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ORIGINAL PAPER

A School Nurse-Delivered Intervention for Anxious Children: An Open Trial

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Abstract Anxiety disorders are common in children and severely impair their functioning. Because a hallmark symptom of anxiety is somatic complaints, anxious youth often seek help from their school nurse. Thus, school nurses are in an ideal position to identify anxious children and intervene early. This study assessed the feasibility of a brief nurse-administered intervention (CALM—Child Anxiety Learning Modules) based on cognitive behavioral strategies to reduce anxiety symptoms and improve academic functioning. Nine elementary school nurses completed a one-day training and administered the CALM intervention to 11 children with elevated symptoms of anxiety (*M* age: 8.09; range 5–11; 54% male; 91% White). Feasibility of the intervention was assessed using several indicators (e.g., training satisfaction, intervention satisfaction/helpfulness). Pre-post intervention child outcomes were collected from evaluators, parents, children, and teachers. Results indicated that the majority of nurses were highly satisfied with the training and reported the intervention was feasible. Paired *t* tests on pre-post outcome measures revealed significant reductions in anxiety, somatic symptoms, and concentration problems. Nurses (70%), parents (81%), and children (50%) reported that the intervention was either somewhat or very helpful. Preliminary results identified barriers to implementation but also suggest that the intervention is feasible and helpful. A sufficiently powered randomized controlled trial is needed to assess the intervention's efficacy.

Keywords Child anxiety · School nursing · Brief anxiety interventions · Cognitive behavioral therapy

Introduction

Anxiety disorders represent the most prevalent form of psychopathology in children (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Velting, Setzer, & Albano, 2002), causing interference in multiple domains of functioning (Langley et al., 2014). Untreated anxiety disorders tend to run a chronic course (Broeren, Muris, Diamantopoulou, & Baker, 2013; Hughes, Lourea-Waddell, & Kendall, 2008) and increase the risk of developing mental health disorders during adulthood (Beesdo et al., 2007; Bittner et al., 2007).

Despite a wealth of evidence supporting the effectiveness of cognitive behavioral interventions for childhood anxiety, only 30% of children with anxiety disorders receive adequate treatment (Chavira, Stein, Bailey, & Stein, 2004; Gulliver, Griffiths, & Christensen, 2010; Merikangas et al., 2011). Possible explanations for low service utilization among anxious youth include lack of access to mental health providers, the inconvenience of scheduling and traveling to a clinic, the high cost of services, and inadequate insurance coverage (Owens et al., 2002). Consequently, it is crucial to offer mental health services in places where children frequent (e.g., schools, primary care) and to enhance the capacity of existing providers (e.g., school clinicians, nurses, primary care

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providers) to deliver evidenced-based mental health interventions.

Schools are an ideal setting to deliver mental health interventions because school services are more affordable (or offered at no cost) and accessible than care provided in private specialty care clinics. Additionally, such interventions can more directly address the anxiety-provoking situations that children face daily in school (e.g., separation from parents, interactions with peers, academic performance, extracurricular performances; Kendall, Settipani, & Cummings, 2012; Langley, Bergman, McCracken, & Piacentini, 2004). Existing school-based mental health programs repeatedly demonstrate effectiveness in reducing anxiety (Masia Warner et al., 2016; Herzig-Anderson, Colognori, Fox, Stewart, & Masia Warner, 2012); however, these are treatment programs delivered by mental health professionals who are often burdened by heavy caseloads and cannot serve all anxious children in the school. Equipping additional providers within the school system with the skills to provide immediate, short-term psychoeducational interventions to alleviate acute distress may help to address these barriers.

Because a hallmark symptom of anxiety is somatic complaints (Ginsburg, Riddle, & Davies, 2006), anxious youth are often "frequent flyers" in the school nurse's office (Ollendick & March, 2004) presenting with a variety of vague physical complaints (e.g., stomachaches, headaches). Somatic symptoms exacerbate distress and disrupt academic functioning by contributing to higher rates of academic problems and school absences (Hughes et al., 2008; Kendall, Krain, & Treadwell, 1999; White & Farrell, 2006). Thus, school nurses are in an ideal position to identify and intervene early in the trajectory of anxiety disorder development and serve as an advocate and liaison between families, schools, and specialty mental health services in the community (Allison, Nativio, Mitchell, Ren, & Yuhasz, 2014; Ravenna & Cleaver, 2016). Nurses are also integral members of the school interdisciplinary team which is charged with identifying and addressing children's physical, social, and behavioral difficulties that negatively impact academic functioning (National Association of School Nurses; 2015).

According to the National Association of School Nurses (NASN), school nurses spend 32% of their time providing mental health services (NASN, 2013), and involvement in school mental health programs has been identified as one key role for school nurses by NASN leaders (Magalnick & Mazyck, 2008). Yet, school nurses receive minimal training in mental health interventions, and report low confidence in being able to identify, assess, and intervene with children suffering from mental health difficulties (Membride, McFadyen, & Atkinson, 2015; Stephan & Connors, 2013). Related, in a national survey, 36.9% of nurses reported needing more training in behavioral health (Mangena & Maughan, 2015). This need for additional training reflects a larger scale gap already identified in the literature for training school providers in evidence-based practices (e.g., assessment and early intervention) for mental health issues (Evans & Weist, 2004; Kutash, Duchnowski, & Lynn, 2006).

Emerging data suggest that school nurses can be trained to successfully implement evidence-based mental health interventions and already effectively implement psychoeducational behavioral health interventions for many chronic medical problems, such as asthma and obesity (Bruzzese et al., 2010; Pbert et al., 2013). With respect to mental health interventions, a number of studies suggest that universal programs delivered by school nurses can decrease anxiety and depression (Attwood, Meadows, Stallard, & Richardson, 2012; Stallard, Simpson, Anderson, & Goddard, 2008; Stallard, Simpson, Anderson, Hibbert, & Osborn 2007). Noteworthy, Stallard et al. (2005) successfully trained school nurses on the FRIENDS program (a universal intervention designed to reduce anxiety); although results were positive in terms of satisfaction and improvement in child anxiety symptoms, barriers related to its sustainability in schools were identified (Stallard et al., 2005), including high cost, the high number and long length of the sessions (i.e., 10 sessions), the need for classroom involvement which takes time away from necessary classroom instruction and poses a conflict with curriculum requirements, and limited time that nurses can devote in their regular work day to implementing this intervention. Additionally, universal interventions do not allow for personalized care for those with more severe symptoms. Consequently, alternative approaches that are feasible for nurses to implement are needed.

