Protocol - Prevention and intervention of cyber abuse targeting children and adolescents: A systematic review to evaluate current approaches

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Version Published version / final PDF


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1. Cover Page

Title
Prevention and intervention of cyber abuse targeting children and adolescents: A systematic review to evaluate current approaches.

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Sources of Support
The Research Institute for Evidence-based Social Work with funds from Bell Canada

Submitted
Date edited June 27, 2007
Date of last substantive update: August 30, 2007
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2. Background for the Review

**Definition of Cyber Abuse**

The rapid growth of electronic and computer based communication and information sharing during the last decade has changed individuals’ social interactions, learning strategies and choice of entertainment. The Internet has created a new communication tool, particularly for young people whose use of e-mail, websites, instant messaging, web cams, chat rooms, social networking sites and text messaging is exploding worldwide. There is evidence, for example, that young people’s use of the Internet is now a preferred pastime over watching television (Kaynay & Yelsma, 2000; Nie & Hillygus, 2002).

While there are many benefits that result from electronic based communication, the Internet also has a dark side whereby young people can fall victim to sexual perpetrators, stalkers, exploiters, and peers who bully online. Recent large scale cross-sectional studies on the prevalence of cyber abuse demonstrate that this is a growing problem, in which commonly recognized forms of child maltreatment (sexual and emotional abuse) are being pursued via the Internet (Berson, Berson & Ferron, 2002; Mitchell, Finkelhor & Wolak 2001, 2003; Ybarra & Mitchell, 2004a, 2004b). These findings have been supported by studies from around the world suggesting that the prevalence of cyber abuse of children and youth is growing dramatically (Aloysius, 2001; Arnaldo & Finnström 1998; Cowburn & Dominelli, 2001; Durkin & Low, 1998; Finkelhor, Mitchell, & Wolak, 2000; Sellier, 2001), with detrimental short and long term effects on the psychosocial functioning of the children and youth involved.

Cyber abuse is an umbrella term that encompasses a wide range of activities including cyber bullying, cyber stalking, cyber sexual solicitation, and cyber pornography. Cyber bullying includes the use by peers of email, cell phones, text messages, and Internet sites to threaten, harass, embarrass, socially exclude, or damage reputations and friendships. Cyber stalking, as an extension of the physical form of stalking, is where individuals utilize electronic mediums such as the Internet to pursue, harass or contact another in an unsolicited fashion. Cyber sexual solicitation is the use of electronic mediums such as the Internet to identify, “groom,” and entice
individuals to perform sexual acts on or offline. Cyber pornography includes the production and dissemination of graphic sexual content through technology, such as the Internet and cell phones.

**Prevalence and Impact of Cyber Abuse**

Prevalence studies have highlighted the extent of the impact of cyber abuse in the lives of children and youth. The Youth Internet Safety Survey, a US nationally representative telephone survey of 1500 youth between the ages of 10 and 17 who use the Internet regularly, was first conducted in 2000 and subsequently updated in 2005 (Finkelhor et al., 2000; Wolak, Mitchell, & Finkelhor, 2006). The Youth Internet Safety Survey highlighted exposure to cyber pornography as well as experience with cyber sexual solicitation and cyber bullying, in particular.

With respect to cyber pornography, 34 percent of youth reported being exposed to sexual content online that they did not want to see in 2005, an increase from 25 percent in 2000. Cyber stalking through online harassment also increased, to nine percent of youth Internet users in 2005 from six percent in 2000. While a smaller proportion of youth Internet users received unwanted sexual solicitations in 2005 (13 percent) than 2000 (19 percent), the number of youth Internet users receiving aggressive sexual solicitations – in which sexual solicitors made or attempted to make offline contact with youth – remained the same. Most disturbingly, the already low rate at which authorities were informed about online sexual solicitation decreased during the period from 2000 to 2005, with nine percent of incidents of solicitation reported in 2000, compared to only five percent in 2005 (Wolak et al., 2006).

