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ORIGINAL PAPER

Internalizing and Externalizing Symptoms Moderate Treatment Response to School-Based Trauma and Grief Component Therapy for Adolescents

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Abstract Internalizing and externalizing problems commonly co-occur with adolescent post-traumatic stress and grief reactions. However, little is known about whether these co-occurring symptoms moderate adolescents' response to sequenced components of trauma- and grief-focused interventions. Forty-four middle school students (aged 12–14) rated their self-identified Top Problem during a 17-week flexibly tailored course of Trauma and Grief Component Therapy for Adolescents (TGCTA), a group-based treatment for traumatized and bereaved youth. Baseline internalizing and externalizing symptoms were examined as potential moderators of adolescents' response to skills-building (Module I), narrative-sharing (Modules II and III), and developmental progression (Module IV) phases of intervention. Piecewise analyses of change during the three treatment phases indicated that adolescents with more internalizing symptoms showed significantly less improvement during the skills-building phase and significantly more improvement during the narrative construction phase. Findings provide preliminary evidence that: (a) traumatized and bereaved adolescents show different trajectories of response to different TGCTA components as a function of internalizing versus externalizing baseline symptoms and (b) assessing self-nominated problems and broad-spectrum internalizing and externalizing symptoms can guide trauma- and bereavement-informed treatment planning and monitoring.

Keywords Post-traumatic stress disorder · Grief · Adolescent group treatment · Externalizing symptoms · Internalizing symptoms

Introduction

Students attending schools in economically disadvantaged communities are frequently exposed to co-occurring traumatic events and the deaths of loved ones, both of which can adversely affect their psychological wellbeing and school functioning (e.g., Dyregrov, 2004; Kaplow, Saunders, Angold, & Costello, 2010). The school-based approach to mental health that emerged in the 1990s represented an important advance in reaching disadvantaged students who had not been traditionally well served by the community mental health system (Weist et al., 2014). This approach incorporates evidence-based interventions that allow treatment providers greater flexibility in adapting treatments for implementation in school settings (Chorpita & Daleiden, 2014). However, evaluating the effectiveness of potential interventions for use in schools poses significant challenges. Although treating students for clinical syndromes carries value, treatment evaluations often fail to assess students' perceptions of their problems and the degree to which treatment successfully addresses those

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problems. Treatment planning may be further complicated when students present with co-occurring internalizing or externalizing symptoms. In the current study, we used students' ratings of their self-nominated Top Problem to evaluate Trauma and Grief Component Therapy for Adolescents (TGCTA; Saltzman et al., 2016), a school-based group treatment that specifically targets post-traumatic stress (PTS) and maladaptive grief (MG) reactions. We then tested whether baseline internalizing and externalizing symptoms moderated students' responses to different modularized components of the 17-week treatment.

Previous studies have demonstrated the effectiveness of TGCTA in reducing PTS and MG reactions among adolescents (Layne et al., 2001, 2008; Saltzman, Pynoos, Layne, Steinberg, & Aisenberg, 2001). More recently, data from a prior study of the same school-based TGCTA implementation examined in the current study also demonstrated significant pre- to post-treatment reductions in both PTS and MG reactions, producing a 61% rate of reliable change as well as significant linear declines in symptoms over the course of treatment (Grassetti et al., 2015). TGCTA is designed to address the needs of a heterogeneous group of students by targeting both PTS and MG reactions—two related yet distinct conditions (Goenjian et al., 2009; Laor et al., 2002; McClatchey &Vonk, 2005; O'Connor, Lasgaard, Shevlin, & Guldin, 2010). As a result, TGCTA is well suited for disadvantaged communities where trauma and loss are both prevalent and where local schools lack resources to individually tailor treatments for every student in need of mental health services (Lyon et al., 2014). The treatment is designed to address both PTS and MG reactions and the complex interplay of symptoms that can complicate efforts to recover from either condition (Pynoos, 1992). The therapeutic focus on trauma and bereavement derives from the observation that PTS and MG reactions often occur and co-occur within the broader context of accumulating risk factors (e.g., life threatening accidents and physical injury) (Pynoos et al., 2014). These major life adversities not only underscore the need for effective mental health services for at-risk youth (Layne et al., 2014), but also create therapeutic opportunities to foster cohesion-building member-to-member exchanges among group members who share common life experiences and treatment goals (Davies, Burlingame, & Layne, 2006).

