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DBT Skills Training Groups for School Personnel Working in High-Need Schools: An Analysis of Attendance and Stress

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ABSTRACT

The COVID-19 pandemic presented unprecedented challenges for school communities with long term impacts still unknown. School personnel working in high need, low wealth schools are uniquely at risk for pandemic-related stress given extensive changes to their work life and concerns regarding student trauma exposure. We delivered DBT skills training to 39 school personnel (89% female, mean years of experience was 18.49 [*SD* = 7.88]). Close to 20% of the sample reported moderate-to-severe anxiety, depression, and stress and substantial impact of COVID-19 on loved ones. Multilevel regressions indicated significant decreases in stress between the 1st-2nd sessions attended (p = .004), and the 3rd-6th sessions attended (p = .04). Sessions 7-8 were not associated with significant decreases in stress (p = .51). Study limitations, implications, and conclusions are discussed.

Keywords: stress and coping, school personnel mental health, secondary trauma, dialectical behavior therapy, skills training

A robust literature documents that school personnel experience high levels of stress and burnout (Lambert et al., 2015; Sandilos et al., 2018; von der Embse et al., 2019). In a study of teachers conducted before the COVID-19 pandemic, 46% endorsed "high daily stress" with stress levels comparable to physicians and nurses (Herman et

al., 2020). School personnel working in low wealth, high needs schools face unique stressors due to funding inequities (Adamson & Darling-Hammond, 2012), high teacher and administrator turnover (Carver-Thomas & Darling-Hammond, 2017; Miller, 2013; Ronfeldt et al., 2013; Shernoff et al., 2016), and the negative impact of institutional racism on students and teachers (Bottiani et al., 2019; Merolla & Jackson, 2019; Reskin, 2012). Teacher stress and resultant burnout can weaken teacher commitment and investment in teaching with studies highlighting a negative relationship between teacher stress and student outcomes (Arens & Morin, 2016; Hoglund et al., 2015; McLean & Connor, 2015). Mosley et al. (2023) aptly argues that equitable access to high quality instruction requires a workforce of teachers who are healthy.

In the wake of the pandemic, the work life of school personnel was upended as they were considered essential workers who had to make immediate, sweeping changes to deliver instruction to students and support families in the school community (Nadeem et al., 2022). School personnel working in low wealth, high needs communities faced unique stressors given the uneven impact of the pandemic on ethnic racial minorities who experienced increased risk of COVID-19 infections, hospitalizations, and death (Garo & Butler, 2022; Hamilton et al., 2020; Price-Haywood et al., 2020). Nadeem et al. (2022) conducted a rapid needs assessment in partnership with two large urban districts highlighted teachers (N = 430) and found significant concerns regarding student exposure to direct and indirect COVID-19 related trauma in addition to learning losses.

This indirect experience of a traumatic event by witnessing the devastation of the pandemic on the students and families can be conceptualized through the lens of secondary trauma, which can result in increased physiological reactivity and emotional distress (Borntrager et al., 2012; Costa et al., 2015; Figley & Kleber, 1995). School personnel had the added burden of supporting students and families while simultaneously managing the pandemic in their lives, with studies pointing to educator experience of compassion fatigue (Yang et al., 2021), emotional exhaustion, (Chan et al., 2021) and significant concerns regarding student instructional loss and trauma exposure (Nadeem et al., 2022). The challenge of helping others while also being affected by a crisis has been documented as a risk factor for burnout and compassion fatigue among essential workers in disaster contexts (Costa et al., 2015; Lambert & Lawson, 2013).

Group-Based Interventions to Address Stress

Researchers and practitioners have focused on the impact of teacher stress and how to build an infrastructure of support to promote health and wellness in schools (Calvert et al., 2021; Navarro, 2020; Nickerson & Sulkowski, 2021). This includes group-based interventions that support school personnel to effectively cope with stress and build resilience (Harris et al., 2016; Iancu et al., 2018; Roeser et al., 2012; Shernoff et al., 2022). Eyal et al. (2022), for example, implemented an online mind–body group with 28 teachers designed to improve their self-care and coping skills in the context of the pandemic using a trauma informed approach. Findings from qualitative analyses indicated that this brief, three session model was feasible to

implement and that many participants valued the online format and were able to apply the skills during challenging interactions with students. Findings also highlighted how the group, for some teachers, created a sense of community, support, and continuity at a time in which they felt isolated.

Behavioral and cognitive behavioral groups to reduce teacher stress and burnout have also been implemented in schools prior to the pandemic (von der Embse et al., 2019). According to a recent systematic review, behavioral and cognitive behavioral interventions are often short in duration (i.e., 3 to 15 sessions), include a combination of relaxation strategies, altering beliefs regarding stressful events, and addressing the physiological components of stress, and have effect sizes that range from medium to large (ES = .52 to 2.66;von der Embse et al., 2019). Initiatives aimed at helping school personnel cope with stress also extend beyond the pandemic given teaching is a stressful job and teaching in low wealth, high-need schools has unique challenges that are well documented in the literature (Atkins et al., 2017; Cappella et al., 2008; Garo & Butler, 2022; Mosley et al., 2023; Shernoff et al., 2011; 2016). Funding inequities, fragmented resources, and high turnover all contribute to differences in teachers reported experience of stress in higher versus lower wealth schools (Bottiani et al., 2019; McCarthy et al., 2021). Thus, school mental health providers, including school social workers, school psychologists, guidance counselors, and school leaders play an important role in helping address teacher stress and bring an important systems lens to this work as well.

