



Multi-Tiered Culturally Responsive Behavior Support: A Qualitative Study of Trauma-Informed Education in an Australian Primary School

Dayna Schimke¹, Govind Krishnamoorthy^{1*}, Kay Ayre², Emily Berger³ and Bronwyn Rees⁴

¹ School of Counselling and Psychology, University of Southern Queensland, Ipswich, QLD, Australia, ² School of Education, Edith Cowan University, Perth, WA, Australia, ³ Faculty of Education, Monash University, Melbourne, VIC, Australia, ⁴ Young Minds Psychology, Ipswich, QLD, Australia

OPEN ACCESS

Edited by:

Helen Elizabeth Stokes,
The University of Melbourne, Australia

Reviewed by:

Judith Howard,
Queensland University of Technology,
Australia
Lyra L'Estrange,
Queensland University of Technology,
Australia

*Correspondence:

Govind Krishnamoorthy
Govind.Krishnamoorthy@usq.edu.au

Specialty section:

This article was submitted to
Educational Psychology,
a section of the journal
Frontiers in Education

Received: 31 January 2022

Accepted: 29 April 2022

Published: 03 June 2022

Citation:

Schimke D, Krishnamoorthy G,
Ayre K, Berger E and Rees B (2022)
Multi-Tiered Culturally Responsive
Behavior Support: A Qualitative Study
of Trauma-Informed Education in an
Australian Primary School.
Front. Educ. 7:866266.
doi: 10.3389/feduc.2022.866266

There is growing awareness of the impact of intergenerational trauma and community disadvantage on the educational achievement of Aboriginal and Torres Strait Islander (First Nations) children in Australia. Scholars have identified the need for culturally responsive and trauma-informed approaches to complement existing disciplinary and behavior support practices utilized in schools. This pilot research project explored the experiences of primary school teachers who were supported to implement trauma-informed practices in a regional primary school with a large number of First Nations students. Qualitative interviews with eight teachers were conducted after a 3-year (2017–2020) implementation of the Trauma-Informed Behavior Support (TIBS) program. Using a thematic analysis approach, the study identified the following themes: changes in teacher knowledge about the impact of intergenerational trauma, acknowledgment of the multi-systemic influences on student behavior difficulties, increased self-efficacy in providing culturally safe learning environments and strategies for building relationships with First Nations students. The findings offer insights into factors that support the successful and sustainable implementation of culturally responsive and trauma-informed practices in primary school settings.

Keywords: adverse childhood experience (ACE), culturally responsive and trauma-informed practice, primary school, multi-tiered system of supports (MTSS), trauma informed care (TIC)

INTRODUCTION

School attendance and levels of literacy and numeracy of Aboriginal and Torres Strait Islander children in Australia (hereafter referred to as First Nations Peoples) fall behind those of non-Indigenous students (Commonwealth of Australia, 2020). These inequalities in educational outcomes can be attributed to a complex interaction between historical, social, and environmental factors. First Nations Peoples have endured genocide and the forced removal of children from their families for over 60 years (referred to as the “Stolen Generations”). This historical maltreatment

and intergenerational trauma related to colonization, continues to impact the lives and experiences of First Nations Peoples, with ongoing injustices, institutional discrimination, and racism. First Nations children experience Adverse Childhood Experiences (ACE) at a higher rate than the general population (AIHW, 2020). The “cumulative harm” of the impact of ACEs is complex, can persist for several decades (Thoma et al., 2020) and can be transmitted inter-generationally (Atkinson et al., 2014). First Nations children are more likely than non-Indigenous children to be the subject of child protection concerns (48 per 1000 First Nations children compared to 7.2 per 1000 non-Indigenous children) (AIHW, 2020). Theories regarding the mechanisms of how such early adversity impacts school functioning identify the role of intergenerational disadvantage and developmental trauma on children (Menzies, 2008).

Studies examining the impact of ACEs on educational outcomes report that children who experience adversity have lower academic achievement, greater special education needs, and higher non-completion rates compared to children who do not experience adversity (Perfect et al., 2016). Given the pervasive and chronic nature of the impact of ACEs in childhood, schools can be an important part of a multi-systemic, wraparound treatment approach. Drawing on ecological system theories (Bronfenbrenner, 1992; Cicchetti and Valentino, 2015), wraparound support refers to a community-based approach to providing comprehensive, integrated services through multiple professionals and agencies and in collaboration with families (Fallon and Mueller, 2017; Chafouleas and Iovino, 2021). Chafouleas et al. (2021) highlight two important challenges in the implementation of such practices in school settings. Firstly, they point to the need for systemic, multi-tiered implementation of trauma-informed care (TIC) practices in schools, and a greater understanding of factors impacting the successful implementation of these practices in schools. They also comment that current TIC practices are at risk of not sufficiently acknowledging systemic, cultural, and intergenerational factors that may influence the implementation of trauma-informed educational practices (Chafouleas et al., 2021).

Contextualizing Trauma-Informed Care in Schools: Incorporating Culturally Responsive Practices

The recognition of the disproportionate exposure of ACEs among First Nations and minority students has led researchers to turn their attention to the use of practices that attempt to account for the historical, cultural, and community-based influences on the students' lives and development. Gay (2010) defines culturally responsive practices in education as those that utilize cultural knowledge, information about historical and intergenerational trauma, and frames of reference to make learning inclusive and relevant for all students. Approaches to culturally responsive practice with Australian First Nations students include consideration of specific cultural protocols that influence how Aboriginal and Torres Strait Islander Peoples think of social and emotional wellbeing. For example, Miller and Berger (2020, p. 44) emphasize

that attention be paid to the “unique strengths, challenges and cultural values of Aboriginal and Torres Strait Islander people” as key considerations of a culturally responsive, trauma-informed approach. Additionally, Dobia and O'Rourke (2011) suggest that culturally responsive practices adopt a holistic view of wellbeing that includes dimensions of physical, mental, cultural, and spiritual learning that occurs across a range of contexts – such as the family, community, land, and society.

While there have been programs designed to be culturally responsive to the needs of First Nations families in health and social services (Educaring; Atkinson, 2017), there appears to be limited research into the use of such programs within mainstream Australian educational contexts. As scholars and researchers highlight the need for support programs to be designed around the cultural needs of First Nations children (Atkinson, 2008), further research is required on the impact of such approaches in reducing the ongoing disparities in educational outcomes amongst Aboriginal and Torres Strait Islander students. Scholars have highlighted the need to understand the complexities related to sustainably implementing culturally responsive practices in schools, by integrating them with existing multi-tiered support frameworks (Chafouleas et al., 2016; Berger, 2019).

