School-Based Education Programs for the Prevention of Child Sexual Abuse: A Cochrane Systematic Review and Meta-Analysis

Kerryann Walsh¹, Karen Zwi², Susan Woolfenden², and Aron Shlonsky³

Abstract

Objective: To assess evidence of the effectiveness of school-based education programs for the prevention of child sexual abuse (CSA). The programs deliver information about CSA and strategies to help children avoid it and encourage help seeking.

Methods: Systematic review including meta-analysis of randomized controlled trials (RCTs), cluster RCTs, and quasi-RCTs.

Results: Twenty-four studies with 5,802 participants were included. Child self-protective skills, odds ratio = 5.71, confidence interval = [1.98, 16.51]; factual, standardized mean difference (SMD) = 0.61 [0.45, 0.78]; and applied knowledge, SMD = 0.45 [0.24, 0.65], increased in the intervention group, and knowledge gains were retained at 6 months, SMD = 0.69 [0.51, 0.87]. There were no differences in anxiety or fear, SMD = −0.08 [0.22, 0.07], and findings regarding disclosure of abuse were inconclusive.

Conclusion: Children’s self-protective skills and knowledge can be increased by participation in school-based sexual abuse prevention programs. However, it is unknown whether gains in skills and knowledge actually decrease the likelihood of CSA.

Keywords

child sexual abuse, child sexual assault, primary prevention, systematic review, meta-analysis

Introduction

The World Health Organization (WHO, 1999, p. 15) defines child sexual abuse (CSA) as the involvement of a child in sexual activity that he or she does not fully comprehend, is unable to give informed consent to, or for which the child is not developmentally prepared and cannot give consent, or that violates the laws or social taboos of society.

CSA is a problem of considerable magnitude with short- and long-term repercussions for those victimized. Recent meta-analyses of data collected from retrospective studies of adults in countries and cultures worldwide estimate that 10–20% of female children and 5–10% of male children have experienced CSA on a spectrum from exposure through unwanted touching to penetrative assault before the age of 18 years (Barth, Bermetz, Heim, Trelle, & Tonia, 2013; Pereda, Guilera, Forns, & Gomez-Benito, 2009; Stoltenborgh, Van IJzendoorn, Euser, & Bakermans-Kranenburg, 2011). These data are likely to underestimate its true prevalence because two thirds of individuals never disclose their victimization (London, Bruck, Ceci, & Shuman, 2005) and most cases go unreported to authorities (Wyatt, Loeb, Solis, & Carmona, 1999). Sexual abuse has been reported across all socioeconomic and ethnic groups, in both males and females, and perpetrators can include adults or other young people outside the family as well as within it (Finkelhor, 1993; Turner, Finkelhor, Hamby, Shattuck, & Ormrod, 2011).

The WHO estimates that CSA contributes to 7–8% of the global burden of disease for females and 4–5% for males (Andrews, Corry, Slade, Issakidis, & Swantson, 2004).

CSA is associated with adverse psychosocial outcomes such as depression (Roosa, Reinholtz, & Angelini, 1999), posttraumatic stress disorder (Widom, 1999), antisocial and suicidal behaviors (Bensley, Van Eenvy, Spieker, & Schoder, 1999), eating disorders (Perkins & Luster, 1999), alcohol and substance abuse (Spak, Spak, & Allebeck, 1998), postpartum depression and parenting difficulties (Buist, 1998), sexual revictimization, and sexual dysfunction (Fleming, Mullon, Sibthorpe, & Bammer, 1999). A recent meta-analysis found CSA was also associated with higher rates of physical health conditions, including gastrointestinal, gynecological, and cardiovascular problems and obesity (Irish, Kobayashi, &
A longitudinal analysis of the association between childhood sexual abuse and educational achievement found a linear relationship between increasing severity of CSA and poorer educational achievement, however the relationship was confounded by sociodemographic characteristics (e.g., lower maternal age and qualifications) and family functioning variables (e.g., interparental violence) known to be associated with child maltreatment (Boden, Horwood, & Fergusson, 2007). These consequences are far reaching into families and communities, with significant costs for institutions in terms of primary and rehabilitative health care, education and welfare assistance, child protection, and justice system costs (Fang, Brown, Florence, & Mercy, 2012). The time of greatest vulnerability for CSA appears to be during the prepubescent and early pubescent periods, for example, in the United States, between 7 and 12 years of age (Finkelhor & Baron, 1986), in Ireland 5–12 years (McGee, Garvan, de Barra, Byrne, & Conroy, 2002), and in China 4–15 years (Chen, Dunne, & Han, 2004). These risk periods fall predominantly into the elementary (primary) school years.

School-Based Education Programs for Prevention of CSA

School-based education programs for prevention of CSA were first developed by women’s sexual assault prevention collectives in the United States in the 1970s (Berrick & Gilbert, 1991). Programs were rapidly and widely adopted across the United States, assisted in some states by policy mandates, and by the mid-1990s, it was estimated that two thirds of 10- to 16-year-olds in the United States had participated in programs (Finkelhor, Asidigian, & Dziuba-Leatherman, 1995a). School-based programs have since emerged as an important primary prevention strategy in many countries. From a public health perspective (Rosenberg & Mercy, 1991), schools are appropriate systems for program delivery because programs can be implemented universally at comparatively little cost without stigmatizing those at greater risk (Wurtele & Kenny, 2010); program content aligns with school health curricula (Sexuality Information and Education Council of the United States, 2004; Walsh et al., 2013); and schools provide a direct conduit to other prevention targets such as school personnel, parents, extended families, and communities (Duane & Carr, 2002).

School-based education programs for prevention of CSA are typically presented to groups of students (e.g., in classes) and are tailored to ages and cognitive levels. They seek to prevent CSA by providing students with knowledge and skills to recognize and avoid potentially sexually abusive situations and with strategies to physically and verbally repel sexual approaches by offenders. They endeavor to minimize harm by disseminating messages about appropriate help seeking in the event of abuse or attempted abuse and equip adults with strategies for responding quickly and effectively to disclosures to protect children from further abuse. Interventions aim to transfer the knowledge and skills learned by the child or adolescent in the classroom to real-life situations. Interventions work by capitalizing on effective pedagogical principles used by classroom teachers and program facilitators, most notably those based on social cognitive learning theories (Bandura, 1986; Vygotsky, 1986), which stress the social context of learning via the use of instruction, modeling, rehearsal, reinforcement, and feedback (Wurtele, Marrs, & Miller-Perrin, 1987).

There is some evidence from cross-sectional, community-based studies conducted in the United States that participation in school-based CSA prevention programs may decrease the occurrence of CSA. A study of 2,000 10- to 16-year-olds found that those exposed to more comprehensive prevention education were more knowledgeable about sexual abuse, more likely to report using self-protection strategies, more likely to report protective efficacy, more likely to have disclosed their victimization, and less likely to engage in self-blame (Finkelhor et al., 1995a). In a follow-up study, the same individuals were more likely to use the protective strategies they had been taught when confronted with threats and assaults (Finkelhor, Asidigian, & Dziuba-Leatherman, 1995b). Two further studies with high school (Ko & Cosden, 2001) and college students (Gibson & Leitenberg, 2000) showed programs were associated with reduced incidence of CSA. However, these studies harbor the limitations of retrospective recall and have not been replicated with larger and more diverse samples. Research with sexual offenders on their perceptions of the efficacy of children’s self-protection strategies in actual abuse situations found that the most effective strategy, reported by three quarters of offenders, was to tell the offender they did not want to participate in sexual activities. Girls under the age of 12 years effectively used six such strategies to avoid abuse: demanding to be left alone, saying they would tell someone, crying, saying they were scared, saying the they did not want to, and saying “no” (Leclerc, Wortley, & Smallbone, 2011). These same verbal strategies are commonly taught in school-based education programs for prevention of CSA (Duane & Carr, 2002).