Online, group-based stress management interventions are a promising avenue of support for school personnel, and participation in these supports can promote better mental health for educators (Kilbourne et al., 2018; Shernoff et al., 2011; 2022). However, there are substantial time and workload barriers associated with these supports that could interfere with participation (Shernoff et al., 2021). These initiatives, like other professional development activities, may have opportunity costs such that school personnel miss the opportunity to engage in other crucial tasks, including grading papers, preparing lessons, meeting with parents, and providing individual supports to students. Do these group-based mental health supports, which are designed to be helpful, increase workload or inadvertently increase stress (Özer & Beycioglu, 2010; Sandilos et al., 2018)?

Important scientific questions arise regarding how school personnel, who are already substantially overburdened and overcommitted, engage with stress management interventions. Attendance, and its relation to stress, is an important marker in understanding the extent to which school personnel can prioritize these services. Although the field of health psychology has been examining the predictors of engagement in treatment, very few studies have examined attendance and its relationship to stress in the context of school-based professional development (Ellis et al., 2022; Hayton et al., 2013). Therefore, the goal of this study was to explore educator engagement in a multi-session stress management intervention, including whether the number of sessions attended predicted changes in stress and if stress was associated with attending subsequent sessions. Using a data-driven approach, we explored whether there were increases or plateaus in stress over the course of the intervention that could inform future implementation of these groups and if a WISE intervention approach that prioritizes brief participation has potential value

(Kilbourne et al., 2018). Results can also inform our understanding of the role that stress plays in predicting which school personnel may be able to commit to a multi-session, school-based group support. In addition, we aimed to describe participants' overall emotional adjustment and the impact of the pandemic on participants in Fall 2020. This was a time when the participating district was fully remote after the first wave of COVID-19 had surged, and lockdown orders had ended.

DBT Skills Training to Reduce Stress and Promote Coping

Dialectical Behavior Therapy (DBT) is a cognitive-behavioral intervention designed to treat borderline personality disorder and chronic suicidal behavior (Linehan et al., 2002). The comprehensive treatment includes individual sessions, phone coaching, group skills training, and intensive supervision with several randomized trials indicating strong efficacy (Feigenbaum et al., 2012; Linehan et al., 1991; Neacsiu et al., 2010). Group skills training is designed to improve coping and adjustment by teaching participants mindfulness, interpersonal effectiveness, distress tolerance, and emotion regulation. DBT group skills training has been evaluated as a stand-alone treatment for clinical populations with preliminary evidence of effectiveness in traditional (20+ session) and abbreviated (e.g., 8 session) models (Valentine et al., 2015). DBT skill training is also emerging as a promising early intervention to improve coping, resilience, and quality of life among non-clinical samples. In a small sample of freshman college students with adjustment issues, participating in an 8-week DBT skills training group was associated with statistically significant improvements in self-reported depression, anxiety, and stress (Üstündağ-Budak et al., 2019). Drossel et al. (2011) also implemented DBT skills training with individuals caring for adults diagnosed with dementia who were at at-risk for elder abuse. Drossel et al. (2019) found increases in problem-focused coping and well-being that were statistically significant in addition to reductions in caregiver fatigue that were statistically significant from time 1 to time 2.

The distinctive focus on teaching acceptance (e.g., mindfulness) and change skills (e.g., emotion regulation) concurrently was conceptualized as important to helping school personnel manage stress generally and during the pandemic for three reasons. First, the uncertain timeline and significant workload increases required some measure of acceptance of the new reality and circumstances in the moment. Second, working in schools during the pandemic also required school personnel to use effective emotion regulation skills to adapt to the increased workload and decreased resources and to ensure their responses to challenges did not make their situation worse (Linehan, 2015; Rizvi et al., 2021). Third, school personnel, similar to other professions in which there is an emotional labor associated with the work (e.g., police officers, EMTs), are continually exposed to emotionally provocative situations and often do not have the luxury of removing themselves from the situation to calm down. Teachers, social workers, school psychologists, and principals often must continue engaging with diverse stakeholders and develop skills to regulate their emotions and cope in the moment.

Using DBT skills training with school personnel suggests the potential of using this type of support in schools and how it can be supported by a range of mental health

professionals. A DBT skills training group was implemented with a sample of elementary teachers (N = 27) working in public schools in a Brazilian city (Justo et al., 2018). Teachers attended four weekly groups (3 hours total) in addition to one follow up session. Findings indicated improvements in observed interactions between teachers and students and teacher emotional awareness (Justo et al., 2018). Recruitment challenges and attrition issues among the teacher sample raised concerns about overall feasibility. A second feasibility study of DBT skills training with educators found significant decreases in stress and dysfunctional coping and increases in DBT skill use from an 8-session model (Shernoff et al., 2022). Examining the application of DBT skills training to non-clinical samples, such as school personnel, is an important gap in the research that this study is designed to address.

