. The 5 cohort sessions, with teams of 13 to 18 schools per session, were assembled to learn about state concussion laws; recognition of mTBI signs and symptoms; the TBI recovery process; and best practices to return children to school, learning, and play.

Guided by the ECHO model, faculty presented a 15-minute educational lecture followed by 45 minutes of interactive and participant-driven case study discussion during each 1-hour virtual session (Table 2). Cohorts 1 through 3 were conducted between January and March of 2019. Cohorts 4 and 5 were completed between October and December of 2019.

The RTL ECHO pilot evaluation was designed to examine the questions of satisfaction, peer support, knowledge of national guidelines and trainings, knowledge and self-efficacy, home-school-medical setting partnerships, and suggestions for RTL ECHO program improvement (Table 3).

Data Analysis

Descriptive statistics summarizing cohort post-session and post-program survey data were analyzed using SPSS (Version 22).¹⁹ Shapiro-Wilk test results indicated non-normal data distribution ($p < .001$) thus tests of statistical significance are based on the nonparametric Wilcoxon Signed Rank test. Transcripts developed from focus group proceedings were reviewed for key content and themes by the program evaluator and corroborated by program staff and faculty observations based on their participation in each cohort. For reporting, data are combined across the 5 cohorts.³

RESULTS

Satisfaction

Across the 5 cohorts, a total of 133 respondents completed 1 or more of the 5 post-session participant surveys for a total of 228 completed surveys. Thirty-eight respondents participated in a focus group. Based on results of the post-program survey, 90% of participants reported they agreed or strongly agreed that they were satisfied with the training overall, that the content of RTL ECHO was relevant to their student/patient population, and the RTL ECHO was a valuable use of their time. Additionally, >75% of participants reported that the ECHO made them better at their job and that participating in RTL ECHO increased their professional satisfaction (Table 4).

In post-session focus groups, participants spoke to the value of the didactic and case study components of the RTL ECHO and the ECHO model, overall.

One participant stated: “I experienced a lot of similar cases and I think the cases really made the lectures come alive. At least for me, I think that was their value to really show how, in individual cases, you apply the information that you just learned. The lectures are fine ... but how you apply them is really the important part.”

Peer Support

Over 92% of participants responding to the post-program survey agreed or strongly agreed that RTL ECHO participation contributed to their professional network and 57.9% agreed/strongly agreed that RTL ECHO participation lessened feelings of isolation. Further, 64.6% affirmed that their school district has (or is developing) a network of peer connections both locally and in other states to support work with students who have experienced a mTBI after RTL ECHO participation compared to 34.8% pre-ECHO (data not shown).³

One participant stated: “I feel like I have more resources, like I certainly could look people up and ask specific questions. For me this has provided a lot of resources, whether those are actual websites or content or actual people to reach out. I reached out to (participant name) about the RTL policy they have, and she e-mailed me about it so I could use it as a template in our district. Six weeks ago, I would not have known where to start. At least now, I know there are other people out there in the same boat as me, who I can run ideas off of or ask what they are doing or ask them for their resources and get that information.”

Perceived Knowledge of National Guidelines and Trainings

Post-program survey findings based on participants’ retrospective self-report of pre-/post-knowledge change indicate that RTL ECHO improved participants’ perceived knowledge regarding AAP and CDC national guidelines and training resources. For example, while 28.9% and 52.1% reported that they were knowledgeable/very knowledgeable about AAP concussion-related guidance and CDC mTBI-related guidance, respectively, before the program, these percentages improved to 85.5% and 88.4% after the program (Table 5). Further, informed by their ECHO experience, focus group attendees reported that they recognized opportunities to improve RTL-related procedures and policies in their schools/districts and reported taking initial steps to address gaps and deficits.

One participant stated: “I have for several years been saying I am going to write an RTL procedure but then I would kind of get stuck because when I would look up and try to find out ‘What is the evidence-based practices regarding this? What is the new information coming out?’—every time I tried to sit down and think about how I’m going to go about this there was some new bit of information or I was not quite sure, is this really the most recent or really what should I be using as my references ... Participating with a group—with people who are experts who presented very well-outlined information and gave us lots of resources—I really feel confident now that I can put a procedure together.”

Another participant stated: “... our school system does great with RTP but I don’t know that we’ve really delved into the RTL and really have a good grasp of the best way to do that.

This program has really helped me to figure out even where to start those discussions and start to get that implementation in place to try to help these students.”