Study Aims

This study, funded by the Department of Education's Institute of Education Sciences, reports preliminary data on feasibility and child outcomes of the CALM (Child Anxiety Learning Modules), a brief nurse-administered intervention which is based on empirically supported cognitive behavioral strategies and designed to reduce anxiety and improve academic functioning in elementary school children. Specifically, this report includes findings related to the (1) feasibility and acceptability of the intervention, assessed via nurse training satisfaction, child recruitment and session attendance, nurses' fidelity in delivering the intervention, and participants' satisfaction with CALM; and (2) pre-post intervention child outcomes (anxiety symptoms, physical symptoms, global functioning, and

academic functioning) using multiple informants obtained in the context of an open trial of CALM.

Method

Study Design

A pre-post open trial was conducted in Connecticut (CT) and Maryland (MD) in 8 elementary schools. Baseline and post-intervention evaluations were completed by study evaluators who were not blind to the intervention. Nurses, parents, children, and teachers also completed baseline and post-intervention assessments.

Participants

Nurse Participants

Nine volunteer nurses participated in the open trial. All participating nurses were White females who worked at least part time as a school nurse in a public or private CT or MD elementary school. Nurses' age ranged from 34 to 60 years ($M = 52.44$, SD = 8.3). The majority of the nurses (55.6%) had a bachelor's degree, 22.2% had a master's degree, and 22.2% had an associate degree, and all were registered nurses. Years of school nursing experience after graduation ranged from 1.5 to 30 years ($M = 13.12$ years, SD = 9.21). Nurses reported that they typically treat an average of 108.12 (SD = 53.04) children during the typical school week, and approximately 12% of these children were suspected of having excessive anxiety. Nurses endorsed having received minimal previous training in cognitive behavioral strategies for anxiety ($M = 2.22$ on a 5-point scale, 1 = none, 5 = a lot).

Child Participants

Eleven children from MD and CT were enrolled in the study. Children were eligible to participate if they had elevated symptoms of anxiety as indicated by (a) a total score of 15 or higher on the *Screen for Child Anxiety-Related Emotional Disorders* (SCARED; Birmaher et al., 1997) and/or (b) a Clinician Severity Rating (CSR) of 3 or higher on the *Anxiety Disorders interview Schedule* (ADIS-IV P/C; Silverman & Albano, 1996). Children were not eligible if they had a condition contraindicating the study intervention, were receiving any other psychosocial treatment for anxiety, or were not living with their legal guardian. See Fig. 1 CONSORT diagram for flow of participants during the study.

Of the 11 child–parent dyads that completed baseline and post-intervention evaluations, 10 were White and 1 was biracial (White/American Indian). Child age ranged from 5 to 11 years ($M = 8.09$; SD = 1.81), and 54% were male. All the participating children were in regular classes and 1 was concurrently enrolled in a gifted class. None of the children qualified for reduced or free lunch, and nearly 73% of their families had an annual income over $80,000. All 11 children completed study requirements and 0 were considered dropouts.

The majority (90.9%) of children met diagnostic criteria for at least one anxiety disorder based on the ADIS-IV P/C. Primary (i.e., the most severe and impairing) diagnoses included generalized anxiety disorder (GAD; 63.6%), separation anxiety disorder (SAD; 18.2%), and social phobia (SOP; 9.1%). Thirty-six percent ($n = 4$) had a comorbid psychiatric disorder, half of which (18%, $n = 2$) had a comorbid anxiety disorder. None of the children received any previous psychiatric diagnosis or treatment nor were they taking medications for anxiety or other mental health disorders.

Measures

Feasibility and Acceptability

Training Satisfaction and Feedback Questionnaire is an 11-item measure completed by nurses who rated various aspects of the training (e.g., overall satisfaction, stated objectives being met, perceived helpfulness, and perceived feasibility to implement the intervention) on a 7-point Likert scale ranging from 1 (not at all) to 7 (very much). Nurses also rated the perceived difficulty of implementing each CALM module from 1 (not at all difficult) to 4 (very difficult).

Session Summary Form (SSF). Session summary data pertinent to the intervention (e.g., attendance, child engagement in the session, information covered during the session, session length, and child's understanding of session content) were recorded at the end of each session by the nurse, and also served as ongoing progress notes. Nurses also rated their perceived confidence in delivering the CALM intervention after each meeting with a child using a 7-point scale (1 = not at all confident; 4 = somewhat; 7 = extremely confident).

Intervention Fidelity Form is a measure developed by study staff to assess nurse fidelity to the CALM modules and the quality of administration. Twenty-five percent of available recorded sessions for each enrolled case was randomly selected and coded. For this study, 2 items were rated on a 4-point scale (1 = poor, 2 = Fair, 3 = Good, 4 = Very good) and were used to assess (1) overall fidelity implementing key CALM components, and (2) non-specific intervention factors (e.g., maintaining a positive