Stress and Session Attendance

Examining the relationship between stress and attendance in the context of DBT skills training is important given the current study used an abbreviated 8-session format. This is shorter than the 20+ sessions traditionally used with DBT skills training – making it all the more important to explore whether stress changed as a function of the number of sessions attended (Rizvi & Steffel, 2014). In addition, examining stress and its relationship to attendance is informative, but rarely examined in teacher training and professional development studies. Eyal et al. (2022) used a 3-session, 50-minute format in which teachers attended the mind–body groups on three consecutive weeks with thematic analyses highlighting mixed findings related to number and timing of sessions. Some teachers found the consistency of the sessions promoted a sense of routine and predictability, some teachers wanted more frequent sessions, and some indicated timing the groups after the school day added stress and was a barrier to attendance. Among a sample of Head Start teachers who were participating in trainings designed to improve classroom climate, stressors were not found to be a barrier to participating in the training and to the contrary, those educators reporting more stress attended more trainings than educators reporting lower stress (Li Grining, 2010).

Understanding how stress interacts with attendance helps shed light on the minimum number of sessions required to support teacher health and wellness and can also inform dosage benchmarks in future studies. Understanding the relationship between session attendance and stress also has implications for how limited resources in schools can be allocated to support stress management interventions for school personnel (Pianta et al., 2014; Straus et al., 2022).

The Temporal Impact of Stress on Session Attendance

Given job demands and workload are robust predictors of educator stress and asking school personnel to participate in professional development increases their workload, exploring whether stress is associated with teacher attendance has implications for training and professional development (Bakker & Demerouti, 2007). While the existing literature has examined school and classroom factors associated with teacher engagement in professional development, very few studies have

examined individual factors, including how stress predicts engagement in professional development (Domitrovich et al., 2015). Findings from a feasibility study using DBT skills training with educators points to the possible role that stress played in attendance given there was a significant difference in the proportion of groups attended based on stress at baseline (Shernoff et al., 2022). Teachers with the highest proportion of attendance (4+ sessions) reported elevated stress on the Perceived Stress Scale (Cohen et al., 1994) when compared to teachers with lower attendance (1-3 sessions) who reported normative stress. Drossel et al. (2011) examined the effectiveness of DBT skills training among high-risk caregivers of individuals with dementia and found that high stress was associated with attending follow-up sessions.

In the field of health psychology, studies have examined predictors of attendance and adherence to cardiopulmonary rehabilitation sessions with a focus on anxiety, depression, and stress (Ellis et al., 2022; Hayton et al., 2013). Ellis et al. (2020) examined how stress influenced subsequent attendance at cardiopulmonary rehabilitation sessions among a sample of 47 adults with cardiovascular or chronic pulmonary diseases. Results from multi-level modeling indicated higher negative mood (b = .315, p = .018) was associated with decreased likelihood of attending a subsequent rehabilitation treatment session the following week.

In the current study, we explored whether stress ratings predicted who would attend and who would miss a subsequent session. Currently, we are unaware of any studies that have examined whether stress predicts engagement in professional development and training in a sample of school personnel particularly when leveraging longitudinal data. This is another gap in the literature that has implications for planning and delivering these supports, particularly if these supports are perceived as causing additional burdens or competing with other priorities.

Research Design and Questions

This study included a secondary analysis of baseline measures of stress, coping and COVID-19 impact in addition to repeated measures of stress and attendance among school personnel participating in a DBT skills training group during the pandemic. We explored the relationship between attendance and stress in the context of DBT skills training group to help inform how best to develop health and wellness interventions that are useful and contextually relevant (Domitrovich et al., 2015; Fixsen et al., 2005; Proctor et al., 2011; Proctor et al., 2009). Our research questions were as follows: (1) How did school personnel rate their emotional adjustment and COVID-19 impact at baseline? (2) How did stress change as a function of the number of sessions attended? and (3) Was there an association between stress and attending the subsequent DBT skills training session?

METHODS

This work was conducted with Institutional Review Board approval and in accordance with ethical guidelines for the protection of human subjects.

Participants

Participants were recruited via an email from the district inviting them to participate in a virtual, 8-session DBT skills training group for stress management. The group was offered in Fall 2020 when the district was fully remote during the pandemic and remained remote for the entire 2020-2021 school year. These procedures were followed at the request of our district partners to protect email privacy and to ensure confidentiality more readily. Recruitment flyers were distributed to approximately 500 teachers and school personnel who were instructed to sign up online to attend an informational session (capped at 50 participants). The first 50 who signed up were sent zoom invitations by district personnel. Forty-seven school personnel attended the informational meeting and forty-four (94%) consented to participate in the study. Five school personnel who had consented attended only the first session and were excluded from the analyses.

The final sample (N = 39) of school personnel included n = 30 teachers (77%), n = 5 administrators (13%) and n = 4 guidance counselors/social workers (10%) working in one medium-sized district at an elementary (49%), middle (20.5%), high school (10.3%) or multiple school setting (20.2%). This district was located in close proximity to the epicenter of the initial wave of the COVID-19 pandemic in the US. Eighty-nine percent of the sample was female, 12.8% held bachelor's degrees, 74.4% held master's degrees, 7.7% held doctorates, and 5.1% indicated other. Mean age of the sample was 46.5 (SD = 9.5) and mean years of experience was 18.5 (SD = 7.9). Fifty-six percent of participants were African American/Black, 15.4% were Latinx, 17.9% were White, 2.6% indicated Other (7.7% missing). Eighty-five percent of students in the district qualified for free or reduced lunch and 88% of families were designated as economically disadvantaged.