In 2002, the National Centre for Missing and Exploited Children conducted a survey of 1,501 youths, ages 10 to 17, with similar results. One in five of the youth were found to have received a sexual solicitation over the Internet in that year. Three percent had received an aggressive sexual solicitation (offered to meet somewhere, called on the telephone, or received money or gifts), and one in four reported unwanted exposure to nude pictures or people engaged in sex. Results of the survey also indicated that less than ten percent of these approaches were ever reported to police and only 40 percent of the incidents were mentioned to parents (Magid, 1998).
Regarding cyber bullying, there remains little research that explores this phenomenon. Peer victimization and aggression that occurs online can be conceptualized similarly to traditional bullying (Ybarra & Mitchell, 2004b), comprising behaviours with the intent to distress the child who is victimized (Olweus, 1993) and with an actual or perceived power imbalance (Ybarra & Mitchell, 2004b). The findings of the Youth Internet Safety Survey are that approximately one in five youth reported experience with online harassment within the past year (Ybarra & Mitchell, 2004a). A study conducted in a Canadian city found that about 70 percent of students reported hearing about incidents of cyber-bullying, 21 percent had been bullied several times, and 3 percent reported engaging in this form of bullying (Beran & Li, 2005). A considerable percentage of youth who identified being bullied online also reported that they were targets of traditional bullying, whereas other youth reported being victims of online harassment but not of traditional bullying. Three percent of the youth reported being both aggressors and targets, four percent reported being targets only and 12 percent reported acting aggressively towards others online. A study by the Cyberspace Research Unit at the University of Central Lancashire found that of the one in four young people who reported being bullied through email or text messaging approximately one-third will never tell anyone about the harassment (O’Connell, Price & Barrow, 2004). This corresponds with the findings that a significant percentage of children who are bullied through traditional methods do not tell anyone (Hanish & Guerra, 2000; Mishna, Pepler, & Wiener, 2006).

Although not identical phenomena, research on traditional bullying can be used as a starting point for examining online bullying (Ybarra & Mitchell, 2004b), leading to concerns regarding the social, emotional and academic impact of cyber bullying on children and youth. Beran and Li (2005) administered a survey asking students about their reactions to cyber bullying. The majority of students reported feelings of sadness, anxiety, and fear, and stated that it affected their ability to concentrate on their school work and to attain good marks. Findings suggest that the effects of traditional bullying may be far-reaching for children who bully and who are victimized, both of whom are at risk of experiencing emotional, social, and psychiatric problems that may persist into adulthood (Craig, 1998; Crick & Bigbee, 1998; Nansel, Overpeck, Pilla, Ruan, Simons-Morton, Scheidt, 2001; O’Connell, Pepler, & Craig, 1999). One significant
difference between online and traditional bullying is the perceived anonymity of the child who bullies in the case of online harassment (Ybarra & Mitchell, 2004b).

As with traditional bullying, a systemic-ecological framework is considered essential in order to understand and address cyber abuse, including cyber bullying, cyber stalking, cyber sexual solicitation and cyber pornography (Atlas & Pepler, 1998; Hanish & Guerra, 2000; Olweus, 1994). This framework builds on the assumption that, since people are embedded in social and environmental contexts, multiple factors invariably contribute to social behavioural patterns (Cairns & Cairns, 1991; Germain & Bloom, 1999). According to this conceptual framework, cyber abuse does not reside solely with the child who is exposed to cyber abuse or who is victimized, but unfolds in the social context of the peer group, the classroom, the school, the family and the larger community and society as a whole. The victimized child’s inability to defend him/herself is integral. Given the belief that protection from abuse is a fundamental human right, others are obliged to intervene (Atlas & Pepler, 1998; Finkelhor, 1995; Olweus, 1991, 1997).

All aspects of cyber abuse targeting children and youth, including cyber bullying, cyber stalking, cyber sexual solicitation, and cyber pornography, have increased significantly. This increase has been met with an associated greater interest in developing prevention and intervention strategies to protect this vulnerable population. For example, Article 17 of the 1989 United Nations Convention on the Rights of the Child provided an international framework for child protection issues associated with the media. These prevention and intervention strategies encompass educational campaigns for children and parents about the risks of the Internet, the development of software which filters or blocks offensive material, and methods to prevent potential offenders from carrying out cyber abuse as well as treatment for those who do offend.

Though the research is sparse, efforts to document the impact of cyber abuse provide a picture of the significant repercussions of cyber abuse and the vulnerability of children and youth targeted for abuse. Thirty-eight percent of youth who experienced online harassment reported emotional distress as a result of the incident (Ybarra et al., 2006) and youth who were online aggressors reported struggling with a number of psychosocial difficulties, including problematic
relationships with parents, delinquency and substance use (Ybarra & Mitchell, 2000a). Depressive symptoms were associated with being sexually solicited online (Ybarra, Leaf, & Diener-West, 2004), while an association has been found between depressive symptoms and being harassed online among youth, particularly males (Ybarra, 2004). It is clear that a focus on prevention and intervention efforts is pivotal to ensure the safety of children and youth for whom technology is increasingly an academic and social necessity and way of life.

