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ORIGINAL ARTICLE

Pilot Evaluation of DIsability Anti-BuLlying (DIAL) Training for Elementary Special and General Education Teachers: Impact on Teacher Self-Efficacy Attitudes Toward Bullying and Student Outcomes

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Abstract
Youth bullying is a significant concern in the USA, particularly for youth with disabilities. This pilot study explores outcome data related to the DIsability Anti-BuLlying (DIAL) training program for general and special education teachers to prevent bullying generally with a particular focus on youth with disabilities. Six schools were *randomly assigned* to receive the DIAL intervention or delayed (control) intervention. All teachers ($n=65$) responded to a self-report survey before and after module completion. Teachers completed measures on their teaching efficacy, interactions with students, and attitudes toward bullying and completed reports of social cognition, anxiety, and bullying for their K-5 students ($n=472$). Teachers ($n=36$) enrolled in the three intervention schools completed four online modules focused on improving attitudes, efficacy, and skills to prevent bullying/victimization for K-5 students with and without disabilities. Results indicated teachers who received the DIAL program reported higher levels of self-efficacy and lower levels of maladaptive attitudes toward bullying.

Keywords Bullying · Professional development · Elementary school · Disabilities · Teachers

Bullying remains a pervasive problem for school-aged youth in the USA (Burns et al., 2022; Gage et al., 2021). According to the most recent national report, over 20% of students report being bullied at school, which represents more than 5.6 million American youth (Burns et al., 2022). Bullying is a pervasive issue because it spans all of life's domains and has detrimental impacts on psychosocial, psychosomatic, behavioral, social, and educational outcomes and functioning (Rose et al., 2019). For example, evidence suggests that youth involved in bullying (i.e., victims, perpetrators) experience detrimental outcomes such as depression, social anxiety, and low self-esteem, which could contribute to academic and behavioral challenges (see Polanin et al., 2021 for meta-analysis). It should also be noted that bullying is a specific form of peer-to-peer aggression that is defined by an imbalance of power, intent to cause harm, and behaviors that are repeated or likely to be repeated without intervention (Gladden et al., 2014).

While bullying is an issue for all youth, there are specific subsets of students that are more at risk for increased bullying involvement. Specifically, students with disabilities (SWDs) are disproportionately involved in bullying as both victims and perpetrators (Rose et al., 2022; Gage et al., 2021), and this disproportionality persists over time (Rose & Gage, 2017). For example, using the US Department of

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Education's Office of Civil Rights data, Gage and colleagues (2021) reported that in 2021 approximately, 47% of SWDs in the sample experienced victimization and 24% were disciplined for bullying others, concluding that SWDs were 53% more likely to be victimized and 93% more likely to be disciplined for bullying others when compared to their peers without disabilities.

Additionally, SWDs who are victims of bullying tend to report higher levels of psychological distress and physical and emotional harm when compared to their peers without disabilities (Hartley et al., 2015). Therefore, it is imperative for special and general education teachers to possess the knowledge, self-efficacy, and skills to recognize and respond to bullying among all youth, especially among SWDs (Rose & Monda-Amaya, 2012; Rose et al., 2019). To promote knowledge acquisition, self-efficacy in intervening, and the skills necessary to recognize and respond to bullying among all youth, the current study evaluated the DIAL professional development training program for K-5 educators, with a specific emphasis on SWDs, on teacher and student outcomes associated with bullying and concomitant psychosocial factors (Espelage et al., revised & resubmitted). The overall design of the professional development was to directly prepare educators to address complex and nuanced bullying scenarios involving at-risk subgroups of youth, including SWDs, to improve knowledge, skills, and self-efficacy in bullying prevention for all youth.

Preparation of Educators to Address Bullying

Teachers are integral to bullying prevention and intervention efforts, yet many teachers report a need for additional training on recognizing and responding to bullying incidents (Bradshaw et al., 2013; Waasdorp et al., 2021). This preparation is especially important, as the USA faces one of the most critical teacher shortages in history. For example, 43% of public schools report understaffing in general education elementary teachers and 65% in special education (U.S. Department of Education et al., 2022). However, the shortage of well-qualified special education teachers has been documented at the state and national level for decades (Barth et al., 2016; Billingsley & Bettini, 2019; McLeskey & Billingsley, 2008; Sindelar et al., 2010; Theobald et al., 2021). In a recent national study of 366 special education teachers, Hester and colleagues (2020) examined reasons for work-related stress, burnout, and the desire to leave the profession through qualitative interviews. Results pointed to lack of administrative support and the lack of professional development (PD) contributing to these outcomes. Therefore, it is imperative to provide in-service teachers with high-quality PD to recognize and respond to bullying among all students, especially those with SWDs.

Teacher Perceptions of Bullying

Divergence between staff and student estimates of the rates of bullying is seen in elementary, middle, and high school, with staff consistently underestimating the frequency (Bradshaw et al., 2007; National Academies of Sciences, Engineering, & Medicine [NASEM], 2016). Bradshaw and colleagues (2007) found that differences in estimates were most pronounced in elementary schools; although 33.7% of elementary students reported being bullied twice or more in the past month, less than 1% of elementary school staff estimated a similar rate whereas 70% of staff estimated the rate to be less than 10% of students. While teachers often view physical forms of bullying as a serious problem in their schools (Nicolaides et al., 2002; Yoon & Bauman, 2014), many teachers are unaware of how serious verbal and physical forms of bullying can be, resulting in ineffective identification and response (Bradshaw et al., 2007; Farley, 2018; Kochenderfer-Ladd & Pelletier, 2008). However, data indicate that physical, relational, and verbal victimization maintain similar detrimental short- and long-term outcomes (Crosby et al., 2010; Kim et al., 2022).

Teachers have also been found to differ significantly in their beliefs about bullying motivations in physical and online spaces (Compton et al., 2014). Such definitional variations indicate inconsistent teacher beliefs and in turn signal inconsistent teacher responses to bullying (Sokol et al., 2016) As such, providing teachers with targeted support for developing a holistic understanding of bullying and intervention strategies, especially those concentrated on the experiences of youth who are most at risk for bullying involvement, including SWDs, is imperative. Further, Andrà and colleagues (2019) found that part of the reason teachers participate in PD opportunities is to make sense of their role as "the kind of teacher" who can prevent incidents related to their area of practice (Andrà et al., 2019).