Implementation of Trauma-Informed Education Practices: Multi-Tiered Approaches

Multi-tiered systems of support in schools refer to a data-driven, stepped model of student support that matches evidence-based practices with student level of need. For example, the Multi-Tiered Systems of Support (MTSS) refers to a three-tier model of interventions and supports for students. Tier 1 supports are delivered universally to all students, including those not currently at risk of social-emotional difficulties. Tier 2 consists of targeted interventions and supports aimed at at-risk students (i.e., those exhibiting signs of psychological distress). Finally, those students who are exhibiting severe and complex social-emotional needs are provided intensive supports and school-based interventions at Tier 3 (Chafouleas et al., 2016; Berger, 2019). Research has shown that such multi-tiered systems have been related to positive outcomes for both students and teachers (McIntosh et al., 2016), including increased emotional regulation in students (Bradshaw et al., 2015), reduced problematic student behavior (Kelm et al., 2014; Bradshaw et al., 2015), and increased teacher morale, efficacy, and job satisfaction, leading to teacher longevity (Ross et al., 2012; Kelm et al., 2014). Incorporation of culturally responsive and trauma-informed practices into such multi-tiered systems requires capacity building for all school staff to achieve effective, school-wide implementation. This includes training, coaching, and leadership support (Flannery and McGrath Kato, 2017; Lowenthal, 2020). When professional development and coaching related to TIC is delivered in school settings, teachers report an increase in their knowledge about trauma and trauma-responsive practices as well as their understanding of how to help trauma-exposed students in schools (Dorado et al., 2016). Many of the

educational frameworks and practices proposed are primarily linked to First Nations students in Canada, or minority groups in the United States, with few studies to date examining the application of such culturally responsive, multi-tiered systems in an Australian school context.

Summary and Research Questions

Culturally responsive and TIC practices represent a promising approach to mitigate the negative impact of factors influencing the educational outcomes of First Nations students. This study is part of a program of research utilizing qualitative and quantitative methods exploring the experience and impact of a novel multi-tier, culturally responsive, TIC program, Trauma Informed Behavior Support (TIBS; Ayre and Krishnamoorthy, 2020) in a regional primary school in Australia. The research questions guiding the investigation are:

RQ1: In what ways does the program change teacher knowledge and attitudes about trauma-informed and culturally responsive practices?

RQ2: What are the changes in teacher trauma-informed and culturally responsive practices following the program implementation?

It is hoped that the findings will provide guidance on the program implementation, and inform the design of larger evaluation studies of the program. The following sections will provide an overview of the school involved in the research, as well as a description of the TIBS program and its implementation at the school.

CONTEXT

The school at the center of this study was a public primary school (pre-school to grade six) located in Northern Territory, Australia. The school was deemed appropriate for the pilot implementation of the program, given the large percentage of First Nations children enrolled at the school. At the time of the study, the school population was 230 students, with an average class size of 33 students. The student group consisted of 92% First Nations students and up to 70% of students for whom English is an Additional Language or Dialect (EALD). Sixty-eight percent of students were identified as having a disability. Approximately 40% of the students were living in government-funded public housing facilities. The staff consisted of 10 classroom teachers and five teacher aides. The staffing group also consisted of five administration and business support staff. The 10 classroom teachers included those who were in specialist teacher roles such as Physical Education, Librarian, and Social Emotional Wellbeing teacher. All staff participated in the training. Four staff members identified as being of First Nations descent. The average age of the teaching staff was 43 years ($SD = 13.85$). The teaching staff had an average of 15 years of teaching ($SD = 9.79$) experience, 5 years ($SD = 4.15$) of which being at that school. With the exception of one teacher who moved from a substitute teaching position at

the school into a permanent teaching position, there were no changes to the teaching staff during the 3-year period of the program implementation.

PROGRAM ELEMENTS AND IMPLEMENTATION

Figure 1 includes the implementation logic model of the Trauma Informed Behavior Support (TIBS) (Ayre and Krishnamoorthy, 2020) program and outlines key activities and objectives of the program implementation over 3 years. The TIBS program uses a three-tier approach to implementing TIC practices to support vulnerable students. As outlined in the “Assumptions” and “Theoretical Foundations” sections of the program logic model (**Figure 1**), TIBS is based on a trans-theoretical framework of practice that draws on developmental traumatology, social-learning, and systems theories (see Ayre and Krishnamoorthy, 2020 for a detailed description of the framework). The program provided a framework of practice based on principles of TIC (SAMHSA, 2014) and culturally responsive and healing centered practice (Hammond, 2014).

The “Activities” related to the program implementation (**Figure 1**) describes the three tiers of student support, as well as the timeline for the program implementation. The implementation planning and co-design phase occurred between February 2017 and May 2017, and involved consultation with school staff, key stakeholders and elders and cultural brokers within the school community (see Bellamy et al., 2022 for descriptions of the program co-design and consultation process). Each tier was implemented using a blended-learning training approach (Strayer, 2012), with participants engaging in online learning and in-person workshops. A guided analytic approach was utilized to support teachers in applying the concepts of the training, and co-design activities and practices that align with the program’s guiding principles. The preliminary training programs for the three tiers was completed at the end of June 2017, with the program trainers continuing to work with the school community to implement the program till November 2020 (**Figure 1**).

Tier 1 training content related to whole of school practices and was provided to all school staff (including administrative and business support personnel) and key stakeholders (see “Output” section in **Figure 1**). Suggested practices in this tier related to all the students at the school. Tier 2 focused on classroom specific practices and was offered to the teaching staff and teacher aides. With classroom teachers across all the grades at school involved in this training, all students at the school were exposed to practices in this tier. Finally, Tier 3 related to the trauma-informed functional behavior analysis process, and was provided to the members of school’s leadership team (**Figure 1**). This higher level of training was aimed at building capacity in the leadership team to provide coaching and support to teachers who had difficulties in supporting particular students with complex needs. A total of 15 students were identified across the 3 years that required interventions related to Tier 3 practices of the program. A detailed description of the program content related to each tier of the program can be found in Appendix A.