Despite evidence of the general effectiveness of TGCTA in reducing PTS and MG symptoms (Layne et al., 2001; Saltzman et al., 2001), there is a need to identify potential moderators of treatment response. Knowledge of moderators can guide efforts to assess, conceptualize, and treat youth with PTSD reactions, MG reactions, or both. However, the traditional focus of treatment outcome research on symptom reduction *per se* (using standardized *nomothetic* assessments) restricts analyses to subgroups of students with elevated MG or PTS reactions. Conversely, the use of adolescents' self-identified Top Problems provides an alternative measure of treatment response for both traumatized and bereaved youth (Weisz et al., 2011). This *idiographic* approach complements nomothetic methods by adding unique person-centered specificity in formulating treatment objectives and evaluating treatment outcomes, and client-guided assessment tools can strengthen the therapeutic alliance by monitoring progress on treatment goals that are a priority for the adolescent (Christon, McLeod, & Jensen-Doss, 2015; Weisz et al., 2011). The Top Problem idiographic approach also used a brief measure that reduces burdens associated with frequent (i.e., weekly) assessments and can be used to map trajectories of change in response to different treatment components.

Internalizing and Externalizing Symptoms as Moderators of Response to TGCTA Components

The implementation of TGCTA in the current study is a modularized, multicomponent group treatment for adolescents who report moderate to severe levels of PTS and/or MG reactions (Layne et al., 2008; Saltzman et al., 2016). Module I practice elements include psychoeducation; emotion regulation, problem-solving, and social support skills training; and activities to strengthen group cohesion. Module II focuses on reducing PTS reactions through constructing a trauma narrative, therapeutically exploring worst moments, and clarifying links between traumatic experiences and trauma reminders. Module III focuses on reducing MG reactions through psychoeducation, clarifying links between losses and loss reminders, and processing intense emotions surrounding loss (e.g., sadness, anger, guilt, despair) (Layne et al., 2014). Module IV focuses on consolidating treatment gains, problem-solving current adversities, prosocial engagement, and adopting a future orientation (Layne et al., 2008; Saltzman et al., 2006, 2016). However, little is currently known about factors that may potentially influence adolescents' responses to specific modules or phases of TGCTA.

Consistent with a search for potential moderators, it is possible that adolescents' responses to these components may vary as a function of co-occurring internalizing and externalizing problems. In particular, youth with co-occurring *externalizing problems* (i.e., ADHD symptoms, aggression, and risk-taking behaviors) may have difficulty attending to treatment components that involve affective sharing, and thus show poorer overall treatment response. Youth who exhibit externalizing behaviors may engage in such behaviors to avoid distressing trauma- or grief-related thoughts and feelings (Cole-Detke & Kobak, 1996; Grant et al., 2005). Drawing on the literature linking trauma

exposure to aggressive behavior, Kerig and Becker (2010) posit that some youth may manifest PTSD symptoms as heightened aggression, anger, and irritability. Although further treatment-based study in this regard is necessary, it may be that youth who show increased externalizing behaviors have particular difficulty engaging in the narrative construction phase, which requires acknowledgment of, exposure to, and sharing of difficult experiences (Kobak, Zajac, Herres, & Krauthamer-Ewing, 2015; Saltzman et al., 2016).

In contrast, youth with co-occurring *internalizing* symptoms may better attend to treatment components, allowing them to use the coping skills they acquire early in treatment to manage their distress and engage more productively in subsequent narrative phases. Youth with internalizing symptoms may also respond better to narrative work in group settings given their greater capacity to adhere to group norms, make appropriate disclosures, and exchange support (Davies et al., 2006; Dodge, 1986). Despite the possibility that youth with co-occurring internalizing or externalizing symptoms may cope with their trauma- or loss-related distress in different ways, little is known about how these broader symptom profiles predict, and potentially contribute to, adolescents' responses to TGCTA. Even less is known about whether co-occurring internalizing and externalizing symptoms may moderate adolescents' responses to the psychoeducation and skills-building, versus narrative construction, components of trauma- and loss-focused treatment.