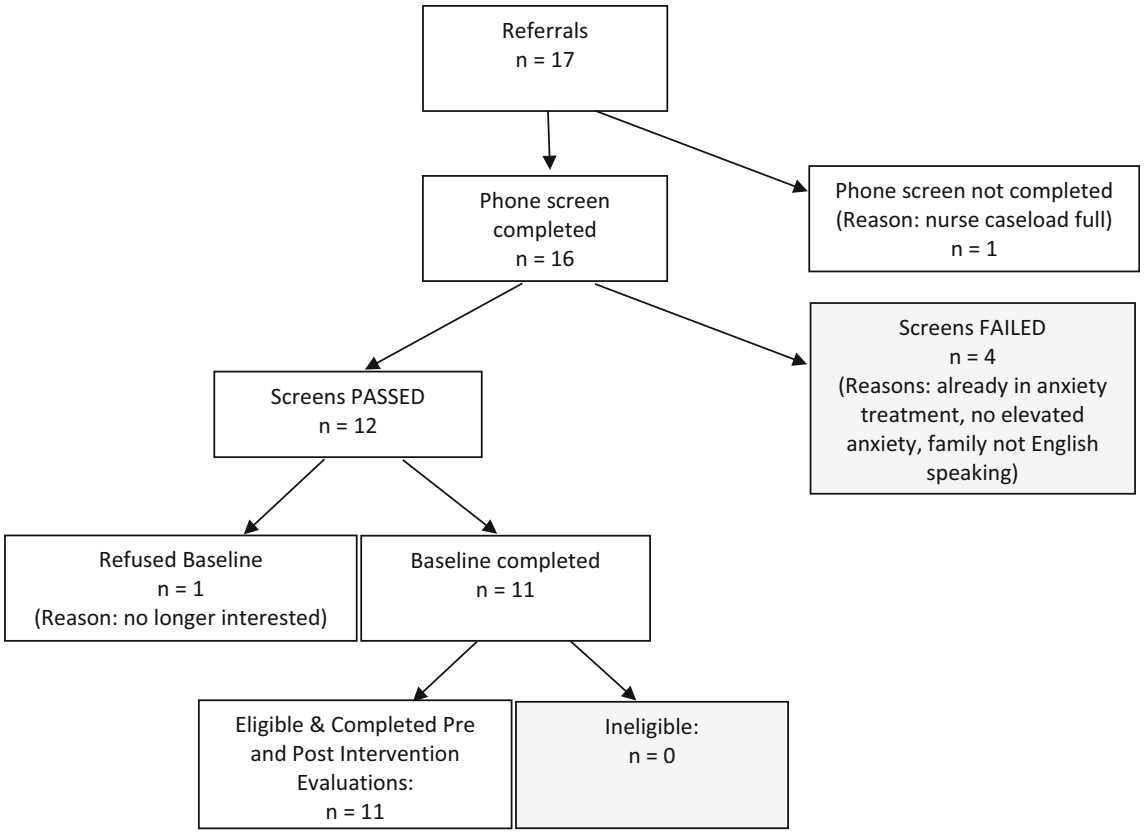

Fig. 1 Flowchart of participants throughout the study

working relationship, assessing child's comprehension of materials).

CALM Satisfaction Form is a 17-item measure of intervention satisfaction and helpfulness developed by study staff. Items about the CALM components were rated on a 4-point scale (0 = very unhelpful, 4 = very helpful). The form was completed by the child and the parent during the post-intervention evaluation. The nurse version was completed by the nurse after her final meeting with the child.

Exit Interview. Study staff arranged a 15–30-min in-person or phone interview with each nurse at the end of their participation in the study. The interview assessed the nurses' experience delivering the intervention (e.g., use of the manual and handouts, perceived barriers) perceived impact of the intervention, and suggestions for improvements.

Child Anxiety Symptoms

Screen for Child Anxiety-Related Emotional Disorders, Child and Parent Versions (SCARED; Birmaher et al., 1997, 1999) is a 41-item child- and parent-reported measure of childhood anxiety. Children and parents rated each item using a 3-point Likert scale (0 = not true or hardly ever true, 1 = somewhat true or sometimes true, 2 = very true or often true). The SCARED total score is the sum of the 41 items, with higher numbers indicating more severe anxiety symptoms (a total score of 25 or higher suggests the child has a clinically significant level of anxiety and may meet criteria for an anxiety disorder). In the current study, the SCARED child and parent versions demonstrated strong internal consistency at baseline ($\alpha = .92$ and .94, respectively).

Anxiety Disorders Interview Schedule for DSM-IV, Parent and Child Versions (ADIS-IV P/C; Silverman & Albano, 1996) is a semi-structured interview designed to assess for and differentiate anxiety diagnoses according to the DSM-IV criteria. Evaluators assign a severity/impairment rating for each disorder, the Clinician Severity Rating (CSR, range 0–8; 4 required to assign a diagnosis). The ADIS-IV P/C has good test–retest reliability for the parent interview ($r = 0.98$) and for the child interview ($r = 0.93$; Silverman, Saavedra, and Pina, 2001) and is sensitive to treatment effects (Walkup et al., 2008).

Clinical Global Impression—Severity (CGI-S) and Improvement (CGI-I) Scales (Guy, 1976). The CGI-S/I are scales rated by evaluators to provide a global score of anxiety severity (during the past week) and improvement in anxiety (since baseline), respectively. The CGI-S ranges

from 1 (not at all ill) to 7 (extremely ill), and the CGI-I indicates level of improvement from 1 (very much improved) to 7 (very much worse) and is only rated at the post-intervention evaluation. Both scales have been used extensively in child anxiety treatment trials (Walkup et al., 2008).

Child Functioning

Children's Somatization Inventory (CSI-24; Walker, Beck, Garber, & Lambert, 2009) is a widely used 24-item parent- and child-reported measure of somatic complaints. Parents and children rate the presence of physical symptoms using a 5-point scale ranging from "not at all" to "a whole lot." In this sample, the scale showed good internal consistency for both parent and child reports ($\alpha = .83$ and .88, respectively).

The Children's Global Assessment Scale (CGAS; Shaffer et al., 1983) is a widely used rating scale completed by the evaluator to indicate a child's global functioning over the previous month on a scale of 1 (lowest) to 100 (highest). In general, scores below 60 are indicative of increasingly severe impairment in functioning. The CGAS has demonstrated high interrater reliability, retest reliability, and sensitivity treatment effects with anxious children (RUPP: Anxiety Study Group, 2002).

Academic and Classroom Behavior

Teacher Observation of Classroom Adaptation-Checklist (TOCA-C; Koth, Bradshaw, & Leaf, 2009) is a 21-item measure completed by teachers about the student's classroom behavior and adjustment to the school environment in three domains: concentration problems, disruptive behavior, and prosocial behavior. The measure has demonstrated predictive and construct validity with continuity in ratings from kindergarten through fifth grade (Koth et al., 2009). Internal consistency for each scale in the current sample at baseline ranged between $\alpha = .93$ and .96.