Intervention Efforts to Improve Teacher Self-Efficacy for Bullying Prevention

An initial approach to supporting teacher development and preparation is to improve self-efficacy. Specifically, teachers with higher levels of self-efficacy in recognizing and responding to bullying are also more likely to effectively intervene in bullying situations and implement strategies to proactively resolve bullying (Duong & Bradshaw, 2013; Fischer & Bilz, 2019). For example, Fischer and Bilz (2019) found that teachers with high self-efficacy beliefs (more than one standard deviation above the mean) were 1.5 times more likely to intervene immediately than teachers with mean self-efficacy beliefs. This finding was independent of

gender, work experience, or type of bullying (i.e., direct or indirect). Recently, a 2021 systematic review yields consistent findings that show teachers who generally feel confident in managing bullying would intervene more often (Fischer et al., 2021). In another meta-analysis, Van Verseveld and colleagues (2019) evaluated the effectiveness of bullying prevention programs with explicit teacher training components and determined that teachers who received the training reported higher self-efficacy, knowledge, and responsiveness to intervene in bullying behavior in schools.

Similarly, in a post-bully prevention intervention using a shared teacher/student training, Battey and Ebbeck (2013) facilitated teacher focus groups which revealed that teachers developed "a shared language with the students in regard to appropriate behavior" and identified strategies needed "in developing a warm school environment" (p. 214). Similarly, in a shared teacher/student bullying prevention training, James and colleagues (2006) explored teacher-focused impacts of the PD experience and determined that 72% of teachers reported greater confidence in their ability to manage bullying and 84% reported increased vigilance related to bullying prevention. Therefore, by providing teachers with a high-quality, interactive PD with authentic examples involving complex and nuanced scenarios, coupled with actionable knowledge and skills to identify, mitigate, and prevent further bullying, teachers will be more prepared to address bullying within their classroom among all youth.

Current Bullying Prevention Intervention Efforts

In a meta-analysis, Gaffney and colleagues (2021) identified specific elements of anti-bullying programs that were associated with effectiveness elements beyond those targeting teacher efficacy. Decreases in school-based bullying perpetration were found for interventions that included whole-school approach, anti-bullying policies, classroom rules, information for parents, informal peer involvement, and work with victims. Additionally, when teachers are trained to openly condemn bullying behavior and arouse empathy for victims, youth who engage in bullying report significantly higher intentions to improve behavior (Garandeau et al., 2016). This indicates that teachers, when trained properly, carry high potential for reducing bullying. While many bully prevention programs yield modest reductions in bullying, evidence consistently supports high-quality PD and training for teachers can serve as a vehicle to reduce bullying perpetration and victimization (Gaffney et al., 2019, 2021; NASEM, 2016; Ttofi & Farrington, 2011). Specifically, teachers are on the frontlines and are often responsible for implementing prevention programs; thus, their pedagogical dexterity and self-efficacy in implementing prevention programs are the cornerstone to positive program outcomes (Merrell et al., 2008).

Considerations for Effective Professional Development

From a theoretical perspective, interventions grounded within a *Social-Ecological Framework* (Bronfenbrenner, 1977) tend to be more comprehensive and effective in reducing bullying among school-aged youth (Gaffney et al., 2021; NASEM, 2016). For example, studies consistently report that negative school environmental factors (e.g., policies, staff reaction to bullying) can lead to an increase in the frequency of bullying, aggression, and victimization and reduce the likelihood of students feeling safe in their school (Espelage et al., 2014; Goldweber et al., 2013). In contrast, youth with positive perceptions of their school environment are less likely to exhibit externalizing behaviors (e.g., aggression; Espelage et al., 2014; Goldweber et al., 2013). Therefore, drawing from the *Social-Ecological Framework*, the school environment is an important microsystem that influences how students view bullying and aggression, how adult role models influence student behavior, and how school-level norms and policies shape student behaviors (Bronfenbrenner, 1977; Espelage et al., 2014; Waasdorp et al., 2021).

From this perspective, PD efforts should be comprehensive in nature, and encompass training that is applicable to various educational environments designed to support all students. In addition to being engaging and interactive, PD in bullying prevention should be grounded in evidence-based practices. For example, Rose et al. (2019) argued that current trends in bullying prevention include (1) an operationalization of bullying and affiliated roles, (2) recognizing risk and protective factors associated with escalated rates of bullying involvement associated with specific subgroups of youth, (3) systematically evaluating risk factors through behavioral risk screeners, (4) situating bully prevention efforts within a multi-tiered system of support with an emphasis on social and emotional learning, and (5) implementing interventions designed to increase social and communication skill acquisition. By embedding these components into PD for bullying prevention, educators can proactively focus on teaching students positive social skills, attitudes, and behaviors that support learning and ultimately increase academic achievement, while decreasing the prevalence of bullying involvement among all students, including SWDs.

Impact of Improved Teacher Responses to Bullying

Schools must address bullying in the context of their primary mission of promoting academic achievement and school success. However, there is a scarcity of high-quality PD programs available to today's educators. There is no readily available evidence-based training with published research

that incorporates training specifically for general and special education teachers regarding bullying prevention among youth at risk, including SWDs; the existing PD options (Allen, 2010; Charmaraman et al., 2013; Dedousis-Wallace et al., 2014; Esposito et al., 2007; Mikami et al., 2011) do not adequately address the complexity, nuances, or gap between teacher knowledge on disability and bullying/victimization. A few studies (Berry et al., 2012; Bourke-Taylor et al., 2018) examined the role of PD for special education teachers, but also lacked depth of content related to bullying/victimization as connected to disability. The DIAL program supports teachers to make the critical changes for individual students, for their classroom, and within their school culture and multi-tiered support systems (see Fig. 2).

Theory of Change and Logic Model

Overall, the DIAL program covers all the necessary content for educators to conceptualize, implement, and assess bully prevention efforts within their school or district (Fig. 1). The DIAL program supports the recommendations of NASEM (2016) by outlining how schools can implement multi-component and a multi-tiered system of supports (MTSS). MTSS is a framework that helps educators provide academic and behavioral strategies for students with various needs. Critical components of MTSS include universal screening of all students early in the school year, tiers of interventions that can be amplified in response to levels of need, ongoing data collection and continual assessment, school-wide approach to behavioral expectations and supports, and parent involvement (Batsche et al., 2005; Fuchs & Fuchs, 2006; McIntosh et al., 2010; Weingarten et al., 2020). Experts in the field suggest that bully prevention interventions should be implemented within an MTSS framework (McCree et al., 2022; Song et al., 2019). Doing so allows for students to receive intervention at multiple timepoints to meet their individualized needs.