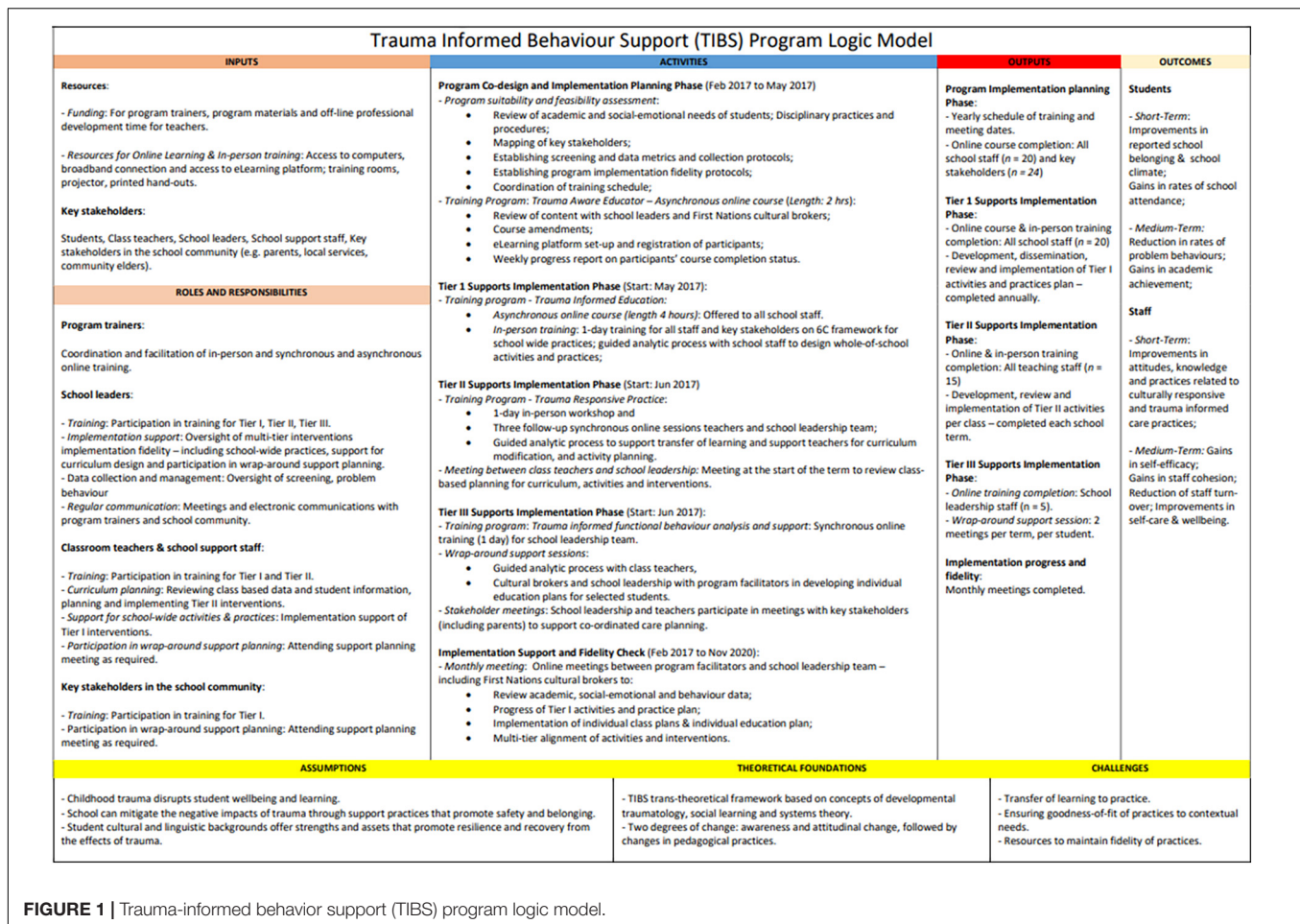


FIGURE 1 | Trauma-informed behavior support (TIBS) program logic model.

A key feature of the training and implementation was the consultation with First Nations school staff and First Nation elders in the local community. Examples of culturally responsive practice elements integrated into the training following these consultations included:

- highlighting the impact of power differentials in the engagement of First Nations students in institutions perceived as being governed by non-Indigenous individuals.
- understanding language and practices used to “problematize” First Nations individuals – both in the past and the present.
- identifying how the legacy of colonization is maintained by institutions through hegemonic practice and oppressive policies.
- recognizing First Nations families’ ways of learning.
- sharing stories that affirm First Nations students and their families as holders of expert knowledge about their lives and experiences, within and outside of educational systems.
- promoting practices that foster cultural safety for First Nations students and families that require a critical reflection of knowledge, skills, and attitudes to provide an

experience of school as a safe, accessible, and responsive environment that is free of racism.

Other examples of culturally responsive practices include:

- First Nations cultural broker checking in at children’s homes each morning and driving them to school in the school bus, being a support person for student’s families at school and stakeholder meetings, and advocating for their needs in other forums and settings.
- cultural broker to attempt to contact and check in on the welfare of families, or obtain information through community contacts, if the student had not attended school.
- obtaining consent to provide child/family specific information to teachers to support a strengths-based perspective and reduce the possible misinterpretation of behaviors.

To ensure the successful implementation of the TIBS program, the program facilitators met regularly with the school leadership team (see “Activities” section in **Figure 1**). These meetings provided the team an opportunity to review procedures and practices in the context of emerging needs and competing demands (see “Challenges” section in **Figure 1**). The meetings also provided an opportunity for the leadership

team to consolidate key learning and receive support for the practical and emotional challenges of supporting students at the school. The research questions guiding the present investigation relate to the short-term impact of the program on educator's knowledge, attitudes and skills following the implementation of the program (**Figure 1**).

MATERIALS AND METHODS

Participants

Participants consisted of eight primary classroom teachers from the school ($n = 8$). A purposeful sample was used, with selected teachers being those who could provide informed accounts of the implementation of the TIBS program (Palinkas et al., 2015). Teachers were given information about the project at a staff meeting to assist in their decision to participate in interviews, and written consent was provided by all participants prior to participating in the interviews. All the teachers and support staff at the school were invited to be part of the research, including First Nations staff. The participants were classroom teachers that taught a range of year levels, from pre-school to Year 6 (for students aged 4 – 12 years old). The sample also consisted of practitioners who held specialist roles of Librarian, Physical Education teacher, and Social Emotional Wellbeing teacher. All participants identified as being Caucasian and female. First Nation staff ($n = 3$) at the school were unable to attend the scheduled interviews. All the First Nations staff were away on leave during the interviews, with two of the staff unwell and the third away to attend a funeral. The participant length of experience at the school ranged from 1 to 10 years. The participant with 1 year of experience had previously worked at the school as a substitute teacher, and had recently moved into a permanent classroom teacher role. All interview participants took part in the training provided. All interviews were conducted by one of the training facilitators during November 2020, with approval from the University of Southern Queensland (USQ) Human Research and Ethics Committee (No. H15REA191). To ensure anonymity participants were de-identified by randomly allocating numbers to each interview transcript.

Materials

Semi-structured interviews were used to gather information from participants. Interview questions were focused on how teachers transformed their knowledge of TIC as well as change to their use of trauma-informed and culturally responsive practices at the school (see Appendix B for interview questions). All interviews were transcribed verbatim, and participants offered the opportunity to check their transcribed interviews to ensure true and accurate accounts were recorded. One participant provided minor adjustments to reflect accuracy of some terms used in the interview.