A power analysis was conducted using expected parameters (e.g., N = 39, eight data points per person, □□=.05, power = 0.8), using the Power Curves for Multilevel Studies applet (Kleiman, 2021). Results suggested that the sample size was adequately powered for medium (Cohen's d = .5) to large (Cohen's d = .8) effect sizes. Nine participants did not respond to the stress survey item after the first week and were excluded from analyses for research questions 2 and 3 (i.e., N = 30), which was powered to detect large effect sizes. There was also a sizeable amount of missing responses for stress ratings (28.75%) in the final sample, due entirely to attendance (i.e., 0% missing data for sessions attended). As a result, there would be no impact of missing data on Research Question 2 because only attended sessions were included in analysis. For Research Question 3 cases with missing stress data from the previous session were excluded listwise. Due to missing data, the final sample size to answer Research Questions 2 and 3 was 30, powered to detect large effect sizes.

Assessments

Emotional Adjustment at Baseline

The Depression Anxiety Stress Scales-21 (DASS-21 (Lovibond & Lovibond, 1995) assessed overall emotional adjustment in the context of the pandemic. The

DASS-21 has three subscales which have strong internal consistency (Depression Subscale α = .91, Anxiety Subscale α = .81, Stress Subscale α = .89) and demonstrate concurrent validity with other measures of anxiety and depression (Antony et al., 1998; Lovibond & Lovibond, 1995). Each of the 21 items were rated on a 4-point scale (0 = *did not apply to me* to 3 = *applied to me very much, or most of the time*). All three DASS-21 subscale scores were used descriptively to answer Research Question 1, including calculating z-scores for the anxiety, depression, and stress subscale scores. *Z*-scores ≤ 1.0 were considered normal to mild and *z*-scores > 1.0 were considered moderate to severe levels of anxiety, depression, and stress (Lovibond & Lovibond, 1995).

COVID Impact at Baseline

The impact of the pandemic on school personnel was assessed via four items from the Epidemic-Pandemic Impacts Inventory (EPII;Grasso et al., 2020). The EPII was developed during the COVID-19 pandemic to evaluate the impact of the pandemic on different domains of one's personal life. The first item, *Impact on Others*, assessed whether in the past week, someone close to them was quarantining, infected, hospitalized, or had died (check all that apply). The second item, *Personal Impact*, assessed if they had personally been quarantining, infected, or hospitalized (check all that apply). The third item assessed *Financial Impact*, or how much the pandemic caused them financial problems (1 = *not at all* to 5 = *extremely*). The fourth item, *General Worries*, assessed overall concerns and fears regarding COVID-19 (1 = *not worried at all* to 5 = *extremely worried*). Scores from this measure were used descriptively to answer Research Question 1.

Session Attendance

Attendance data were collected weekly by the research team who attended the DBT skills training groups. To answer Research Question 2, session attendance was calculated as the total number of sessions attended but those sessions did not need to be consecutive. To answer Research Question 3, session attendance was dichotomized (i.e., 1 = Attended and 0 = Not attended).

Stress

Stress was measured via a single-item measure of global stress adapted from the Occupational Stress Questionnaire (Elo et al., 2003). At the beginning of each session, participants reported how often they experienced stress in the past week, on a scale of 1 = *never* to 5 = *very often.* Participants were reminded that the definition of stress included an "unpleasant emotional experience associated with feelings of anger, anxiety, tension, or frustration" (Kyriacou, 2001). These data were collected by the research team via Qualtrics instead of the group leader to reduce the influence of social desirability bias. A single-item measurement approach was used to reduce response burden, because global experience of stress was the construct of interest, and because single-item stress measures have demonstrated adequate concurrent and

predictive validity in prior research with teachers (Eddy et al., 2019) and other professionals (Elo et al., 2003). Traditional approaches to reliability for single item measures (e.g., Cronbach's alpha, MacDonald's Omega) are not appropriate, but intraclass correlation (ICC) can be used as an indicator of reliability. The ICC (Wolak & Wolak, 2015) package in *R* was used to calculate ICC for the stress item in this sample, ICC = .41, 95% CI [.22, .61], suggesting variability in stress ratings was better accounted for by within-person differences in ratings and weaker group-level reliability. Longitudinal stress ratings were included in multilevel modeling to answer Research Questions 2 and 3.

Demographic Characteristics

Seventeen items assessed educator demographic information. Items included gender, age, race/ethnicity, educational background, grades taught, highest degree, and years of experience.

Procedures

Eight 1-hour DBT skills training sessions were delivered synchronously via Zoom during after school hours (3:30-4:30 pm) in Fall 2020 when the district was fully remote due to the pandemic. The group leader encouraged an informal, collaborative style in which she encouraged participants to share with one another, ask questions, and comment on each other's experiences by raising a hand, unmuting, or using the chat feature. In addition, during the early sessions, the group leader facilitated rapport building activities, ice breakers, and introductions to help participants form relationships and actively engage in the groups.