Behavior Assessment System for Children (BASC-2; Reynolds & Kamphaus, 2002)—Teacher Version. The BASC-2 is a 139-item teacher-reported measure that assesses children's problematic and adaptive behaviors at school across several domains. Items are rated on a 4-point scale that corresponds to the frequency with which each behavior occurs (N = never, S = sometimes, O = often, A = almost always). For the current study, only the anxiety subscale was used. Raw scores for this subscale were converted to *T* scores for normative comparisons. Internal consistency for the anxiety subscale ranged from .78 to .81 for the ages in our sample (BASC-2; Reynolds & Kamphaus, 2004).

Woodcock–Johnson Tests—Achievement and Cognitive Batteries (WJ-III; Woodcock, McGrew & Mather, 2001) are norm-referenced measures of academic achievement and cognitive abilities that are individually administered by the evaluator. In the current study, only the subtests measuring fluency achievement (reading, writing, and math fluency) and the digits backwards for the cognitive abilities were used. The measure has good internal consistency as well as evidence of content and concurrent validity (Woodcock et al., 2001).

Attendance Form is a 2-item measure completed by teachers indicating the number of full and partial days of school missed by the child over the prior 2-week period. It was completed at baseline and post-intervention.

Demographics

Family Demographic Form collects basic information from the parent about the child and the family including age, sex, race, income, and parents' marital status.

Nurse Background Questionnaire is a 20-item measure that assessed demographic characteristics (e.g., age, gender, race) and professional experience factors (e.g., specialty, training, type of license, average caseload).

Intervention Description

The CALM intervention was designed to be a brief school nurse-administered intervention for elementary school children. It consists of 6 modules which are administered over an 8-week period in school with the individual anxious child. This was done to allow nurses greater flexibility in deciding upon the number of sessions dedicated to each specific module. Aimed to best suit school nurses' schedules, CALM allows nurses to flexibly deliver modules and tailor session length and frequency, although sessions were expected to be brief (15–30 min). The CALM program is based on common elements of cognitive behavioral strategies shown to reduce anxiety symptoms (Higa-McMillan, Francis, Rith-Najarian, & Chorpita, 2015). The intervention components include psychoeducation, relaxation training, behavioral exposure, cognitive restructuring, problem-solving, and relapse prevention. One optional module includes parent psychoeducation about child anxiety. In contrast to psychotherapy and consistent with its brief format, CALM is predominantly a psychoeducational and skill-building intervention. The intervention was designed for children who had not yet been identified for or accessed more formalized mental health services, but were presenting to the school nurse with somatic complaints. A brief description of the CALM intervention is provided in Table 1. A full description of the rationale for the skills and the implementation strategies can be found in a previous

Table 1 A brief description of the CALM intervention

Module name	Description of Module Goals
Psychoeducation	Establish rapport and provide an orientation to the program
	Provide education about the nature and prevalence of anxiety
	Describe the CBT model and the key signs of anxiety
	Describe the CALM intervention strategies
C = Calm down by learning relaxation strategies	Introduce concept of physiological tension associated with anxiety
	Teach relaxation strategies (progressive muscle relaxation, deep diaphragmatic breathing, etc.)
A = Actions that will reduce anxiety	Provide rationale for gradual exposure (facing fears) in real life
	Review steps for exposures
	Select and assign exposure
L = Listen to scary thoughts and change them into coping thoughts	Introduce concept of negative "self-talk"
	Review common cognitive distortions
	Teach steps for challenging and changing thoughts
M = Manage problem using problem-solving strategies	Introduce the SOLVE method
	Practice problem-solving skills
Relapse prevention	Review strategies to prevent future exacerbations of anxiety and problematic avoidance
	Review child's progress and plan for generalizing skills
	Prepare child for termination of the CALM sessions
Parent psychoeducation	Provide information about the CALM program
	Provide psychoeducation about anxiety and CBT skills
	Discuss how parents can help facilitate children's acquisition of anxiety management skills

published paper (Drake, Stewart, Muggeo, & Ginsburg, 2015).

Procedure

Study approval was provided by the UConn Health Institutional Review Board. Nurses, parents, and children who volunteered to participate provided written informed consent/assent. Nurses were recruited through direct emails, flyers, and word of mouth from study staff and their district school nursing supervisors. Interested nurses contacted the study staff to discuss the details of the study. After providing consent, nurses completed the pre-training measures (e.g., background questionnaire). Nurses then completed a one-day in-person training. The training involved an overview of anxiety symptoms in children and a description and rationale of each CALM module (see Table 1). In addition to educational instruction, nurses were also given the opportunity to role-play intervention skills, watch training videos where study staff demonstrated the CALM modules, and were provided with relevant reading materials. Nurses were also provided with comprehensive intervention manuals which included explicit instructions for each session, delineated the goals for each session, reviewed the rationale for each skill, sample dialogue to illustrate how the concepts could be explained to children, examples of in-session activities, and the home practice to be assigned at the end of the session. After the training, nurses completed the training feedback questionnaire. Once trained, nurses assisted with child recruitment by sharing study information with the parents of potentially eligible children. Once a nurse was assigned an eligible case, the intervention was initiated. During the intervention period, nurses had access to supervision with a licensed clinical psychologist per their request. Weekly supervision was offered via email or phone to work flexibly with the nurses' schedules. Upon completing the intervention with each child, the nurses also completed the satisfaction questionnaire and participated in the exit interview. Nurses were provided compensation for completing the training as well as the intervention forms ($25 and $50 gift cards, respectively).

Children were recruited through their school nurses or through flyers. Interested families contacted the study staff, and after "passing" a brief telephone screen, met with study staff to provide formal informed consent/assent and completed an in-person evaluation. The evaluation involved a diagnostic interview with the parent and the

child and administration of questionnaires. Each family identified one teacher to complete forms about the child's classroom behavior and attendance. Teachers were compensated $20 after completing the measures at each time point (total $40). Approximately 9 weeks after the baseline evaluation, families completed the post-evaluation, including the CALM satisfaction form. Families were compensated $20 after the baseline and $40 after evaluation. During the intervention phase, in case of worsening of symptoms, children were allowed to be referred for specialized treatment in the school or in the community, and this information (if any) was recorded during their post-intervention assessment. Additionally, as needed families were provided with a list of referrals to mental health specialists and extra resources on anxiety (books, Web sites).