Prior Reviews

Several prior reviews have synthesized literature on school-based education programs for prevention of CSA. Our searches identified 21 reviews published up to August 2014. Over half were published in the 1990s with the most recent appearing in 2009. Most were traditional narrative reviews summarizing the findings of existing intervention studies, however these were not systematic; they did not have defined objectives, specific search strategies, explicit inclusion and exclusion criteria, or a method by which to appraise study quality. Four previous studies using meta-analysis were identified (Berrick & Barth, 1992; and Davis & Gidyz, 2000; Heidotting, Keiffer, & Soled, 1994; Rispens, Aleman, & Goudena, 1997). These reviews were limited by methodological flaws such as pooling randomized and nonrandomized studies, aggregating diverse outcomes, and the use of suboptimal statistical methods. Prior reviews have differed in their scope, are now outdated, and none have been replicated.
Prior reviews were also limited by theoretical flaws. For example, the classification of programs as primarily active or passive (also termed behavioral or instructional; see, e.g., Davis & Gidycz, 2000). This theoretical dichotomy is unsound from an educational perspective because most programs are, in practice, multifaceted, involving a much broader range of integrated teaching methods used to deliver program content (MacMillan, MacMillan, Offord, Griffith, & MacMillan, 1994). Classifying programs as either active or passive may therefore lead to erroneous conclusions about program effects, and more needs to be known about specific program characteristics that contribute to program effectiveness.

This systematic review and meta-analysis improves upon prior reviews by offering an objective, rigorous, comprehensive, and contemporary assessment of all the evaluation studies in the area and presenting this in a format that is transparent and replicable. Advancing upon prior work, this review applies a comprehensive search strategy using the most advanced databases across multiple disciplines, capitalizes upon advances in the availability of electronic documents, narrows inclusion criteria to programs focused specifically on CSA prevention, focuses only on gold standard evaluations using experimental methods, assesses risk of bias in included studies (Higgins et al., 2011), and uses newly introduced synthesis methods for meta-analysis (e.g., Borenstein, Hedges, Higgins, & Rothstein, 2009). The original review was published in 2007 (Zwi et al., 2007). This article details the substantive review update undertaken with research published up to September 2014.

**Objectives**

The objective of this review is to systematically assess evidence of the effectiveness of school-based education programs for the prevention of CSA. Specifically, to assess whether programs were effective in improving students’ protective behaviors (i.e., self-protective skills) and knowledge about sexual abuse prevention; skills and knowledge were retained over time; and program participation resulted in a greater likelihood of disclosure of sexual abuse and/or produced harmful effects.

**Method**

We used the Cochrane Handbook for Systematic Reviews of Interventions (Higgins & Green, 2011) for guidance on all aspects of the review including question development, eligibility criteria, searching, screening, data extraction, assessment of risk of bias, data analysis, and presenting and interpreting results (see http://community.cochrane.org/handbook). We used meta-analysis to quantitatively synthesize effects of school-based interventions (Borenstein et al., 2009; Higgins & Green, 2011).

**Types of Studies**

We included studies if they were randomized controlled trials (RCTs), cluster-RCTs, or quasi-RCTs where participants were randomly allocated to the intervention or control group or were allocated using a quasi-random method such as day of the week, alphabetical order, or other sequential allocation such as class or school.

**Types of Participants**

The study population comprised children (aged 5–12 years) and adolescents (aged 13–18 years) attending primary (elementary) or secondary (high) schools.

**Types of Interventions**

Included interventions were school-based education programs focusing on knowledge of sexual abuse and sexual abuse prevention concepts, or skill acquisition in protective behaviors, or both, compared with no intervention or the standard school curriculum. We excluded interventions for preventing relationship and dating violence, and sexually coercive peer relationships, as these were reviewed elsewhere (Fellmeth, Heffernan, Nurse, Habibula, & Sethi, 2013); interventions for abduction prevention, the aims of which did not clearly refer to prevention of CSA; interventions aimed broadly at child protection or personal safety in which it was not possible to isolate the effects of the sexual abuse component; and interventions set entirely in before- and after-school programs, and early childhood programs that were not in schools (e.g., day care settings).

**Types of Outcome Measures**

Child outcome measures were:

1. protective behaviors (i.e., self-protective skills, as measured by an independently scored simulation test);
2. knowledge of sexual abuse or knowledge of sexual abuse prevention concepts, or both (as measured by questionnaires or vignettes);
3. retention of protective behaviors over time;
4. retention of knowledge over time;
5. harm, manifest as parental or child anxiety or fear (as measured by questionnaires); and
6. disclosure of sexual abuse by a child or adolescent during or after programs (as measured by official records of student self-reports to school staff, child protective services, or police).

Outcomes measured did not form criteria for inclusion in the review. We included studies meeting the inclusion criteria for types of study, participants, and interventions only.

**Search Strategy**

A comprehensive search strategy was devised with the aim of identifying and retrieving all relevant studies in the field, published and unpublished. Searches for the original review were conducted in August 2006. We updated these extensively to September 2014 incorporating new search terms to describe...
recent concepts and adding new databases. We searched the following 15 databases:

- Cochrane Central Register of Controlled Trials (CENTRAL 2014, Issue 8);
- Ovid MEDLINE(R), 1946 to August Week 4, 2014;
- EMBASE (OVID), 1980 to 2014 Week 36;
- PsycINFO (OVID), 1967 to September Week 1 2014;
- CINAHL (EBSCOhost), 1937 to current;
- Social Science Citation Index (SSCI), 1970 to 29 August 2014;
- ERIC (EBSCOhost), 1966 to current;
- Sociological Abstracts (ProQuest), 1952 to current;
- Conference Proceedings Citation Index—Science (CPCI-S), 1990 to 29 August 2014;
- Conference Proceedings Citation Index—Social Sciences & Humanities (CPCI-SSH), 1990 to 29 August 2014;
- Database of Abstracts of Reviews of Effects (DARE) 2014, Issue 3, part of the Cochrane Library;
- ClinicalTrials.gov (clinicaltrials.gov/);
- ICTRP (apps.who.int/trialsearch/);
- Australasian Theses (via TROVE; trove.nla.gov.au/);
- Networked Digital Library of Theses and Dissertations (NDLTD; via SCIRUS; ndltd.org/serviceproviders/scirus-etsdsearch); last searched September 2013, not available in September 2014.

Search terms and strategies were modified slightly according to the conventions for individual databases. There were no restrictions on language or publication date. We also hand searched reference lists of previous systematic and narrative reviews and reference lists of included studies. We searched program evaluation databases such as the Promising Practices Network (RAND Corporation 2013) and Blueprints for Healthy Youth Development (Center for the Study and Prevention of Violence, 2013). To identify unpublished studies, we circulated requests via e-mail to relevant Listservs (e.g., Child Maltreatment Research Listserv). Details of the search strategy are available from the full review (Walsh, Zwi, Woolfenden, & Shlonsky, 2015) in the Cochrane Library at http://www.cochranelibrary.com/.

Data Collection and Analysis

Screening and selection of studies. We screened and selected studies in three phases. In Phase 1, we imported titles and abstracts of articles identified in the searches into reference management software, and two review authors independently screened them. We excluded papers if they clearly did not meet the inclusion criteria (i.e., study design, participants, type of intervention, and types of comparisons). In Phase 2, two review authors independently screened the titles, abstracts, and methodology sections of papers appearing to meet inclusion criteria. In cases where agreement could not be reached during screening, we asked a third and fourth review author to independently assess the study against the inclusion criteria and resolved these cases via discussion and consensus. In Phase 3, we retrieved the full text of studies meeting all inclusion criteria for data extraction, and we linked together multiple reports of the same study (e.g., Blumberg, 1987; Blumberg, Chadwick, Fogarty, Speth, & Chadwick, 1991; Chadwick, 1989). One study was translated into English (Del Campo Sanchez & Sanchez, 2006).