The sessions occurred consecutively over nine weeks (one week was rescheduled due to district professional development) and followed a similar format and structure each week. School personnel were provided with an encrypted link to log into the university Zoom account and were muted automatically upon entry. Each session began with the research team collecting stress data via a Qualtrics link insertedin the chat. Those team members remained online to actively moderate, address technical problems (e.g., connectivity issues, failed video), and to ensure participants had required materials. Participants were encouraged to enable their video if in a private area and when their connection allowed and to remain muted unless they were sharing. The chat feature was enabled throughout to allow the participants and moderators to write to each other publicly and privately.

After data collection was completed, the group leader encouraged participants to share their experiences implementing the skill introduced in the prior session (i.e., homework review) either verbally or via the chat feature. Next, the group leader introduced a new skill via didactic review of PowerPoint slides and modeling and asked participants to identify times outside of the group when they would be most likely to enact the skill. School personnel were also encouraged to access brief videos (see Table 1 for hyperlinks) which provided an animated overview of the skill that was introduced to consolidate their learning. At the end of each group, participants

were encouraged to share their experiences, reflect on the group process, and share facilitators and barriers to actively participating in the group.

The content reviewed during the sessions followed the *DBT Skills Training Manual* (Linehan, 2015) with a focus on four core skills: (1) mindfulness, (2) distress tolerance, (3) emotion regulation, and (4) interpersonal effectiveness (see Table 1 for a description of the four core skills introduced). These skills were introduced because they balanced acceptance and change and reflected content featured in prior implementations of skills training groups as a standalone intervention (Blackford & Love, 2011; Linehan, 2015; Rizvi & Steffel, 2014). Sessions focused on tying the skills to participants' work life to the greatest extent possible, such that the goal was to increase coping in the context of their professional life and interactions with students, parents, and colleagues. A clinical researcher with 10 years of experience delivering DBT skills training led the sessions under the supervision of a DBT expert with 20+ years of experience providing DBT supervision.

Table 1: The DBT Skills Training Session Skills Covered and Description

Session	Skill and Focus	Description	YouTube Link
1 - 2	Mindfulness (Acceptance)	Learning how to balance emotion and reason mind (Wise Mind) Learning how to observe, describe, and participate in the present moment without judgment	https://youtu.be/-uOGRaTaVv4 https://youtu.be/JUSaQL1_zXE https://youtu.be/oYdrMpnE93s
3 - 4	Distress Tolerance (Acceptance)	Crisis survival skills for tolerating painful situations. Acknowledging unchangeable aspects of reality to minimize suffering.	https://www.youtube.com/watch?v=bl1Sy7xR92g https://www.youtube.com/watch?v=CwnHez9TC6c https://www.youtube.com/watch?v=vwNnG7mIu1E

5 -7	Emotion Regulation (Change)	Reducing vulnerabilities and experiencing emotions instead of trying to change/reject them	https://www.youtube.com/watch?v=9jiYIHVGKCE https://www.youtube.com/watch?v=NECs97k_8Z4 https://www.youtube.com/watch?v=fDWn-cqKKrg
8	Interpersonal Effectiveness (Change)	Effective communication and assertiveness to get what you want.	https://www.youtube.com/watch?v=Gmjd-9PmCi4

Analyses

Multilevel linear spline regressions examined the relationship between session attendance and stress (Research Question 2) using the splines package in R Statistics (R Core Team, 2022). Multilevel linear spline regressions are useful for modeling non-linear change in relationships. Spline models are highly flexible and can account for observed changes within discrete phases and multiple changes in trajectory, even when a specific pattern of change is unknown (Howe et al., 2016). Discrete phase changes in linear slopes are separated by knot points, where one phase ends and another one begins. These knot points are estimated a priori based on theory, empirical evidence, machine learning-based algorithms, or visual inspection. We based knot points on visual inspection of plotted study relationships given there was no existing theory or studies examining knot points in the context of DBT interventions to inform our knot points, and because the small sample inhibited cross-validation required in machine-learning approaches.

For all spline models, one regression slope was specified per phase of change in each linear slope. For each slope, we inspected unstandardized betas, 95% confidence intervals, and *p* values. Finally, spline models were compared to simpler multilevel linear models to evaluate whether approaching these data with one phase in linear regression vs. multiple slopes when adding splines was associated with improved model fit. Linear models were created using the *lme4* package (Bates, 2010). Comparisons were conducted using AICs (lower is a better fitting model) of the more complex spline models and the less complex multilevel linear models.

Binary logistic regression using the *lme4* package (Bates, 2010) examined whether stress predicted educator attendance at the subsequent DBT skills training session (Research Question 3). A lead (i.e., $Time_{N+1}$), participant-mean centered stress variable was calculated prior to analysis to aid in the interpretation of how individual stress was related to attendance at the subsequent session by removing between-person variance. Confusion matrices, odds ratios, 95% confidence intervals,

p values, intraclass correlation coefficients, and random effects for stress (e.g., variation in residuals, intercepts) were evaluated.

RESULTS

How Did School Personnel Rate their Emotional Adjustment and Impact of COVID?