Procedure

Participants were interviewed in November 2020, at the end of the 3-year implementation of the TIBS program. The design of interview process was guided by the principles of TIC (SAMHSA,

2014). To promote a sense of felt safety in speaking with the researcher, all participants were given an information sheet about the purpose and intent of the research, and opportunities to meet and speak to the researchers about the interviews in person. Similar to other aspect of the program implementation, the questions used in the interview were first presented to the school leadership, as well as the key cultural brokers in the school for consultation. The focus of these consultations was to ensure that the questions were adequately sensitive to issues relating to culture, history and other pertinent issues relevant to the school community, as well as the program. The questions were suitably amended based on the feedback received in this process. The feedback from the consultation process highlighted the need to attend to the participant's emotional state when discussing potentially distressing topics, and provide them with the required support during and after the interview. Guidance for the participants regarding this was included in the research information sheet.

To ensure confidentiality and privacy, the interviews occurred in-person, in a private room at the school. Transparency regarding the interview process was supported by participants receiving the interview questions prior to the interviews, to provide them an opportunity to think more deeply about the questions and their responses. Thus, participants were emailed or provided a printed copy of the interview questions (see Appendix B) approximately 2 weeks prior to the interviews being conducted. The participants were reminded of the voluntary nature of research participation, and were also reminded that they could choose not to answer certain question. While the pre-determined questions guided the interviews, the flexible nature of semi-structured interviews allowed participants to deviate from the questions and introduce specific beliefs and points of relevance and interest (Stake, 2005). The opportunity to extend their responses in this way provided a balance between planned and impromptu responses. Many participants commented that their pre-prepared interview notes served as a valuable prompt during the interview process, helping them to convey their individual perspectives and experiences more confidently and accurately. Participants were given time off class to participate in the interviews and length of interviews were kept to between 30 and 60 min. Interviews were conducted back-to-back over 2 days by one of the original TIBS facilitators.

Analysis

Initially, all interviews were read in their entirety before coding was applied using NVivo (QSR International, 1999). To minimize bias and maintain rigor in coding, three coding cycles were utilized, with coding conducted by the chief investigator, and then checked by the remaining authors for interrater validity. The first coding cycle involved the researcher familiarizing themselves with the interview context, participant language and perspectives of the interviews. A preliminary set of quotes and themes were identified, as well as sections requiring clarification with the researcher who conducted the interviews. Pattern coding was then used as a second cycle to categorize the similarly coded data into categories that captured the overall meaning of the codes (Saldaña, 2013). Thematic analysis

methodology (Braun and Clarke, 2019) was utilized to synthesize key categories of coded data and identify themes that had four or more participants who made similar comments or statements. The interviews were analyzed for ways in which the teacher made meaning of the trauma-informed and culturally responsive knowledge provided to them in their context, and their perceptions of the impact of the skills and strategies of the program.

FINDINGS

There were five themes identified overall, two in relation to research question one and three for research question two. **Table 1** provides an overview of the themes related to each research question.

RQ1: In What Ways Does the Program Change Teacher Knowledge and Attitudes About Trauma-Informed and Culturally Responsive Practices?

Increased Awareness of the Presence and Impact of Intergenerational Trauma Amongst Students

Awareness of the pervasive presence and impact of traumatic stress responses in students is often the first and vital step in behavior change when responding to students exposed to adversity (Parker et al., 2020). For First Nations students, teachers spoke of their increased understanding of historical and intergenerational influences on the experience of traumatic stress in children and their families. While several teachers were cognizant of the social impacts of colonization on First Nations families, the training appeared to have highlighted the links between student behaviors, physiological stress responses and intergenerational trauma across various settings, including school.

“it’s like the legacy of what has happened in the past. It’s still playing out for these families today. . . . It’s not their fault, but you’ve got to focus on the good things and figure out how things can be different” (Participant 3).

“now seeing trauma holistically, I understand how it affects the brain, cognition and all facets of someone’s life, as well as intergenerational trauma which really wasn’t on my radar” (Participant 2).

Changes in Beliefs About Causes and Multi-Systemic Influences on Student Behavior Difficulties

There appeared to be a shift in participants thinking about the causes, or reasons for student’s challenging behaviors in the classroom. There also seemed to be a change in how educators modified their thinking, beliefs, and attributions about disruptive classroom behaviors – from students being willfully disobedient and having antisocial personality traits to their exhibiting problem behaviors due to unmet social-emotional and learning needs.

“I think I’ve changed my attitude to fully understand kids. Sometimes I still had that little niggling mindset that was like

you’ll be right. Just go and suck it up and get on with life. . . the challenging behavior, they’re not doing it to get at us, there’s a reason behind the behavior” (Participant 1).

“challenging behavior is a cry for help. . . it’s not naughty. . . kids don’t come to school to annoy us. . . they come to school to have a lovely time. . . they’re kids that bad stuff happened to” (Participant 4).

Participants spoke of the importance of taking time for reflection before making judgments and responding to student behaviors. Gains in teacher capacity to reflect on the influence of the complex, multi-systemic factors outside of the school on student behaviors was evident in the following quotes.

“so much is about the child’s family, what’s happening at home, what they have been through. There is so much grief and loss. It comes out as not listening or back-chatting but it’s sadness and worry” (Participant 5).

“they feel like they are being constantly watched and judged by people like us. Departments and systems. It must feel like everyone’s out to get them into trouble” (Participant 7).

RQ2: What Are the Changes in Teacher Trauma-Informed and Culturally Responsive Practices Following the Program Implementation?

Increased Flexibility in the Use of Culturally Relevant and Play-Based Learning

Participants spoke of their growing awareness of the need to flexibly utilize pedagogical practices that addressed the differentiated learning and social-emotional needs of the students in their classroom.

“my teaching practices have become more fluid and my goals for the end of the day look very different to what they did prior to this” (Participant 2).

Six out of the eight participants also reflected that since the training, curriculum planning and design had purposefully included information linked to students’ culture of origin and first languages. Teachers spoke of incorporating information related to the First Nation’s Peoples racial, ethnic, and linguistic history in the Northern Territory, across Australia, and in First Nations communities around the world.

“I try really hard to include. . . things that I have learnt about the [Indigenous] culture and language. . . things like numbers and names of animals in different languages. . . and so I try and incorporate into the lesson plans. Kids that are speakers of language you know that they’re actually that’s their first language so they can actually teach us things as well” (Participant 8).