Data extraction and management. We used an electronic data extraction form adapted from the checklist of items specified in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins & Green, 2011, table 7.3a). Two review authors independently performed data extraction in the original review. In the review update, one new review author performed data extraction for all studies, and a second review author who was involved in data extraction in the original review performed data extraction only for new studies. Data were entered into the Cochrane Collaboration’s software, Review Manager (RevMan, 2015) 5.2, and checked for accuracy by a research assistant, working independently, and who was not a review author. All discrepancies were resolved via discussion.

Via e-mail, we contacted authors of studies in which methods of sequence generation, allocation concealment, or blinding were unclear, asking for additional information. We also contacted corresponding authors of studies with insufficient information to allow inclusion in meta-analyses and studies that used cluster randomization with a request to provide additional detail.

Assessment of risk of bias. Problems with the design, conduct, and reporting of studies of interventions can produce misleading results in which there is risk that studies may over- or underestimate the true effects of the interventions (Higgins & Green, 2011). We assessed risk of bias in each study using the seven domains on the Cochrane revised “Risk of bias” assessment tool (Higgins & Green, 2011, table 8.5a): (i) random sequence generation, (ii) allocation concealment, (iii) blinding of participants and personnel, (iv) blinding of outcome assessment, (v) incomplete outcome data, (vi) selective reporting, and (vii) other sources of bias. We assessed included studies on each domain as “low risk,” “high risk,” or “unclear risk” with the latter indicating lack of information or uncertainty. We entered this information into RevMan and summarized it in a Risk of bias table for each included study. Further details about this process can be found in the full review.

Calculating effect sizes. Effect sizes were calculated using methods and formulae recommended in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins & Green, 2011). We reported the summary of effect for dichotomous outcomes as an odds ratio (OR) with 95% confidence interval (CI). Continuous outcomes were reported as the standardized mean difference (SMD) with 95% CI. SMDs are appropriate for data synthesis, where different outcome measures are used across studies.

The allocation of participants to study conditions in groups rather than as individuals (known as cluster randomization)
alters the type of statistical methods required in data analysis to calculate effect sizes and their standard errors. Studies having this design feature should adjust results with appropriate statistical methods and publish intraclass correlation coefficients (ICCs; Campbell, Elbourne, & Altman, 2004). However, we found ICCs were not reported in included studies nor were they available from study authors, and no ICC for school-based CSA prevention interventions had been published, hitherto, in the literature. We noted that estimates of .1 and .2 had been used in a review of school-based violence prevention programs (Mytton, DiGuiseppi, Gough, Taylor, & Logan, 2006), based on the rationale for a published ICC of .15 for similar trials (Conduct Problems Prevention Research Group, 1999b in Mytton et al., 2006), and this was considered a plausible yet conservative estimate for the impact of clustering at the classroom level (Schochet, 2008). We reasoned that a suitably conservative approach would be to use the extremes of ICC .1 and .2 to calculate a design effect for each cluster RCT according to the formula given in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins & Green, 2011, section 16.3.4). We weighted these using the generic inverse variance function and used random effect models.

**Assessing heterogeneity.** Assessing heterogeneity involves considering between study diversity and determining whether the degree of variability is at an acceptable level for statistically combining studies (Higgins, 2008). We assessed heterogeneity using visual inspection of forest plots and two statistical measures ($\tau^2$ and the $I^2$ statistic), in order to describe and measure variability in the data (Borenstein et al., 2009). The $I^2$ statistic and its CIs describe the proportion of variability in effect size estimates resulting from heterogeneity rather than chance (Higgins, 2008; Higgins & Green, 2011).

**Data synthesis.** We synthesized the data using tools provided in Review Manager (RevMan) 5.2 (RevMan, 2012) and assessed the appropriateness of combining studies based on sufficient comparability with respect to the type of intervention, the type of outcome measures, and the nominated data collection points pre- and postintervention. We then calculated summary statistics (OR for dichotomous data and SMD for continuous data) with 95% CIs for each study. We used a random effects model to combine data. In all cases, we generated pooled estimates for those studies for which complete statistical data were available or could be derived (i.e., counts and proportions for dichotomous data; means and standard deviation [SDs] for continuous data). Forest plots were presented for each of the pooled estimates. In all cases, we corrected for small sample size bias by using Hedges’ g, which is the default in RevMan.

**Results**

**Results of the Searches**

The original review identified 15 studies (Zwi et al., 2007). In the new searches, we identified a total of 12,969 records through database searching and a further 58 records from other sources (see study flow diagram in Figure 1). After duplicates were removed, we screened the titles and abstracts of 10,218 records and, in addition to gray literature and citation searches, located an additional 10 papers. The original included studies were reassessed and one (Pacifici, Stoolmiller, & Nelson, 2001) was excluded due to its focus on sexual violence prevention in the context of dating relationships for adolescents (see Fellmeth et al., 2013). In total, this current review included 24 unique trials reported in 29 papers. A comprehensive list of excluded studies with reasons for exclusion can be found in the full review (Walsh et al., 2015, pp. 87–90).

**Characteristics of Included Studies**

Table 1 summarizes the characteristics of included studies. Of the 24 included studies, 7 were RCTs, 11 were cluster RCTs, and 6 were quasi-RCTs. Of the quasi-RCTs, all but Del Campo Sanchez and Sanchez (2006) used a Solomon four-group design (Campbell & Stanley, 1963; Solomon, 1949). The unit of randomization in 14 studies was clusters (classrooms, schools, or districts). Of these, 11 were cluster RCTs (as above) and 3 were quasi-RCTs. In 10 trials, the unit of randomization was individual school students. Of these, seven were RCTs and three were quasi-RCTs.

Studies were conducted in a number of different countries. Sixteen studies were conducted in the United States. Three studies were conducted in Canada (Daigneault, Hébert, McDuff, & Frappier, 2012; Hébert, Lavoi, Piche, & Poitras, 2001; Tutty, 1997). Single studies were conducted in China (Lee & Tang, 1998), Germany (Krahé & Knappert, 2009), Spain (Del Campo Sanchez and Sanchez, 2006), Taiwan (Chen, Fortson, & Tseng, 2012), and Turkey (Çeçen-Eroğul & Kaf Hasirci, 2013).

The total number of participants randomized in cluster RCTs ranged from 74 (Poche, Yoder, & Miltenberger, 1988) to 1,269 (Oldfield, Hays, & Megal, 1996). Eleven studies each included more than 200 participants. All studies were conducted in school settings: 23 in primary (elementary) schools and 1 in a special school for adolescents with intellectual disabilities (Lee & Tang, 1998). The studies were conducted with children of varying ages, sometimes grouped together. Ten studies were conducted with younger participants from kindergarten to Grade 3; eight studies with older participants from Grade 4 upward; and six studies combined younger and older participants together. None of the included studies were conducted in secondary (high) school settings.

**Participants**

A total of 5,802 school-aged participants were included in the 24 trials. Study participants’ mean ages at baseline ranged from 5.8 years (Harvey, Forehand, Brown, & Holmes, 1988) to 13.44 years (Lee & Tang, 1998). The proportion of females in the included studies ranged from 45% (Çeçen-Eroğul & Kaf
Figure 1. Study screening and selection process (study flow diagram).
Hasirci, 2013; Poche et al., 1988) to 55% (Crowley, 1989). Ethnicity data were reported in 13 studies. Two studies reported 100% Chinese participants (Chen et al., 2012; Lee & Tang, 1998); in five studies, the predominant ethnicity reported was White or Caucasian comprising 74% to 97% of participants (Grendel, 1991; Oldfield et al., 1996; Poche et al., 1988; Snyder, 1986; Tutty, 1997); and six studies reported diverse samples in which the proportion of non-White participants ranged from 32% (Hazzard, Webb, Kleemeier, Angert, & Pohl, 1991) to 66% (Dake, Price, & Murnan, 2003).

