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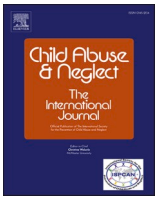

Trauma-informed care beliefs scale-comprehensive for child welfare carers using Rasch analysis☆

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ABSTRACT

Background: The literature on trauma-informed care practices (TIC) indicates that this framework is beneficial for young people, carers, and staff. However, a significant gap in the literature and practice is the absence of psychometrically sound scales to measure carer adherence to TIC principles. Emerging evidence suggests that TIC practices shift carer attitudes and beliefs, which mediate positive outcomes for both carers and young people.
Objective: To develop a theoretically comprehensive and psychometrically sound measure of carer TIC beliefs using Rasch methodology.
Participants and setting: Active carers (N = 719, M = 43 years, SD = 10.7 years) from online support groups in Australia, Canada, the United States of America, the United Kingdom, and the Republic of Ireland completed the questionnaire online.
Methods: Based on previous research (e.g., limitations of the Trauma-Informed Belief Scale-Brief [TIBS-B]; Beehag, Dryer, et al., 2023a) and a scoping review of the TIC literature (Beehag, 2023), 61 candidate items were created that covered the three main characteristics of carer-related TIC theory (i.e., beliefs on TIC strategies to manage trauma symptoms, beliefs on the impact of adverse childhood experiences (ACE), and beliefs on the importance of self-care/reflection). The resulting data was subjected to Rasch analyses.
Results: Following analyses and minor modifications, a 35-item version of the questionnaire was confirmed, which fitted the Rasch model and demonstrated unidimensionality, reasonable targeting, and sound internal consistency reliability (Person Separation Index = 0.81).
Conclusions: The TIBS-C is a psychometrically sound measure of child welfare carer TIC beliefs. Future studies are needed to provide further evidence of its validity (e.g., predictive validity), reliability (e.g., test-retest reliability) and clinical utility.

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1. Introduction

Trauma-informed care practices (TIC) are an accreditation requirement for many child welfare providers across the world (Substance Abuse and Mental Health Services Administration, 2014; NCTSN, 2008). Whole organization implementation of TIC involves training all levels of staff and carers, from CEO to child welfare carers, and ensures all organizational systems and procedures are aligned with TIC principles (Harris & Fallot, 2001). While there is evidence that TIC is beneficial for young people, carers, and staff, the quality of this research continues to be limited by a range of contextual factors (i.e., transience, high attrition rates, and lack of resources), low implementation fidelity, and an absence of psychometrically sound scales for use with carers (Beehag, 2023; Beehag et al., 2023; Bunting et al., 2019). In this context, carers comprise all types of care roles in child welfare, including foster care, kinship care, adoptive care, respite care, and residential care (youth workers). The objective of the current study was to develop a more comprehensive and psychometrically sound scale that evaluates carer beliefs about carer-related TIC practices, building on the earlier Trauma-Informed Beliefs Scale-Brief (TIBS-B; Beehag et al., 2023). The TIBS-B was designed as a brief measure, and while shown to have sound psychometric properties, because of its brevity (13 items) it does not provide a comprehensive examination of the various components comprising carer-related TIC theory and practice. The development of a scale that assesses carer beliefs is crucial, as carers spend more time with young people with adverse childhood experiences (ACE) than anyone else, and arguably play the most critical role in their rehabilitation (Cox et al., 2021; Perry, 2009).

1.1. Impact of adverse childhood experiences

Young people placed in child welfare have typically experienced adverse childhood experiences (ACE; Zelechoski et al., 2013). That is, the experience of a single or repeated exposure to physical, sexual, or emotional abuse; neglect; parental drug or alcohol misuse; or exposure to domestic violence (Felitti et al., 1998). ACE are linked to a range of childhood and adult psychiatric disorders and medical conditions across the lifespan (Bellis et al., 2019). Recent estimates suggest ACE cost the United States of America (US) approximately $750 billion annually (Copeland et al., 2018). High numbers of ACE are associated with unemployment, welfare dependence, incarceration, and medical and psychiatric treatment costs across victim's lives (Copeland et al.). In terms of immediate impact of ACE, a young person may present with mild-to-severe psychopathology, including a range of psychiatric disorders (e.g., Complex PTSD, Conduct Disorder, Generalized Anxiety Disorder, Reactive Attachment Disorder, Oppositional Defiant Disorder; Felitti et al., 1998). Young people with ACE often display a broad variety of behaviors including, stealing, absconding, aggression, violence, distrust, self-harm, suicidal behavior, food hoarding, and sexualized behaviors, and can have relationship difficulties (Giaconia et al., 1995; McMillen et al., 2005). These behavioral concerns are regarded to be trauma symptoms that can cause high levels of stress and distress for carers (Molnar et al., 2020). Consequently, placements are often terminated, and the young person moves onto the next placement or more intensive support (e.g., residential care). The cycle of trauma, relationship breakdowns, and transience then continue for the young person (Marshall et al., 2011; van Santen, 2015).

1.2. Status of TIC practice literature

Multiple systematic and scoping literature reviews demonstrate TIC practices to be beneficial for young people with ACE, carers, and child welfare agencies (Bailey et al., 2019; Bunting et al., 2019). Training on TIC practices increase carer knowledge (Conners-Burrow et al., 2013), increase fidelity of TIC implementation, and assist carers to interpret the young person's behavior through a "trauma lens" (e.g., interpret distance in relationship as "distrust" as opposed to the youth rejecting the carer; Cummings & Swindell, 2019; Kramer et al., 2013). After TIC implementation, there is a reduction in youth trauma symptoms (Bartlett et al., 2016; Jankowski et al., 2019), young people report feelings of safety increase and there are improvements in relationships with their carers (Fisher & Kim, 2007; McPherson et al., 2018). In addition, TIC implementation has been reported to be associated with fewer reports of maltreatment (Murphy et al., 2017), higher rates of young people transitioning to lower levels of care (Barto et al., 2018), and increased permanent placements (Murphy et al., 2017). Additional benefits to agencies adopting TIC practices include carers and staff feeling more confident and less stressed (Hodgdon et al., 2013; Kramer et al., 2013). However, despite these reported benefits several large-scale studies reported that after significant financial investment to implement TIC over three to five years, staff indicated that they did not believe their service to be fully 'trauma informed' (Lang et al., 2016), suggesting that there are unknown barriers to successful implementation of TIC practice and principles.

TIC literature continues to be limited by methodological barriers (Beehag, 2023; Bunting et al., 2019). The complex nature, transient and often systemic stress of child welfare context continues to prevent methodologically robust studies (Bailey et al., 2019). The quality of studies is limited by small sample sizes, high attrition rates, inconsistent outcome measures, lack of control groups, low implementation fidelity and short follow up periods (Bailey et al., 2019; Purtle, 2020). Several researchers have highlighted the need for psychometrically sound measures of TIC to enable a more methodologically robust and data driven approach in child welfare practice and research (Baker et al., 2016; Baker et al., 2021). More specifically, Bailey et al. highlighted the need for psychometrically sound measures that are purposefully developed for use with carers given that these individuals play the most important role in youth rehabilitation.