Perceived Knowledge and Self-Efficacy

Perceived knowledge of key aspects of TBI-related care, management, and RTL processes increased in all areas from pre- to post-RTL ECHO, based on participants’ retrospective pre/post self-reports. Identifying common signs and symptoms of mTBI increased from 84.1% to 100.0%, appropriate mTBI-related management in the educational setting increased from 44.8% to 86.9%, benefits of early return for students who have experienced mTBI increased from 31.8% to 86.9%, and importance of written policies and procedures increased from 55.1% to 97.1%. All self-efficacy scores increased from 60.8 to 72.5% pre-ECHO to 89.8 to 98.6% post-ECHO. Exemplar quotes from focus group participants also illustrated perceived improvements in perceived knowledge and self-efficacy.

One participant stated: “Just last week I had a student similar to the last case presented, where a student came in with a doctor’s note but no explanation as to why the child needed to be out of PE, but very quickly could determine it was because of a concussion and it didn’t say when it happened. In doing the follow-up and having done the [ECHO] class, I just felt much more confident in creating a plan with the parent and the communication that I sent and was able to give to the teachers.” Another participant stated: “I was not feeling very confident when I first started experiencing all these kids with concussions. It was like, ‘Oh my gosh, what do I do here?’ ... and kind of sitting back and just waiting for information rather than actively seeking the information and getting the information with my new confidence in what I’ve learned through the program.”

Home-School-Medical Setting Partnerships

Participant retrospective pre/post self-assessments on the post-program survey indicate that RTL ECHO training resulted in a significant increase in developing a process to facilitate communication (from 55.1% to 69.7%) and strengthened partnerships between the home, school, and medical settings (from 68.1% to 84.6%).

One participant stated: “... communications that I have with the students when they come in after newly being diagnosed with a concussion and talking with them about what we can do for them as far as academics and what they can expect from the school, from the health office, from their teachers, just sharing that with them as well as sharing information with the teachers on what they can expect from this student and what they can look for ... it’s a circle that goes to the parents as well, as far as their expectations of their student, of the school. ECHO was useful in all of those areas.”

Outcomes

Post-program survey reports indicate 95.7% of respondents anticipate making changes in best practice guidelines, professional practice, or policy/procedure as a results of RTL ECHO participation. Focus group members described numerous ways in which they had already begun or planned to utilize ECHO learnings in their school/district settings.

Recurring themes included policy development/revision and sharing RTL ECHO-related knowledge and resources with other school personnel and families.

One participant stated: “A couple lectures had some documents and a symptom scale I used to update my current RTL practice. I was able to implement it that day when I needed it. It was really helpful. This is also the time of year where I am getting ready for the next school year with my forms and documentation so I was able to use what I learned from those sessions and what our lectures were telling us.”

Another participant stated: “I actually got to use it right after we were done. We had an elementary student who did not return with any instructions regarding a concussion. Mom was planning to keep her home for a whole month and we were able to tell her that, ‘No, that’s not a good return to school policy.’ We were able to share with her what we had just learned and within a week we had the child back in school. So, I felt pretty good to make that kind of a turnaround just from this program.”

Suggestions for RTL ECHO Program Improvement

Participant-suggested improvements for future RTL ECHOs included greater support and next step guidance for translating knowledge into actionable procedures/policies, increased focus on stakeholder engagement, and the addition of formal touchpoints after the initial ECHO program concludes to foster accountability and address unanticipated challenges. Participants also spoke to the value of engaging additional members of the school/district team in future RTL ECHOs to facilitate collaboration required for policy implementation and system-level changes. Focus group members suggested future iterations of RTL ECHO could identify additional strategies to support school-based professionals in navigating the sometimes contradictory guidance received from community-based physicians. Several also requested AAP heighten efforts to increase awareness of AAP recommendations regarding concussion management for all health care clinicians who see children and youth.

One participant stated: “I think it would have been fantastic to actually have a discussion about how to create an RTL policy because we received a lot of instruction about a lot of different things but it’s the actual writing of the policy ... I would have liked to see a session that talked about how to write a policy and then how to implement the policy.”

Another participant stated: “I would love it if we had the opportunity to convene again in the future ... if we could have successive opportunities to work on things like policy development and teacher training.”

DISCUSSION

Evaluation of the pilot RTL ECHO highlights the potential positive impacts and outcomes for both individual participants and the systems in which they work to care for and educate children/youth with mTBI. Participants reported high satisfaction with RTL ECHO sessions and demonstrated self-perceived gains in knowledge and self-efficacy in the implementation of best-practice, guideline-informed care and support for young people experiencing mTBI and their families. Reports of increased self-efficacy reflect confidence in knowing where to

find and access mTBI resources for RTL and protracted mTBI symptoms and empowerment to communicate with students/families. The RTL ECHO also holds the potential for school-level policy that could have a long-term impact on care, support, and management of children/adolescents experiencing mTBI, as well as increasing communication and collaboration with families, within schools and with health care providers outside of the school.