The participants also discussed the incorporation of play into their students’ learning. In addition to promoting engagement, educators shared their understanding and awareness of the importance of play for the development of social and emotional skills in young children. Many highlighted how this was particularly important for students who had experienced

TABLE 1 | Key research questions and the corresponding themes identified in the interviews.

Research questions	Themes
(1) In what ways does the program change teacher knowledge and attitudes about trauma-informed and culturally responsive practices?	(1) Increased awareness of the presence and impact of intergenerational trauma amongst students. (2) Changes in beliefs about causes and multi-systemic influences on student behavior difficulties.
(2) What are the changes in teacher trauma-informed and culturally responsive practices following the program implementation?	(1) Increased flexibility in the use of culturally relevant and play-based learning (2) Increased use of strategies to improve teacher–student relationships and cultural safety of learning environments (3) Increased self-care, staff cohesion and collaboration with cultural brokers.

adversity, as a means of promoting a sense of safety and connection to the school community and was evidenced thus:

“there’s a lot more play in the classrooms and interestingly, with more play and more relaxation in the classroom, the learning’s happening” (Participant 5).

“more play-based learning and those social learning situations. . . the social and emotional learning strategies come up so much more in my day to day teaching than before” (Participant 2).

“we do a lot of play, a lot of those young play experiences. . . those relationship building play experiences” (Participant 8).

Increased Use of Strategies to Improve Teacher–Student Relationships and Cultural Safety of Learning Environments

Teachers spoke of the program helping develop a focus on relationship building with students and the importance of this in creating a sense of safety in classroom environments. This included developing trust and rapport with students. For example:

“getting trust by giving them what they need. . . we don’t question the fact we have to provide breakfast, uniform, lunches. . . . We just do it. . . if a kid doesn’t have food, we just do it” (Participant 4).

“Building the strong relationships, that’s definitely the one that I consider to be the most important, as soon as those relationships are solid, just about everything else is a lot easier to manage” (Participant 6).

“having things around the classroom that make the kids feel like it’s theirs. . . making sure the kids feel really safe and comfortable in the classroom. . . acknowledging the differences but also celebrating them” (Participant 7).

“often I’ll take them outside and we’ll talk about their feelings over a kick of football rather than sitting down and sharing it as a whole class which I might do with other students because I know that that’s how their family works. They’ll sit down and they’ll have a yarn about it and they’ll work it out together. Whereas I know with those boys, they don’t do that at home so I’m not going to make them do that here. It’s not appropriate. But they’re happy to talk just outside and one of them in particular is quite good” (Participant 4).

Participants also spoke of having a broader awareness of the need for “cultural safety” in classrooms and across the whole school environment – working to explicitly communicate to all members of the school community that individuals of culturally

and linguistically diverse backgrounds are to be respected, valued, and celebrated. Participants noted processes where incidents of discrimination and bullying were reported and discussed amongst the staff. At a whole-of-school level, members of the leadership team of the school spoke of the need to adequately address such incidences with students and with families as being an important component of maintaining an inclusive and safe school climate.

“I’ve become more doggedly aware of the importance of the school environment. . . my awareness has really become much more attuned to what we need to be doing in schools. . . a trauma-informed approach can’t come from just one person. . . it has to be a whole school platform and without that it just wouldn’t work” (Participant 8).

Within the classroom, teachers described a variety of pedagogical strategies that promoted both social-emotional learning, and cultural safety. For example, one teacher shared how the visual point scale, or “feeling thermometer,” used to monitor feelings and for check-ins throughout the day was individualized using artwork and language related to the student’s culture and language of origin. Participants also spoke of songs and dance routines provided by First Nations community groups and cultural brokers being incorporated into sensory breaks and mindfulness activities that highlighted stories related to land and culture. One teacher shared how “calm boxes” – a collection of items intended to support students’ emotion regulation – were put together for each student: “. . . we would have sensory items for them. . . but we would get them to bring things that were important. . . like photos of families. . . totems. Bringing a piece of their life and culture outside of the school. . . making it their own special thing.” Teachers highlighted the value of a shared language and curriculum regarding social and emotional skills at the school as this provided them with an opportunity to reinforce the use of these skills across various school settings.

The participants also spoke of whole of school activities that promoted inclusion and social-emotional learning. A school-wide calming strategy, that all participants agreed had been highly effective, was Morning Muster. Morning Muster was a whole of school assembly at the start of each day that included the singing of songs based on social-emotional skills (diaphragmatic breathing practice) and songs led by First Nations teachers and community elders. Calming spaces were common across all areas of the school with teachers highlighting the importance of having consistent processes for students to access and utilize those spaces

outside the classroom when they required time to regulate their emotions. Two rooms were made available for students to use when requiring a break from the class and were personalized using artwork and photographs of First Nations sportspeople and celebrities. Individual and group check-ins were offered by the school's Social Emotional Wellbeing teacher. Students having difficulties engaging with the curriculum were given the option to have individual check-ins from a staff member of their choice. This nominated staff member was usually the student's designated contact person and was often a teacher or support staff member of the same cultural or linguistic background.

Participants interviewed highlighted the utility of such whole-of-school practices in providing a shared language and consistency in the expectations of students at the school.

"(across) the whole school . . . the wording that we use for social-emotional skills has been really helpful in my class" (Participant 3).

"students are all taught the same concepts about relationships and feelings. It gets reinforced daily and gradually I think we're seeing an improvement in behavior over time" (Participant 5).

Increased Self-Care, Staff Cohesion and Collaboration With Cultural Brokers

All participants identified self-care activities they undertook in their own time to help maintain their wellbeing. These included leaving school on time and not thinking about or discussing school in their own time, participating in activities or hobbies unrelated to work or school, meditation, traveling and holidays, and yoga. All participants were in agreement that because of the training, new self-care activities were employed and those existing prior to the training were given renewed priority. The participants also spoke of increased collegiality amongst the staff and leadership. They described both providing, and receiving support, from colleagues. As part of implementing trauma-informed practices at the school, teachers reported increased group cohesion and discussed the importance of teachers supporting each other. For example:

"you can't be an individual player here. . . using the idea of if you need to check out that's okay. . . do you need me to take your class or take a child for a bit?" (Participant 4).

"I feel like I'm always supported. . . I feel like I have a really good relationship with the staff at school" (Participant 8).

Teachers also spoke of the influence of the school leadership in promoting this collegiality and teamwork amongst the staff following the implementation of the program. They described the leadership team as having listened to their concerns, showing concern for teacher well-being, modeling a good work-life balance and respecting teacher autonomy. For example:

"just saying when that student can't be with me right now. . . or I need a break. . . That's really heard by the leadership team. . . they really listen" (Participant 7).

"I think at the start I definitely wasn't good at realizing my wellbeing needed to be a priority. . . we've had lots of reminders of that. . . I've never had a boss ever that would say to me you need to

put you first in order to come here and do your job the next day" (Participant 2).