Parental socioeconomic position, religious background, and participants’ school achievement data (e.g., grades) at baseline were not reported in any study. In one study, the Peabody Picture Vocabulary Test (Dunn & Dunn, 1981) was used to assess children’s receptive and expressive language ability at baseline (Fryer, Kraizer, & Miyoshi, 1987a, 1987b), and, in another study, Raven’s (1960) Standard Progressive Matrices was used as a measure of general intellectual ability at baseline (Lee & Tang, 1998). In the latter study, participants were adolescent Chinese females with mild intellectual disabilities from four special needs schools in Hong Kong, China. None of the studies enrolled participants on the basis of previously reported abuse.

**Interventions**

Table 2 provides a summary of key features of the interventions. In all 24 trials, interventions focused specifically on CSA prevention. The targets of the interventions were school-aged children who were taught knowledge of sexual abuse, sexual abuse prevention concepts, and/or protective behaviors (i.e., self-protective skills). A wide range of previously published, modified, and new prevention programs were used in the trials. Fifteen discrete programs were identified. Contents of or topics covered in the intervention programs included safety rules, body ownership, private parts, distinguishing appropriate and inappropriate touches, distinguishing types of secrets, and whom to tell. Four studies also included abduction prevention content (Chen et al., 2012; Fryer et al., 1987a, 1987b; S. Kraizer, 1991; Poche et al., 1988).

Teaching methods included rehearsal, practice, or role-play reported in 12 studies, discussion in 10 studies, and modeling in six studies. The teaching method, review, which involved revisiting previous content and summarizing new content, was nominated in one study (Grendel, 1991). A specific suite of teaching strategies was designated in four studies, including instruction, modeling, rehearsal, social reinforcement, shaping, feedback, and group mastery (Chen et al., 2012; Lee & Tang, 1998; Saslawsky & Wurtele, 1986; Wurtele, Saslawsky, Miller, Marrs, & Britcher, 1986).

Program delivery formats were reported in the majority of studies. These included film, video, and DVD formats in 12 studies, theatrical plays in three studies, and multimedia presentations in two studies. Additional resources used by program facilitators included songs, puppets, comics, a coloring book, a storybook, and games. No programs were delivered electronically in interactive web- or computer-based formats.

The duration of the intervention programs in the included trials ranged from a single 45-min session (Oldfield et al., 1996) to eight 20-min sessions on consecutive days (Fryer et al., 1987a, 1987b). Fourteen interventions were brief (i.e., less than 90 min total duration), and the remainder were longer, lasting from 90 to 180 min in total duration.

In 17 trials, the effectiveness of prevention programs was compared to that of a wait-listed control group. In the seven remaining studies, the control group interventions were as follows: discussion about self-concept (Saslawsky & Wurtele, 1986; Wurtele et al., 1986), multimedia presentation with no child abuse content (Harvey et al., 1988), fire safety (Blumberg, 1987; Blumberg et al., 1991; Chadwick, 1989), fire or water safety (Hazzard et al., 1991), attention control program (Lee & Tang, 1998), and a game of hangman (Snyder, 1986). All programs were delivered on school premises and during school hours, apart from one study in which the program was delivered in the morning, before school classes began (Chen et al., 2012).

**Effects of Interventions**

We present the main findings on the effects of the interventions for the six outcomes: (i) protective behaviors (self-protective

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**Table 1. Characteristics of Included Studies.**

<table>
<thead>
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<th>Characteristic</th>
<th>Number of Studies</th>
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<td>Publication year</td>
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<td>1980–1989</td>
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<tr>
<td>1990–2000</td>
<td>7</td>
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<td>2001–2009</td>
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<tr>
<td>Quasi RCT</td>
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<td>1–200</td>
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<td>200+</td>
<td>11</td>
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<tr>
<td>Participants</td>
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<tr>
<td>Total number of participants</td>
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<tr>
<td>Mean age range (years)</td>
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<td>Gender proportion range (female), %</td>
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*Note.* RCT = randomized controlled trials.
Table 2. Summary of the 24 Included Studies.