An important component of the ECHO model is the development of a community of practice to support health care professionals—particularly those in medically underserved and under-resourced areas. Mild TBI, not unlike other medical conditions, requires coordinated communication and collaboration. Our findings suggest that school personnel may still need additional guidance and assistance with some logistical and communication issues. Approximately half of participants indicated they were not using the CDC and AAP mTBI guidelines in their work and a substantial proportion had not identified a point person for communicating with health care providers of students who had sustained a mTBI. Use of RTL ECHO could promote awareness and implementation of CDC and AAP mTBI guidelines.

Improvements in self-perceived awareness, knowledge, confidence, and independence are essential in establishing a school's multidisciplinary team approach to RTL. However, how a participant intends to utilize the new information to make systemic change to a larger system is one of the most important indicators of a program's impact. Many participants were able to identify concrete ways in which they were already or were planning to use the information learned in their schools' policies to better serve students who have sustained a mTBI. Given the brief length of each RTL ECHO cohort, follow-up with participants in 6–9 months was recommended by the CDC and AAP to assess progress toward implementation of planned changes in policy and trainings as well as barriers encountered to inform the next RTL ECHO. Future RTL ECHOs may be even more impactful by recruiting school and/or district-level teams comprised of school health (nursing and mental health), athletics, classroom, and administrative roles and ideally, community health care providers. Future ECHOs may also consider adding several “booster sessions” at regular intervals after the primary program concludes to allow intensive focus on implementation next steps and address challenges that participants face once back in their home settings.

Limitations

A limitation of the brief curriculum period is the inability to assess, beyond the short-term, to what degree knowledge translated into action and whether changes in procedures/policies occurred at a level commensurate with intent. As mentioned, future ECHOs may wish to follow up with participants 6–12 months post-program to gather information on longer-term outcomes and accomplishments as well as emergent barriers. Related, most of the measures captured in the survey and focus groups were self-reported. For example, we examined self-reported improvement in knowledge and self-efficacy. Future studies may consider including a more robust evaluation that includes a quantitative knowledge assessment pre- and post-RTL ECHO implementation and also an assessment on the improvement in student outcomes after the program. The generalizability of RTL ECHO evaluation findings is

limited due to several factors including the lack of a comparison or control group, a lack of standardized tools with established reliability and validity to assess changes in participant knowledge, and the relatively small proportion of participants who completed the post-session questionnaires and post-program survey and took part in the focus groups. In addition, the pilot lacks student/patient/family-report data to corroborate improvements, examine student health and educational outcomes, and was not able to address change in school policy over time.

Conclusions

The positive evaluation findings of the pilot RTL ECHO suggest that telementoring maybe successfully applied to RTL for school professionals. The RTL ECHO can help foster actionable momentum and change toward codified RTL procedures and policies for students returning to school after a concussion. Additionally, there are multiple benefits of virtual versus in-person training. Limiting barriers (such as time off work, travel time, and cost) are important benefits, while virtual training also offers opportunities to develop a wide-spread network of colleagues and easy access to experts.

IMPLICATIONS FOR SCHOOL HEALTH

The ECHO model is replicable and scalable. The model has been adapted globally to address over 100 different complex health topics by over 400 ECHO replicating partners in over 40 countries. Because it is a simple, flexible model, it may be adjusted to meet local needs and has been diffused throughout the United States and the world. High ratings of satisfaction for participation in the RTL ECHO training reinforce the evidence-based, telementoring structure of the model as a format capable of disseminating complex cross-disciplinary information that increases knowledge, skill, and confidence in a satisfying manner. Trainings for school staff that are easy to access and limit time away from duties in the classroom/clinic/school could be a cost-effective strategy to effectuate downstream support for thousands of students as they return to learn post-TBI.

Due to training via telementoring versus in-person participation, school personnel are also able to build networks with colleagues from across the country (potentially from across the world) to increase their learning. The implication for school health is that the RTL ECHO project helped school personnel build independence and connectivity with like-minded colleagues around the country. This is especially important with the emergence of a new protocol such as RTL where guidelines and best practices are quickly changing and evolving.

The application of enhanced knowledge and confidence toward revision or development of school RLT-related policies, procedures, and practice changes perhaps has the greatest implication for school health. The results of the RTL ECHO Project highlight an emerging evidence-based format for robust, satisfying, and effective knowledge and self-efficacy acquisition. Additionally, it shows promise that knowledge and self-efficacy gained through this format has the potential to lead to widespread programmatic and systemic changes in schools regarding RTL following TBI.

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Table 1.

Description of the AAP Return to Learn ECHO Cohorts

Cohort	Sites	Attendees	States
1	16	22	13 (TX, CO, WI, NE, SC, MN, FL, NJ, VA, PA, IL, NC, CA)
2	12	19	13 (CO, PA, OH, WA, WI, GA, IA, VA, TX, CA, NC, KS, IL)
3	16	24	1 (IN only)
4	13	32	7 (AR, CA, CO, DE, IN, WA, WI)
5	18	36	12 (ME, IN, CO, OR, CA, IL, MD, PA, MO, AK, MA, WA)

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Table 2.