The Current Study

In summary, more research is needed on how co-occurring internalizing or externalizing symptoms relate to, predict, and potentially influence youth's response to specific phases and associated components of TCGT-A. Accordingly, this study used adolescents' weekly ratings of distress associated with their self-identified Top Problem to address two primary aims. Our first aim was to examine piecewise rates of change in adolescents' ratings of their Top Problem across three phases of TGCTA. The *Piece I* phase was comprised of Module I (foundational skills-building) components; *Piece II* was comprised of narrating and working through trauma (Module II) or loss events (Module III) narrative-sharing components; and *Piece III* was comprised of Module IV (consolidating therapeutic gains, promoting developmental progression) components. Our second aim was to evaluate pre-treatment internalizing and externalizing symptoms as potential moderators of youths' responses to each of the three treatment phases. Overall, we expected that all youth would experience a decline in their Top Problem ratings across each phase of treatment. However, we hypothesized that youth with co-occurring internalizing symptoms would show *more* benefits from TGCTA (steeper declines in symptoms) across each phase of treatment, whereas youth with predominantly co-occurring externalizing symptoms would show less benefit from the narrative-sharing phase of treatment.

Methods

Participants

Participants included 44 seventh- and eighth-grade students from three middle schools who participated in an open trial of TGCTA (Grassetti et al., 2015). The University of Delaware Institutional Review Board approved the study procedures, and study participants were treated in accordance with ethical standards. The schools were located within a socioeconomically disadvantaged school district. School demographics indicated that (averaged across the three middle schools) a substantial portion of the combined student body received free or reduced-price lunch (61.03%) and were African American (43.97%). Teachers or counselors referred 89 students to be screened for PTS and MG reactions in October/November. Of these, 65 students (73%) who met the initial selection criterion for PTS (an overall score greater than or equal to 30 on the UCLA-RI) or MG reactions (a score of 2 or above on at least one grief item) were then referred for a follow-up interview in November/December to identify whether there was a significant traumatic or loss event. If such an event was identified, each student was guided in selecting an event as a focus for the narrative phase of treatment (Saltzman e al., 2016). Forty-four (67.7%) of the 65 students interviewed began treatment in January. Of the 21 students who were individually interviewed and did not begin the group, eight were excluded due to lack of a significant trauma or loss event on which to focus their narrative (i.e., students reported PTS and MG symptoms but did not identify a related event), six expressed reluctance at receiving treatment in a group context, three did not receive parental consent for treatment, two moved to different schools, one was already receiving trauma treatment elsewhere, and one was referred to a higher tier of care due to safety risks (see Layne et al., 2008).

Of the students who began treatment, 44% chose a predominately trauma-focused narrative (e.g., experienced a medical emergency) and 56% chose a predominately loss-focused narrative (e.g., death of mother to cancer). For students whose narrative focus contained both trauma and loss components (e.g., losing a loved one due to a violent homicide), therapists guided students in constructing a narrative that reflected their more salient distress reactions

(PTS or MG). Students' mean age was 13.43 years (SD = 0.78). Fifty-six percent self-identified as non-Latino White, 29% identified as African American, and 15% identified as Hispanic/Latino. Out of 17 sessions, students attended an average of 12.58 sessions (SD = 4.58). Over the course of treatment, 11 students dropped out of therapy (one student was expelled from school and ten students no longer wished to participate) and 33 completed treatment.

The 25% attrition rate of youth who began treatment is comparable to that of trauma treatment studies with similar populations in clinical outpatient contexts (e.g., Cohen, Mannarino, & Iyengar, 2011). However, other youth trauma interventions have shown decreased rates of attrition as well as increased initial intervention uptake (i.e., rate of initiating treatment after randomization). For instance, Jaycox et al. (2010) report a substantially higher rate of uptake (98%) and a lower rate of attrition (9%) for children randomized to receive trauma-focused intervention in schools following Hurricane Katrina.

Dependent Measure

Top Problem

In a baseline-screening interview, participants were asked to identify the top three problems for which help is currently needed (Weisz et al., 2011) and then rank each problem on an 11-point scale ranging from 0 (*not at all a problem*) to 10 (*a huge problem*). Participants again rated the weekly severity of those problems at the start of each therapy session. The Top Problem identified by students in this sample ranged from concerns about family health, school performance, and youths' own symptoms and functioning. Weisz et al. (2011) report good test–retest reliability, convergent and discriminant validity, slope reliability, sensitivity to change, and incremental validity in describing youth change trajectories over and above symptom-based measures.

To give a sense of the different types of problems the students self-identified, we categorized participants' Top Problem into one of six categories: *worry/anxiety* (n = 10; e.g., worries about mother's health), *problems with caregivers* (n = 3; e.g., fighting with father), *peer problems* (n = 4; e.g., fighting with other kids at school), *academic problems* (n = 3; e.g., trouble concentrating in school), *loss/grief* (n = 15; missing mother), and *PTS symptoms* (n = 5; bad memories of the past). Two students' Top Problem (negative self-referential thoughts, health problems) did not clearly fit into any category. Approximately 55% of the students identified a Top Problem associated with their chosen narrative topic (e.g., Top Problem was missing their mother; the subsequent narrative focused on loss of mother to cancer). Even when the Top Problem did not explicitly refer to students' trauma or loss narratives, many Top Problems referred to symptoms or associated features of PTS and MG (e.g., worry, difficulty concentrating). The dependent variable was the rating of the participants' Top Problem.