Descriptive analyses of the DASS-21 at baseline indicated 18% of the sample reported moderate to severe anxiety (*z*-scores ranged from 1.14 to 2.37) while 82% reported normal to moderate anxiety (*z*-scores ranged from .83 to -1.31). Twenty percent of the sample reported moderate to severe depression (*z*-scores ranged from 1.10 to 2.87) and 80% reported normal to moderate depression (*z*-scores ranged from .60 to -1.17). In addition, 21% of the sample reported moderate to severe stress (*z*-scores ranged from 1.01 to 2.07) and 79% reported normal to moderate stress (*z*-scores ranged from .80 to -1.72).

Regarding COVID-19 financial impact and general worries, 23% of the sample reported that in the past week, the pandemic had caused "*a lot*" or "*extreme*" financial burdens while 31% indicated "*some*" financial burdens associated with the pandemic. In addition, one quarter of the sample (25.6%) indicated they were "*not worried*," 33.3% indicated feeling "*somewhat worried*" and 41% indicated feeling "*very worried*" or "*extremely worried*" about COVID-19. With regards to COVID-19 impact on others, 21% of the sample indicated that in the past week, someone close to them was quarantining, 23% indicated someone close to them was infected by COVID-19, 18% indicated a loved one was hospitalized, and 20% indicated someone close to them had died from COVID-19. The percentage of school personnel experiencing a direct personal impact of COVID-19 was lower, including 2.6% quarantining and 2.6% infected.

How Did Stress Change as a Function of the Number of Sessions Attended?

Visual inspection of stress ratings over time suggested knot-points at session 2 and 6 for many participants. The more complex spline model (AIC = 366.56) had significantly better model fit compared to the simpler multilevel linear model (AIC = 369.12; $\chi^2(2) = 6.5634$, $p = .04$). Results of the linear spline regression indicated significant decreases in stress between the first and second sessions attended ($b = -.67$, 95% CI [-1.12, -.22], $p = .004$), and the third through sixth sessions attended ($b = -.60$, 95% CI [-1.18, -.01], $p = .04$). This suggests that there was a .67 point reduction (on a 5-point scale) in stress in the first two sessions, and a .60 reduction in sessions 3-6. Sessions 7-8 were not associated with significant decreases in stress, although change remained in the desired direction ($b = -.12$, 95% CI [-.46, .23], $p = .51$). Figure 1 illustrates the pattern of changes in stress based on number of sessions attended.

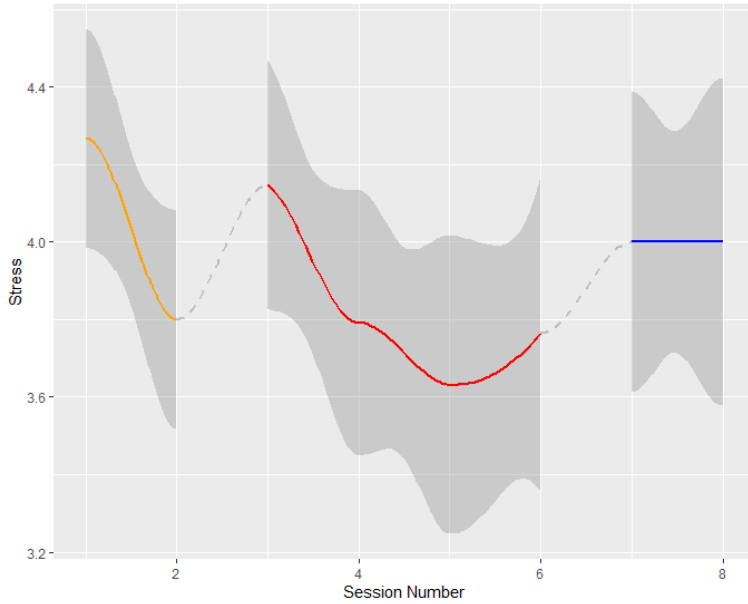

Figure 1: Changes in Stress as a Function of Number of Sessions Attended
Note. Shaded portions represent 95% confidence intervals.

Although we were primarily interested in sample level variation, a large intercept, and differences between marginal and conditional R^2 suggests a high degree of within-person variation (see Table 2).

Table 2: Multilevel Spline Regressions Illustrating Changes in Stress as a Function of Attendance

		Stress	
Predictors	*b*	95% CI	*p*
(Intercept)	4.18	3.90 – 4.47	< 0.001
Sessions 1-2	-0.67	-1.12 – -0.22	0.004
Sessions 3-6	-0.60	-1.18 – -0.01	0.044
Sessions 7-8	-0.12	-0.46 – 0.23	0.505
Random Effects			
σ^2	0.35		
$\tau_{00\ ID}$	0.31		
ICC	0.46		
N_{ID}	30		
Observations	171		

Note. Marginal R^2 / Conditional R^2 0.051/0.491

Was there an Association Between Stress and Attending the Subsequent Session?