1.3. TIC beliefs

Emerging evidence suggest that TIC practices shift carer attitudes and beliefs, which mediate positive outcomes for carers and

young people (e.g., Baker et al., 2016; Crawley et al., 2021). Lang et al. (2016) reported that carers with favorable TIC beliefs were associated with decreased trauma symptoms in young people. Jankowski et al. (2019) reported positive changes in carer attitudes following TIC practice multi-modal implementation. Rivard et al. (2005) reported that youth workers with the most favorable TIC beliefs were associated with improved outcomes for young people. However, a key limitation in these studies is that none used measures of carer TIC beliefs or attitudes with demonstrated psychometric properties for carers.

There is a clear need to develop a TIC beliefs scale for carers to better understand how carer TIC beliefs result in improved outcomes for young people. The emerging literature links favorable TIC beliefs to reduced trauma symptoms and higher TIC implementation. This association indicates a clear need to identify the mechanisms of behavioral and attitudinal change to enhance the likelihood of successful TIC implementation (Baker et al., 2016). Carer TIC beliefs are potentially a critical mediator for TIC practice implementation, and with this in mind, accurately measuring these beliefs becomes key to successful TIC implementation and appropriate training and preparation of carers before they are paired with young people (Baker et al., 2010; Baker et al., 2021).

1.4. Available TIC psychometric scales for carers

Four psychometric scales are commonly used to assess aspects of TIC beliefs; however, each of these measures has limitations pertaining to application to carers (e.g., Colton & Xiong, 2010). Colton and Xiong's scale identifies deficits in staff TIC beliefs, with a focus on restraint and seclusion, and organizational systems. This scale was not designed for child welfare, nor is it based on TIC theory. This scale was developed using participants who worked at an inpatient hospital, and the scale has unknown reliability or validity for child welfare settings. The Attitudes Related to Trauma-Informed Care Scale (ARTIC-Revised; Baker et al., 2016; Brown et al., 2012) assesses staff beliefs about the Risking Connection model of TIC. The ARTIC demonstrated strong psychometric properties in a study of 760 teachers, healthcare workers, and community-based mental health workers. The ARTIC has excellent internal consistency and test-retest reliabilities. However, a key limitation in the development of this scale and its demonstrated psychometric properties is that the same sample of participants was used to both identify its seven-factor structure (exploratory factor analysis) and confirm its factor structure (confirmatory factor analysis). Furthermore, the sample did not include any child welfare carers. Therefore, while the ARTIC is considered a reliable tool for assessing TIC attitudes, its intended use is for school environments, not for carers and/or residential environments. The Trauma System Readiness Tool (TSRT; Hendricks et al., 2011) was designed as part of the National Child Traumatic Stress Network campaign aimed at supporting TIC practice implementation in child welfare settings. The TSRT includes scales to measure TIC knowledge, TIC attitudes, and TIC implementation. To date, there are no studies examining the psychometric properties of this measure, so its psychometric properties remain unknown.

1.5. TIC beliefs scale-brief

The TIC Beliefs Scale-Brief (TIBS-B) was designed as a brief scale to assess carer beliefs about TIC practices (Beehag et al., 2023). To the authors' knowledge, this is the only available carer-related measure of TIC developed using Rasch methodology (Rasch, 1961). The TIBS-B has good psychometric properties, an overall good fit, and good reliability (Person Separation Index = 0.77); however, it is brief with 13 items. The authors noted the low number of items was a result of a response bias (ceiling effect) due to the Likert response format and a lack of reverse scored items (Beehag et al., 2023). The low number of items resulted in key aspects/characteristics of carer-related TIC theory not being measured, such as the importance of the relationship between youth and carer (Fehrenbach et al., 2022), which underpins the theory for a range of TIC models (e.g., Crawley et al., 2021). Further, there were no items measuring intergenerational trauma (Marshall et al., 2011), coregulation strategies for carers, or carer self-efficacy (Cox et al., 2021; García-Martín et al., 2015), which are considered critical aspects of TIC. The scale was therefore not exhaustive for all relevant TIC carer practices.

1.6. The current study

The aim of the current study was to extend the TIBS-B (Beehag et al., 2023), and develop a more theoretically comprehensive measure of carer TIC beliefs using Rasch methodology (Rasch, 1961). The current study made a range of changes to the TIBS-B, including a different response format and additional items to cover critical aspects of TIC theory. Like the TIBS-B, the current scale was designed to assess carer TIC beliefs, including all forms of child welfare (e.g., foster care, kinship care, adoptive care, residential care youth workers).

Rasch methodology was used instead of a classical test theory for several reasons. Rasch analysis has been used to develop and evaluate a wide variety of psychometric scales, including scales used in education and rehabilitation (Chalmers et al., 2016; Misajon et al., 2016), depression (Siegert et al., 2010), stress (Medvedev et al., 2017), and pregnancy-related anxiety (Brunton et al., 2018). Rasch analysis has advantages over classical test theory, particularly for evaluating scales at the individual item level. The Rasch analysis does this by focusing on the person's characteristics and traits and item difficulty (differential item functioning; DIF), which then allows for more precise detail and increased information on the measure's performance (Tennant & Conaghan, 2007). The Rasch analysis is consistent with the principle that a measurement instrument should perform consistently independent of a person characteristics and traits (e.g., age, gender, or culture; Thurstone, 1939). A measure with good DIF allows for valid comparisons between groups. Rasch analysis verifies whether the measure is unidimensional, which is considered a fundamental requirement for summed total scale scores to be used (Tennant & Conaghan, 2007). When a unidimensional Rasch model is achieved, ordinal-to-interval conversion tables can be produced from the Rasch model to enhance the precision of the measure. Lastly, Rasch analysis provides a range of diagnostic information that allows the test developer to comprehensively address the properties of their scale.

2. Method

2.1. Questionnaire development process

Fig. 1 summarizes the multi-stage item development process that resulted in the reduction of 85 candidate items to the final 61 candidate items completed by participants. The 85 initial candidate items were recommended by the expert review panel from the TIBS-B study (Beehag et al., 2023). The first step in the item review process was informed by a scoping review on TIC practices, to ensure the candidate items covered key aspects of carer-related TIC constructs that have empirical support (Beehag, 2023). The scoping review evaluated 32 TIC practice studies which covered 12 different TIC practice models with published studies. The review identified three key carer-related TIC characteristics, which were (i) "trauma-informed strategies to manage trauma symptoms" (i.e., importance of relationship between carer and young person, need for physical and psychological sense of safety, etc.; Cox et al., 2021); (ii) "knowledge of the impact of trauma," in terms of psychological (i.e., how youth see themselves and the world) and behavioral (i.e., common trauma symptoms, such as poor social skills and aggression; Conners-Burrow et al., 2013; Kramer et al., 2013) sequalae; and (iii) "carer self-care and self-reflection" (i.e., carers understanding the risk of vicarious trauma and self-care strategies; Holden et al., 2010; Izzo et al., 2020). These three constructs were used to categorize the 85 items.