Participants also discussed the importance of collaborating with First Nations teachers at the school when planning for supporting students at the school. In particular, several teachers highlighted the value of having a First Nations community elder as part of the school staff. In addition to building trust with students and their families, the community elder acted as a mentor for teachers at the school in developing their culturally responsive practices.

"Having [First Nations teachers] in the school is a great resource. . . [working with them] helps bridge the cultural differences. . . and influences our understanding of the culture of our students" (Participant 7).

DISCUSSION

The growing awareness of the prevalence and impact of ACEs and childhood trauma has spurred educators to embrace new approaches to support vulnerable students. Efforts at improving the educational outcomes of students impacted by such adversities has focused on changing practices to become trauma-informed and culturally responsive, to meet the needs of marginalized students, including First Nations students. This research investigated the impact of a novel TIC program in a regional primary school. The 3-year implementation of the multi-tier support program included a focus on the use of culturally responsive practices with a cohort of students, the majority of whom were First Nations children. The first research question aimed to understand the changes in teacher knowledge and attitudes about culturally responsive practices. Despite the general awareness amongst the teachers at the school of the adversity many of their students faced, teachers reported that the training illustrated the prevalence of ACEs, and how the resultant intergenerational trauma in children manifests in behavioral difficulties and disengagement at school. This finding is consistent with previous research on the need for more comprehensive understanding amongst educators of how symptoms of traumatic stress amongst students effects functioning and performance in educational settings (Morgan et al., 2015).

The changes in awareness and attitudes amongst teachers regarding student needs and drivers of student behavior concerns is significant in the development of inclusive practices. Adults who attribute hostile intent to child behaviors have been found to frequently hold unrealistic beliefs about the developmental capacities of the students (Wang and Hall, 2018). Such beliefs have been linked to the use of emotive and coercive disciplinary practices and feelings of frustration amongst teachers (Wang and Hall, 2018). The teacher's reports highlight a more nuanced understanding of the factors contributing to the social-emotional needs of First Nations students - attributions that include the incorporation of historical and multi-systemic impacts on the student and their families. It is likely that holding such an empathic view of First Nations students will form the foundations

for the compassionate use of proactive, relationship-focused practices, aimed at promoting safety and teaching students social-emotional skills. Further research is required to corroborate the links between teacher beliefs and empathy, and the successful implementation of such programs.

Several of the themes identified highlight the increased focus on understanding and celebrating the cultural and linguistic backgrounds of the First Nation students at the school. The teachers appeared both willing to include culturally relevant material into curriculums and seemed to indicate increased self-efficacy in doing so. Surveys of cultural competency amongst teachers have highlighted that while many teachers have good intentions, a misalignment with First Nations cultural protocol can create difficulties (AITSL, 2020). Teachers have been found to feel guilt, and at times be paralyzed by a fear of offending when delivering content related to First Nations Peoples. Given several of the teachers interviewed were non-Indigenous, it is likely that the access to First Nations staff and cultural brokers at the school may be an important source of support for teachers in this regard. The collaboration and development of a close working relationship between First Nations staff and other non-Indigenous educators appears to have allowed teachers to embrace vulnerability and feeling uncomfortable in order to discuss issues such as racism, colonization and systemic disadvantage (AITSL, 2020). While there is a greater need for more professional development opportunities to support teacher's cultural competency, the recruitment, retention and consultation of First Nations teachers appears to be an important enabling factor in the implementation of the program.

The use of play-based learning was another important shift in practice that the teachers recognized as a result of the TIBS training. Teachers reflected that understanding the impact of trauma on cognitive and developmental process in the training allowed them to understand the importance of play. Curriculums that allow students to engage in play-based developmental experiences present opportunities for students to partake in enjoyable and engaging activities that also develop self-regulation skills that are vital developmental skills required for students to be successful at school (Bohlmann and Downer, 2016). Teachers spoke of play-based learning as providing them an opportunity to build stronger relationships with their students, while engaging students in aspects of the curriculum that may otherwise be perceived as uninteresting or irrelevant. While the research did not assess for the specific effects and unique contributions of the individual coaching and ongoing training provided to school staff, such findings highlight the need for ongoing support required to facilitate the transfer of learning to practice following professional development (Garet et al., 2001; Hershfeldt et al., 2012).

Increased group cohesion amongst teachers and school leadership was an unexpected outcome of the program implementation. While the program did not explicitly target improvements in group cohesion through its content, participants reported a sense of "having each other's back" in relation to supporting students with challenging behaviors using trauma-informed practices. Rather than feeling like they were working in isolation, participants reported a sense of support

from their colleagues that some teachers reported they had never felt before in any other school setting. This also allowed the participants to be more effective in their roles and to take better care of themselves within and outside the workplace. Scholars such as Sandra Bloom (Bloom and Farragher, 2010) have highlighted the risk of communication networks within organizations breaking down in the face of chronically stressful work conditions. Multi-tiered TIC programs can help schools create a culture of safety, respect, support, and democratic and transparent decision making that can create the conditions for teachers to be able to provide TIC to their students (Bloom and Farragher, 2010). The measurement and understanding of these organizational processes, such as organizational climate (Bloom and Farragher, 2010; McChesney and Aldridge, 2018), may be an important area of research for the implementation of TIC programs.

Finally, many teachers attributed their commitment to their own wellbeing to the support from the school leadership. A key feature of the implementation of the program was the focus across the school on the wellbeing of the staff. Teachers reported self-care and a good work-life balance was well supported and actively encouraged by the leadership team which enabled them to put these practices in place without a sense of guilt. Teachers reported feeling validated by the leadership team regarding their role and with the decisions they made about how to run their classrooms. Similar comments were made about the benefits of having a school leadership group supportive of TIC practices. Supportive leadership such as this, is fundamental to driving organizational change (Shultz, 2014) and sustainability of TIC in schools. The leadership team behaviors described by the teachers reflect those promoted in the literature as characteristic of TIC champions (Koury and Green, 2017; Hales et al., 2019). TIC champions understand the impacts of trauma and use their knowledge of trauma to assist, facilitate and guide others within the organization by embracing a "trauma-first" way of thinking (Koury and Green, 2017, p. 146). There is emerging research to highlight the role of leadership in facilitating organizational change in procedures and policies of organizations to promote TIC (Howard, 2019). However, limited research has been conducted on the role of educational leadership on the implementation and sustainability of trauma-informed practices (Rosenthal, 2019). This may be an area of enquiry for the future.