Data Analysis Plan

Feasibility and acceptability were assessed using descriptive statistics. Intervention outcomes (pre-post) were examined using paired samples *t* tests. Since it was hypothesized that participant outcomes would improve following the intervention, all *t* tests reported are one-tailed tests. Two missing items were observed on the SCARED-P/C and CSI 24-P/C at post-evaluation and were handled with mean replacement. Ten of the eleven participants completed all the pre- and post-evaluation measures (the 11th child was too young to complete self-reported questionnaires). For these measures, a smaller sample was used in the analysis.

Results

Intervention Feasibility

Training Satisfaction and Feedback

Table 2 presents results from the Nurse Training Satisfaction and Feedback Questionnaire. Satisfaction levels regarding the training and the materials were uniformly high. After the training, nurses' perceived implementing the CALM modules was low.

Recruitment and Attendance

All nurses enrolled at least one child; children attended an average 5.45 sessions with their school nurse (range 4–8; mode: 6). The length of each session ranged from 11 min to 1 h (mode: 19 min; mean: 30.93 min). The time spent on each individual module was fairly homogenous: The longest modules were Psychoeducation and Changing Thoughts (see Table 3). During the 8-week intervention phase, 100% of children received the CALM intervention modules on Psychoeducation, Relaxation skills (C = Calm down), and Exposure (A = Actions that will reduce anxiety); 63.63% completed all six modules.

Intervention Fidelity

Results showed that the mean overall fidelity rating for implementing specific CALM modules was 2.78 (SD = .90) on a 4-point scale (1 = poor, 2 = fair, 3 = good, 4 = very good). The mean for the non-specific therapeutic skills was 3.1 (SD = .69).

Nurses' perception of their confidence in delivering CALM with each enrolled child at the first session and last session was 5.09 (SD = 1.22) and 6.09 (SD = .94), respectively; $t(10) = -1.98$, $p = .076$ (1 = not at all confident; 7 = Extremely confident).

Overall, nurses used an average of 1.5 supervision meetings with the study staff over the course of the intervention (range 0–6; mode = 0). Two nurses elected not to access supervision.

Participant Satisfaction with Intervention

Table 3 presents the results from the CALM satisfaction measures completed by children, parents, and nurses. Overall, high levels of intervention helpfulness were reported across reporters.

Exit Interview

Potential and experienced barriers to nurse implementation of the intervention were assessed using exit interviews. The two main barriers identified through these interviews were a lack of uninterrupted time and private space during the regular school hours. All nurses reported an overall positive experience in participating in the CALM study and found the materials (manual, handouts) useful and easy to follow. Nurses also reported they found the Exposure module (A = Actions that will reduce anxiety) to be the most challenging module.

Pre–Post Intervention Outcomes

Child Anxiety

Results of pre-post paired *t* tests appear in Table 4. Results indicated significant reductions in anxiety based on child self-reported SCARED-C; $t(9) = 3.36$, $p = .004$, 95% CI [3.24, 16.56], *Cohen's* $d = 0.81$, parent-reported SCARED-P; $t(10) = 4.07$, $p = .001$, 95% CI [4.29, 14.66], *Cohen's* $d = 0.77$, and evaluator-reported CGI-S;

Table 2 Nurses training satisfaction responses

	Mean	SD
Satisfaction items		
Overall satisfaction with the training	7.00	.00
Training will help me treat children with anxiety	6.56	.72
Feasibility of intervention in school	5.89	1.05
Training met the stated objective (teach about anxiety & CALM intervention)	6.88	.35
Perceived difficulty items pre-intervention		
Psychoeducation	1.83	.41
Relaxation (C = Calm down and practice relaxation)	1.67	.52
Exposure (A = Actions that can help; facing fears)	1.67	.52
Cognitive restructuring (L = Listen to and challenge unhelpful Thoughts)	1.83	.41
Problem-solving (M = Manage problems using problem-solving skills)	2.17	.41
Relapse prevention	1.83	.41
Parent psychoeducation	2.00	.63

Scale for satisfaction items: 1 = not at all; 4 = moderately/sometimes; 7 = very much; $n = 9$; scale for difficulty items: 1 = not at all difficult; 2 = a little difficult, 3 = somewhat difficult, 4 = very difficult; $n = 6$

$t(10) = 5.24$, $p = .00005$, 95% CI [.57, 1.42], *Cohen's* $d = 1.56$, with medium to large effect sizes. Five children (45.5%) were classified as "responders" to the intervention based on the CGI-I (i.e., a score of 1 or 2 indicates significant improvement). Diagnostic changes on the ADIS-IV P/C revealed that the percentage of children with an anxiety disorder dropped from 90% at baseline to 45.5% at post.

Somatic Symptoms

As shown in Table 4, significant reductions in somatic symptoms were reported at post-intervention by parents CSI-24; $t(10) = 2.49$, $p = .016$, 95% CI [41, 7.58], *Cohen's* $d = .78$ 9 and children CSI-24; $t(9) = 2.21$, $p = .027$, 95% CI [−.18, 15.98], *Cohen's* $d = .85$.

Global Functioning

Global functioning scores, as measured by the CGAS, were significantly higher at post-intervention, with a small effect size, $t(10) = -3.45$, $p = .003$, 95% CI [−12.11, −2.61], *Cohen's* $d = .35$ (Table 4).

Academic and Classroom Behavior

Results indicated no statistically significant pre-post changes on teachers' ratings of disruptive behaviors or prosocial behaviors (see Table 4). In contrast, teacher-rated concentration problems were significantly lower at post-intervention with a small- to medium effect size, TOCA concentration problems; $t(10) = 2.33$, $p = .02$, 95% CI [.01, .73], *Cohen's* $d = .35$. No statistically significant changes were found for child anxiety based on the BASC 2-T; $t(10) = 1.12$, $p = .12$, 95% CI [−3.29, 11.65], *Cohen's* $d = 0.26$. Children's working memory and academic fluency as measured by subscales of the Woodcock–Johnson showed no statistically meaningful pre-post changes. However, all scores were at average age-/grade-level expectations. Children's number of partial or full days missed within the last 2 weeks at the pre- and post-intervention evaluations reduced from 16 to 4.