Based on the findings of the scoping review and the limitations identified in the TIBS-B development process (i.e., low number of items, response bias, ceiling effect insufficient breadth of TIC characteristics), the authors reworded the item format and reduced the number of candidate items to 61 (Beehag et al., 2023). Based on the response bias and ceiling effect issues with the TIBS-B study design, 10 reverse coded items were added. In addition, the response format was changed by restructuring the response options so that participants indicated their answer on a five-point scale in relation to two opposing anchoring points (rather than indicating the extent to which they agree or disagree with the statement as per Likert scale). This response format has been effectively used in other parenting or caring scales (e.g., parenting scale; Fung & Fung, 2020) and was used in the current scale to address issues of response bias and ceiling effects identified in the TIBS-B (Beehag et al., 2023). The 85 items were grouped into three key carer-related TIC characteristics described above, and repeated or similarly worded items were combined deleted. It was noted that while the various TIC practice models mentioned the need for self-care and self-reflection (third characteristic presented above), none of the reviewed studies used any measures to evaluate its benefits (Beehag, McGrath, et al.; Bunting et al., 2019). Lastly, four inter-generational items were included in the final 61 items because of the growing literature finding that the offspring of parents who were raised in child welfare are at risk of being raised in child welfare themselves, when the implicit objective of child welfare is to break the cycle of inter-generational trauma (Marshall et al., 2011; Moore et al., 2022).

All 61 items were written at a grade 6 reading level (Kincaid et al., 1975). A high proportion of First Nations young people live in child welfare in developed countries (Chartier et al., 2020). Therefore, a widely respected Indigenous Australian child welfare practitioner, who works in a senior management position in a large child welfare agency in Australia, was consulted. They provided advice on ensuring the item wording was culturally sensitive and appropriate.

2.2. Participants

Active care providers (of a young person aged between six and 20 years) who were members of online carer support groups across

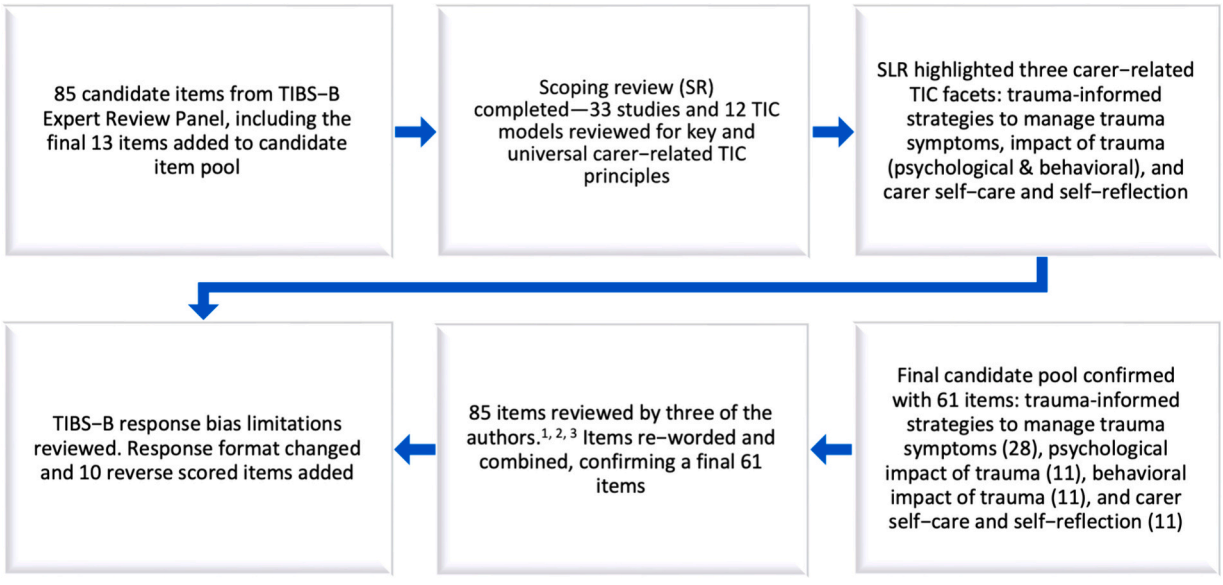

Fig. 1. Flow chart demonstrating how the candidate item pool was developed.

Australia, Canada, US, United Kingdom (UK), and Republic of Ireland, were invited to participate in an online questionnaire for this study. Of the 906 participants who started the survey, 719 participants (79.36 %) completed all items. Table 4 shows demographic information for these participants. There were more female (675; 93.9 %) than male participants (44; 6.1 %). There was a high proportion of foster carers (445; 61.9 %) and a smaller than expected number of both adoptive carers/parents (75; 10.4 %) and residential youth workers (95; 13.2 %). Approximately 66 % of participants (480) had three or more years of experience in providing care to youth with ACE. Approximately 80 % of participants (576) reported to be moderately (>13 h) or highly trained (>24 h) and moderately or highly knowledgeable in TIC practices, which indicated that 80 % of the participants reported to be well trained in TIC. Approximately 20 % of participants (143) reported to have low knowledge and completed low amounts of TIC training (<13h). A total of 87 participants (12.1 %) reported to be of First Nations heritage.

The participant demographic variables used for the Rasch analysis (Rasch, 1961) were gender, age, years of experience, type of care provided, extent of TIC training and perceived TIC knowledge, First Nations status, and country of residence. The Rasch analysis permits inclusion of only seven variables, so extent of TIC training and TIC knowledge were combined to create three categories: "low training and knowledge," "moderate training and knowledge," and "high training and knowledge" (see Table 1).

2.3. Online questionnaire

Participants were presented with the 61 candidate items and were asked to indicate their answer on a five-point scale in relation to two opposing anchoring points. The participants selected the option that corresponded with their TIC belief on parenting or caring for young people with a history of ACE. The participants then completed eight demographic items (see Table 1). The online questionnaire took approximately 20 min to complete and was comprised of the 61 candidate items and eight demographic items.

2.4. Procedure

Following approval from Charles Sturt University Human Research Ethics Committee (H20324), child welfare organizations, and online carer support groups were asked to distribute a brief description and a link to the survey via their communication channels (e.g., monthly newsletter or Facebook group page). A small incentive for participation was provided in the form of a chance to win one of four vouchers worth $40 (Australian). Participants were given clear information on the purpose of the study and were provided with an example item to ensure they understood the response format. Participants were informed that they could withdraw at any time, and incomplete item responses were interpreted as withdrawal of consent.

2.5. Data analyses

The Rasch analysis was computed using RUMM2030 (Andrich et al., 2009). A likelihood-ratio test was conducted prior to analysis to guide the decision on which polytomous model was most appropriate. Significant differences between response option thresholds across individual items were found; thus the unrestricted Partial Credit version of the Rasch model was used for the current data set (Tennant & Conaghan, 2007). We evaluated the Rasch model fit and psychometric properties of the TIBS-C using statistical parameters outlined by Tennant and Conaghan (2007). During each phase of Rasch analysis misfitting items were crossed checked with a table that ranked each candidate item level of importance to be included in the final scale. Each item was given a "1", "2" or "3" to indicate the level of need to be in the final Rach model. A "1" indicated that it was "essential", a "2" indicated that it was "important" and then a "3" indicated that it was "not essential" to be included in the final Rasch model. For example, if the candidate item was rated as a "3" and was a borderline fit, it was removed. Conversely, if an item was rated as a "1" and was a borderline fit, it was included. Note Table 3 presents the item-fit statistics for the first model (M1) with all 61 items; the item-fit statistics for each of the subsequent models can be provided upon request. Compliance of data to fundamental principles of measurement was assessed in terms of unidimensionality, invariance of subgroups (using differential item functioning [DIF]), and consistency in measurement unit across the continuum of the scale was established by developing ordinal-to-interval conversion tables (Hobart et al., 2007). For ease of interpretation of Rasch analysis terminology see Table 2 for definitions.

Table 4
Summary of overall Rasch model fit statistics.