The Current State of Research

A preliminary search of peer reviewed journals and the grey literature has uncovered a growing emphasis on protecting children and youth from the dangers of the Internet. For example, several programs have been developed to educate children and youth about the risks of Internet use (Chibnall, Wallace, Leicht, & Lunghofer, 2006; Crombie & Trinneer, 2003; Davidson & Martellozzo, 2005; Gray, 1997; KidSmart, 2002; Wishart, Andrews, & Yee, 2005; Wishart, Dungworth, & Smith, 2002; Woolley & Gabriels, 1999). As well, new strategies have been created to block children’s access to unapproved websites (Censorware Project, 2000; Consumer Reports, 2001, 2005; Richardson, 2002; Schneider, 1997); to filter graphic descriptions and images (Hunter, 2000; Schneider, 1997); to monitor children’s online activities through parent education programs; and to reduce child exploitation through the development of specialized law enforcement programs.

Efforts to educate children and youth regarding the dangers of online activity have received particular emphasis in the prevention and intervention grey literature. Education efforts for children and youth are predominantly administered by teachers and located within school settings (Chibnall et al., 2006; Crombie & Trinneer, 2003; Davidson & Martellozzo, 2005; Gray, 1997; KidSmart, 2002; Wishart et al., 2005; Wishart et al., 2002; Woolley & Gabriels, 1999). In addition to presentations, innovative educational mediums include computer games (Crombie & Trinneer, 2003), cyber solicitation simulations (Davidson & Martellozzo, 2005), and websites (KidSmart, 2002). Preliminary research has also shown that children appear to be responsive to Internet safety messages within the context of drama-based learning (Berson & Berson, 2002; KidSmart, 2002).
Educational efforts are aimed at a range of student ages, from age 5 (Woolley & Gabriels, 1999) to age 19 (Livingstone & Bober 2005), with a particular emphasis on middle-school children (Crombie & Trinneer, 2003; Davidson & Martellozzo, 2005; Gray, 1997). Educational efforts have been undertaken in New Zealand (Woolley & Gabriels, 1999), England (Davidson & Martellozzo, 2005; Wishart et al., 2005; Wishart et al., 2002), the United States (Chibnall, Wallace, Leicht, & Lunghofer, 2006; KidSmart, 2002), and Canada (Crombie & Trinneer, 2003; Gray, 1997). Research to evaluate these educational efforts has focused on assessing outcomes related to children’s knowledge of online safety strategies, knowledge of dangers involved in Internet use, and high risk online behaviour.

Research findings have shown the benefit of educational activities, suggesting that youth who receive education regarding Internet safety exhibit more knowledge regarding Internet safety strategies (Chibnall et al., 2006; Crombie & Trinneer, 2003; Davidson & Martellozzo, 2005; Gray, 1997), and regarding dangers associated with Internet use (Davidson & Martellozzo, 2005). However, there is also evidence to indicate that while knowledge increased as a result of education, there was little to no change in high-risk online behaviour (Chibnall et al., 2006; Crombie & Trinneer, 2003).

Technological initiatives such as Internet filtering or site blocking have also received research attention. In particular, the efficacy of technological efforts to block websites with sexual or other inappropriate and offensive content has been analyzed (Censorware Project, 2000; Consumer Reports, 2001, 2005; Richardson, 2002; Schneider, 1997). The importance of filtering software is evident in research noting that children and youth will evade rule based restrictions placed by their parents on Internet use (Livingstone & Bober, 2005). The associations between technological preventions and exposure to sexual materials (Mitchell, Finkelhor, & Wolak, 2003) and Internet harassment (Ybarra & Mitchell, 2004) have also been assessed. Intended outcomes include the ability of technological intervention to filter or block sexual content.
Internet filtering and site blocking have been shown to be reasonably effective in reducing – but not eliminating – the amount of sexual content to which children are exposed online (Consumer Reports, 2001, 2005; Hunter, 2000; Mitchell et al., 2003; Schneider, 1997). In addition, software was found to improperly block benign content (Consumer Reports, 2001, 2005; Hunter, 2000; Schneider, 1997). The connection between the amount of sexual content that passed through the filter and the amount of benign content improperly filtered was found to be related to the level of block setting used (Richardson, 2002). While filtering software was associated with a decrease in exposure to sexual content, it was not linked to a decrease in Internet harassment (Ybarra & Mitchell, 2004).