Baseline Internalizing and Externalizing Problem Measures

Brief Problem Checklist

The Brief Problem Checklist (BPC; Chorpita et al., 2010), measured at baseline and at the start of the first session, is a 12-item measure of internalizing problems (six items; scores can range from 0 to 12; $\alpha = .80$), externalizing problems (six items; score range, 0–12; $\alpha = .65$), and total problems (12 items; score range, 0–24; $\alpha = .76$), developed by applying item response theory and factor analysis to data from the Youth Self-Report (YSR; Achenbach & Rescorla, 2001) and the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001). The BPC internalizing and externalizing subscales have shown strong psychometric properties, including significant correlations in hypothesized directions with other internalizing and externalizing measures, as well as correspondence with diagnostic profiles from clinical interviews (Chorpita et al., 2010).

Short Mood and Feelings Questionnaire

The Short Mood and Feelings Questionnaire (SMFQ, Angold, Costello, & Messer, 1995) is a 13-item test of depressive symptoms (e.g., "I felt miserable or unhappy"). At the baseline assessment, students rated how much they had "felt or acted this way" in the past two weeks on a three-point Likert scale ranging from 0 (*not true*) to 2 (*true*). Using a cutoff score of 8, the SMFQ has shown strong sensitivity and specificity for identifying major depressive symptoms among youth (Angold et al., 1995). In the current sample, pre-treatment internal consistency was strong ($\alpha = .93$).

Strengths and Difficulties Questionnaire

The Strengths and Difficulties Questionnaire (SDQ, Goodman, Meltzer, & Bailey, 1998), administered at the baseline assessment, is a 25-item brief self-report questionnaire designed for adolescents aged 11–16 to screen for emotional and behavioral problems. We used the five-item Conduct Problems subscale for the current study ($\alpha = .65$). Respondents report on a three-point Likert scale (*not true, somewhat true, certainly true*) regarding their behavior during the last 6 months.

Other Baseline Measures

PTS Symptoms

The UCLA PTSD Reaction Index (UCLA-RI; Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998) is a self-report measure of DSM-IV PTSD symptoms. Students completed this measure at the baseline assessment by rating items on a five-point Likert scale assessing the frequency with which symptoms were experienced during the past month. For the current study, we scored the UCLA-RI to generate an overall severity score (range 0–68), with scores of 30–39 indicating moderate PTS symptom severity and scores ≥40 indicating severe to very severe PTS symptoms (Saltzman et al., 2001). Scores ≥38 show good sensitivity and specificity for detecting PTSD (Saltzman et al., 2001). In the current sample, the UCLA-RI showed strong internal consistency at pre-treatment (full-scale $\alpha = .91$). Forty-one percent of the sample reported baseline severity scores ≥38.

Maladaptive Grief Reactions

Most grief items were adapted from prior grief measures (Layne et al., 2001, 2008). At the baseline assessment, students rated the frequency (experienced during the past month) of MG reactions in relation to a specific death on a five-point Likert scale ranging from 0 (*none of the time*) to 4 (*most of the time*). Four items tapped into existential/identity distress ("Life for me doesn't have much purpose since he/she died"), and four items assessed circumstance-related distress ("Upsetting thoughts about how the person died keep me from enjoying good memories of him/her"). The eight items showed strong internal consistency at pre-treatment ($\alpha = .94$).

Intervention Protocol

TGCTA was implemented during 17 weekly 50-min sessions conducted in three schools across six separate groups from January to June. Therapeutic teams were assigned to each of the three schools and were comprised of one masters-level graduate student and one experienced grief counselor who had been trained in the TGCTA model by one of the treatment developers. Therapists also received telephone and live supervision from a licensed doctoral-level community therapist, as well as two 3-h supervision calls with the treatment developer to monitor fidelity and answer questions. During live supervision, the doctoral-level community therapist monitored fidelity by qualitatively examining therapist usage of program activities and teaching points. During phone calls, the treatment developer monitored fidelity to the treatment manual by

reviewing each session with the therapists, who reported on their usage of program components.