Analyses	Item fit residual: *M* (*SD*)	Person fit residual *M* (*SD*)	Goodness of fit		PSI	Significant *t*-test (unidimensionality)	
			χ^2 (df)	*p*		%	Lower bound CI
M1 (initial 61 items)	0.88 (3.73)	−0.03 (1.39)	2213.97 (549)	<0.01	0.90	9.32	7.73
M2 (35 items)	0.61 (2.23)	−0.17 (1.30)	695.00 (315)	<0.01	0.84	6.68	5.08
M3 (four testlets)	−0.33 (1.07)	−0.40 (0.98)	57.39 (36)	<0.05	0.79	1.25	−0.34
*M4 (three testlets)	−1.02 (4.22)	−0.42 (0.87)	36.28 (27)	0.11	0.81	1.67	0.08

Note. *M4 indicates the final Rasch model of three testlets and 35 items.

Table 1
Summary of the relevant demographic data in percentages.

Demographic variable	N (%)
Gender	
Female	675 (93.9 %)
Male	44 (6.1 %)
Age	
Range	52 years
Mean	43 years
SD	10.7 years
Years of experience	
0–2 years	239 (33.2 %)
3–5 years	170 (23.6 %)
6–10 years	134 (18.6 %)
> 10 years	176 (24.5 %)
Type of current care provided	
Foster care	445 (61.9 %)
Kinship care	104 (14.5 %)
Residential care	95 (13.2 %)
Adoptive care	75 (10.4 %)
Training and knowledge	
Low training and knowledge	143 (19.9 %)
Moderate training and knowledge	353 (49.1 %
High training and knowledge	223 (31.0 %)
First Nations	
Yes	87 (12.1 %)
No	632 (87.9 %)
Country of residence	
Australia	285 (39.6 %)
UK	76 (10.6 %)
USA	314 (43.7 %)
Canada	27 (3.8 %)
Republic of Ireland	17 (2.4 %)

Table 2
Descriptions of procedures of Rasch analyses (Beehag et al., 2023).

Concept examined	Procedure description
Overall Rasch model fit	Overall Rasch model fit was evaluated by observing χ^2 statistics for item-trait interaction, item, and person fit residuals. The ideal fit is for the item-trait interaction to not be significant, and for standard deviations and means to be close to 1.00 and 0.00, respectively, for item and person fit residuals. When the χ^2 is significant, it indicates violation of the hierarchical order and difficulty of items across the construct or trait. Individual items fit residuals between −2.50 and +2.50 were considered as acceptable fit to the Rasch model.
Unidimensionality	Principal component analysis (PCA) of residuals was used to test unidimensionality. To evaluate whether there were any other associations between items, the PCA was used to exclude latent trait components. Unidimensionality was confirmed with <5 % of significant independent *t*-test comparisons.
Reliability	The Person Separation Index (PSI) is used to estimate the scale reliability with acceptable values of >0.70 for group comparisons and >0.85 for individual comparisons.
Targeting of item and persons	Targeting of item and persons allows for understanding how well the participants trait levels are covered by the measure, with means >0.00 indicating the participants are located at the higher level of the construct; and means <0.00 indicating the lower level of the construct.
Differential item functioning (DIF)	Each item was inspected for DIF. DIF examines invariance of items across demographic variables, such as age, sex, years of caring, etc. See below paragraph for a description of each of the demographic variables included in the evaluation. We explored real DIF (or significant DIF) and artificial DIF; the latter can occur because of exploring for DIF (Balalla et al., 2019).
Local dependency	Local dependency is where an item response is influenced by the participant's response on another item. Local dependency can be identified by residual correlations values that exceed the margin of 0.20 compared to the mean of residual correlations.
Testlets	When issues with DIF, ordering thresholds, or local dependency are identified testlet models are used. Testlets are created by grouping two or more related items to reduce the error variance while maintaining construct validity (Krägeloh et al., 2013).

3. Results

Model M1 is the initial baseline fit with the 61 candidate items. Item locations are shown in Table 3, indicating a substantial number of items with elevated fit indices (<2.50). The overall item-trait interaction for this Rasch model was significant ($\chi^2(549) = 2213.97$, $p < 0.001$), indicating a misfit to the Rasch model (see Table 3). There was also evidence contradicting the assumption of unidimensionality of the scale.

In iterative analyses, 26 misfitting items were deleted, resulting in Model M2 that contained a total of 35 items (see Table 4). Although chi-square was substantially reduced, the overall fit of this 35-item model was still significant ($\chi^2(315) = 695.00$, $p < 0.001$). While the lower bound confidence interval approximated the 5 % cut-off, it was still above this value so the model could not be

Table 3
Individual item-fit statistics for all items in the M1 model. Bold items indicate that the item was included in the final scale.