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Intervention</th>
<th>Intervention Content</th>
<th>Intervention Methods</th>
<th>N</th>
<th>Study Design</th>
<th>Outcomes Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blumberg, Chadwick, Fogarty, Speth, and Chadwick (1991)</td>
<td>Stop, tell someone, own your body, protect yourself</td>
<td>Body ownership/body rights; body openings needing protection (eyes, ears, and private places); appropriate and inappropriate touches; safety rules (stop, go, tell, tell, tell, and keep telling until somebody listens); perpetrators are usually someone known to the child; sexual abuse is not the child's fault; appropriate and inappropriate secrets</td>
<td>Role-play, modeling, rehearsal, and discussion</td>
<td>264</td>
<td>Cluster RCT</td>
<td>Protective behaviors (simulation) Knowledge (questionnaire-based knowledge) Knowledge (vignette-based knowledge) Disclosures</td>
</tr>
<tr>
<td>Child Abuse Primary Prevention Program (CAPP)</td>
<td></td>
<td>Discriminating types of touches based on feelings; they have the right to say no; safety rules &quot;Say No,&quot; &quot;Go,&quot; and &quot;Tell&quot;; no one should touch private areas unless you need help; &quot;touching secrets&quot; or &quot;secrets that hurt&quot; should never be kept; sexual abuse is never the child's fault</td>
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<tr>
<td>Çeçen-Eрогul and Kaf Hasirci (2013)</td>
<td>Preventing child sexual abuse psychoeducational training program based on the Good Touch/ Bad Touch program (Childhelp, 2011) adapted for the Turkish culture</td>
<td>My body belongs to me; discriminating good touch/bad touch; promises; body safety rules; saying &quot;No&quot;; secrets; talking with adults; and abuse is never a child's fault</td>
<td>Video, lecture, role-play, modeling, and rehearsal</td>
<td>36</td>
<td>RCT</td>
<td>Knowledge (questionnaire-based knowledge)</td>
</tr>
<tr>
<td>Chen, Fortson, and Tseng (2012)</td>
<td>Based on Red Flag/Green Flag People (Rape and Abuse Crisis Center, 2008) and red flag/green flag people II (Grimm, Haseltine, &amp; Schwandt, 1994)</td>
<td>Body ownership, distinguishing appropriate from inappropriate touches and requests, distinguishing types of secrets, and abduction prevention training based on the book &quot;Who Is a Stranger and What Should I Do?&quot; (Girard, 1985)</td>
<td>Instruction; modeling, role-play, rehearsal, practice, feedback, and reinforcement</td>
<td>46</td>
<td>RCT</td>
<td>Knowledge (questionnaire-based knowledge) Knowledge (vignette-based knowledge)</td>
</tr>
<tr>
<td>Crowley (1989)</td>
<td>Good Touches/Bad Touches: A Program to Prevent Child Sexual Abuse (Mental Health Association of Westchester County, 1984)</td>
<td>Individuals are unique and special, feelings are special and important, different kinds of touches, body ownership, touching, saying no, distinguishing types of secrets, identifying trusted adults, how to tell</td>
<td>Discussion; structured activities, including active participation and rehearsal, film, and review</td>
<td>293</td>
<td>Quasi-RCT</td>
<td>Knowledge (questionnaire-based knowledge)</td>
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<tr>
<th>Author (Year)</th>
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<th>Intervention Methods</th>
<th>N</th>
<th>Study Design</th>
<th>Outcomes Measured</th>
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<tbody>
<tr>
<td>Daigneault, Hébert, McDuff, &amp; Frappier (2012)</td>
<td>ESPACE child sexual abuse prevention program, French adaptation of the CAPP workshop (Cooper, 1991)</td>
<td>Awareness of personal rights, (safe, strong, and secure), self-assertion skills (self-defense yell), and appropriate responses to instances of abuse (seeking out peer support, confiding in a trusted adult). Also, prevention of verbal and physical violence</td>
<td>Role-playing, guided discussions, behavior modeling, and rehearsals</td>
<td>160</td>
<td>Quasi-RCT</td>
<td>Knowledge (questionnaire-based knowledge) Knowledge (vignette-based knowledge) Harm</td>
</tr>
<tr>
<td>Dake, Price, and Murnan (2003)</td>
<td>Child abuse prevention curriculum modified from an existing curriculum (title not reported)</td>
<td>Abuse problems children may encounter; people in family and community support systems that children can turn to; three types of touches; personal safety rules; child abuse is never a child’s fault; child abuse should never be kept secret; empathy for others who find themselves in abusive situations</td>
<td>Role-play, video, and discussion</td>
<td>450</td>
<td>Cluster RCT</td>
<td>Knowledge (questionnaire-based knowledge)</td>
</tr>
<tr>
<td>Dawson (1987)</td>
<td>Child sexual abuse prevention program presentation + film from the series Child Sexual Abuse: A Solution (Adams &amp; Fey, 1984)</td>
<td>Definitions; session standards; purpose of session; discriminating appropriate and inappropriate touches; trusting feelings; talking with a trusted adult; offender characteristics and approaches; offenders are likely to be someone they know; personal safety rules; distinguishing appropriate and inappropriate secrets; child sexual abuse is against the law; children are not to blame; skills for resisting or avoiding abuse; identifying support systems</td>
<td>Role-play, modeling, problem-solving activities (“what if” situations); questions and answers</td>
<td>237</td>
<td>Cluster RCT</td>
<td>Knowledge (questionnaire-based knowledge)</td>
</tr>
<tr>
<td>Del Campo Sanchez and Sanchez (2006)</td>
<td>Prevention of child sexual abuse program (Lopez &amp; DelCampo, 1997)</td>
<td>Details not reported</td>
<td>Details not reported</td>
<td>382</td>
<td>Quasi-RCT</td>
<td>Knowledge (questionnaire-based knowledge) Disclosures Harm</td>
</tr>
<tr>
<td>Fryer et al. (1987)b</td>
<td>Children Need to Know Personal Safety Training Program (S. K. Kraizer, 1981)</td>
<td>Four safety rules to follow when they are not with care-taking adults: stay an arm’s reach away from strangers, don’t talk to them, don’t take anything from them, and don’t go anywhere with them</td>
<td>Role-play</td>
<td>48</td>
<td>RCT</td>
<td>Protective behaviors (simulation) Knowledge (questionnaire-based knowledge)</td>
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<tr>
<td>Grendel (1991)</td>
<td>Child Sexual Abuse Prevention Program (Women Helping Women, Ohio, no citation)</td>
<td>What is a stranger? public versus private parts of the body, happy versus sad touches, trusting your feelings or inner voices, 3 body safety rules (say no, get away, tell someone), what if situations/concrete examples, who could you trust to tell?</td>
<td>Film, discussion, and review</td>
<td>100</td>
<td>Cluster RCT</td>
<td>Knowledge (Questionnaire-based knowledge): Knowledge (vignette-based knowledge)</td>
</tr>
<tr>
<td>Harvey, Forehand, Brown, and Holmes (1988)</td>
<td>Good Touch–Bad Touch program (no citation)</td>
<td>Defining sexual abuse; differentiating between good, bad, and sexually abusive touches; identifying who can sexually abuse children; five body safety rules (I can decide with whom I want to share my body; recognizing when “something wrong” is happening to me; learning to say no and get away; learning to tell someone what happened; and recognizing that, if abuse occurs, it is never my fault)</td>
<td>Story, game, film, song, and role-plays utilizing modeling, rehearsal, and social reinforcement</td>
<td>90</td>
<td>RCT</td>
<td>Knowledge (Questionnaire-based knowledge): Knowledge (vignette-based knowledge)</td>
</tr>
<tr>
<td>Hazzard, Webb, Kleemeier, Angert, and Pohl (1991)</td>
<td>Adaptation of feeling yes, feeling no (National Film Board of Canada, 1985) + sexual abuse prevention curriculum for children + homework handouts</td>
<td>Touches can give children positive or negative feelings; children can say no, leave, and tell a trusted adult; defining child sexual abuse; children can problem solve (use “three stranger questions”) to avoid dangerous situations with strangers; sometimes children are sexually abused by someone they know; there are many adults who can help so keep telling if the first adult does not believe you; sexual abuse is never the child’s fault</td>
<td>Video tape, discussion, and role-play, plus Spiderman and Power Pack comic book (Marvel Comics, 1984) and homework handouts</td>
<td>399</td>
<td>Cluster RCT</td>
<td>Knowledge (Questionnaire-based knowledge): Knowledge (vignette-based knowledge): Disclosures</td>
</tr>
<tr>
<td>Hébert, Lavoie, Piche, and Poitras (2001)</td>
<td>ESPACE child sexual abuse prevention program, adapted from CAPP (Cooper, 1991)</td>
<td>Enhance children's awareness of their personal rights; basic prevention concepts and skills; self-assertion skills; self-defense yell; children are encouraged to ask friends for help and to tell a trusted adult if abuse occurs; verbal and physical abuse and bullying; workshops for parents and teachers.</td>
<td>Role-play, guided discussions, behaviour modeling, and rehearsal.</td>
<td>133</td>
<td>Quasi RCT</td>
<td>Knowledge (Questionnaire-based knowledge): Knowledge (vignette-based knowledge): Harm</td>
</tr>
<tr>
<td>Author (Year)</td>
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<tr>
<td>Kolko, Moser, and Hughes (1989)</td>
<td>Red Flag/Green Flag program (Williams, 1980)</td>
<td>Defining sexual abuse; differences between good and bad touching from strangers, familiar people, and family members; prevention rules; potentially helpful adults; discussion of personal experiences, and training in prevention skills (say no, get away quickly, and tell adult immediately); parent orientation session; in-service training for teachers and volunteers</td>
<td>Film + coloring book</td>
<td>337</td>
<td>Cluster RCT</td>
<td>Knowledge (questionnaire-based knowledge) Disclosure</td>
</tr>
<tr>
<td>Krahé and Knappert (2009)</td>
<td>LIVE: a live performance of a theatre play entitled (No) Child’s Play</td>
<td>Promoting children’s skills in handling uncomfortable interactions with adults, such as being asked to keep a secret when they feel uneasy; promoting confidence in their ability to seek help</td>
<td>Theatrical performance</td>
<td>148</td>
<td>Cluster RCT</td>
<td>Knowledge (vignette-based knowledge) Harm</td>
</tr>
<tr>
<td>S. Kraizer (1991)</td>
<td>The Safe Child Program (S. Kraizer, 1991)</td>
<td>Your body belongs to you; you have a right to say who touches you and how; if someone touches you in a way that you do not like, in a way that makes you feel funny or uncomfortable, or in a way that you think is wrong, it’s okay to say no; if the person does not stop, say “I’m going to tell”; if you have a problem, or if something like this is happening to you, tell and keep telling until someone helps you; adults cannot read your mind, you need to communicate clearly and fully; touch should never have to be a secret. Also includes: prevention of abuse and abduction by strangers; prevention of physical and emotional abuse; safety in self-care</td>
<td>Video, role-play, and classroom activities</td>
<td>670</td>
<td>Cluster RCT</td>
<td>Protective behaviors (simulation) Knowledge (questionnaire-based knowledge)</td>
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<tr>
<td>Lee and Tang (1998)</td>
<td>Behavioral Skills Training Program (Wurtele, 1990)</td>
<td>We are the bosses of our bodies; the locations of private parts; touching your own private parts is acceptable when done in private; it is appropriate for doctors, nurses, or parents to touch children’s private parts for health or hygiene reasons; otherwise, it is not okay to have private parts touched or looked at by a bigger person; it is wrong to be forced to touch a bigger person’s private parts; a bigger person’s inappropriate touching of a child’s private parts is never the child’s fault; personal body safety rule “It’s not okay for a bigger person to touch or look at my private parts” (unless they need help as in situations when their private parts get hurt)</td>
<td>Instruction, modeling, behavioral rehearsal (practice), shaping, social reinforcement, and feedback</td>
<td>77</td>
<td>RCT</td>
<td>Knowledge (Questionnaire-based knowledge): Knowledge (vignette-based knowledge)</td>
</tr>
<tr>
<td>Oldfield, Hays, and Megel (1996)</td>
<td>Project TRUST (Anderson, Morris, &amp; Robins, 1990)</td>
<td>The touch continuum (nurturing, confusing, and exploitative); the right to question or refuse exploitative touch; the way to say no to uncomfortable situations; the fact that perpetrators can be either people you know or strangers</td>
<td>Discussion, theatrical play, question/response period</td>
<td>1,269</td>
<td>Cluster RCT</td>
<td>Knowledge (questionnaire-based knowledge): Disclosure</td>
</tr>
<tr>
<td>Poche, Yoder, and Miltenberger (1988)</td>
<td>Videotape intervention (no citation)</td>
<td>Several child abduction scenes in which adults approach children in a friendly manner and entice them; child actors demonstrate two safety rules (no further detail reported)</td>
<td>Video, questioning, articulation of strategies, feedback, guiding of attention, praise, and using the child’s viewpoint</td>
<td>74</td>
<td>Cluster RCT</td>
<td>Knowledge (questionnaire-based knowledge)</td>
</tr>
<tr>
<td></td>
<td>Videotape intervention + behavioral rehearsal (no citation)</td>
<td>Several child abduction scenes in which adults approach children in a friendly manner and entice them; child actors demonstrate two safety rules (no further detail reported)</td>
<td>As above with the addition of behavioral rehearsal in a role-play</td>
<td></td>
<td></td>
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<tr>
<td>Saslawsky and Wurtele (1986)</td>
<td>Film: Touch (Illusion Theater Company, 1984)</td>
<td>Portrayal of abusive incidents with modeling of four prevention skills (say no, yell for help, get away, and tell someone and keep telling until someone believes you)</td>
<td>Film, discussion and review</td>
<td>67</td>
<td>Quasi-RCT</td>
<td>Knowledge (questionnaire-based knowledge): Knowledge (vignette-based knowledge)</td>
</tr>
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<tbody>
<tr>
<td>Snyder (1986)</td>
<td>Good Secrets, Bad Secrets (citation not reported)</td>
<td>General safety; distinguishing appropriate and inappropriate touching; assertiveness; help seeking and action planning.</td>
<td>Role-play, discussions, story-like situations.</td>
<td>177</td>
<td>Quasi-RCT</td>
<td>Knowledge (questionnaire-based knowledge)</td>
</tr>
<tr>
<td>Tutty (1997)</td>
<td>Who Do You Tell program (Calgary Sexual Assault Centre, 1983)</td>
<td>Prevention concepts, giving information, permission to say no to unwanted touch, whether children should be suspicious of all touches or adults, a parent information evening, and teacher in-service workshop</td>
<td>Discussion, pictures, short videos, and role-plays</td>
<td>231</td>
<td>RCT</td>
<td>Knowledge (questionnaire-based knowledge) Harm</td>
</tr>
<tr>
<td>Wolfe, MacPherson, Blount, and Wolfe (1986)</td>
<td>Theatrical plays performed by volunteer medical students (title not reported)</td>
<td>Five themes: abuse can be perpetrated by someone you love and trust; feelings generated in such circumstances; importance of telling someone, even if unsure of what is happening; abuse is not your fault; and getting help right away is the best way to respond</td>
<td>Theatrical skits and discussion</td>
<td>290</td>
<td>Cluster RCT</td>
<td>Knowledge (questionnaire-based knowledge)</td>
</tr>
<tr>
<td>Wurtele, Saslawsky, Miller, Marrs, and Britcher (1986)</td>
<td>Film: “Touch” (Illusion Theater Company, 1984)</td>
<td>Body safety rules (saying No; yelling for help; getting away; telling someone and keep telling until someone believes you)</td>
<td>Film, discussion, and review</td>
<td>71</td>
<td>RCT</td>
<td>Knowledge (questionnaire-based knowledge) Knowledge (vignette-based knowledge)</td>
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<td></td>
<td>Body Safety Training (Wurtele &amp; Miller-Perrin, 1986)</td>
<td>Three specific self-protective skills (being able to identify the location of one’s private parts; knowing when it is “okay” or “not okay” to have their private parts touched; developing verbal responses (e.g., saying No! in a big voice) and motor responses (e.g., getting away and telling someone) in potential abuse situations</td>
<td>Instruction, modeling, rehearsal, social reinforcement, shaping, and feedback + group mastery of skills</td>
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Note. RCT = randomized controlled trials.