The perceptions of filtering and blocking software have been researched with variable results. Research on the perceptions of filter users has highlighted a lack of product understanding, noting that librarians indicated little knowledge of the programs their school libraries utilize (Curry & Haycock, 2001). The receptivity of those more knowledgeable of filtering software has been more positive, with foster parents who were given a software filtering program noting fewer household problems associated with online pornography and violence (Finn & Kerman, 2004). Of particular interest is the benefit of using technological solutions to cyber abuse with, rather than on, children and youth given the tendency among children and youth to evade restrictions unilaterally placed on their Internet use (Livingstone & Bober, 2005).

Internet safety and prevention is a young field beginning to take shape, both through strategies developed to provide Internet safety for children and youth and through empirical research to evaluate the effectiveness of such strategies. Recent web-based evaluations have been located within the grey literature, some of which use quasi-experimental designs with outcome measures to evaluate program efficacy such as children’s knowledge of online safety strategies, knowledge of dangers involved in Internet use, and high risk online behaviors. Other programs have reported plans to conduct such evaluations. These developments demonstrate that the field is maturing in both sophistication and rigor. It is imperative that these strategies be systematically reviewed to ensure the field moves in directions that are informed by empirical evidence.
Contribution of this review

This systematic review will have implications for policy, practice, and research. In particular, the review could influence educational and law enforcement policy and practice as well as future research in cyber abuse prevention and interventions to ameliorate victimization. Evidence regarding the efficacy of prevention and intervention strategies with regards to cyber safety and cyber abuse will be disseminated to children’s service agencies, children’s mental health organizations, public awareness organizations, schools, researchers, policy makers and parents, children and youth. As well, results will be made available to Internet service providers so they can compare these results with their current protection mechanisms and identify gaps and emerging trends. By systematically reviewing the current state of prevention and intervention strategies to address cyber abuse, this review will contribute to a research agenda that develops stringent criteria to best test for program effectiveness.

3. Objectives of the Review

The primary purpose of this review is to conduct a comprehensive examination of the literature in order to collect all evidence regarding strategies to prevent and intervene with respect to cyber abuse and to systematically review the evidence to determine the best ways to prevent and intervene with cyber abuse and keep children and youth safe. Cyber abuse is defined as the abuse of children or adolescents in the form of bullying, sexual solicitation, stalking, or child pornography, or any other type of physical or emotional harm enabled by the use of the Internet and other forms of information and communication technology, such as text messaging and the use of cellular telephone cameras. Cyber safety is defined as the condition of being safe online, which includes freedom from danger, risk, threat or injury while online. The increase of cyber safety has been explored by means of various approaches to promote cyber safety through prevention and intervention strategies designed to develop knowledge and awareness among children, adolescents and their parents to reduce risky behaviors online. Specifically, we aim to:

- Identify the maximum possible number of articles on prevention of and intervention with cyber abuse in relation to children and adolescents published during the past 10 years;
• Synthesize the evidence contained in published and unpublished literature on prevention and intervention to combat cyber abuse; and
• Identify major gaps to guide future research efforts.

In addition we aim to explicate how cyber abuse is understood in the literature and to assist practitioners and policy makers involved in the early detection and management of cyber abuse involving children and adolescents.

4. Methodology

Criteria for considering studies for this review

Types of studies

The scope of this review is experimental and quasi-experimental prevention and intervention strategies that target children ages 5 to 19 years old and that utilize a comparison group. Studies will be eligible for the review if 1) the study evaluated a prevention or intervention which was administered to children and youth between the ages of 5 and 19 years and/or their parents; 2) the prevention or intervention targeted outcomes primarily related to children and youth exposed to the Internet; 3) the evaluation used an experimental or two-group quasi-experimental research design which included a no treatment or minimal treatment comparison group (single-group designs will be excluded); 4) the allocation of study participants to experimental or comparison group will have been by random allocation and the allocation of study participants to quasi-experimental designs will have been by parallel group design created through the use of naturally created groups such as classrooms. The studies will vary with respect to the method of constructing the comparison group and will also vary concerning their use of statistical controls to reduce the threat of selection bias; 5) studies included in this review will include a post-program measure of knowledge or behavior change regarding cyber abuse and online practices. These may include surveys of Internet knowledge, awareness of the risks associated with online activity, the development of online safety practices, and measures of the frequency of risky online behaviors; and 6) the evaluation was conducted within the last 10 years. There are no restrictions on the language of the study report or geographical location where the study was conducted.
Our operational definition of cyber abuse includes cyber bullying, cyber stalking, cyber sexual solicitation and cyber pornography. Whenever possible, we will code these types of cyber abuse separately in the analysis. To be included in the review, evaluations must include children and youth who have been exposed to the Internet and/or their parents, however, we will be flexible regarding the amount of exposure to the Internet. Regarding the comparison group, our preliminary search found that evaluations of cyber abuse prevention and intervention strategies mostly used comparison groups that received no treatment. For studies that include some treatment, we will code this as a variable for data analysis.