Item number	Category/item	Location	*SE*	FitResid	χ^2
Characteristic One: trauma-informed strategies to manage trauma symptoms					
1	It is: (a) important for the young person to stay in contact with their biological family, or (b) not important for the young person to stay in contact with their biological family	−0.73	0.04	4.55	31.04
2	When my young person is acting out or misbehaving: (a) I try to calm them down before talking to them about their consequences, or (b) I warn them of the consequences of misbehaving before trying to calm them down	−0.37	0.05	3.00	17.87
3	**When parenting or caring for young people with a trauma history:** (a) I focus on making them feel safe (e.g., lights on, lock doors, I act confident), or (b) I focus on addressing issues other than their feelings of safety	−0.08	0.06	0.20	15.67
4	When I attempt to talk to my young person about their bad decisions or behavior: (a) I can't avoid having long arguments with them, or (b) I don't get into an argument with them	−0.49	0.04	2.85	19.56
6	When a young person struggles with making and keeping relationships: (a) I let them figure out what social skills they need to work on, or (b) I help them to develop their social skills	−0.12	0.05	2.92	8.29
7	**Young people with trauma histories:** (a) need different behavior management strategies compared with young people without trauma histories, or (b) respond best to normal parenting strategies	0.15	0.06	−0.47	16.89
10	When my young person misbehaves: (a) I only give consequences that I know I can carry out, or (b) in the heat of the moment, I often give consequences that I cannot carry out	−0.06	0.05	1.95	7.78
11	In addition to what I can provide: (a) my young person requires support and treatment from various services and specialists to repair the impact of their trauma, so they do not maintain the same pattern of behaviors displayed by their parents, or (b) my young person does not need any specialist support or treatment, so they do not maintain the same pattern of behaviors displayed by their parents	−0.06	0.06	2.68	10.28
12	When parenting or caring for young people with a trauma history: (a) building a trusting relationship is important for them to heal their trauma, or (b) my relationship with them is not as important as them getting good treatment from specialists (e.g., psychologist)	0.13	0.07	2.29	11.68
14	When a young person is stressed: (a) I help them to consider other ways of handling stress (e.g., talking to me), or (b) I don't help them, as they need to learn for themselves	0.59	0.08	−3.62	36.37
20	The young person's immediate and extended family should: (a) not be involved in important decisions about the young person, or (b) continue to be involved in important decisions for the young person	−1.19	0.04	3.53	28.24
23	When my young person repeatedly misbehaves: (a) I never threaten them with leaving the placement, or (b) I threaten them that they will be leaving the placement	0.19	0.06	0.66	5.26
28	**When parenting or caring for young people with a trauma history:** (a) I prioritize building their social connections with family, friends, and the community, or (b) building their social connections with family, friends and the community is not a priority	0.01	0.05	−0.04	24.11
29	To help young people feel safe: (a) I work on setting up a structured routine and go with the flow when appropriate, or (b) I let them change their routine as they want, we just go with the flow of the day most of the time	−0.07	0.06	2.98	14.49
31	When my young person is struggling with their emotions: (a) I help them process their emotion and explore helpful ways of coping, or (b) I leave them alone, and let them learn for themselves	0.24	0.06	−3.28	53.09
33	**When my young person misbehaves:** (a) I never call them names, or (b) I often call them names	0.31	0.08	1.22	10.81
37	When I am struggling to manage my young person's behavior: (a) I feel comfortable to talk to my case worker or other supports to get help or (b) I do not to talk to my case worker or support options to get help	−0.86	0.04	5.13	41.88
38	I am the kind of carer: (a) who sets clear and consistent expectations on my young person's behavior, or (b) whose expectations depend on how I am feeling; I am generally inconsistent in my expectations of their behavior	0.17	0.06	−0.10	14.13
40	When parenting or caring for young people with trauma histories: (a) it's rare for me to think about the positives or how hard their life has been when they are stressing me out, or (b) no matter how difficult it is to care for the young person, I am always able to remind myself of the good things about them and how hard their life has been	−0.39	0.05	1.05	11.37
42	**It is:** (a) important that my young person connects with their cultural and/or religious background, or (b) not important to help my young person connect with their cultural and/or religious background	0.03	0.06	−0.83	19.44
45	**When parenting or caring for young people with trauma histories:** (a) one of the most important things to do is to make them feel safe, or (b) there are more important things to focus on other than making a young person feel safe	0.97	0.11	−1.99	42.17
49	When my young person misbehaves: (a) I use consequences as a last resort, or (b) I always threaten them with consequences	−0.47	0.05	1.55	8.83
50	**When the young person misbehaves:** (a) I'll ensure they know that I am disappointed for days, or (b) we talk about the bad decision and then move on with the routine and focus on the positives	0.16	0.06	−1.03	19.71
51	**It is:** (a) important for the young person to be able to express their opinions on important decisions about their life, or (b) irresponsible to let the young person influence big decisions about their life	0.41	0.07	−3.10	39.85
52	**When the young person misbehaves:** (a) I stay calm but talk firmly, or (b) I get angry and yell	−0.15	0.05	−1.67	22.44
54	**When parenting or caring for young people with trauma histories:** (a) I am prepared to work through the extremely good and bad times with my young person, or (b) if their behavior doesn't improve, they will have to move to a different placement	0.34	0.06	−0.14	23.44
55	Knowing the impact of trauma on young people: (a) helps me better understand their challenging behaviors, or (b) is not important, I just focus on teaching them right and wrong	0.60	0.08	−3.52	56.39

(*continued on next page*)

Table 3 (*continued*)

Item number	Category/item	Location	*SE*	FitResid	χ^2
56	Case conferences or collaborative meetings about my young person are: (a) a waste of time, or (b) helpful to get everyone's opinion on how we can best support my young person	−0.77	0.04	5.66	37.68
Characteristic Two: psychological impact of trauma					
8	**Young people with trauma histories:** (a) often have negative beliefs about themselves, or (b) rarely have negative beliefs about themselves	0.60	0.07	−2.46	37.47
16	**Young people with trauma histories:** (a) rarely have negative thoughts about their future, or (b) have more negative thoughts about their future than usual	−0.22	0.05	2.22	24.68
18	**Young people with trauma histories are:** (a) more likely to experience trauma in the future, or (b) not at a greater risk of experiencing trauma in the future	0.13	0.05	−0.16	11.29
22	Young people with trauma histories are: (a) often on alert for danger, or (b) often unconcerned about danger	−0.68	0.04	7.60	76.75
24	**Young people with trauma histories:** (a) are at increased risk for medical/physical health problems across their lifespan, or (b) have no increased risk of medical/physical health problems across their lifespan	0.29	0.06	0.19	17.46
32	**Young people with trauma histories:** (a) have difficulties communicating their thoughts, or (b) don't have any difficulties communicating their thoughts	0.49	0.06	−3.12	34.42
35	I believe: (a) that my young person's parents probably have a history of childhood trauma, or (b) it is unlikely that my young person's parents had a history of childhood trauma	−0.03	0.05	2.91	19.35
39	**Young people with trauma histories:** (a) often blame themselves for the bad things that have happened in their life, or (b) rarely blame themselves for the bad things that have happened in their life	0.07	0.06	−2.39	45.48
43	**Young people with trauma histories expect:** (a) others to let them down, or (b) others to always be there for them	0.46	0.06	−2.99	36.51
47	**Young people with trauma histories are: (a) more likely to have mental health conditions in adulthood, or (b) not at a greater risk of mental health conditions in adulthood**	0.74	0.07	−2.78	39.80
60	**Young people with trauma histories are:** (a) doing the best they can, or (b) could be doing much better if they tried harder	0.44	0.06	−2.97	37.81
Characteristic Two: behavioral impact of trauma					
9	**Young people with trauma histories are:** (a) often distant in their relationships with people, or (b) are seldom distant in their relationships with people	−0.02	0.05	0.31	11.87
13	**When parenting or caring for young people with a trauma history, I believe:** (a) trauma can impact young people in different ways, or (b) it generally impacts young people in the same way	0.52	0.08	1.67	13.17
15	Young people with trauma histories are: (a) not at a greater risk of developing drug and alcohol problems, or (b) are more likely to have drug and alcohol problems when they are older	−0.50	0.04	5.36	46.51
17	**Young people with trauma histories: (a) often have sleep difficulties (e.g., wake early, wake often, nightmares), or (b) have normal sleep patterns**	0.28	0.07	−1.20	20.50
21	**Young people with trauma histories are:** (a) often skilled in making new and long-lasting friendships, or (b) often not skilled at making new and long-lasting friendships	0.07	0.05	−0.14	16.41
25	**Young people with trauma histories:** (a) often overreact or get upset over small things, or (b) are no more likely to overreact or get upset over small things	−0.10	0.06	0.62	11.74
27	**Young people with trauma histories:** (a) often struggle to maintain relationships/friendships, or (b) have no difficulty maintaining relationships/friendships	0.32	0.06	−2.43	44.50
30	**Young people with trauma histories:** (a) often struggle to think before they act, or (b) always think before they act	0.58	0.07	−2.52	26.25
41	**Young people with trauma histories:** (a) often have difficulty controlling their emotions, or (b) know how to control their emotions, they just choose not to	0.64	0.08	−3.90	52.26
46	**I believe that:** (a) there is an increased risk of my young person engaging in similar behaviors to those of their biological parents at some stage of their life, or (b) there is no increased risk of my young person engaging in similar behaviors to those of their parents at some stage of their life	0.08	0.06	0.80	2.12
57	**I believe that:** (a) the young person's trauma has resulted in them not always being in control of their thoughts, decisions, and behavior, or (b) the young person is always in control of their thoughts, decisions, and behavior, they just choose not to do the right thing	0.45	0.07	−3.31	60.98
Characteristic Three: carer self-care and self-reflection					
5	How I parent or care for young people with trauma histories is: (a) likely to be affected by my own stress levels, or (b) unlikely to be affected by my stress levels	−1.08	0.04	16.92	463.97
19	When I am feeling stressed: (a) I know what I need to do to ensure my ability to parent or provide care is not impacted, or (b) it's hard to do anything about it, as the young person needs me	−1.12	0.04	6.16	40.22
26	**When I am having a difficult conversation with my young person:** (a) I am aware of my tone of voice and body language, or (b) I do not think about my tone of voice or body language	0.40	0.06	−2.84	33.15
34	When parenting or caring for young people with trauma histories: (a) carers are unlikely to develop similar trauma symptoms, or (b) it may result in carers developing similar trauma symptoms (e.g., disrupted sleep, flashbacks)	−1.03	0.04	10.65	170.47
36	Parenting or caring for young people with trauma histories is: (a) potentially very stressful, or (b) no more stressful than parenting young people without trauma histories	−0.20	0.06	4.75	27.68