skills), (ii) knowledge (questionnaire-based knowledge and vignette-based knowledge), (iii) retention of protective behaviors over time, (iv) retention of knowledge over time, (v) harm (parental or child anxiety or fear), and (vi) disclosures.

Protective behaviors. Of the 24 included studies, three studies reported collecting data on protective behaviors (i.e., demonstration of self-protective skills; Fryer et al., 1987a, 1987b; S. Kraizer, 1991; Poche et al., 1988). All used a version of a stranger simulation test involving the staging of a simulated abuse or grooming situation with each individual child where a research assistant, posing as a stranger, requested the child’s help with a task that required them to go with the stranger (e.g., accompany the stranger to the stranger’s car to do a special task). Children’s responses were recorded by independent assessors using contemporaneous video monitoring (Fryer et al., 1987a, 1987b; S. Kraizer, 1991) or by the research assistant (Poche et al., 1988). Scoring was pass or fail. All three studies were conducted with children in lower primary school (kindergarten to Grade 3).

Only the Fryer (n = 48; RCT; 1987a, 1987b) and Poche et al. (n = 74; cluster RCT; 1988) studies could be included in the meta-analysis for protective behaviors, as S. Kraizer 1991 (n = 670; cluster RCT) did not report a breakdown of pass or fail scores for intervention and control groups. In the analysis, heterogeneity approached the moderate range (I² = 27%; τ² = .16) and was nonsignificant (p value = .24). Protective behaviors were greatly enhanced in intervention groups compared to control groups immediately postintervention (OR = 5.71, 95% CI = [1.98, 16.51]; two studies; n = 102; Figure 2). The results did not change when we made adjustments using ICCs to correct errors made in studies, where data were analyzed without accounting for the clustering of students in classes or schools (ICC = .1, OR of 5.43, 95% CI = [1.88, 15.65]; ICC = .2, OR of 5.16, 95% CI = [1.81, 14.70]).

Knowledge (questionnaire-based knowledge). Of the 24 included studies, 21 reported questionnaire-based knowledge using a range of different measures. Eighteen studies were included in the meta-analysis comprising a total of 4,657 participants. In the meta-analysis, there was evidence of substantial heterogeneity (I² = 84%; τ² = .10). The high χ² statistic (104.76; df = 17) and low p value (<.00001) indicated variation in effect estimates beyond chance. The SMD was 0.61 (95% CI = [0.45, 0.78]), reflecting an average 0.61 SD increase in factual knowledge, across various measures, for the intervention group. These results suggest that children exposed to the interventions tend to display increased factual knowledge about sexual abuse and its prevention, when measured immediately after completion of the program, and the effect is of a moderate size (Figure 3). The results did not change when adjusted for clustering (ICC = .1, SMD = 0.66, 95% CI = [0.51, 0.81]; ICC = 0.2, SMD = 0.63, 95% CI = [0.50, 0.77]).