Limitations and Directions for Future Research

This study is limited in that it is based entirely on self-reports of a small number of educators from one school. Research that builds on this pilot research may gather further evidence of changes in awareness and attitudes of trauma among teachers through reliable measures, such as the Attitudes Related to Trauma-Informed Care (ARTIC) self-report measure (Baker et al., 2016). Additional quantitative data from the school relating to perceptions of school climate, attendance rates, rates of problem behaviors and changes in academic achievement may provide insight into the impact of the program. Observational assessments of the teacher's implementation of the practices

of the program may have provided further information to corroborate the interview data obtained. While First Nation staff and cultural brokers in the school community were closely involved in the program implementation and research design, First Nations staff members were unavailable to be interviewed for the research, as they were on leave. As the interviews were conducted over a short-period of time (2 days), it is possible that increased flexibility in the facilitation of the interviews may have been beneficial. It is likely that the replication of the program implementation at another school may highlight other complexities related to the training and implementation of culturally responsive practices. A detailed exploration of the experiences of First Nations teachers, students and their families may shed further light into the impact of the program. Overall, the findings of the study highlight the need for a larger program of research investigating the efficacy of the TIBS approach.

CONCLUSION

The research explored teacher experiences of the implementation of a culturally responsive, TIC program in a regional primary school in Australia. The study is significant given the limited research into programs targeted at improving teacher capacities in utilizing culturally responsive practices. The key findings relating to attitudinal change in teachers, incorporation of culturally relevant content into the curriculum, the facilitation of inclusive and culturally safe disciplinary procedures and social-emotional learning have important implications for educators working to improve the educational outcomes of First Nations students. The implementation processes of collaboration and co-design with members of the school community – particularly First Nation community members – appear to be promising approaches for the future. The findings highlight several novel pedagogical practices that may be helpful for both First Nations

students, and those that are non-Indigenous. The findings of this pilot study also provide some preliminary support for the TIBS program and suggest the need for replicating the program implementation in different school contexts.

DATA AVAILABILITY STATEMENT

The original contributions presented in this study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by University of Southern Queensland Human Research Ethics Committee. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

GK and KA contributed to the conception and design of the study. DS and KA conducted the interviews. DS conducted the qualitative analysis and wrote the first draft of the manuscript. GK, KA, EB, and BR wrote sections of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2022.866266/full#supplementary-material>

REFERENCES

- Atkinson, C. L. (2008). *The Violence Continuum: Australian Aboriginal Male Violence and Generational Post-Traumatic Stress*. Darwin, NT: Charles Darwin University.
- Atkinson, J. (2017). 'Educating': planning safe learning environments for children with trauma. *Bedrock* 22, 6–7.
- Atkinson, J., Nelson, J., Brooks, R., Atkinson, C., and Ryan, K. (2014). "Addressing individual and community transgenerational trauma," in *Working Together: Aboriginal and Torres Strait Islander Mental Health and Wellbeing Principles and Practice*, eds P. Dudgeon, H. Milroy, and R. Walker (Canberra: Australian Government Department of the Prime Minister and Cabinet).2, 289–307.
- AITSL, (2020). *Indigenous Cultural Competency in the Australian Teaching Workforce: Discussion Paper*. Available online at: https://www.aitsl.edu.au/docs/default-source/comms/cultural-competency/aitsl_indigenous-cultural-competency_discussion-paper_2020.pdf (accessed February 28, 2022).
- AIHW (2020). *Child Protection Australia 2018-19*. Paddington, NSW: Australian Institute of Health and Welfare. doi: 41CWS
- Ayre, K., and Krishnamoorthy, G. (2020). *Trauma Informed Behavior Support: A Practical Guide to Developing Resilient Learners*. Available online at: <https://usq.pressbooks.pub/traumainformedpractice/> (accessed January 20, 2022).
- Baker, C., Brown, S., Wilcox, P., Overstreet, S., and Arora, P. (2016). Development and psychometric evaluation of the attitudes related to trauma-informed care (ARTIC) scale. *Sch. Ment. Health* 8, 61–76.
- Bellamy, T., Krishnamoorthy, G., Ayre, K., Berger, E., Machin, T., and Rees, B. E. (2022). Trauma-informed school programming: a partnership approach to culturally responsive behavior support. *Sustainability* 14:3997.
- Berger, E. (2019). Multi-tiered approaches to trauma-informed care in schools: a systematic review. *Sch. Ment. Health* 11, 650–664. doi: 10.1007/s12310-019-09326-0
- Bloom, S., and Farragher, B. (2010). *Destroying Sanctuary: The Crisis in Human Service Delivery Systems*. New York, NY: Oxford University Press. doi: 10.1017/CBO9781107415324.004
- Bohlmann, N. L., and Downer, J. T. (2016). Self-regulation and task engagement as predictors of emergent language and literacy skills. *Early Educ. Dev.* 27, 18–37. doi: 10.1186/s12913-016-1423-5
- Bradshaw, C. P., Waasdorp, T. E., and Leaf, P. J. (2015). Examining variation in the impact of school-wide positive behavioral interventions and supports: findings from a randomized controlled effectiveness trial. *J. Educ. Psychol.* 107, 546–557. doi: 10.1037/a0037630
- Braun, V., and Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qual. Res. Sport Exerc. Health* 11, 589–597. doi: 10.1080/2159676X.2019.1628806