(*continued on next page*)

Table 3 (*continued*)

Item number	Category/item	Location	*SE*	FitResid	χ^2
44	**When parenting or caring for young people with trauma histories it's:** (a) important to schedule enjoyable activities for myself, or (b) not important to schedule enjoyable activities for myself	−0.11	0.05	1.38	11.55
48	Parenting or caring for young people with trauma histories can: (a) traumatize carers, or (b) rarely traumatizes carers	0.02	0.05	3.95	24.50
53	**When my young person is stressing me out I:** (a) focus on calming myself down, or (b) don't focus on calming myself down	−0.26	0.05	−1.12	40.09
58	**I believe after managing incidents or escalations with my young person:** (a) it's important to reflect on what I did well and what things I could have done better, or (b) it's important to move on and not think about it again	0.20	0.07	0.84	23.23
59	**I believe that either:** (a) I have the abilities and skills to be a great carer, or (b) I don't have the abilities and skills to be a great carer	−0.19	0.05	0.52	11.47
61	**When I am I feeling stressed, I believe that:** (a) it's important to stand back and think of ways I could change to improve my relationship with my young person, or (b) it's important for the young person to change their behavior for our relationship to improve	0.27	0.06	−1.25	31.56

considered unidimensional.

The authors agreed that these were the best 35 items that maintained internal construct validity, and no further items were to be removed. Subsequent analyses thus explored to what extent misfit may be due to local dependency. To test this possibility, four testlets were created that were informed by TIC theory; testlet one: trauma-informed for carers to manage trauma symptoms (item numbers: 3, 7, 28, 33, 42, 45, 50, 51, 52, 54); testlet two (a): impact of trauma: psychological (items: 8, 16, 18, 24, 32, 39, 43, 47, 60); testlet two (b) impact of trauma: behavioral (items: 9, 13, 17, 21, 25, 27, 30, 41, 46, 57); and testlet three: carer self-care and self-reflection (Items: 26, 44, 53, 58, 59, 61) and also guided by inspection of fit residuals. Even though multidimensionality issues were now resolved, and the fit of this Model M3 was improved compared to the previous model (i.e., Model M2), the item-trait interaction was still significant (Table 4).

In the final step of the analysis, testlets one and two (b) were combined in Model M4 based on inspection of person-item residual correlations (0.53). Theoretically, testlets one and two (b) are related with the former focusing on trauma-informed strategies to manage trauma symptoms (e.g., aggression) and testlet two (b) focusing on the behavioral implications of trauma on the young person (e.g., young people are distant in their relationships due to harsh discipline from their father). The final item-trait analysis for the overall Rasch model fit for the final 35 items and 3 testlets, demonstrated a good to excellent overall fit for the Rasch model and the chi square was no longer significant ($\chi^2(27) = 36.28$, $p > 0.05$). Moreover, the model can also be considered unidimensional. The Person Separation Index (PSI), which is analogous to the internal consistency index coefficient alpha, was 0.81 (Fig. 2).

Finally, no evidence of differential item functioning (DIF) from demographic variables (i.e., gender, country of residence, etc.) was observed.

Fig. 1 above shows the person-item thresholds distribution for the final 35 items. It provides visualization of how well TIC beliefs are measured by the thresholds of individual items. The upper graph in Fig. 1 provides the distribution of the participants on each item, and the lower graph illustrates the frequency of item distribution thresholds (Tennant & Conaghan, 2007). The combination of both graphs in Fig. 1 shows that the participant mean is lower than the item mean, indicating that more people reported favorable TIC beliefs. A high number of items were regarded as difficult, which is demonstrated by the lower graph with fewer people above (to the

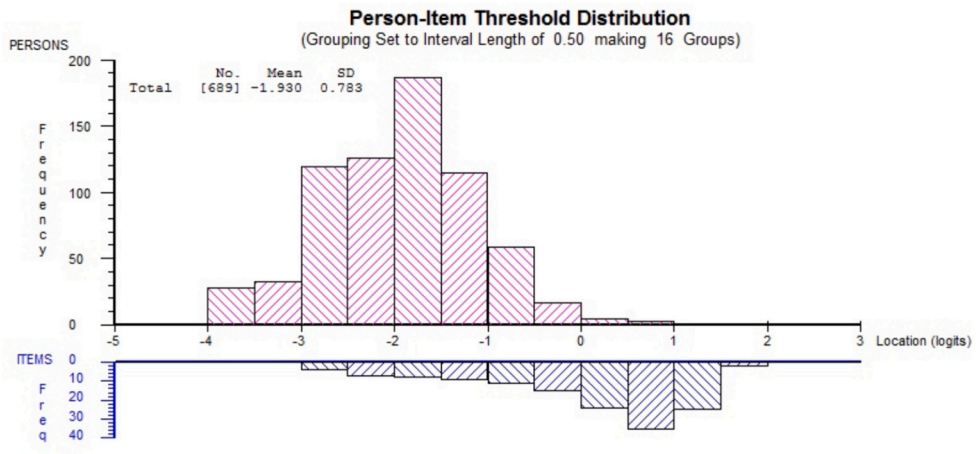

Fig. 2. Person-item threshold distributions for the 35-item TIC belief scale-comprehensive (TIBS-C) scale.
Note. Results are shown in logit units.

right of the figure). This indicates that the TIBS-C covers more difficult items compared to easier items, demonstrated by the higher number of people on the items with lower thresholds (to the left of the figure). Taken together, the TIBS-C is more accurate at differentiating between individuals at the lower end of the scale (i.e., with less favorable beliefs) than in differentiating between individuals at the higher end of the scale (i.e., with more favorable beliefs). The distribution is close to normal, and item thresholds cover over 95 % of the sample. The targeting was not perfect as indicated by the person mean being slightly elevated compared to the item mean. However, there were no significant ceiling or floor effects with 95 % of the sample perfectly covered by item thresholds.

As a final step in the present Rasch analysis, conversion algorithms were generated to permit the transformation of ordinal-scale summary scores to interval-level data. Instructions for scoring conversion are provided in Table 5. Note that this conversion can only be conducted for respondents with no missing data. The authors can be contacted for assistance with this conversion.

4. Discussion

TIC practices continue to be a requirement for accreditation of child welfare providers across the developed world (Middleton et al., 2019). TIC literature demonstrates TIC to be beneficial for young people, carers, and staff in child welfare (Bailey et al., 2019; Bunting et al., 2019). The quality of the studies appears to be limited by a range of contextual issues (i.e., transience, high attrition rates and under resourced), and an absence of psychometrically sound scales to measure carer adherence to TIC principles (Bailey et al., 2019;

Table 5
Converting from ordinal- to interval-level scores for the 35-Item TIBS-C.