When it comes to operationalizing the logic model of the DIAL program, the training aims to increase school staff's efficacy to mitigate bullying and promote prosocial skills, which will drive improved social, emotional, and behavioral outcomes for SWDs, including feelings of school connectedness, improved student–teacher relationships, and decreased academic difficulties and prevalence of bullying (Fig. 1). For teachers, the DIAL program seeks to achieve intermediate teacher outcomes of increased knowledge of bullying experiences with SWDs and students at risk for disability identification, increase competency to intervene when bullying occurs, improve teacher effectiveness, job satisfaction, self-efficacy, and classroom management skills, decrease teacher stress, and raise confidence working with SWDs (Fig. 1). Finally, improvements of these teacher outcomes are likely to be associated with student bullying involvement and other psychosocial outcomes. Ultimately, the novelty of the DIAL program is its ability to provide core bullying prevention knowledge and techniques with and immediate focus on complex and nuanced scenarios regarding youth who are most at risk for bullying involvement, including SWDs, that can supplement existing programming or serve as a stand-alone intervention if efficacious.

Current Study

This pilot study is an initial small-scale evaluation of the online DIAL program that targets educators' knowledge about school bullying and competencies in intervening and prevention in general, but also includes information relevant to the unique aspects of bullying for SWDs. Three research questions guide this work: (1) Do K-5 educators who completed the DIAL program report increases

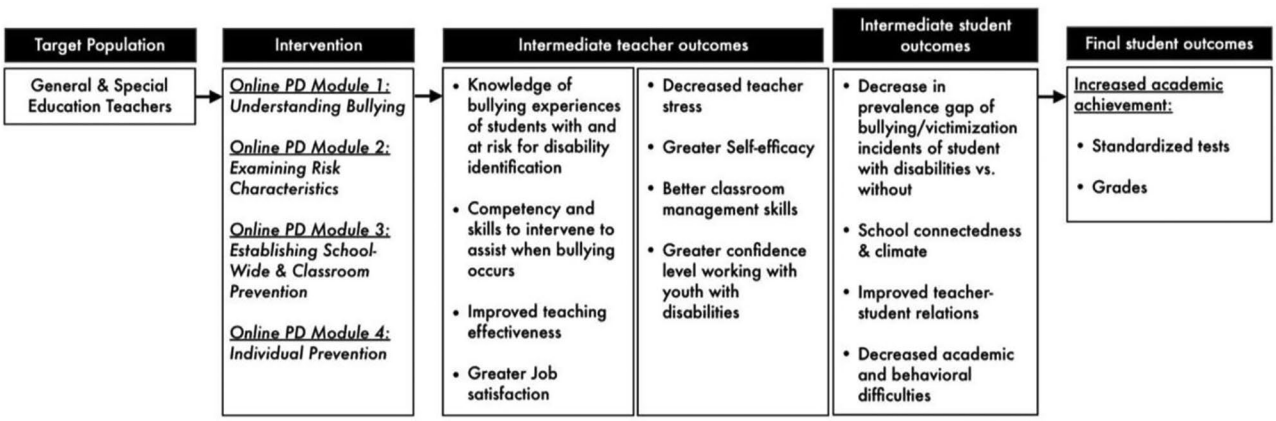
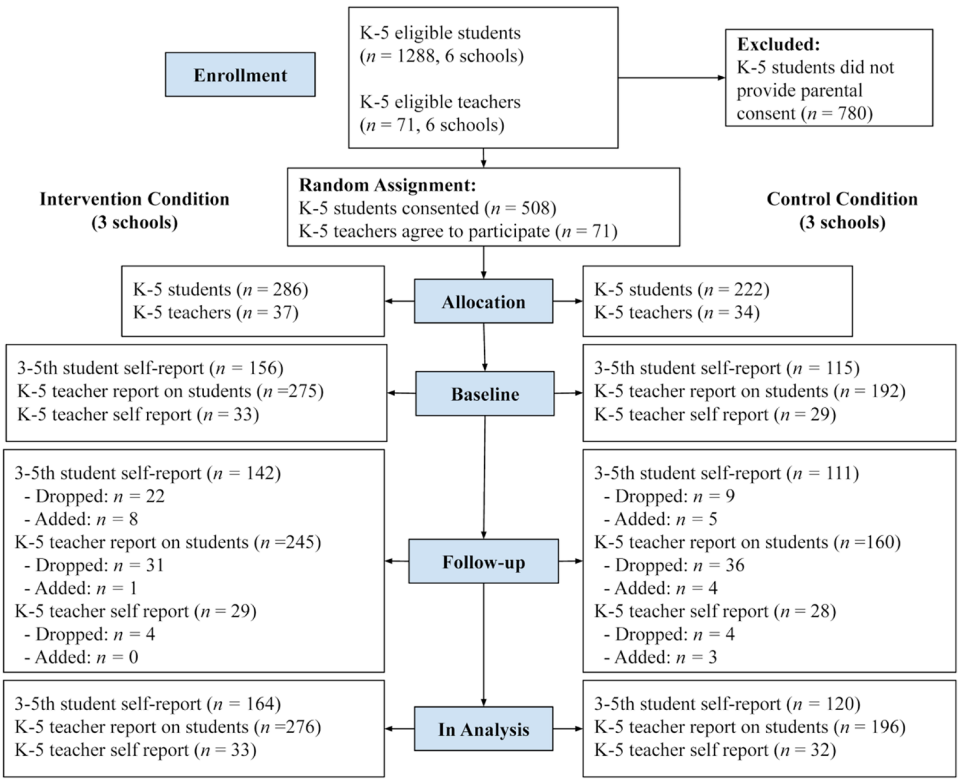


Fig. 1 DIAL professional development theory of change and logic model

Fig. 2 CONSORT diagram



in knowledge and skills for effectively identifying, mitigating, and preventing bullying among K-5 students compared to educators who were in the delayed intervention condition? (2) Do K-5 educators who completed the DIAL program report less bullying and more positive psychosocial outcomes among their students compared to educators in the delayed intervention condition? (3) Do 3rd–5th grade students with educators who completed the DIAL program report less bullying and more positive psychosocial outcomes in comparison to students with educators in the delayed intervention condition?

Methods

Research Design and Data Collection Procedures

Pre-post data were collected in six elementary schools in a large urban school district in a southeastern US state; teachers in three schools received the DIAL program and teachers in the other three schools were placed on a waitlist. The school district research office selected the six schools to participate and provided the research team with contact information for each school. An informational meeting with the research team and school administrators (e.g., principal, assistant principal, counselor, dean of students) was held prior to implementation to introduce the project goals, establish the timeline, discuss strategies for securing active parental consent for K-5 students, and delineate expectations for all parties involved. A second informational meeting with similar content was then held with all participating teachers at each school.