- Bronfenbrenner, U. (1992). "Ecological systems theory," in *Six Theories of Child Development: Revised Formulations and Current Issues*, ed. R. Vasta (London: Jessica Kingsley Publishers). 187–249.
- Chafouleas, S. M., and Iovino, E. A. (2021). Engaging a whole child, school, and community lens in positive education to advance equity in schools. *Front. Psychol.* 12:758788. doi: 10.3389/fpsyg.2021.758788
- Chafouleas, S. M., Pickens, L., and Gherardi, S. A. (2021). Adverse childhood experiences (ACEs): translation into action in K-12 education settings. *Sch. Ment. Health* 13, 213–224. doi: 10.1007/s12310-021-09427-9
- Chafouleas, S., Johnson, A., Overstreet, S., and Santos, N. (2016). Toward a blueprint for trauma-informed service delivery in schools. *Sch. Ment. Health* 8, 144–162. doi: 10.1007/s12310-015-9166-8
- Cicchetti, D., and Valentino, K. (2015). "An Ecological-Transactional perspective on child maltreatment: failure of the average expectable environment and its influence on child development," in *Developmental Psychopathology: Volume Three: Risk, Disorder, and Adaptation*, eds D. Cicchetti and D. J. Cohen (New York, NY: Wiley). 129–201.
- Commonwealth of Australia (2020). *Closing the Gap Report 2020*. Canberra: Commonwealth of Australia. Department of the Prime Minister and Cabinet.
- Dobia, B., and O'Rourke, V. (2011). *Promoting the Mental Health and Wellbeing of Indigenous Children in Australian Primary Schools*. Canberra: Commonwealth of Australia.
- Dorado, J., Martinez, M., McArthur, L., and Leibovitz, T. (2016). Healthy environments and response to trauma in schools (HEARTS): a whole-school, multi-level, prevention and intervention program for creating trauma-informed, safe and supportive schools. *Sch. Ment. Health* 8, 163–176. doi: 10.1007/s12310-016-9177-0
- Fallon, L. M., and Mueller, M. R. (2017). Culturally responsive wraparound supports: collaborating with families to promote students' behavior regulation across settings. *Contemp. Sch. Psychol.* 21, 201–210.
- Flannery, K. B., and McGrath Kato, M. (2017). Implementation of SWPBIS in high school: why is it different? *Prev. Sch. Fail.* 61, 69–79.
- Garet, M., Porter, A., Desimone, L., Birman, B., and Yoon, K. (2001). What makes professional development effective? Results from a national sample of teachers. *Am. Educ. Res. J.* 38, 915–945.
- Gay, G. (2010). Acting on beliefs in teacher education for cultural diversity. *J. Teach. Educ.* 61, 143–152.
- Hales, T. W., Green, S. A., Bissonette, S., Koury, S. P., and Nochajski, T. H. (2019). Trauma-informed care outcome study. *Res. Soc. Work Pract.* 29, 529–539. doi: 10.1177/1049731518766618
- Hammond, Z. (2014). Culturally Responsive Teaching and the Brain. Promoting Authentic Engagement and Rigor Among Culturally and Linguistically Diverse Students. Thousand Oaks, CA: Corwin Publishing.
- Hershfeldt, P., Pell, K., Sechrest, R., Pas, E., and Bradshaw, C. (2012). Lessons learned coaching teachers in behavior management: the PBIS plus coaching model. *J. Educ. Psychol. Consult.* 22, 280–299. doi: 10.1080/10474412.2012.731293
- Howard, J. (2019). A systemic framework for trauma-informed schooling: complex but necessary! *J. Aggress. Maltreat. Trauma* 28, 545–565. doi: 10.1080/10926771.2018.1479323
- QSR International (1999). *NVivo Qualitative Data Analysis Software*. Doncaster, VIC: QSR International.
- Kelm, J., McIntosh, K., and Cooley, S. (2014). Effects of implementing school-wide positive behavioral interventions and supports on problem behavior and academic achievement in a canadian elementary school. *Can. J. Sch. Psychol.* 29, 195–212. doi: 10.1177/0829573514540266
- Koury, S. P., and Green, S. A. (2017). Developing trauma-informed care champions: a six month learning collaborative training model. *Adv. Soc. Work* 18, 145–166. doi: 10.18060/21303
- Lowenthal, A. (2020). Trauma-informed care implementation in the child-and-youth-serving sectors: a scoping review. *Int. J. Child Adolesc. Resil.* 7, 178–194. doi: 10.7202/1072597ar
- McChesney, K., and Aldridge, J. M. (2018). A new tool for practitioner-led evaluation of teacher professional development. *Teach. Dev.* 22, 314–338. doi: 10.1080/13664530.2017.1418418
- McIntosh, K., Kelm, J., and Canizal Delabra, A. (2016). In search of how principals change: a qualitative study of events that help and hinder administrator support for School-Wide PBIS. *J. Posit. Behav. Interv.* 18, 100–110. doi: 10.1177/1098300715599960
- Menzies, P. (2008). Developing an aboriginal healing model for intergenerational trauma. *Int. J. Health Promot. Educ.* 46, 41–48.
- Miller, J., and Berger, E. (2020). A review of school trauma-informed practice for aboriginal and torres strait islander children and youth. *Educ. Dev. Psychol.* 37, 39–46.
- Morgan, A., Pendergast, D., Brown, R., and Heck, D. (2015). Relational ways of being an educator: trauma-informed practice supporting disenfranchised young people. *Int. J. Inclusive Educ.* 19, 1037–1051. doi: 10.1080/13603116.2015.1035344
- Palinkas, L., Horwitz, S., Green, C., Wisdom, J., Duan, N., and Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Adm. Policy Ment. Health Ment. Health Serv. Res.* 42, 533–544. doi: 10.1007/s10488-013-0528-y
- Parker, J., Olson, S., and Bunde, J. (2020). The impact of trauma-based training on educators. *J. Child Adolesc. Trauma* 13, 217–227. doi: 10.1007/s40653-019-00261-5
- Perfect, M. M., Turley, M. R., Carlson, J. S., Yohanna, J., and Saint Gilles, M. P. (2016). School-related outcomes of traumatic event exposure and traumatic stress symptoms in students: a systematic review of research from 1990 to 2015. *Sch. Ment. Health* 8, 7–43.
- Rosenthal, L. (2019). *Fits and Starts: One Elementary School's Journey Toward Trauma-Informed Leadership*. (Doctoral Dissertation, East Carolina University). Greenville, NC: East Carolina University.
- Ross, S., Romer, N., and Horner, R. (2012). Teacher well-being and the implementation of school-wide positive behavior interventions and supports. *J. Posit. Behav. Interv.* 14, 118–128. doi: 10.1177/1098300711413820
- Saldaña, J. (2013). *The Coding Manual for Qualitative Researchers*. 2nd Edn. Thousand Oaks, CA: SAGE Publications.
- Shultz, C. (2014). Learning is change: creating an environment for sustainable organizational change in continuing and higher education. *Can. J. Univ. Contin. Educ.* 40, 1–26. doi: 10.1111/ajag.12324
- Stake, R. E. (2005). *Multiple Case Study Analysis*. New York, NY: The Guilford Press.
- Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learn. Environ. Res.* 15, 171–193. doi: 10.1007/s10984-012-9108-4
- SAMHSA (2014). *SAMHSA's Concept of Trauma and Guidance for a Trauma-Informed Approach*. Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Thoma, M. V., Hölte, J., Eising, C. M., Pfluger, V., and Mc Gee, S. L. (2020). Resilience and stress in later life: a network analysis approach depicting complex interactions of resilience resources and stress-related risk factors in older adults. *Front. Behav. Neurosci.* 14:216. doi: 10.3389/fnbeh.2020.580969
- Wang, H., and Hall, N. C. (2018). A systematic review of teachers' causal attributions: prevalence, correlates, and consequences. *Front. Psychol.* 9:2305. doi: 10.3389/fpsyg.2018.02305

Conflict of Interest: KA and GK are the co-developers of the Trauma Informed Behaviour Support program.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2022 Schimke, Krishnamoorthy, Ayre, Berger and Rees. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.