Data Analytic Strategy

Our initial goal was to identify and aggregate multiple indicators of pre-treatment internalizing and externalizing symptoms to use as Level 2 moderators in subsequent multilevel analyses. Multiple indicators of each type of symptom were aggregated to reduce measurement error. We then tested an unconditional piecewise multilevel model that examined rates of change in the ratings for the number one ranked Top Problem during each of the three pieces of treatment: (a) Piece 1 consisted of the eight skills-building sessions; (b) Piece 2 consisted of the six narrative construction sessions; and (c) Piece 3 consisted of the final three consolidation sessions. Finally, we tested pre-treatment internalizing and externalizing symptoms as Level 2 moderators of rates of change in each of the three treatment pieces. All multilevel models used intent-to-treat analyses based on the 44 students who initially began the treatment protocol. We used maximum likelihood estimators to account for missing data given that demographic and pre-treatment measure comparisons showed no significant differences between the 11 students who dropped out of treatment and the 33 students who completed the full course of treatment.

Results

Preliminary Analyses

Table 1 presents descriptive statistics and correlations among study variables. The three pre-treatment measures of *internalizing* symptoms (SMFQ, BPC baseline, BPC pre-session (1) converged strongly (r's ranged from .67 to .80). Further, the three pre-treatment measures of *externalizing* symptoms (SDQ conduct, BPC-ext baseline, BPC-ext pre-session 1) also converged strongly (r's ranged from .61 to .72). Standardizing and averaging the three pre-treatment measures for each construct created composite indexes of internalizing and externalizing symptoms. Consistent with data on PTSD and broadband symptom profiles among adolescents (Saigh, Yasik, Obserfield, Halamandaris, & McHugh, 2002), PTS reactions covaried with both internalizing and externalizing symptoms. In contrast, MG reactions showed a less robust, more differentiated pattern of covariation and were only associated with SDQ conduct problems. Adolescents with trauma-focused as opposed to loss-focused narratives reported similar mean externalizing, $t(31) = -.69$, $p = $ n.s., and internalizing symptoms, $t(31) = -1.96$, $p = $ n.s.

Table 1 Descriptive statistics and correlations among study variables

		Mean	SD	1.	2.	3.	4.	5.	6.	7.
1.	Baseline BPC int.	5.07	3.13	–						
2.	Baseline mood and feelings	8.94	5.70	.70**	–					
3.	Session 1 BPC int.	4.22	2.86	.80**	.67**	–				
4.	Baseline BPC ext.	4.02	2.33	.21	.36*	−.02	–			
5.	Baseline SDQ conduct	4.49	2.54	.34*	.58**	.21	.66**	–		
6.	Session 1 BPC ext.	3.88	2.46	.26	.43*	.26	.72**	.61**	–	
7.	PTS severity	32.73	14.94	.46**	.63**	.55**	.38*	.50**	.36*	–
8.	MG reactions	7.46	4.21	.24	.24	.05	.24	.32*	.11	.22

BPC brief problems checklist, *SDQ* strengths and difficulties questionnaire, *PTS* post-traumatic stress, *MG* maladaptive grief

* $p < .05$; ** $p < .01$

Classification of participants' Top Problem into internalizing versus externalizing problems was not related to whether the narrative topic focused on trauma or loss, $\chi^2(1) = .27$, $p = $ n.s.

Piecewise Growth Models

Two-level piecewise growth models using *Hierarchical Linear Modeling* 7 software (HLM 7; Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011) examined change in adolescents' ratings of their Top Problem over each of the three pieces of treatment. We created separate dummy-coded piecewise variables for the first eight sessions (Piece I, consisting of TGCTA Module I skills-building components), the next six sessions (Piece II, containing flexibly tailored Module II trauma-focused or Module III loss-focused narrative construction components), and the final three sessions (Piece III, containing Module IV treatment consolidation components). To test growth over each piece, we first specified an unconditional growth model in which we entered the dummy-coded variables as predictors at Level 1 and specified no predictors at Level 2. All Level 2 random effects were free to vary. The resulting Level 1 model appears as follows:

$$\text{Outcome}_{ti} = \beta_{0j} + \beta_{1j}(\text{Piece I}_{ij}) + \beta_{2j}(\text{Piece II}_{ij})$$
$$+ \beta_{3j}(\text{Piece III}_{ij}) + r_{ij}$$