Next, we employed matched pairs random assignment to assign schools to the DIAL program or delayed intervention conditions (Imai et al., 2009). The six schools were paired based on student enrollment, teacher full-time equivalence, percentage of English language learner students, and percentage of SWDs with the criterion of minimizing the Mahalanobis distance between school pairs. Within each pair, one school was then randomly assigned to the DIAL program and the other to the delayed control condition. The matched pairs random assignment was conducted using the nbpMatching package (Beck et al., 2016) in R (R Core Team, 2022).

Teacher and student participants completed baseline (i.e., pre) measures in Fall 2021 (November to December) prior to the DIAL program. Institutional review board (IRB) approval was secured at the lead PI's institution. The IRB required active parental consent for all K-5 students in each of the six schools and teachers also provided active consent. Students in 3rd–5th grades provided assent and could skip any question or stop responding at any time. At the end of the survey, the research team encouraged the students to reach out to parents or teachers if they were experiencing bullying. The teacher surveys consisted of self-report measures of teaching efficacy, perceptions of bullying, willingness

to intervene, and job satisfaction. Teachers also provided reports of behavior, social cognition and anxiety, conflict, and bullying for each of the students in their classroom (K-5th grades) that had parental consent to participate in the evaluation. Students in grades 3–5 completed a self-report survey about their classroom experiences, bullying, victimization, and prosocial behavior. The research team of 4-to-6 graduate students, one project coordinator, and two professors administered the survey in classrooms, media center, or library. Teachers were not present. The survey was given in paper and pencil form and was read to the students by one of the graduate students. Reading the survey aloud enabled students to ask clarifying questions. Teachers then participated in the DIAL program modules throughout the 2021–2022 school year followed by teachers completing the post-surveys online in late Spring 2022 (May to July, 2022). Surveys were then administered in late Spring 2022 (May to June, 2022) to the same 3rd–5th graders with the same procedure as the pre-surveys.

Participants

Of the 1288 students eligible, parental consent was received for the 508 (39%) students who participated in the study. Sixty-five (92%) of the eligible 71 teachers consented to participate. Additional participation details are in Fig. 2. Teacher demographics ($N=65$) by condition are in Table 1. Overall, 92% identified as female and 8% as male. By grade, the sample was 15% kindergarten, 13% 1st, 17% 2nd, 17% 3rd, 20% 4th, and 18% 5th grade teachers. The majority of teachers identified as Hispanic (52%) followed by Black or African American (20%), Haitian (12%), White (11%), and Multiple or Other race (5%). See supplemental materials for coding decision details. At baseline, 56% of teachers had a master's degree, 3% completed some post-graduate work, and 41% had a bachelor's degree. Student demographics by condition for the self-report sample ($N=284$) and teacher report on student sample ($N=472$) are in Table 2. Notably, 252 students had both a self-report and teacher report. Overall, in the teacher-report sample, 10% of students were in kindergarten, 14% in 1st grade, 22% in 2nd grade, 18% in 3rd grade, 21% in 4th grade, and 17% in 5th grade with 53% identifying as a boy, 44% as a girl, and 3% as another gender. Similar to their teachers, the majority of students identified as Hispanic (62%) followed by Haitian (18%), Black or African American (9%), White (6%), and Multiple or Other race (5%). During the school year, 17% of students received English language learner services and 35% of students had an identified exceptionality (15% gifted, 10% specific learning disability, 5% other health impairment, 4% autistic, 1% language impairment, 1% speech impairment).

Table 1 Teacher demographic characteristics frequency and percentage

Characteristic	Control ($N=32$)	DIAL Program ($N=33$)
Race		
Black or African American	12 (38%)	1 (3%)
Haitian	4 (12%)	4 (12%)
Hispanic	11 (34%)	22 (69%)
White or European American	3 (9%)	4 (12%)
Multiple or other	2 (6%)	1 (3%)
Not reported	0	1
Grade		
Kindergarten	4 (14%)	5 (16%)
1st grade	4 (14%)	4 (12%)
2nd grade	5 (18%)	5 (16%)
3rd grade	4 (14%)	6 (19%)
4th grade	6 (21%)	6 (19%)
5th grade	5 (18%)	6 (19%)
Not reported	4	1
Gender		
Female	29 (94%)	28 (90%)
Male	2 (6%)	3 (10%)
Not reported	1	2
Education level at baseline		
Bachelor's degree	14 (50%)	11 (33%)
Some post-graduate work	1 (4%)	1 (3%)
Master's degree	13 (46%)	21 (64%)
Not reported	4	0

DIAL Professional Development Modules

The DIAL program consists of four modules focused on informing general and special education teachers about how to effectively recognize and respond to bullying, with a specific emphasis on SWDs. The DIAL program focuses on understanding bullying among K-5th grade youth, evaluating the role of student behavior, and implementing evidence-based practices that are grounded in sound behavioral principles. Module 1 provides the foundational knowledge needed to understand bullying and distinguish bullying from other kinds of aggression. Additionally, it provides a brief overview and importance of IEPs and 504 plans and introduces global risk factors of bullying involvement. Module 2 expands on material covered in the previous module by further discussing disability classifications and eligibility criteria covered by IDEA and Section 504, as well as risk factors that increase the likelihood of bullying involvement for SWDs, including social and communication skill differences, disability-specific characteristics and supports, and prejudice associated with their intersectional