Curriculum Covered in ECHO Sessions

Session Title	Session Description
mTBI: signs and symptoms	Overview of a mild traumatic brain injury (mTBI), also known as a concussion, and the recovery process.
Return to learn for school: an overview	The various stages of return to school following a concussion (ie, return to school, return to learn, return to play, and return to athletics) and the role each for each member of the concussion team. Pros and Cons of RTL Legislation.
Return to school	The difference between return to school (physically returning the child to the classroom) and return to learning (educators helping students with a concussion maximize learning while minimizing flare ups). Identification of audience for Return to School.
Return to learn	Common effects of concussion and how this can impact a student in the classroom setting were covered. Tips for academic adjustments were provided. Utilization of existing educational frameworks for students who struggle at school. Identification of audience for Return to Learn.
Return to play and protracted recovery	The return to play progression for both physical activity and sports were covered. Faculty also provided guidance on prolonged recovery.

Table 3.

RTL ECHO Pilot Evaluation Outcome Questions

1.	Were participants satisfied with the RTL ECHO experience? (Satisfaction)
2.	Did RTL ECHO increase perceptions of peer support and connectivity with other school personnel around mTBI diagnosis and RTL and RTP? (Peer Support)
3.	Did RTL ECHO participation promote awareness and potential future use of CDC ¹⁸ and AAP guidelines and training specific to best practice mTBI diagnosis and management? (Knowledge of National Guidelines and Trainings)
4.	In what ways did the RTL ECHO contribute to participants' knowledge and self-efficacy around the care and management of mTBI and the RTL process? (Knowledge and Self-Efficacy)
5.	Did RTL ECHO contribute to mechanisms for increased communication and partnerships related to student mTBI management between the home, school, and medical setting? (Home-School-Medical Setting Partnerships)
6.	What short-term outcomes resulted from RTL ECHO participation? (Outcomes)
7.	What suggestions did program participants have for improving the RTL ECHO? (Suggestions for RTL ECHO Program Improvement)

Table 4. Participant Post-Program Ratings of Satisfaction With Return to Learn (RTL) ECHO

	% Agree/Strongly Agree	% Neutral	% Disagree/Strongly Disagree
Satisfaction			
I was satisfied with this training overall.	97.1	1.5	1.5
The content of RTL ECHO was relevant to my student/patient population.	92.8	2.9	4.3
RTL ECHO was a valuable use of my time.	91.3	4.3	4.3
Participating in RTL ECHO makes me better at my job.	88.4	7.2	4.3
Participating in RTL ECHO increased my professional satisfaction.	78.3	20.3	1.4
Peer support			
Participating in RTL ECHO contributed to my professional network	92.8	2.9	4.3
Participating in RTL ECHO lessened feelings of isolation	57.9	34.8	7.2

Percentages may not add to 100% due to rounding.

Table 5.

Participant Retrospective Knowledge of National Guidelines and Trainings and Self-Reported Knowledge and Self-Efficacy in Caring for Youth With Mild Traumatic Brain Injury and Managing the Return to Learn (RTL) Process, pre-and post-RTL ECHO, n = 61 (8 Cases From the Original n = 69 Were Excluded Due to Missing Data)

	Pre-ECHO (% Knowledgeable or Very Knowledgeable)	Post-ECHO (% Knowledgeable or Very Knowledgeable)*
Knowledge of national guidelines and trainings		
AAP concussion-related guidance	28.9	85.5
CDC mTBI-related guidance	52.1	88.4
Knowledge of mTBI		
Common signs and symptoms of mTBI	84.1	100.0
Symptom checklists for recognizing a student with mTBI	65.2	95.7
Provision of appropriate mTBI-related monitoring in the educational setting	50.7	94.2
Provision of appropriate mTBI-related management in the educational setting	44.8	86.9
The typical mTBI recovery process	50.7	95.7
The benefits of early return for students who have experienced an mTBI	31.8	86.9
The importance of written policies and procedures regarding RTL	55.1	97.1
The required return to play (RTP) progression and criteria	55.1	87.0
Self-efficacy	Pre-ECHO (% Agree/Strongly Agree)	Post-ECHO (% Agree/Strongly Agree)
I know where to find information and resources regarding mTBI and RTL	72.5	98.6
I understand when to access additional supports for protracted mTBI recovery	60.8	95.7
I am able to communicate with students and families regarding return to school/RTL	63.7	98.6
I am able to communicate with students and families regarding RTP/sports	68.1	89.8

* All pre-post differences are significant (<.001) based on Wilcoxon Signed Rank test (2-tailed).