Ordinal scores	Interval		Ordinal	Interval		Ordinal	Interval	
	Logits	Scale	scores	Logits	Scale	scores	Logits	Scale
35	−4.07	35.00	82	−0.22	116.47	129	0.76	137.01
36	−3.50	47.02	83	−0.18	117.21	130	0.77	137.28
37	−3.15	54.57	84	−0.15	117.91	131	0.78	137.54
38	−2.92	59.30	85	−0.11	118.61	132	0.79	137.77
39	−2.76	62.81	86	−0.08	119.30	133	0.81	138.02
40	−2.62	65.64	87	−0.05	119.96	134	0.82	138.28
41	−2.51	68.05	88	−0.02	120.61	135	0.83	138.51
42	−2.41	70.18	89	0.01	121.25	136	0.84	138.74
43	−2.31	72.12	90	0.04	121.86	137	0.85	138.98
44	−2.23	73.96	91	0.07	122.45	138	0.86	139.21
45	−2.15	75.67	92	0.10	123.04	139	0.87	139.44
46	−2.07	77.30	93	0.12	123.61	140	0.88	139.65
47	−2.00	78.84	94	0.15	124.16	141	0.89	139.90
48	−1.92	80.36	95	0.17	124.69	142	0.91	140.16
49	−1.86	81.80	96	0.20	125.22	143	0.92	140.39
50	−1.79	83.22	97	0.22	125.73	144	0.93	140.62
51	−1.72	84.59	98	0.25	126.23	145	0.94	140.88
52	−1.66	85.92	99	0.27	126.72	146	0.95	141.11
53	−1.60	87.23	100	0.29	127.19	147	0.96	141.36
54	−1.54	88.52	101	0.31	127.65	148	0.98	141.62
55	−1.48	89.77	102	0.34	128.09	149	0.99	141.89
56	−1.42	91.01	103	0.36	128.52	150	1.00	142.17
57	−1.36	92.22	104	0.38	128.94	151	1.02	142.46
58	−1.31	93.40	105	0.40	129.36	152	1.03	142.76
59	−1.25	94.58	106	0.41	129.74	153	1.04	143.07
60	−1.20	95.72	107	0.43	130.14	154	1.06	143.41
61	−1.14	96.87	108	0.45	130.52	155	1.08	143.77
62	−1.09	97.99	109	0.47	130.90	156	1.09	144.13
63	−1.04	99.08	110	0.49	131.26	157	1.11	144.53
64	−0.99	100.16	111	0.50	131.62	158	1.13	144.95
65	−0.94	101.22	112	0.52	131.96	159	1.15	145.40
66	−0.89	102.27	113	0.53	132.30	160	1.18	145.88
67	−0.84	103.29	114	0.55	132.64	161	1.20	146.39
68	−0.79	104.30	115	0.57	132.95	162	1.23	146.94
69	−0.74	105.30	116	0.58	133.27	163	1.26	147.53
70	−0.70	106.27	117	0.60	133.59	164	1.29	148.17
71	−0.65	107.22	118	0.61	133.90	165	1.32	148.86
72	−0.61	108.15	119	0.63	134.22	166	1.35	149.62
73	−0.57	109.06	120	0.64	134.52	167	1.39	150.47
74	−0.52	109.97	121	0.65	134.81	168	1.44	151.42
75	−0.48	110.83	122	0.67	135.11	169	1.49	152.52
76	−0.44	111.70	123	0.68	135.38	170	1.55	153.83
77	−0.40	112.54	124	0.69	135.68	171	1.63	155.43
78	−0.36	113.37	125	0.71	135.95	172	1.73	157.53
79	−0.32	114.17	126	0.72	136.23	173	1.87	160.53
80	−0.29	114.95	127	0.73	136.48	174	2.12	165.79
81	−0.25	115.71	128	0.75	136.76	175	2.56	175.00

Baker et al., 2016). The main goal of the current study was to address this gap by developing a theoretically comprehensive and psychometrically sound scale to measure carers beliefs on TIC practices. The results of the Rasch analyses indicate that this final version of the Trauma-Informed Care Beliefs Scale-Comprehensive (TIBS-C) has good fit, unidimensionality, reasonable targeting, and sound internal consistency. The final model includes a comprehensive number of items from the three key characteristics of carer-related TIC practices, i.e., carer beliefs on trauma-informed strategies to manage trauma symptoms, carer beliefs on the psychological and behavioral impact of ACE on young people, and carer beliefs on the importance of self-care and self-reflection. The final 35 item TIBS-C is a psychometrically and theoretically sound measure.

In reaching this final 35 item version of the TIBS-C, 36 misfitting items were deleted. Statistically, the misfitting items did not contribute to the Rasch model, possibly because they do not measure TIC practices. Review of the 36 deleted items (see Table 3) indicates that they may not have been specific to TIC principles. For example, item 38 refers to whether the participant believes in setting clear and consistent boundaries for their young person, which is a common parent belief, and not exclusive to TIC (Koome et al., 2012). Similarly, item 10, which refers to whether the participant provides only potential consequences they can follow through with, is helpful for young people with ACE but is not exclusive to TIC (Koome et al., 2012). While items specific to carer-related TIC principles were deleted, the final 35 items were considered sufficiently comprehensive in covering the carer-related core TIC constructs. Further, 12 of the 13 items from the TIBS-B questionnaire were included in the final 35 items providing further corroborative evidence for the internal construct validity of the TIBS-C and TIBS-B (Beehag et al., 2023). The TIBS-C showed no evidence of DIF, indicating that this measure performed consistently independent of carer age. In other words, carers understand, interpret, and respond to the items of the TIBS-C in a similar manner regardless of their age or country of residence. The TIBS-C has been shown to be unidimensional (supporting the validity of summed total score) with excellent reliability. The TIBS-C also differentiated between test-takers at the low-end of the scale (i.e., to identify individuals with low levels of TIC beliefs who warrant further investigation for training and/or support). The ordinal-to-interval conversion of the TIBS-C scores provides further precision to the scoring and analyses of the data obtained from this measure.

The final 35 items of the TIBS-C covered the three care-related TIC constructs. First, there are 10 items on beliefs on *trauma-informed strategies to manage trauma symptoms* (item numbers: 3, 7, 28, 33, 42, 45, 50, 51, 52, 54), which includes strategies that focus on the importance of the relationship between the young person and carer and with other members of the community, the need to make the young person feel psychologically and physically safe, and items on the importance of coregulating conflict when the young person is in an emotional state (Jonkman et al., 2017; Kramer et al., 2013). The theory of these items is included across various TIC models with growing empirical support, including the Neurosequential Model of Therapeutics (Cox et al., 2021; Perry, 2009) and Trust Based Relational Intervention (Razuri et al., 2016). The theoretical foundations of most TIC models are based on increasing the quality of relationships with young people who have experienced ACE, making them feel safe, and strategies to manage their trauma symptoms (Brown et al., 2012; Fisher & Gilliam, 2012; García-Martín et al., 2015).