The overall intercept represented average scores in the student-reported Top Problem variable at Session 1, and the slope variables represented change in Top Problem ratings during each piece. Top Problem ratings decreased significantly across all three pieces (see Fig. 1). Average rates of change in Top Problem ratings were −0.30 ($t = -3.80$, $p < .001$) for each week in Piece I, −0.20 ($t = -2.36$, $p < .05$) for each week in Piece II, and −0.29 ($t = -2.10$, $p < .05$) for each week in Piece III. Random effects were statistically significant for the Top Problem intercept, Piece I slope, and Piece II slope, signifying that
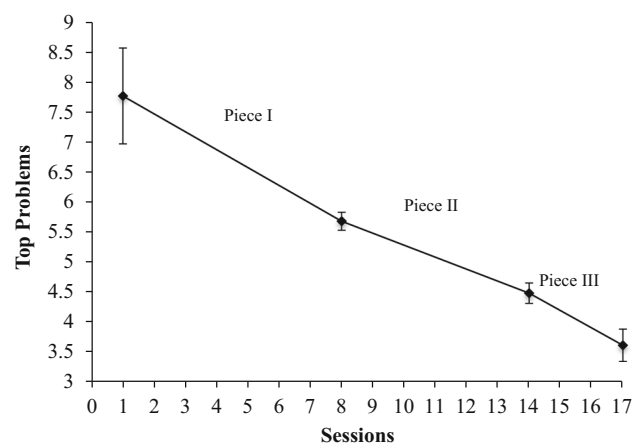

Fig. 1 Unconditional piecewise model for Top Problem ratings

participants varied to a significant degree in their average scores for Top Problem at Session 1, as well as in their individual rates of change in Top Problem scores across Pieces I and II.

We next tested whether internalizing and externalizing problems moderated treatment response by examining the effects of baseline internalizing and externalizing problems on piecewise trajectories of change in Top Problem scores (see Table 2; Fig. 2). Baseline internalizing and externalizing scores were entered as Level 2 moderators of the overall intercept and the slopes for each piece. There were no significant differences in baseline intercept levels of Top Problem scores across levels of internalizing ($b = 0.14$, $t = 0.14$, $p = .886$) or externalizing symptoms ($b = -1.38$, $t = -1.18$, $p = .247$). However, providing partial support for our main hypothesis, students with more baseline *internalizing* problems reported significantly less change in Top Problem scores during Piece I ($b = 0.35$, $t = 2.03$, $p = .049$), but significantly *greater* change in Top Problem scores during Piece II ($b = -0.50$, $t = -2.57$, $p = .014$). Baseline internalizing scores did not moderate the rate of change during Piece III ($b = -0.16$,
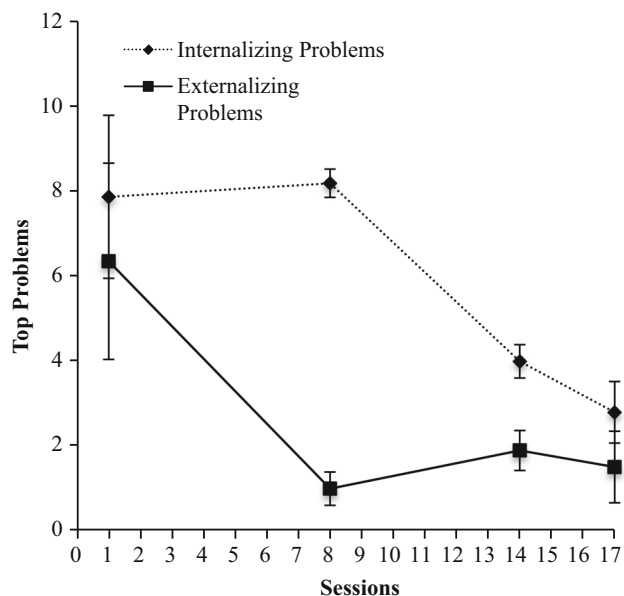
Table 2 Effects of baseline internalizing and externalizing scores on piecewise analysis of rates of change in the Top Problem ratings ($N = 44$)