Table 2 Student demographic characteristics frequency and percentage

Characteristic	Self-report sample ($N=284$)		Teacher-report sample ($N=472$)	
	Control ($n=120$)	DIAL Program ($n=164$)	Control ($n=196$)	DIAL Program ($n=276$)
Race[a]				
Black or African American	8 (7%)	3 (2%)	32 (16%)	10 (4%)
Haitian	29 (25%)	28 (17%)	48 (25%)	36 (13%)
Hispanic	60 (51%)	119 (73%)	89 (46%)	202 (73%)
White or European American	9 (8%)	3 (2%)	15 (8%)	15 (5%)
Multiple or other	11 (9%)	10 (6%)	10 (5%)	13 (5%)
Not reported	3	1	2	0
Gender[a]				
Boy	60 (50%)	88 (54%)	107 (55%)	141 (51%)
Girl	53 (44%)	73 (45%)	78 (40%)	129 (47%)
Other	7 (6%)	2 (1%)	10 (5%)	6 (2%)
Not reported	0	1	1	0
Grade				
Kindergarten	-	-	12 (7%)	28 (11%)
1st grade	-	-	25 (14%)	32 (13%)
2nd grade	-	-	46 (26%)	46 (19%)
3rd grade	25 (24%)	56 (38%)	24 (14%)	50 (20%)
4th grade	45 (44%)	44 (30%)	43 (24%)	44 (18%)
5th grade	33 (32%)	47 (32%)	27 (15%)	44 (18%)
Not reported	17	17	19	32
English language learner[b]	14 (12%)	33 (21%)	27 (16%)	48 (18%)
Not reported	8	10	26	7
Exceptionality type[b]				
Speech impairment	1 (1%)	1 (1%)	1 (1%)	1 (1%)
Language impairment	1 (1%)	0 (0%)	3 (2%)	3 (1%)
Specific learning disability	11 (9%)	18 (11%)	17 (9%)	26 (9%)
Gifted	24 (20%)	19 (12%)	25 (13%)	38 (14%)
Autistic	3 (3%)	6 (4%)	4 (2%)	11 (4%)
Other health impairment	0 (0%)	12 (7%)	2 (1%)	17 (6%)
None	63 (61%)	91 (62%)	125 (71%)	148 (61%)
Not reported	17	17	19	32

Teacher-report sample includes 252 of the students in the self-report sample

[a]Student report unless unavailable then teacher report used

[b]Teacher report unless unavailable then the student report used

identities (e.g., race, gender, sexual orientation, socioeconomic status, religious affiliation). Module 3 includes actionable steps on planning a school-wide and classroom-wide bullying prevention plan. Module 3 is designed to address Tier 1-universal level systems and Tier 2-classroom supports including five subsections, including MTSS. Teachers also construct a MTSS Bullying Prevention Action Plan (MTSS-BPAP) with assigned coaches, who are former educators trained by the project staff. Module 4 is designed to introduce educators to individualized, adaptive intervention methods grounded in sound behavioral sciences they can implement for their students that may need more intensive support (e.g., Functional Behavior Assessments paired with behavior intervention plans, self-management). Each module takes between 30 min to 1 h to complete, not including the time it takes to complete module assignments and meet with their bullying prevention coach. Teachers meet with their coaches on a bi-weekly basis to discuss the module content and how it relates to their students. Additional details on the modules are outlined in another manuscript (Espelage et al., revised & resubmitted). The DIAL program was designed to complement existing bullying prevention efforts by providing foundational knowledge and interventions or serve as a stand-alone intervention.

Measures

All measures used Likert-type response options. Scores for each measure were calculated as the mean of the item responses. Participants must have responded to all items within the measure to receive a score. In total, there were 13 teacher self-report measures, five teacher report of student-focused measures, and eight student self-report measures. Additional details and psychometric evidence for each measure are presented in the supplemental materials.

Teacher Self-Report Measures

The three 4-item subscales from the *Teachers' Self-Efficacy Scale - Short Form* (Tschannen-Moran & Hoy, 2001) were used to measure teachers' confidence regarding student engagement (e.g., "Help my students value learning"; pre: $\omega = .92$; post: $\omega = .82$), instructional practices (e.g., "Use a variety of assessment strategies"; pre: $\omega = .83$; post: $\omega = .86$), and classroom management (e.g., "Calm a student who is disruptive or noisy"; pre: $\omega = .91$; post: $\omega = .89$). Three subscales from the *Student Social Behavior Questionnaire* (Troop-Gordon & Ladd, 2015) measured teachers' unhealthy views toward bully victimization: (a) maladaptive attitudes (five items, e.g., "Students will stop bullying kids who assert themselves"; pre: $\omega = .83$; post: $\omega = .77$), (b) normative attitude (three items, e.g., "Teasing other children is just part of growing up"; pre: $\omega = .92$; post: $\omega = .88$), and (c) avoidance attitude (two items, e.g., "Students will stop picking on those who ignore them"; pre: $\omega = .79$; post: $\omega = .80$).

Teachers' job dissatisfaction and their intentions to leave the profession (e.g., "I will probably look for a new job in the next year"; pre: $\omega = .86$; post: $\omega = .86$) were measured with three items from the *Michigan Organizational Assessment Questionnaire* (Lawler et al., 1975). The prevention PD scale consisted of five items from the *Bullying Perception Survey* (Kennedy et al., 2012) measuring support for bullying prevention PD (e.g., "Bullying prevention should be provided for current teachers and administrators"; pre: $\omega = .89$; post: $\omega = .80$). The *Colorado Trust's Bully Prevention Initiative – Staff Survey* (Csuti, 2008) was used to measure teacher perceptions of (a) students' willingness to intervene in bullying situations (five items, e.g., "A student or group of students is pushing and shoving a weaker student"; pre: $\omega = .94$; post: $\omega = .99$), (b) staff willingness to intervene in bullying situations (five items, e.g., "A student is making fun of and teasing another student who is obviously weaker"; pre: $\omega = 1.00$; post: $\omega = 1.00$), (c) aggression as a problem at the school (five items, e.g., "Students picking fights with other students"; pre: $\omega = .90$; post: $\omega = .92$), (d) school commitment to bullying and violence prevention (10 items, e.g., "Develops policies or programs to prevent bullying"; pre: $\omega = 1.00$; post: $\omega = .99$), and (e) positive school environment and interactions (seven items, e.g., "Teachers and staff in this school usually get along with students"; pre: $\omega = .97$; post: $\omega = .94$).

Teacher Report of Student-Focused Measures

Student social (e.g., "cooperation with peers"), academic (e.g., "preparedness for instruction"), and emotional (e.g., "positive attitude") behavior risk (pre: $\omega = .85$; post: $\omega = .85$) was evaluated using the 19-item *SAEBRS*, a universal screening tool (Kilgus et al., 2013). Physical (e.g., "pushed, shoved, or tripped a weaker student") and non-physical (e.g., "spread rumors about another student") bullying (pre: $\omega = .94$; post: $\omega = .99$) was measured with 8 items from the *Teacher Assessment of Student Behavior* (Brown et al., 2011). Teacher perception of student social cognition (4 items, e.g., "difficulty knowing how others are reacting"; pre: $\omega = .93$; post: $\omega = .94$) and social anxiety (3 items, e.g., "isolates self in social situations"; pre: $\omega = .78$; post: $\omega = .78$) was included from the *Colorado Learning Disabilities Questionnaire* (Willcutt et al., 2011). Conflict in the student–teacher relationship (e.g., "dealing with this student drains my energy") was measured with the 7-item conflict subscale (pre: $\omega = .98$; post: $\omega = .97$) from the *Student–Teacher Relationship Scale* (Pianta, 2001).