Discussion

The primary aim of this open trial was to examine the feasibility of a brief school nurse-delivered intervention. A secondary aim was to explore changes in child anxiety and related symptoms before and after receiving CALM. Nine school nurses were trained and each delivered the intervention to at least one anxious child in their school. The feedback from nurses and families was generally positive; however, specific barriers to delivering the intervention were identified, such as finding uninterrupted time to meet with the child. Pre-post reductions in anxiety and related behaviors were found; the magnitude varied by reporter and construct. Conclusions based on these findings suggest that while further testing in a randomized controlled trial is needed, the CALM intervention shows promise.

Intervention Feasibility

Feasibility was measured in several ways: (1) training satisfaction; (2) recruitment and attendance; (3) nurse fidelity to the intervention modules; (4) parent-, child-, and nurse-reported satisfaction; and (5) qualitative data from the exit interview. Nurses' willingness to participate in the

Table 3 Means and standard deviations for helpfulness, attendance, and length

Modules	Nurse	Child	% of children who received module	Average session length (min)
Modules perceived helpfulness, attendance, length				
Information about anxiety	3.60 (.69)	2.40 (.96)	100% ($n = 11$)	38.27 (15.75)
C = Calm down by learning relaxation strategies	3.70 (.43)	3.10 (.99)	100% ($n = 11$)	29.91 (10.62)
A = Actions that will reduce anxiety (exposure)	3.40 (1.07)	2.10 (1.19)	100% ($n = 11$)	36.00 (11.38)
L = Listen to scary thoughts and change them into coping thoughts	3.40 (.69)	1.78 (1.56)	90.91% ($n = 10$)	37.80 (21.12)
M = Manage problems using problem-solving strategies	3.11 (.78)	2.22 (1.48)	72.73% ($n = 8$)	31.25 (10.94)
Information about preventing future worries and anxiety	2.78 (1.20)	1.89 (1.26)	63.63% ($n = 7$)	28.57 (13.71)
Parent psychoeducation (optional)	2.25 (.95)	–	0% ($n = 0$)	

Items	Nurse	Child
Other intervention components perceived helpfulness		
Activities done in session	3.30 (.82)	2.4 (1.43)
Session handouts	3.30 (1.16)	1.90 (1.10)
Out-of-session practice assignments	3.00 (1.19)	1.67 (1.32)
The school nurse	–	2.56 (1.33)

Nurse	Child	Parent
Overall perceived helpfulness		
3.00 (1.24)	2.30 (1.16)	3.09 (.94)

Helpfulness Items Scale: 0 = very unhelpful; 1 = unsure; 2 = a little helpful; 3 = somewhat helpful; 4 = very helpful. Standard deviations appear in parentheses after the mean

training outside their regular school hours and job demands indicated their interest in learning new skills to help children with anxiety. Despite the limited time (one-day training) to learn new psychoeducational and CBT skills, all the nurses perceived that the strategies learned during the training would help them assist anxious youth. The high satisfaction ratings for the training day and the perception that the new skills would not be difficult to master also suggest that nurses perceived the new skills as within their capacity to implement. Evaluation of the CALM training would be improved by including measures to prospectively assess for changes in knowledge and skills as a result of the training.

Data from the intervention phase indicated that nurses were able to implement CALM as designed; however, there may be a limit to the number and length of sessions nurses can meet with youth while balancing their other school responsibilities. National statistics show nurses have large caseloads of students, operate in a hectic environment of the school health office, and have varied responsibilities (Mangena & Maughan, 2015). To maximize flexibility of intervention delivery and enhance real-world implementation, nurses were given 8 weeks to complete 6 content modules. To accommodate for other job demands and student schedules, some nurses used more frequent, shorter sessions. This allowed them to complete the module content with limited uninterrupted time. Some nurses spent additional sessions reinforcing previously taught material rather than introducing new skills. That nurses were able to incorporate this intervention into their work is encouraging. However, it is not clear whether nurses increased the time they spent dealing with mental or emotional health during their week or replaced old techniques with new skills. Although no formal data on total amount of nurse time devoted to anxious youth before and after CALM were collected as part of this open trial, all the enrolled children were known by the nurses because of their frequent visits to their office, suggesting that nurses were already spending time dealing with these youth and their mental health issues.

An additional factor to consider when evaluating feasibility is the quality with which nurses administered the modules to children. Ratings of nurse fidelity were fair to good, indicating that the nurses were able to deliver the skills adequately but may need more training and/or supervision to excel. To some extent, these data can be considered a measure of training effectiveness, since it assesses the degree to which nurses applied their learning in the context of actual intervention sessions. That said, for many of these nurses, this was the first time they were

Table 4 Means, standard deviations, paired sample *t* tests, and effect sizes for anxiety, global functioning, and academic outcome measures at baseline and post-intervention

Measure	Baseline (*M*; SD)	Post (*M*; SD)	*t*	*p*	*d*
Child anxiety					
SCARED-P	24.82 (13.97)	15.34 (10.23)	4.07	.001*	.77
SCARED-C	26.7 (14.27)	16.80 (9.17)	3.36	.004*	.81
CGI-S	4.27 (0.64)	3.27 (0.64)	5.24	.00005*	1.56
Somatic symptoms					
CSI-24—P	30.91 (6.58)	26.91 (2.7)	2.49	.016*	.79
CSI-24—C	38.3 (12.43)	30.40 (4.40)	2.21	.027*	.85
Global functioning					
CGAS	53 (7.89)	60.36 (8.68)	−3.45	.003*	−.84
Academic outcomes					
BASC—*T* Score anxiety	64.64 (18.46)	60.45 (12.41)	1.25	.1205	.26
TOCA—concentration problems	3.19 (1.02)	2.82 (1.06)	2.33	.021*	.35
TOCA—disruptive behaviors	.63 (.82)	.61 (.65)	.20	.422	.02
TOCA—prosocial behavior	3.45 (.79)	3.62 (.91)	−.86	.205	−.2
WJ—number reversed	101.1 (20.10	112 (11.30)	−1.69	.065	−0.6
WJ—reading fluency	111.5 (15.06)	111.67 (12.20)	−.12	.454	−.01
WJ—math fluency	111.2 (19.71)	107.56 (17.11)	.19	.427	.19