Fixed effects	Coefficient	SE	t ratio	p value
For intercept, $\beta 0$				
Intercept, $\gamma 00$	7.72	0.39	19.78	<.001
Baseline internalizing, $\gamma 01$	0.14	0.98	0.14	.886
Baseline externalizing, $\gamma 02$	−1.38	1.18	−1.18	.247
For Piece I slope, $\beta 1$				
Intercept, $\gamma 10$	−0.31	0.07	−4.53	<.001
Baseline internalizing, $\gamma 11$	0.35	0.17	2.03	.049
Baseline externalizing, $\gamma 12$	−0.36	0.20	−1.79	.082
For Piece II slope, $\beta 2$				
Intercept, $\gamma 20$	−0.20	0.08	−2.46	.018
Baseline internalizing, $\gamma 21$	−0.50	0.20	−2.57	.014
Baseline externalizing, $\gamma 22$	0.35	0.24	1.46	.153
For Piece III slope, $\beta 3$				
Intercept, $\gamma 30$	−0.24	0.15	−1.61	.116
Baseline internalizing, $\gamma 31$	−0.16	0.37	−0.43	.667
Baseline externalizing, $\gamma 32$	0.11	0.43	0.26	.799

Random effects	Variance component	SD	$\chi^2(28)$	p value
Intercept, $u0$	4.66	2.16	122.20	<.001
Piece I slope, $u1$	0.11	0.33	75.11	<.001
Piece I slope, $u2$	0.10	0.32	44.07	.027
Piece I slope, $u3$	0.06	0.25	12.20	>.500
Level 1, r	2.00	1.42		

Fig. 2 Baseline internalizing and externalizing problems as moderators of piecewise change

$t = -0.43$, $p = .667$). In contrast, for students with more baseline *externalizing* scores, we found a trend toward reductions in Top Problem ratings during Piece I ($b = -0.36$, $t = -1.79$, $p = .082$) and no change in Top Problem ratings during Piece II ($b = 0.35$, $t = 1.46$, $p = .153$). Similar to our finding for internalizing problems, baseline externalizing problems did not moderate participants' change trajectories during Piece III ($b = 0.11$, $t = 0.26$, $p = .799$). We found random effects for the intercept, Piece 1 slope, and Piece 2 slope, indicating significant between-student variability on these parameters (see Table 2).

Discussion

This study addressed a significant challenge currently facing school-based treatments for adolescents exposed to trauma and loss: *How do broad-spectrum internalizing and externalizing symptoms that frequently co-occur with trauma- and loss-related symptoms influence adolescents' responses to treatment?* As expected, students' distress ratings of their self-identified Top Problem decreased

significantly across all three phases of treatment. We found mixed support for our hypothesis that adolescents with comorbid internalizing symptoms would show more overall benefits from TGCTA than adolescents with comorbid externalizing symptoms. Students with higher baseline *internalizing* symptoms benefited significantly *less* from treatment during the first phase (focusing on psychoeducation and skills building) compared to students with lower internalizing symptoms, and benefitted significantly *more* during the second phase (focusing on trauma or loss-focused narrative construction). In contrast, youth with more baseline *externalizing* scores showed a trend toward greater reductions in Top Problem ratings during the initial skills-building phase of treatment (Piece I) and showed no significant decline in their Top Problem ratings during the narrative-sharing phase (Piece II).

Although, on average, students showed benefit across all three phases of treatment, the picture emerging from these findings suggests that co-occurring internalizing and externalizing symptoms predict differential benefit from the skills-building versus narrative-sharing phases of treatment. Specifically, students with more internalizing symptoms showed a delayed trajectory of treatment benefit, whereas the trajectories of students high in externalizing symptoms suggest more immediate gains during the initial (Module I) skills-building phase. As expected, students with more internalizing symptoms showed the most benefit from treatment components in which they shared their trauma narratives (a Module II component) or loss narratives (a Module III component). These findings are consistent with prior research showing that depressed or

anxious adults participating in exposure therapy experience an initial increase in symptoms due to anticipated distress, though their symptoms continue to dissipate during the exposure phase as they learn they are able to tolerate this distress (e.g., Hayes et al., 2007; Heimberg & Becker, 2002). The sharing of narratives in a supportive group context may be particularly valuable for reducing negative self-attributions or shame associated with trauma or loss-related experiences in internalizing students (Davies et al., 2006). In contrast, students with predominantly externalizing symptoms may be more disposed to benefit from foundational skills building that enhances their capacity for regulating aggressive and rule-breaking tendencies (Lochman & Wells, 2004). However, externalizing students' lack of benefit from the narrative treatment element must be cautiously interpreted, as their gains in the first phase may have limited the potential benefits of the subsequent narrative construction and sharing phase.