A multilevel logistic regression evaluated whether stress at $Time_N$ was related to likelihood of attendance at $Time_{N+1}$. The intercept of the model suggests that at an individual's average level of stress, there was a 9.16 times greater probability of missing a subsequent session (see Table 3). However, within-person increases from average stress did not significantly increase the likelihood of missing a subsequent session (*OR* = .58, 95% CI [.20, 1.68], *p* = .31). ICC for the model was .51, indicating that 51% of the variance in attendance was due to between-person differences. A confusion matrix based on the model identified true positives (i.e., agreement between model predicted attendance and observed attendance) 100% of the time and true negatives 35.29% of the time. The confusion matrix finding suggests that the logistic regression model was more accurate in predicting school personnel who attended the subsequent session and less accurate in predicting school personnel who missed the subsequent session.

Table 3: Multilevel Logistic Regression with Stress Predicting Subsequent Session Attendance

		Attendance	
Predictors	Odds Ratios	CI	*p*
(Intercept)	9.16	2.86 – 29.36	< 0.001
Stress (person-centered)	0.58	0.20 – 1.68	0.311
Random Effects			
σ^2	3.29		
$\tau_{00\ ID}$	3.42		
ICC	0.51		
$N_{\ ID}$	30		
Observations	141		
Marginal R^2 / Conditional R^2	0.013 / 0.516		
Deviance	114.635		
log-Likelihood	-57.318		

DISCUSSION

The pandemic exacerbated stress for school personnel – but also served to shine a spotlight on the urgent need to support school personnel to effectively manage stress.

Group-based, virtually delivered interventions designed to reduce stress and build resilience can enhance access to supports that may be otherwise unavailable. At the same time, school personnel are already overburdened by job demands and these supports, although designed to be helpful, could inadvertently increase workload and/or impede school personnel's ability to accomplish other important work-related tasks. The purpose of this study was to examine school personnel's engagement in a multi-session stress management intervention, including how stress changed as a function of attendance and if stress was associated with attending subsequent sessions. We also examined overall emotional adjustment and the impact of the pandemic on participants and their loved ones.

The Enduring Impact of the Pandemic on School Personnel

Approximately 20% of this sample reported moderate to severe anxiety, depression, and stress. Similar rates of depression symptoms (23%) were found in a nationally representative sample of teachers (N = 134,693) who reported on their mental health functioning during the pandemic (September 2020–March 2021; Kush et al., 2022). Anxiety symptoms were higher in our sample compared to the Kush et al. nationally representative sample of teachers.Close to one half of the sample reported significant financial burdens and one quarter reported significant worry in the context of the pandemic, which highlights the enduring impact of the pandemic on the general population (Gowen et al., 2023) and the prevalence of stress and exposure to adversity during the pandemic among school personnel (Kraft et al., 2021; Sirs, 2023). This finding is noteworthy given this study took place in a low wealth, high-need community very close to the epicenter of the initial wave of the COVID-19 pandemic. Although the sweeping lockdowns had ended, the majority of school districts in the US were still fully remote in Fall 2020 and the uncertain timeline and unique circumstances faced by individuals employed in schools points to the enduring stress caused by the pandemic. Being in the dual role of managing the pandemic personally while simultaneously supporting students and families who were disproportionately impacted by the pandemic highlights how vulnerable this population is to experiencing longer term mental health effects and potential declines in job performance.

COVID-19 impact results also highlight just how crucial it is to provide opportunities for school personnel to be cared for and for their mental health needs be the focus of support (Borntrager et al., 2012; Costa et al., 2015). The impact of the pandemic on participants in the current study also points to the need for mental health professionals in schools, including social workers, counselors, and school psychologists, to keep trauma-informed care in mind when delivering stress management interventions to adults in schools (Costa et al., 2015). This can include helping school personnel understand and recognize the signs of secondary trauma and compassion fatigue and the importance of focusing on resiliency and self-care in the context of stress management groups (Costa et al., 2015; Eyal et al., 2018; Hydon et al., 2015). In the current study, we centered the group discussions and examples on workplace stressors rather than personal stressors, however future implementations

will include making space for participants to discuss stress related to being in the dual role of supporter and survivor.

Stress and Session Attendance

Multilevel linear spline regressions indicated significant decreases in stress between the first and second sessions attended (p = .004), and the third through sixth sessions attended (p = .04). Sessions 7-8 were not associated with significant decreases in stress (p = .51) although reductions in stress were still evident. Changes in stress in the desired direction in the context of a very challenging time is noteworthy and may indicate that the DBT skills trainings sessions were useful in this small sample of school personnel. These findings converge with the effectiveness of WISE intervention models, which are brief and designed to maximize what can be accomplished in a relatively short period of time given the appropriate target and structure (Schleider et al., 2020). These WISE intervention models acknowledge the need to focus on individual participants receiving an adequate therapeutic dose such that more intensive supports are stepped up as needed. In the context of stress management interventions delivered with school personnel, this could include those individuals who are experiencing spikes in stress relative to their peers or those who do not respond to a lower dose of the intervention (Collins et al., 2007; Kilbourne et al., 2018).

The finding that individual session number was associated with decreased stress particularly between sessions 1-2 and 3-6 points to the possibility of capitalizing on a shorter intervention model in the future. Future studies could also examine ways to customize DBT skills training groups to the needs of individuals and schools. This might include providing opportunities to work with a coach outside of the group for those participants who are struggling with attendance but experiencing high levels of stress or those individuals require a higher dose of the intervention in order to benefit. In addition, this finding suggests that there could have been certain content, or clusters of content associated with decreases in stress, including mindfulness (covered in sessions 1-2) and distress tolerance and emotion regulation (covered in sessions 3-6). Future studies with larger sample sizes could also elucidate specific effects of the content and how it relates to or interacts with participant attendance.