Student Self-Report Measures

Students' positive classroom experiences (e.g., "In this class, I feel like I fit in"; pre: $\omega = .65$; post: $\omega = .64$) were measured with eight items from the *Student Perception Survey* (Colorado Education Initiative, 2013). Students reported their own perpetration of teasing, name calling, social exclusion, and rumor spreading using the 9-item *University of Illinois Bully Scale* (pre: $\omega = .83$; post: $\omega = .87$; Espelage & Holt, 2001). Physical fighting was measured with the 5-item *University of Illinois Fight Scale* (pre: $\omega = .82$; post: $\omega = .79$; Espelage & Holt, 2001), and physical and verbal victimization were measured using the 4-item *University of Illinois Victimization Scale* (pre: $\omega = .76$; post: $\omega = .68$; Espelage & Holt, 2001). Finally, the *Colorado Trust Bullying Prevention Initiative: Student Survey* (Csuti, 2008) was used to measure (a) prosocial behaviors (four items, e.g., "I ignored rumors or lies that I heard about other students"; pre: $\omega = .60$; post: $\omega = .58$), (b) staff bullying intervention (five items, e.g., "a student teases another student"; pre: $\omega = .81$; post: $\omega = .79$), (c) student bullying intervention (five items, e.g., "a student is hurt or upset"; pre: $\omega = .78$; post: $\omega = .82$), and (d) classroom climate (six items, e.g., "My classroom is a good place to be"; pre: $\omega = .77$; post: $\omega = .79$).

Data Analyses

Attrition and Missing Data

Of the 65 teachers who participated in the study, 54 (83%) completed both the pre- and post-survey, 8 (12%) completed only the pre-survey, and 3 (5%) only the post-survey (Fig. 2). Similarly, 240 (85%) of the 284 grade 3–5 students completed both the pre- and post-surveys with 31 (11%) completing only the pre-survey, and 13 (5%) completing only the post-survey. Fisher's exact test (i.e., computes exact *p*-values rather than a test statistic) found no difference in participation rates by intervention condition for teachers ($p = .28$) or for students ($p = .26$). There was a difference for teacher reports of students ($p = .01$) with delayed intervention teachers less likely to complete post-surveys. This difference is accounted for in the analytic models using full information maximum likelihood (FIML) estimation (Enders, 2022, p. 132–135). Logistic regression was then used to investigate whether pre-survey scores, along with race and gender, predicted attrition (Enders, 2022, p. 21; Nicholson et al., 2017). No associations were found for teachers, suggesting data could be missing completely at random (MCAR) or that the tests were underpowered to detect associations (i.e., Type II error). Among students, Black students were more likely to drop out than Hispanic students ($OR = 7.57$, 95%CI = [1.33, 44.63], $p = .02$), indicating data were missing at random (MAR) and not MCAR (see supplemental materials for full results).

After removing cases of attrition, we investigated non-response to individual items to further assess missing data mechanisms (MCAR, MAR, or missing not at random [MNAR]). Only 1.1% and 0.4% of all teacher responses were missing in pre- and post-surveys, respectively; although at each time, 25.8% and 22.8% of teachers, respectively, had at least one missing response. Through a series of logistic regressions—one for each measure—pre-scores and demographic variables were not significantly associated with missingness of post-scores, which again signals that the data were either MCAR or the tests were underpowered. Overall, 3.7% of student responses were missing at each time point. At both times, 96% of students were missing on at least one item with most of the missingness on items related to receiving support services (disability, English language) whereas all other variables had < 2% missingness. Using logistic regression, Black students were more likely to be missing on post-scores than Hispanic students, which again suggests the data were not MCAR.

Analytic Models

Direct Effects A separate linear regression model was run to estimate DIAL program effects on post-scores for each teacher, student, and teacher report of student outcomes while adjusting for pre-scores. All models were run with lavaan (Rosseel, 2012) in R (R Core Team, 2022) using FIML estimation. Cluster robust standard errors were estimated for student outcomes to account for the nesting of students within teachers. Huber-White robust standard errors were estimated for teacher outcomes. We attempted to run multilevel models to account for the clustering of students and teachers within the six schools, but models produced inadmissible solutions for most outcomes, which is not surprising given the small number of schools. We included the pre- and post-scores for the other measures as auxiliary variables in the FIML estimation using the sem.auxiliary function from the semTools package (Jorgensen et al., 2021) to improve the MAR assumption for the missing data (Enders, 2022, p. 17–20). For an effect size, we calculated Hedges's *g*—the standardized mean difference in post-scores between the DIAL program and delayed intervention conditions. In other words, Hedges's *g* is the unadjusted mean difference in standard deviation units. For student outcomes (self-report and teacher reported), the estimate of *g* accounted for the clustering of students within teachers using the formulas from Hedges (2007).

Mediation To examine the potential mediation of teacher attitudes and behaviors on student outcomes, we fit two-wave mediation models with the full ANCOVA latent change score specification described by and using the lavaan code presented in Valente and colleagues (2021). This was a saturated model, which means the model had 0 degrees of freedom and fit the data perfectly. We estimated a separate model for each combination of student outcome (eight self-report and five teacher report) and teacher mediator shown to be significantly related to DIAL program at < .10 in the linear regressions (i.e., student engagement, instructional strategies, avoidance attitude, maladaptive attitude, and aggression problems). As with the direct effect models, the mediation models were run with pre- and post-scores from other measures as auxiliary variables to improve the FIML estimation along with cluster robust standard errors.