This study adds to a growing evidence base supporting the assertion that co-occurring symptom clusters (including internalizing vs. externalizing symptoms) predict differential response to various treatment elements (Chorpita & Daleiden, 2014). These findings provide support both for the utility of integrating ideographic youth ratings of self-nominated Top Problems with nomothetic standard measures of traumatized and bereaved youth and for ongoing efforts to incorporate broad-spectrum measures of distress, risky behavior, and functioning into baseline assessment, case formulation, and treatment planning. More broadly, future research can explore whether interventions can be tailored to address co-occurring symptoms to better meet clients' needs, developmental level, life circumstances, and self-identified problems. In this respect, the current findings emphasize the need to continue building an evidence base pertaining to the effectiveness, feasibility, and acceptability of flexibly tailored modularized treatments for children and adolescents (e.g., Weisz et al., 2012).

Study Strengths and Limitations

Study strengths include the use of Top Problems ratings—an ideographic, client-centered measure of weekly treatment response for addressing the concerns of a diverse group of students treated for mental health concerns in a school setting. Notably, the large overlap between the top-ranked problems and presenting problem suggests that the reduction in Top problem ratings is likely to correspond with reductions in PTS and MG reactions. A second strength is our use of piecewise linear modeling to examine longitudinal trajectories of individual client treatment responses to different TGCTA components. A third strength is our use of multiple measures of internalizing and externalizing symptoms—a feature that allowed us to

assess a broader range of distress and to expand the generalizability of our findings beyond what any single measure would permit.

Regarding study limitations, our exploratory open-trial design lacked a control group, which precludes causal inference regarding treatment effects; our small sample size and 25% attrition rate also limited statistical power to detect relatively small effects as well as generalizability. Our rate of attrition was comparable to clinic-based trauma intervention research (Cohen et al., 2011), but higher than other school-based studies, which have shown attrition rates as low as 9% (Jaycox et al., 2010). While we did not find systematic demographic differences between treatment completers and those who attrited from the treatment groups, future research is needed on the reasons for which youth may drop out of school-based treatment, which is typically much more accessible than clinic-based care (Jaycox et al., 2010).

Further, our use of a teacher-nominated sample to screen for PTS and MG reactions may have tapped teachers' tendency to identify more externalizing as opposed to internalizing symptoms, whereas our reliance on student self-report measures leaves unanswered questions regarding whether improvements in youth functioning were noticed by others in the family or at school. The generalizability of our study results is also limited by the nascent state of the grief field and a current lack of consensus regarding how to best define and assess MG reactions (Kaplow et al., 2012). Finally, although program implementation and fidelity was monitored via live supervision and weekly phone calls with the treatment developers, future studies should include additional methods for monitoring fidelity.

Summary and Future Research

Results of this study, combined with those of a prior evaluation (Grassetti et al., 2015), underscore the need for additional research that replicates and extends these findings. Such studies would benefit from a larger sample size, the use of multiple informants (e.g., parents, teachers), and the use of school records that include attendance, disciplinary, and achievement data including successful developmental transitions (e.g., graduation at follow-up). Future studies can profitably focus on identifying common therapeutic factors that contribute to therapeutic change, as well as specific treatment components that appear most effective in addressing various therapeutic outcomes including PTS reactions, MG reactions, externalizing behaviors, and internalizing behaviors—knowledge that is useful in developing assessment-driven treatment matching algorithms. A related avenue for future research involves evaluating whether the use of baseline assessment, as well

as ongoing treatment monitoring tools, improves triage decisions and reduces the likelihood of treatment failure (Lambert, 2010). Collectively, findings from the present and future studies can contribute to building clinical theory capable of explaining whether and how different treatment elements exert differential effects on specific outcomes, and more broadly, to evaluate how internalizing and externalizing problems may predict and shape response to trauma- and loss-focused treatments.

Our findings of *differential* trajectories of treatment response among internalizing versus externalizing youth also underscore the possibility that skills-building and narrative construction elements differ in their mechanisms of action and degree of effectiveness for students who differ in their assessment profiles. By extension, our findings also point to ways in which modularized, assessment-driven treatment components can apply principles of evidence-based assessment and evidence-based practice to therapeutically benefit traumatized and bereaved youth (Layne, Kaplow, & Youngstrom, 2016). Among these are the systematic use of theoretically grounded, empirically based case formulation and treatment planning tools that use clients' assessment profiles to match and tailor specific treatment components shown to be most effective in addressing clients' particular needs, and identifying and harnessing mechanisms of therapeutic change responsible for producing differential effects (Kobak et al., 2015).

Compliance with Ethical Standards

Conflict of interest No outside interests influenced the research design or data collection.

Human and Animal Rights and Informed Consent All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

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