Multilevel linear spline regressions also pointed to stress changing in nonlinear ways among this group of school personnel. Changes in stress were more abrupt, unexpected, and difficult to predict. This finding is consistent with literature highlighting that treatment change is a dynamic process in which individual trajectories are marked by gains and losses and change that is nonlinear (Hofmann et al., 2020). In this study, it is possible that occupational and/or personal stress led to stress fluctuations over time. Findings also highlight the value of obtaining routine, brief measures of stress to elucidate how stress changes over time and to pinpoint when, during an 8-session intervention, the most change in stress occurred. Findings also highlight the importance of studying the process of changes in stress at an idiographic level to better inform treatment attendance and optimal dosage.

Results from the logistic regression suggest within-person changes in stress (increases from a person's individual average) were not associated with increased

probability of missing the subsequent session. The high probability of missing a subsequent session, combined with 51% of the variance in attendance attributed to between-person differences, suggests that in this sample, there were person-level factors not included in the model (e.g., existing mental health difficulties, greater teaching demands) that were associated with attendance, rather than shifts in an individual's stress level on a given day. In effect, there were participants who did and did not attend, instead of times when an individual did not attend because of more acute stress.

Existing descriptive studies with teachers point to extreme time demands as a significant barrier to engaging in professional development (Collier-Meek et al., 2019; Shernoff et al., 2016) which suggests the importance of maximizing the efficiency with which school personnel are provided with stress management support. Thus, it remains important to explore factors that predict attendance and non-attendance to improve uptake. Attendance analysis studies in health psychology point to the role that stress plays in attendance at subsequent cardiopulmonary rehabilitation sessions (Ellis et al., 2022) while studies have also identified depression (Gathright et al., 2019) and avoidant coping (Spatola et al., 2021) as important predictors of attendance. Additional predictors may also be worth investigating, including participants' beliefs about how much they will benefit, how connected they are to colleagues attending the group, and additional commitments that could impede their attendance.

Implications

School personnel functioned as essential workers during the pandemic. This is not a new phenomenon as schools often serve as community hubs particularly in disaster contexts (Costa et al., 2015). The prevalence of stress among educators before the pandemic (Herman et al., 2020) and enduring adversity during the COVID-19 crisis (Yang et al., 2021) reinforces the need for schools to have prevention models in place so that school personnel have access to support and can routinely practice effective coping. While the secondary trauma research traditionally focuses on how schools can support the mental health needs of students, supporting the mental health needs of school personnel and helping them recognize their own response to crises is also crucial (Borntrager et al., 2012; Hydon et al., 2015).

School administrators must also contend with *who* is best positioned in schools to lead these efforts. Can school mental health providers internal to schools (e.g., school social workers, school psychologists) support these initiatives or is external support is required? School administrators must also consider when low dose intervention models, like the one implemented in the current study, is inadequate for those individuals experiencing more severe mental health concerns and whether a referral for outside therapy is needed. There have been calls for school administrators to advocate for mental health services for minoritized youth to demonstrate and ethic of care and a commitment to youth well-being and academic success (Walker et al., 2022). A similar ethic of care is needed for school personnel who are proximally linked to students.

Given study findings point to the idiographic nature of stress and nonlinear changes in stress over time, stress interventions may also need to incorporate routine self-monitoring of stress among school personnel so that individuals can recognize their response to the intervention and the extent to which shifts in attendance are required. Sharing stress and attendance ratings with participants and incorporating discussions regarding stress and attendance into groups can help individuals reflect on how stress is influencing their ability to engage with support. The examination of real-time interactions between stress and attendance can also provide important insights into how school personnel make decisions regarding their self-care and prioritization of support (adaptively or maladaptively) throughout their busy work week.

Limitations

The lack of control group, small sample size, and power to detect only large effects limits the conclusions that can be drawn from the current study. The single informant study design is also subject to measurement error, or informant bias which can impact the validity of the results. Future research with additional data sources, including direct observations of work performance could help build evidence related to skill transfer. We were also unable to determine the unique impact of the content and sequencing of the DBT skills on changes in stress with future studies benefitting from exploring moderators of dose-response. For example, future research could include trying to pinpoint which school personnel benefitted from attending the first 2 sessions versus more extended engagement with the intervention and which content was critical.

CONCLUSION

The COVID-19 pandemic exacerbated stress for many school personnel and group-based, virtually delivered interventions designed to reduce stress and build resilience can enhance school personnel's adjustment and functioning in the workplace. This study points to the impact of the pandemic on school personnel emotional adjustment and the need for innovative methods and models for supporting teachers to cope with stress. Understanding school personnel engagement in these forms of support, including attendance and its relationship to stress is essential to building an effective service model in schools and helps shed light on how to provide support in contexts where trauma and stress are prevalent. The move to abbreviate the number of sessions delivered is also noteworthy given DBT skills training is traditionally delivered at a much higher dosage (20+ sessions) with other populations (Rizvi & Steffel, 2014).

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