* $p < .05$. *SCARED-P* Screen for Child Anxiety-Related Emotional Disorders-Parent Version, *SCARED-C* Screen for Child Anxiety-Related Emotional Disorders-Child Version, *CGI-S* Clinical Global Impressions Scale—Severity, *CSI-24-P* Children's Somatization Inventory-Parent Version, *CSI-24-C* Children's Somatization Inventory-Child Version, *CGAS* Children's Global Assessment Scale, *BASC-Anxiety* Behavior Assessment System for Children–Teacher Version Anxiety subscale, *TOCA* Teacher Observation of Classroom Adaptation. *WJ* Woodcock–Johnson III Tests of Achievement

teaching the new skills to an anxious child. It is possible that as they implement the intervention with additional children, they will become more comfortable with the material and do so with more fidelity, consistent with their improvement in self-confidence ratings. On the other hand, these data also suggest a need for ongoing performance feedback and additional clinical supervision, both of which have been shown to enhance adoption and fidelity of new skills by non-expert providers (Beidas & Kendall, 2010; Sholomskas et al., 2005).

Since this was an open trial to test the feasibility of CALM, supervision was not mandated; additionally, weekly supervision does not happen in school settings, it is costly and consequently not sustainable, which should be considered for future implementation and dissemination of the program. It is important to state that although nurses were given several resources to guide them through the delivery of each module, such as videos of the modules delivered by expert clinicians, a detailed intervention manual with scripts to use with children for each skill, and extra resources (readings, Web sites, YouTube videos), future research is needed to evaluate the optimal amount of training and supervision, given their well-documented effects on fidelity and outcomes. Interestingly, session ratings on nurses' use of non-specific therapeutic skills were rated higher than fidelity ratings to specific intervention components. Since the CALM training does not specifically emphasize these non-specific skills, this finding may reflect that school nurses typically employ active listening, therapeutic communication, and problem-solving with their students (Bohnenkamp, Stephan, & Bobo, 2015), skills that have shown to have a positive therapeutic impact (Lambert & Barley, 2001).

Satisfaction with the intervention was assessed by nurse, child, and parent reports and serves as another indicator of feasibility. Over 80% of parents and 70% of nurses reported very high ratings on intervention helpfulness and would recommend CALM for other anxious youth. Child reports of satisfaction were lower: 1 child was unsure about intervention satisfaction and 1 was not satisfied; these two children also showed the least amount of improvement in anxiety symptoms based on evaluator report. This finding is consistent with published studies showing that lower treatment satisfaction is associated with poorer outcomes (Smith, Norton, & Mclean, 2013; Tryon & Winograd, 2011). Thus, overall high satisfaction aligns with other measures of feasibility demonstrating that this initial exploration of CALM is feasible.

Lastly, data obtained during our exit interviews identified barriers (as well as potential solutions) to implementation which were mainly consistent with the literature for school interventions, such as a lack of uninterrupted time and private space to devote to the intervention during hectic school days. As has been reported elsewhere

(Bohnenkamp et al., 2015; Langley, Nadeem, Kataoka, Stein, & Jaycox, 2010), administration/principal support played an essential role in the successful implementation of CALM by reserving rooms in the school and allowing private time for nurses to meet with the children; for example, the nurses tried to reserve the space and time needed by conducting the sessions in a separate office or by only responding to medical emergencies for the duration of the meeting with the child. Other times nurses indicated that they planned the sessions at the very beginning or end of the school day, when they have more uninterrupted time. Feedback on the feasibility of the individual modules revealed that the exposure module was perceived as the most difficult to implement and was subsequently simplified. Future work is needed to understand what modules were used most frequently, with what level of fidelity, and whether they are related to child outcomes.

Child Outcomes

Anxiety Severity, Somatic Symptoms, and Global Functioning

Results indicated that after receiving the CALM intervention, children's anxiety levels decreased significantly with medium to large effect sizes. Anxiety reduction was robust as it was reflected across all reporters—parents, children, and evaluators. In addition, 45% of the enrolled children no longer met criteria for their primary anxiety disorder. The reductions in anxiety symptoms seen in this study were consistent with reductions found in previous studies of school interventions for child anxiety that used modular CBT delivered by school mental health workers (Chiu et al., 2013; Ginsburg, Becker, Drazdowski & Tein, 2012) and with emerging literature on the efficacy of brief interventions for mental health problems in both children and adults (Bloom, 2001; Fu, Du, Au, & Lau, 2015; Perkins & Scarlett, 2008). For example, Perkins studied the effectiveness of a single-session intervention for children and adolescents mental health problems presenting to a community clinic in Australia: Results showed a medium to large effect size for symptoms improvement 1 month after the intervention session (Perkins, 2006).

Of particular interest in this study was the reduction in youth somatic symptoms, as these are often the complaints that lead children to seek out their school nurse (Wolk & Kaplan, 1993). Significant pre-post intervention reductions in somatic complaints such as headaches and stomachaches were reported by both parents and children. Treatments for anxiety disorders have demonstrated that reducing anxiety also reduces accompanying somatic symptoms (Crawley et al., 2013; Masia Warner et al., 2011). Reducing these symptoms may also reduce the nurses' burden by decreasing these "frequent flyers" visits in the long term. Future assessment of this via a formal cost–benefit analysis is needed.

Finally, significant improvements were reported in children's global functioning as measured by the CGAS at post-intervention. This finding is consistent with anxiety treatment studies (Tolin, 2010; Walkup et al., 2008) and suggests that even a brief intervention may have benefits not only on targeted anxiety symptoms but also on global functioning. For instance, after receiving the intervention, some children in this study showed improvements in school functioning (e.g., began to participate in after-school activities without a parent present), social functioning (e.g., started playing with other children at recess), and/or had improved personal functioning (e.g., began to use public bathrooms at school and in restaurants).

Looking toward the future of mental health services, it is clear that long-term specialized treatments are too costly to be sustained in schools and the barriers too many to be disseminated to the majority of people in need. The model of care is switching to affordable, briefer, and effective interventions to be delivered by a variety of providers. The number and the content of sessions sufficient to achieve improvement is still an open question in the literature. However, there is an evident trend that brief interventions, administered by a broad network of trained providers, may be a viable first step prior to or while waiting for specialty mental health care. While these early and brief interventions are not a replacement of specialty mental health treatment, they may lead to considerable symptom relief for a significant proportion of youth (Perkins, 2006).