Results

The first research question asked whether the DIAL program improved teachers' attitudes, efficacy, and skills for effectively identifying, mitigating, and preventing bullying among K-5 students. Compared to the delayed intervention condition and while adjusting for pre-score, the DIAL program was associated with higher teachers' self-efficacy for implementing effective instructional strategies post-intervention ($b = 0.28$, 95%CI = [0.07, 0.48], $p = .01$) with a standardized mean difference (unadjusted for pre-score) of $g = 0.48$ (Table 3). The DIAL program

Table 3 Unstandardized linear regression estimates of DIAL program effects

Outcome	DIAL PROGRAM		Pre-survey score			
	b	*95%CI*	*b*	*95%CI*	R^2	*g*
Teacher self-reports ($N=65$)[a]						
Student engagement	0.18^	[−0.01, 0.37]	0.32*	[0.06, 0.57]	.20	0.27
Classroom management	0.11	[−0.08, 0.31]	0.31^	[−0.05, 0.67]	.16	0.21
Instructional strategies	0.28**	[0.07, 0.48]	0.33*	[0.04, 0.61]	.21	0.48
Normative attitude	−0.13	[−0.38, 0.11]	0.27*	[0.01, 0.52]	.14	−0.16
Avoidance attitude	−0.33*	[−0.61, −0.05]	0.53**	[0.34, 0.72]	.35	−0.27
Maladaptive attitude	−0.26**	[−0.46, −0.07]	0.47**	[0.30, 0.63]	.33	−0.14
Job dissatisfaction	−0.10	[−0.34, 0.14]	0.82**	[0.63, 1.00]	.58	−0.18
Students intervene	0.06	[−0.24, 0.36]	0.30^	[−0.02, 0.63]	.09	0.05
Staff intervene	0.08	[−0.17, 0.34]	−0.02	[−0.23, 0.18]	.01	0.18
Aggression problems	0.21^	[−0.02, 0.44]	0.66**	[0.46, 0.87]	.43	0.56
School commitment	0.05	[−0.17, 0.26]	0.82**	[0.59, 1.06]	.55	−0.13
Positive interactions	0.08	[−0.12, 0.28]	0.65**	[0.46, 0.85]	.39	−0.02
Prevention PD	−0.13	[−0.36, 0.09]	0.49**	[0.17, 0.81]	.23	−0.21
Student self-reports ($N=284$)[b]						
Classroom experience	−0.06	[−0.19, 0.07]	0.46**	[0.31, 0.61]	.24	−0.17
Bullying	−0.18	[−0.43, 0.07]	0.63**	[0.50, 0.77]	.37	−0.40
Fight	−0.07	[−0.25, 0.11]	0.58**	[0.48, 0.67]	.41	−0.34
Peer victimization	−0.10	[−0.28, 0.07]	0.41**	[0.30, 0.52]	.22	−0.25
Prosocial	0.21^	[−0.02, 0.44]	0.40**	[0.29, 0.51]	.18	0.17
Staff intervene	−0.01	[−0.23, 0.20]	0.34**	[0.21, 0.47]	.13	−0.10
Student intervene	−0.34**	[−0.54, −0.14]	0.29**	[0.16, 0.42]	.15	−0.51
Class climate	0.03	[−0.16, 0.21]	0.43**	[0.32, 0.55]	.19	−0.01
Teacher reports of students ($N=472$)[c]						
Behavior risk	−0.04	[−0.12, 0.04]	0.82**	[0.76, 0.89]	.68	−0.04
Social cognition	0.06	[−0.06, 0.19]	0.72**	[0.60, 0.84]	.49	−0.01
Social anxiety	−0.02	[−0.16, 0.12]	0.65**	[0.52, 0.78]	.39	−0.10
Conflict	−0.04	[−0.13, 0.05]	0.74**	[0.61, 0.88]	.56	−0.14
Bullying	−0.03	[−0.11, 0.05]	0.78**	[0.58, 0.99]	.55	−0.20

95%CI = 95% confidence intervals, *g* = standardized mean difference between DIAL program and delayed intervention condition at post, which for student measures accounts for clustering of students within teachers using formulas from Hedges (2007)

^p < .10; *p < .05; **p < .01

[a]Estimated with Huber-White robust standard errors

[b]Estimated with cluster robust standard errors given clustering within 37 teachers

[c]Estimated with cluster robust standard errors given clustering within 60 teachers

was also associated with reducing teachers' maladaptive attitudes ($b=-0.26$, 95%CI = [−0.46, -0.07], $p=.01$) and avoidance attitudes ($b=-0.33$, 95%CI = [−0.61, −0.05], $p=.02$) toward bullying with effect sizes of $g=-0.14$ and $g=-0.27$, respectively. Given the small sample of teachers ($n=65$), and therefore the lack of statistical power, it is also worth noting a possible association of the DIAL program with increases in teachers' self-efficacy for engaging students ($b=0.18$, 95%CI = [−0.01, 0.37], $p=.07$, $g=0.27$), but also higher perceptions of student aggression problems ($b=0.21$, 95%CI = [−0.02, 0.44], $p=.08$, $g=0.58$). Regarding the second research question, the DIAL program was not directly associated with teacher reports of students' bullying, conflict, social cognition, or social anxiety. There was, however, a possible indirect, mediated effect of the DIAL program reducing students' social anxiety through a reduction in teachers' maladaptive attitudes toward bullying ($b=-0.07$, 95%CI = [−0.15, 0.00], $p=.06$; Fig. 3). Results from all mediation models are presented in supplemental materials. The third research question investigated whether grade 3–5 students whose educators were in the DIAL program condition reported less

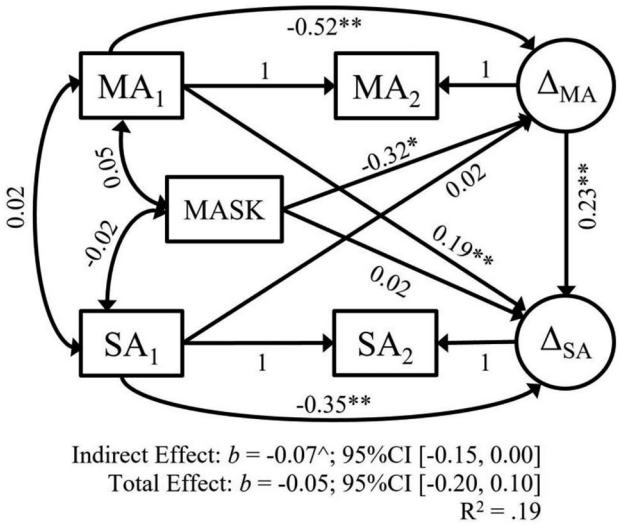


Fig. 3 Latent change score ANCOVA mediation model of DIAL program on students' social anxiety through teachers' maladaptive attitudes toward bully victimization. Note. MA = teachers' self-reported maladaptive attitudes toward bullying victimization. SA = teacher report of students' social anxiety. CI = confidence interval. ^$p < .10$, *$p < .05$, **$p < .01$

bullying and more positive psychosocial outcomes than students in the delayed intervention condition. Contrary to this hypothesis, students in the DIAL program condition reported their peers were less likely to intervene in instances of bullying ($b = -0.34$, 95%CI = [−0.54, −0.14], $p < .01$) in the post-surveys with an unadjusted standardized mean difference of $g = -0.51$ (Table 3). There was also a possible association of the DIAL program and higher student self-reported prosocial behavior ($b = 0.21$, 95%CI = [−0.02, 0.44], $p = .08$) with an effect size of $g = 0.17$. The mediation models did not indicate the presence of indirect effects of the DIAL program on student self-reported outcomes through teacher self-reported attitudes and behaviors (see supplemental materials).