Second, the TIBS-C examines the impact of trauma on young people. There were nine items on the *psychological impact of trauma* (items: 8, 16, 18, 24, 32, 39, 43, 47, 60) and 10 items on the *behavioral impact of trauma* (Items: 9, 13, 17, 21, 25, 27, 30, 41, 46, 57). Every TIC model provides education on the impact of trauma (ACE) in terms of immediate impact (e.g., emotion dysregulation, relationship difficulties, negative sense of self) and long-term implications (e.g., increased risk of trauma, poor educational outcomes, homelessness; Arvidson et al., 2011; Crawley et al., 2021). It is postulated that by understanding the impact of trauma, it informs the specific TIC strategies to be implemented (Cox et al., 2021). For example, if a young person was physically abused by their father, the behavioral and social manifestation may be that the young person does not trust males; it would be important to provide the young person with a positive experience of trusting a male authority figure who does not abuse them. A total of 19 items were included in the final version of the scale that comprehensively covered the psychological and biological impact of trauma on young people.

The TIBS-C also examines beliefs on *carer self-awareness and self-care* (Items: 26, 44, 53, 58, 59, 61), which includes six items that explore participant perceptions of self-efficacy as a carer, beliefs on self-reflecting on the TIC strategies they use, and beliefs on the importance of self-care (e.g., plan enjoyable activities for themselves to reduce vicarious trauma; García-Martín et al., 2015). These carer-specific, self-reflective, and self-care strategies are integral for several TIC models, and qualitative studies with carers indicate that healthy self-care and self-efficacy are imperative to prevent vicarious trauma and compassion fatigue (e.g., Conners-Burrow et al., 2013; García-Martín et al., 2015; Izzo et al., 2020). Nevertheless, very few studies have explored the benefits of favorable beliefs on carer self-care and self-reflective functioning with child welfare carers (Beehag, 2023). Future studies could consider using the TIBS-C to assess the benefits of favorable self-care and self-reflective functioning on carer longevity, compassion fatigue, or trauma symptom reduction with young people.

One item (item 46) on inter-generational trauma was included in the TIBS-C. Inter-generational trauma in child welfare, which refers to transmission of trauma from one generation to the next generation, has received more empirical attention over recent years (Marshall et al., 2011). It is acknowledged that children of parents who were raised in child welfare settings are at risk of also being raised in child welfare (Marshall et al., 2011). There is literature suggesting that trauma can be transmitted within parental DNA (Moore et al., 2022). A recent study found that offspring of parents with PTSD are at increased risk of suffering from chronic pain and/or major psychiatric disorder (Li et al., 2022). The inclusion of this item is a point of difference to comparable TIC beliefs scales, such as the ARTIC (Baker et al., 2016). The inter-generational item assesses carer beliefs about the risk of their young person engaging in similar behaviors to their biological parent at some stage of their life. Further, child welfare outcomes indicate that a high proportion of young people in child welfare leave care prematurely, develop substance use addictions, become homeless, or become involved in the criminal justice system (Courtney & Dworsky, 2006). Consequently, ensuring carers are aware of the long-term commitment and the awareness of risks required for their young person to recover from their ACE is considered critical (García-Martín et al., 2015).

In addition to the psychometric properties of the TIBS-C, there are several strengths of its design. The TIBS-C achieved its aim of

being theoretically more comprehensive than the TIBS-B (Beehag et al., 2023) with the final 35 items covering essential carer-related TIC constructs (e.g., measures carer beliefs on trauma-informed strategies to manage trauma symptoms, the impact of ACE on young people, and the importance of self-care and self-reflection). The current study addressed the limitations presented in the development of the TIBS-B. This included revising the wording of the items, the inclusion of reverse coded items, and revision of the response format. The large sample size of carers from the US, UK, Canada, and Australia provides support for the questionnaire to be used across these countries. All types of child welfare carers were included in the study; therefore, the questionnaire can be used across all types of child welfare care placements (e.g., foster care, adoptive care, residential care). An Australian First Nation child welfare practitioner edited and approved the wording of all items. This is important, as there is a high proportion of young people with First Nations heritage living in child welfare (Chartier et al., 2020). Further, there was a higher-than-expected number of carers who reported First Nations heritage, which adds validity for the questionnaire to be used with First Nations carers.

4.1. Implications for research and practice

The TIBS-C is considered an efficient yet comprehensive measure of carer TIC beliefs, with the average time to complete the final items requiring <10 min. There are several applications for the TIBS-C. It can be used by researchers to track changes in TIC beliefs following training or intervention. It may provide an effective measure for researchers to understand unsuccessful implementation of TIC practices; particularly as parenting and teacher beliefs can be resistant to change despite training and increased knowledge (Azar et al., 2005; Tillema, 1995). This measure can be used to identify carers with less favorable TIC beliefs based on their overall score, as well as by reviewing responses to individual items. The total score and responses to individual items may assist clinicians and agencies in identifying the level of TIC training needed, and the specific beliefs that need to be addressed in training sessions. Child welfare agencies may use the TIBS-C to ensure young people with severe trauma symptomatology are placed with carers who have sufficient understanding of TIC, as well as favorable TIC beliefs. Ultimately, the end benefit of the questionnaire is to help create trauma-informed placements for young people with histories of ACE.

4.2. Limitations and future directions

A few limitations of the current study need to be considered. Due to the recruitment method of inviting current carers who are part of online support groups, the current sample is likely to include individuals with a particular interest in TIC and ACE. The majority of the participants were female and reported having at least moderate TIC knowledge. The scale was designed to be used across all types of carers in child welfare; however, there was a smaller proportion of residential care youth workers (13.2 %). The study did not collect information from participants on which TIC models they had been trained in (i.e., NMT, NCTSN, TBRI, etc.). Future studies should consider other ways to recruit participants with more varied TIC knowledge, more participants from residential care, more males, and should ensure information is gathered on which TIC models the participants have been trained on. Finally, the scale is a self-report scale and people do not always behave congruently with their beliefs and attitudes (Forestier et al., 2020). The addition of open-ended responses should be considered to better understand whether carers behave congruently with their reported TIC beliefs. Open-ended items may focus on understanding carer attachment style. Open-ended items could explore what behaviors the carer is utilizing to help their young person develop a secure attachment style with them, which should provide an understanding of their application of TIC knowledge. Future studies are needed to both replicate the findings of the current study, and further evaluate predictive validity, test-retest reliability and clinical utility of the final 35 items. Moreover, further studies are needed to explore the suitability and validity of the TIBS-C with different First Nations peoples and communities.

5. Conclusion

The overall results support the aim of the study to develop a psychometrically robust scale that comprehensively assesses child welfare carer TIC beliefs. It will help in ensuring TIC training or intervention is provided to in-need carers, to create trauma-informed environments for young people with ACE. The 35 items cover the key aspects of carer-related TIC theory and provide a particularly useful way of identifying carers with less favorable beliefs who require intervention. The TIBS-C addresses the gap of limited TIC psychometric scales and will assist in transitioning the field of TIC into a more data driven sector to inform decisions in both practice and research. The TIBS-C continues to support its remit of working towards ensuring young people with ACE are assigned to trauma-informed placements. The TIBS-C is user friendly, comprehensive yet efficient, and accurate at identifying the less favorable TIC beliefs that require intervention.

CRediT authorship contribution statement

Nathan Beehag: Writing – original draft, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Rachel Dryer:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Andrew McGrath:** Writing – review & editing, Supervision, Methodology, Formal analysis, Conceptualization. **Chris Krägeloh:** Formal analysis, Data curation. **Oleg Medvedev:** Formal analysis, Data curation.

Declaration of competing interest

There are no competing interests to declare.

Data availability

Data will be made available on request.

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