When studies at high risk of bias were excluded, the SMD was reduced to 0.47 (95% CI = [0.29, 0.66]), indicating that knowledge scores may be influenced by assessor bias or contamination from group assessment, or both, such that better controlled studies may generate lower effect sizes for this knowledge outcome. We also examined studies in two age-based subgroups: studies with only younger participants from kindergarten to Grade 3 and studies with only older participants from Grade 4 upward. The SMD was 0.42 (95% CI = [0.08, 0.77]) for the younger group and 0.89 (95% CI = [0.59, 1.19]) for the older group. The test for subgroup differences was just below the statistically significant cutoff of .05 (χ² = 4.04, df = 1; p value = .04). These results indicate that knowledge may be better gained immediately after the intervention by older children.

Knowledge (vignette-based knowledge). Twelve studies used vignette-based measures in various formats, including verbal, picture, and video vignettes. Eleven studies were included in the meta-analysis with a total of 1,688 participants. There was evidence of substantial heterogeneity (I² = 71%; τ² = .08) in the meta-analysis. The high χ² statistic (34.25, df = 10) and
low $p$ value ($<.0002$) provide further evidence of variation in effect estimates beyond chance. The SMD was 0.45 (95% CI = [0.24, 0.65]), indicating that those receiving treatment had an average 0.45 SD increase in applied knowledge as reflected in their responses to vignettes administered postintervention, a gain of moderate effect size (Figure 4). The results did not change when adjusted for clustering (ICC = 0.1, SMD = 0.53, 95% CI = [0.32, 0.74]; ICC = 0.2, SMD = 0.60, 95% CI = [0.31, 0.89]).

When studies at high risk of bias on the blinding of outcome assessment domain were excluded, the SMD was reduced to 0.36 (95% CI = [0.17, 0.56]), indicating a slight testing effect. We again conducted subgroup analyses to assess the effects of participant age as mentioned earlier. The SMD was 0.39 (95% CI = [0.09, 0.69]) for the younger group and 0.56 (95% CI = [0.03, 1.08]) for the older group. The test for subgroup differences was not significant ($\chi^2 = .29, df = 1; p$ value = .59).

Retention of protective behaviors over time. Three of the 24 included studies measured retention of protective behaviors over time. Complete data were not available for any of these studies. Meta-analysis could not be conducted.

Retention of knowledge over time. Questionnaire-based measures were used in 21 of the 24 included studies. Ten of these studies reported on retention of knowledge over time, from 1- to 6-months postintervention. Complete data were available for four studies (956 participants). The effect of intervention seemed to persist beyond the immediate assessment (SMD = 0.78, 95% CI = [0.38, 1.17]; $I^2 = 84\%$, $\tau^2 = .13$, $p$ value = .0003;

![Figure 3. Effects of interventions on questionnaire-based knowledge scores, no correction for clustering.](image-url)
(n = 956) to 6 months (SMD = 0.69, 95% CI = [0.51, 0.87]; $I^2 = 25%$; $t^2 = 0.01$, $p$ value = 0.26; $n = 929$; Figure 5). The results did not change when adjustments were made using ICCs.

Vignette-based measures were used in 12 of the 24 included studies. Nine of these studies reported on retention of knowledge over time. None could be included in a meta-analysis because either the study did not provide data in a form usable in meta-analysis or the study’s wait-listed control group had already received the intervention.

**Harm.** A total of six studies measured harm in relation to children’s participation in school-based sexual abuse prevention programs. We included three studies (795 participants) in the meta-analysis. In these studies, harm was measured via child self-report using anxiety or fear scales, with all studies using unique measures: Dawson (1987) used the State-Trait Anxiety Inventory for Children; Lee and Tang (1998) used the Fear Assessment Thermometer Scale; and Blumberg (1987); Blumberg, Chadwick, Fogarty, Speth, and Chadwick (1991); and Chadwick (1989) used a custom-made scale. There was no heterogeneity ($I^2 = 0\%$, $p$ value = .84). Disclosures occurred more often in the intervention groups ($OR = 3.56$, $95\% CI = [1.13, 11.24]$). Adjusting for the effect of clustering in the Kolko, Moser, and Hughes (1989) and Oldfield et al. (1996) studies, however, had the effect of widening the CIs around the $OR$ ($ICC = 0.1$, $OR = 3.04$, $95\% CI = [0.75, 12.33]$; ICC =: 0.2, $OR = 2.95$, $95\% CI = [0.69, 12.61]$), making the result less certain and indicating the effect of intervention programs on disclosure was sensitive to different assumptions regarding the effect of clustering on the results (Figure 7 shows results with correction for clustering using ICC = .1).

**Disclosure.** We included three studies (1,788 participants) in the meta-analysis for disclosures of previous or current sexual abuse during or after program participation. There was no heterogeneity ($I^2 = 0\%$, $p$ value = .84). Disclosures occurred more often in the intervention groups ($OR = 3.56$, $95\% CI = [1.13, 11.24]$). Adjusting for the effect of clustering in the Kolko, Moser, and Hughes (1989) and Oldfield et al. (1996) studies, however, had the effect of widening the CIs around the $OR$ ($ICC = 0.1$, $OR = 3.04$, $95\% CI = [0.75, 12.33]$; ICC =: 0.2, $OR = 2.95$, $95\% CI = [0.69, 12.61]$), making the result less certain and indicating the effect of intervention programs on disclosure was sensitive to different assumptions regarding the effect of clustering on the results (Figure 7 shows results with correction for clustering using ICC = .1).
Subgroup Analyses

Insufficient information was provided in the included studies to conduct planned subgroup analyses, and there were insufficient studies for this to be meaningful. The problem here was that the included studies provided insufficient information about issues that were hypothesized as being relevant for subgroup analysis such as gender, program type, and setting. We did not conduct subgroup analyses for active or passive involvement, as it was not possible to categorize programs in this way; most were multifaceted, involving combinations of approaches (see Table 2).
Discussion and Application to Practice

This review reported on the effects of 24 trials (published in 29 reports) examining the effectiveness of school-based programs for the prevention of CSA including 5,802 child participants of whom approximately 98.8% were from primary (elementary) schools. Studies were conducted in countries with high and upper-middle income economies according to the World Bank’s analytical income categories (The World Bank, 2013). Most (16 of 24) were conducted in North America, the remainder in Europe, East Asia, and Central Asia. Ethnicity data were poorly reported or not reported in 10 of the 24 studies. Where data were reported, participants were from a diverse range of ethnicities, increasing the generalizability of the evidence, and also suggesting that there is widespread concern about CSA and its prevention.

We assessed program effectiveness according to six outcomes: (i) protective behaviors (self-protective skills), (ii) knowledge (questionnaire-based knowledge and vignette-based knowledge), (iii) retention of protective behaviors over time, (iv) retention of knowledge over time, (v) harm manifesting as parental or child anxiety or fear, and (vi) disclosures of past or current CSA. Our overall interpretation is that there is moderate quality evidence that school-based education programs for the prevention of CSA, of the types described in this review, are effective in increasing knowledge about a range of behaviors that may help primary (elementary) school-aged children avoid potentially dangerous circumstances. In addition, when measured in the context of vignettes or other experimental approaches, children provided with this type of intervention more often act on this knowledge (i.e., behave in ways that are more protective) than children who do not receive the intervention. Results are best immediately postintervention, but there is more limited evidence that some effects are maintained over time.