Academic and Classroom Behavior

Because anxiety symptoms impact attendance, academic functioning, and classroom behavior, teacher reports of changes pre- and post-intervention were essential to evaluate. Data on school attendance also showed improvements. Specifically, among youth who had school absences at baseline, the number of full and partial days for the 2-week period surrounding the baseline and post-intervention evaluations reduced by 75%. Chronic absenteeism is associated with proximal consequences such as poor academic performance and school dropout as well as distal consequences including high-risk behaviors (i.e., substance use, teenage pregnancy, violence), unemployment, poverty, and relational and psychiatric problems in adulthood (Kearney, 2008). Findings from this study, while preliminary, suggest that further examination of the impact of anxiety reduction on school attendance may be an important factor in improving academic success.

No changes were observed on academic achievement (as measured by the WJ-III). Several reasons might explain

this, including that the means on each administrated subscale of the WJ-III fell in the average to high-average classification at baseline, suggesting there may also have been a ceiling effect operating. It is also possible that the intervention was too brief to impact academic achievement because it is fairly stable or that academic improvements may be observed at a later time point.

Significant improvement (with a medium effect size) was observed on the Concentration Problems subscale of the TOCA at post-intervention, suggesting that teachers observed improvement in children's ability to concentrate, stay on task, and complete assignments. Concentration problems among anxious youth have been widely reported in the literature (Barron, Riby, Greer, & Smallwood, 2011; Forster, Elizalde, Castle & Bishop, 2013) and they also represent a key symptom of GAD (63.3% of children in this study had a primary diagnosis of GAD at baseline). In contrast, no changes were reported by teachers on the BASC-2 anxiety scale which assesses how often the teachers observe children's worrying, fearfulness, and perfectionism. It is noteworthy that scores were in the "at-risk" range at both time points, which indicates the teachers did detect some symptoms of anxiety; however, anxiety's interference in the classroom may have been more subtle. It is also possible that since children in our sample did not show significant academic impairment at baseline, there was little room to improve reflecting a ceiling effect. Our finding fits with the literature showing that teachers are better at identifying behavioral and externalizing problems, rather than internal worries and the "self-talk" of children with anxiety/internalizing disorders (Dwyer, Nicholson, & Battistutta, 2006). Therefore, teachers may have been better able to identify changes in concentration problems associated with anxiety because they were more observable behaviors.

Limitations

The results of this open trial should be interpreted within the context of several study limitations. First, in line with the nature of the open trial design, there was no randomization and no comparison group; both families and evaluators were not blind to the intervention condition. Thus, no causal conclusions regarding the interventions impact can be made, and social desirability biases and other threats to internal validity (e.g., maturation) may explain outcomes. Second, although the sample was recruited in two different sites, children and nurses were fairly homogenous in terms of sex, race, and socioeconomic status, and therefore might not be representative of the general population. Third, all participants were volunteers and motivated to be trained and/or receive the intervention from nurses. Data are needed to see how the adoption of the intervention would work with a higher number of more diverse nurses and students to further assess feasibility.

Importantly, this open trial lacks a comprehensive and empirically based measure of fidelity for each of the modules delivered. Fidelity measures are critical to the implementation of interventions in community settings, especially when training non-mental health professionals. A measure of intervention fidelity for each implemented module will be incorporated in future studies. Related, this study did not examine the effectiveness of the training and/or supervision and their impact on fidelity or child outcomes, key components to be included in future projects.

CALM was designed to give school nurses skills to intervene with anxious youth that normally present to their offices, and did not aim to replace psychological treatment nor the role of mental health professionals. Because most of the children enrolled in this study were clinically anxious, ethical and clinical concerns regarding nurses (i.e., non-mental health experts) offering a brief intervention for anxiety can be debated. On the one hand, given that nurses received minimal training and supervision, their limited experience raises questions about whether they should provide services to these youth and whether there might be iatrogenic outcomes if they do. On the other hand, none of the enrolled children had been previously evaluated or treated for anxiety, none of the children reported worsening of symptoms during the study, and many reported improvements at post-evaluation. Thus, one could argue that "something is still better than nothing." Getting anxious children into high-quality specialty mental health clinics would be ideal, but is far from reality (Merikangas et al., 2011). Even when referred, access to services for children requires overcoming a number of significant barriers, including high cost, parental involvement, and lengthy waitlists (Barwick et al., 2013; Brown, Parker, & Godding, 2002). Since school nurses are often the first personnel to encounter these youth, equipping nurses with a psychoeducational and targeted skill-building intervention may serve as an important first step in a continuum of care.

Conclusions

Excessive anxiety in childhood is common and debilitating when left untreated; yet, the majority of anxious youth are under-identified and untreated. Given the long-term consequences of untreated anxiety, it is necessary to enhance access to services by expanding the network of providers. School nurses are uniquely positioned to identify anxiety (NASN; 2011) and to promote mental health and well-being (Onnela, Vuokila-Oikkonen, Hurtig, & Ebeling,

2014; Allison et al., 2014; Kendal, Callery & Keeley, 2011). Findings from this open trial of the CALM intervention suggest that school nurses can be trained to help anxious children using a brief skill-based intervention and already possess qualities to establish and maintain strong therapeutic and cooperative relationships with the students who visit their office. While distinct from treatments provided by specialty mental health providers, this intervention and associated training fills a noted gap in the service delivery system and highlights the potential positive impact on symptom reduction achieved by non-experts. With enhanced access to anxiety reduction services, schools (and school nurses in particular) have an opportunity to make a significant impact on the emotional and academic functioning of anxious children. To fully understand the potential impact of the intervention and examine the comparative efficacy of CALM, a large randomized controlled trial, with a diverse and representative sample, is needed.

In sum, based on this feasibility study, school nurses appear to represent an additional resource in the school to intervene with anxiety symptoms and to broadly address the gap in services utilization by expanding the network of providers for child anxiety.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the Institutional and/or National Research Committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Informed consent: Informed consent was obtained from all individual participants included in the study.

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