Discussion

In this study, we evaluated a high caliber, interactive, cost-efficient, competency-based teacher PD, as current literature points to teacher training as a critical component of efficacious bully prevention programs (Bradshaw et al., 2007; Gaffney et al., 2019; NASEM, 2016; Yoon & Bauman, 2014; Waasdorp et al., 2021). Results of the pilot study determined that teachers that received the DIAL program reported higher levels of self-efficacy related to instructional strategies and lower levels of maladaptive and avoidance attitudes toward bullying. Also, these lower maladaptive attitudes toward bullying were associated with less teacher reported student social anxiety. Teacher self-efficacy was captured by teachers' confidence regarding their ability to effectively engage students, utilize instructional practices, and manage their classrooms. These abilities are fundamental to ensuring a positive classroom climate that is associated with reduced bullying involvement (Duong & Bradshaw, 2013; Fischer & Bilz, 2019). Teacher maladaptive attitudes were measured by items that captured beliefs that victimized students were at fault because they either like the attention or allow bullying to happen, and that victimized students are responsible for bullying prevention because they need to assert or stand up for themselves. These maladaptive attitudes place blame and unwarranted responsibility on the student experiencing bullying rather than the context which is enabling bullying involvement. Teachers who hold these maladaptive attitudes may be less likely to intervene and thus may contribute to bullying in their classroom and school settings (Sokol et al., 2016). Avoidance attitudes were captured by teachers' agreement to items that suggest bullying behaviors go away when the victimized student ignores or stays away from the student(s) bullying them. These maladaptive and avoidant attitudes are particularly harmful for youth most at risk for bullying involvement, including SWDs, because two of the most common predictors are social and communication skill deficits (Rose et al., 2018; Rose & Monda-Amaya, 2012; Sokol et al., 2016), which are specifically addressed throughout the DIAL program.

Although the DIAL program was intended to provide general and special education teachers with the knowledge and skill to prevent bullying by promoting a safe school climate using an MTSS framework, students in the DIAL program condition reported that their peers were less likely to intervene in instances of bullying. Given that the DIAL program was delivered directly to teachers may explain why students did not perceive their peers as willing to intervene in bullying, and the impact of the DIAL program and associated teacher behavioral outcomes may have a more distal impact on influencing a prosocial classroom and school climates. It is probable that students may also need a school-wide approach to bullying prevention and intervention that includes them directly (NASEM, 2016). Furthermore, qualitative analyses from the DIAL program modules suggest that teachers in the intervention had varying levels of understanding regarding MTSS and that the school district had recently implemented MTSS during the 2019–2020 school year (Robinson et al., revise & resubmit). Given the pandemic and school-related closures, it is likely that some teachers were learning about MTSS for the first time through the DIAL program and therefore additional support with MTSS is needed in this school district and beyond.

Limitations

The results of the DIAL program are promising; however, several limitations exist. First, this evaluation was intended only to be a small pilot to collect preliminary efficacy data; therefore, it will be important to conduct a larger trial that would allow for generalizability to more diverse school districts and schools. Second, while this study focused on targeting elementary school teachers, future research should consider how this type of DIAL program would impact pre-service, novice, and secondary teachers, as well as other types of school staff members (e.g., school counselors, nurses, librarians). Third, we were not able to collect data on whether students had received other types of bully prevention instruction; thus, future studies need to consider the impact of DIAL program in combination with student-focused curricula. Fourth, the study was limited to self-report from students and teachers, and teacher report on student behavior. Behavior during class through direct observation was not assessed. Further, we cannot infer that teachers who experienced gains in attitudes or skills regarding instructional strategies utilized those skills within their classrooms. It is also possible that teacher reports on students may be biased toward reporting better student behaviors to portray a positive view of their own teaching practices. Future studies evaluating the DIAL program should employ classroom observations to determine the degree to which teachers are implementing learned skills in their classrooms and whether skills translate to changes in student behaviors, especially regarding SWDs.

Implications

This pilot study demonstrated that elementary school teachers participating in the DIAL program increased their self-efficacy in relation to implementing instructional strategies while reducing their maladaptive attitudes toward bullying. However, there were many instances where the DIAL program did not yield significant changes on key outcomes, including teacher and student reports of bullying and peer victimization. This is not surprising given the modest impact of most school-wide bully prevention programs (Gaffney et al., 2019, 2021; NASEM, 2016; Ttofi & Farrington, 2011). While the DIAL program demonstrated positive outcomes on some measures, it would be important to continue to evaluate its efficacy in additional studies that incorporate this training into the larger school climate improvement or bully prevention plan in schools. Additional evaluations are needed to understand how changes in teachers' attitudes, efficacy, and strategies to foster positive perceptions of the school environment can reduce bullying among all youth, including those most at risk for bullying involvement such as SWDs. This will require the identification of best practices for supporting teachers in the implementation of DIAL program and identifying potential moderators that may enhance the effectiveness of the intervention.

Conclusion

Bullying and bullying prevention are immediate concerns for teachers and school districts across the USA. While bullying impacts many school-aged youth, SWDs are at greater risk of bullying involvement as a function of living in an ableist society that has historically excluded these students in educational settings. As educational practices continue to strive toward inclusivity and the rates of SWDs in general education classrooms increases, it is imperative for general education teachers to receive targeted PD opportunities that address the complex and nuanced bullying involvement among youth most at risk, including SWDs, to intervene and prevent bullying efficiently and effectively. The DIAL program consists of four online modules focused on informing general and special education elementary school teachers about how to effectively recognize and respond to bullying among all youth, with a specific emphasis on SWDs. The results from the pilot study indicated that teachers that received the DIAL program reported higher levels of self-efficacy related to instructional strategies and lower levels of maladaptive attitudes and avoidance attitudes toward bullying.

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Materials/Code Availability Available at https://osf.io/tcxf2/ - All analytic code and codebook for survey items.

Declarations

Ethics Approval The study was approved by the appropriate institutional and/or national research ethics committee (UNC at Chapel Hill, University of Florida) and certified the study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Consent to Participate Informed consent was obtained from all individual participants included in the study. Written informed consent was obtained from the parents.

Conflict of Interest The authors declare no competing interests.

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