Caution in the interpretation of these results is in order. Protective behaviors, also known as self-protective skills, were studied in simulated situations. These were a form of in vivo assessment, which exposed children to an invitation to go with an unknown adult (Fryer et al., 1987a, 1987b; S. Kraizer, 1991; Poche et al., 1988). The use of these simulation techniques is designed to assess children’s skills in responding to actual threats, however, the approach is difficult to justify and raises important ethical questions about balancing risks to participants against potential benefits for research. Assessing children’s skills where there is active concealment via role-playing also presents significant challenges to the principle of voluntary consent. Although this is arguably as close as researchers can get to testing whether participants’ learned skills can be translated into appropriate behavior, several salient issues must be considered. First, it is not known if skills tested in the context of approaches from strangers are the same as those required for children to deal with threats from familiar adults who are the most common perpetrators of CSA. Second, although the generalization of responses from simulated to actual settings has been demonstrated in some educational contexts (see, e.g., Vogel et al., 2006), it cannot be assumed that this applies in the specific context of an approach from an unknown adult toward a child in a school hallway or playground. Third, there is the possibility that this type of outcome assessment may desensitize children to similar occurrences in the future. Outcome assessment of this type, therefore, must be rigorously conducted and monitored.

Knowledge acquisition was the most frequently tested study outcome, either via questionnaires designed to capture factual knowledge or via vignettes that attempt to ascertain applied knowledge. Tests of knowledge acquisition are used routinely in classroom assessment of students’ learning. Children exposed to the interventions displayed increased factual and applied knowledge about CSA and its prevention, when measured immediately after completion of the program, and scores were maintained for intervention participants 1–6 months after program participation. Older children appeared to make greater knowledge gains than younger children when tested using questionnaire-based measures, but not with vignette-based measures, indicating a further need for caution when selecting
outcome measures and interpreting study findings. In this review, it was not possible to quantify the magnitude of knowledge improvement required to produce clinically important protective effects. For example, it is not clear what a 0.61 SD increase in factual knowledge or a 0.45 SD increase in applied knowledge translates to in practical knowledge terms. Are these findings sufficient to offer protective effects under threats of sexual abuse? Further research is required to answer these vexing questions regarding the magnitude of skill or knowledge improvement (or both) that can (if at all) translate to clinically important protective effects. Such evidence will be a necessary precursor to assessing programs’ cost-effectiveness.

On balance of evidence, programs do not appear to cause harm. That is, they do not appear to increase or decrease children’s fear or anxiety. This is important because the historical controversy over school-based CSA prevention programs is concentrated on two outcomes: programs’ actual effectiveness in preventing CSA and concerns over negative program effects (Finkelhor, 2007). In examining individual studies, it appears that when children do report concerns, these manifest as moderate initially and then decline on program completion. Future research should monitor a wider range of children’s and parents’ reactions to programs and assess the transient and/or persistent nature of potential harms associated with program exposure.

The only direct measure of program effects was participants’ disclosures of past or current sexual abuse that were made following interventions. Programs may result in greater odds of disclosures of past or current sexual abuse from children who have been program participants. However, we could not be certain of this result because children’s disclosures were poorly and inconsistently reported or not reported at all. Studies that did report disclosures did not use correct analytic techniques. Future studies must make advances in assessing this direct program outcome by designing more consistent and reliable strategies for recording disclosures; considering data linkage to child protection, hospital, or police records, or both (Blumberg, 1987; Blumberg et al., 1991; Chadwick, 1989; Maclntyre & Carr, 1999; Oldfield et al., 1996); and/or interviewing or surveying participants at repeated follow-up intervals to enable greater detection and referral for secondary prevention. If the ultimate goals of school-based education programs for prevention of CSA are to prevent children from ever experiencing abuse, and in cases where children have already experienced abuse, to stop the abuse, and limit the harm caused, higher levels of evidence are required to demonstrate effectiveness in relation to these primary outcomes. This will require large cohort studies with repeated follow-up into adulthood. However, even large cohort studies may not provide definitive evidence for changes in CSA incidence, as it is underidentified and difficult to prove.

Five previous meta-analyses of sexual abuse prevention programs exist, including the original version of this review (Zwi et al., 2007). Our review differs from previous reviews in that it assesses a broader range of outcomes, applies more rigorous inclusion criteria to select high quality studies. All prior reviews found medium to large effects for knowledge outcomes in favor of intervention groups. These effect sizes ranged from 0.57 (18 studies; Heidotting et al., 1994) through 0.71 (16 studies; Rispens et al., 1997) and 0.90 (13 studies; Berwick & Barth, 1992) to 1.07 (27 studies; Davis & Gidycz, 2000). Our original review (Zwi et al., 2007) found an SMD of 0.59 (95% CI = [0.44, 0.74]; nine studies, n = 3,022) for the questionnaire-based knowledge outcome, which is the outcome most comparable to the outcomes reported in previous reviews. The current review found an SMD of 0.61 (95% CI = [0.45, 0.78]; 18 studies, n = 4,657).

The full systematic review (Walsh et al., 2015) also includes a detailed discussion of the methodological limitations and reporting shortcomings of the included studies. While the use of randomized and quasi-randomized designs is laudable, their presence is no guarantee that the studies were carried out in ways that avoid substantial bias or that they are reported in ways that support high quality synthesis. On the whole, the translation of research into practice in this area is limited by lack of rigor in study methods and failure to report the full range of child, intervention, and study design characteristics that could possibly account for variations in program effects. In the period since the original review was conducted (Zwi et al., 2007), Cochrane Reviews have become more rigorous in identifying methodological limitations in trials via risk of bias analyses, and the CONSORT statement has been developed to provide guidance on the reporting of RCTs (Schulz, Altman, & Moher, 2010). Nevertheless, our review suggests that the methodological quality of trials in this area has not improved substantially. At the time of this review, no study in this area had yet published a study protocol, and we found only one clinical trials register record for a school-based education program for prevention of CSA (see https://clinicaltrials.gov/ct2/show/NCT02181647). This observation is sobering given that our review also showed that the number of gold-standard program evaluations of school-based CSA prevention studies worldwide has declined each decade since the 1980s (see Table 1). Researchers must continue testing these interventions but use study design methodology, data collection tools, trial registration, and reporting guidelines that enable rigorous scientific evaluation and synthesis.

**Conclusion**

Children’s self-protective skills and factual and applied knowledge can be increased by participation in school-based sexual abuse prevention programs. Fifteen programs representing 24 unique studies were evaluated in our review. Currently, schools implement a variety of child-focused interventions aimed at preventing CSA, many of which were not included in this review. Our findings apply only to the types of programs included in this review and do not apply to those programs with substantially different content and methods. We still need to know a great deal more about school-based programs for prevention of CSA, such as their acceptability to parents and teachers, their effectiveness with particular groups of children at greater risk, which specific program components offer the
strongest effects, the long-term outcomes (including a better look at disclosure of past, current, and future abuse and possible adverse events), and their costs.

A public health approach for prevention of CSA proposes that multiple types of interventions are necessary, targeting (i) offenders and potential offenders, (ii) children and adolescents, (iii) situations in which CSA is known to occur, and (iv) communities (Smallbone, Marshall, & Wortley, 2008). School-based education programs fit within this approach, by directly targeting potential victims, and providing a conduit to other important prevention targets in communities such as teachers, parents, and extended families.

While we found few or no adverse outcomes in our review, concerns that these programs introduce complex concepts to children that they may not understand and cause children to be wary of adults should continue to be explored and taken seriously. More importantly, the results from this review should not be misconstrued to imply that children are responsible for protecting themselves from sexual abuse, nor that they can even do so even with the types of knowledge and skills imparted by these programs. Adults who sexually abuse children are clearly responsible for taking advantage of the most vulnerable among us. Equipping children with increased protective skills and knowledge does not replace society’s responsibility to ensure child safety via myriad other means (Finkelhor, 2007). Nonetheless, the overall prevalence of CSA suggests that, even if successful in only a small proportion of situations, it is possible that the skills and knowledge learned in prevention programs may be of assistance to a considerable number of children.

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Authors’ Note

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