**Types of participants**

The population will comprise children and adolescents who use the Internet and other forms of information and communication technology and are therefore vulnerable to being victimized by cyber abuse, children and adolescents who have been victimized through cyber means, and children and adolescents who have been perpetrators of cyber abuse. School-aged children and adolescents will be included in this review (with an expected age range of 5-19). Based on previous research that has identified the importance of parental involvement and parental monitoring to reduce cyber abuse (Chibnall, Wallace, Leicht, & Lunghofer, 2006), we will also include studies that use a sample of parents, although these studies will be treated separately in the analysis.

**Types of intervention**

In order to conduct this systematic review, the preventions and interventions will be divided into four common strategies that have been used to address cyber abuse. Specifically, we will include:

1) Technological and software initiatives used with children and adolescents to block or filter access to inappropriate online content;

2) Online and offline cyber abuse preventive interventions for children and youth delivered through any medium (including face-to-face presentations, video games, interactive software, etc);

3) Online and offline cyber abuse preventive interventions for parents to protect children from cyber abuse;
4) Therapeutic interventions for children and youth who have experienced cyber abuse.

We will review prevention and intervention strategies that are based on technological, psychoeducational, and therapeutic interventions to prevent cyber abuse. Technological measures may include the use of any of the following with children and adolescents: installation of firewalls; installation of antivirus or anti-Trojan software; installation of a key logger; and installation of privacy filters. Psychoeducational measures may include: both online prevention strategies and traditional “offline” strategies with the primary goal to protect children and adolescents from becoming victimized through cyber abuse. The term “online” refers to web-based prevention strategies found on various Internet sites. “Offline,” in contrast, refers to direct contact with children and youth and their parents by informing them of strategies to protect against cyber abuse. Therapeutic interventions may include both online and offline strategies to help individuals who have been involved in cyber abuse as either victimized or as abusing others. It is important to differentiate the various strategies because the primary goal and timing of each may be different (i.e., in therapeutic approaches, counseling or therapy occurs after the child or adolescent has been victimized, or has victimized others, unlike preventive strategies, which aim to improve the conditions so that cyber abuse does not occur in the first place).

Two reviewers will categorize the type of prevention or intervention based on the above definition of terms. In situations where the reviewers do not agree on a selected category, the conflict will be resolved by third party.

**Types of outcome measures**

The primary outcomes of interest for this systematic review include: 1) cyber abuse of children and adolescents; 2) risky behaviors by children and adolescents; 3) knowledge related to cyber abuse; and 4) negative impact on psychological state among those who have been victimized by cyber abuse. Based on the preliminary review of the literature, each prevention/intervention subgroup has addressed these primary outcomes differently:

1) The outcome for technological and software initiatives will include an assessment of child and youth exposure to inappropriate web-based content.
2) The outcomes for online and offline preventive interventions for children and youth will focus on an assessment of knowledge of cyber safety post-intervention and whether any measured change in knowledge impacts future events of cyber abuse and/or risky behaviors while online. A change of mean scores on these measures will be compared to the change of means for the comparison groups.

3) The outcomes for preventive interventions for parents will focus on an assessment of knowledge of technology and increased monitoring to reduce children’s exposure to cyber abuse post-intervention and on whether any change in monitoring impacts future events of cyber abuse and/or risky behaviors while online.

4) The outcomes for therapeutic interventions for children and youth impacted by cyber abuse will include an assessment of risky online behaviors post intervention, as well as an assessment of any impact on adverse outcomes experienced by those victimized by cyber abuse.

Since there is no uniformity in the instruments used for measuring outcomes, each outcome measure will be analyzed separately and the methods of the outcome assessment will be investigated as a source of heterogeneity or possible bias.

**Search strategy for identification of relevant studies**

Based on the preliminary review of the evidence on Internet safety, there are at least four studies that currently meet these requirements. These studies further provide sufficient data to conduct a meta-analysis of the results. We anticipate that additional studies will be included as we expand our systematic information retrieval and as new evidence begins to emerge in the field.

Both published and unpublished work will be considered eligible for the review. A Trial Search Coordinator will be responsible for coordinating this activity. To the greatest extent possible, the search will not be restricted to any single language or nationality. As stated previously, cyber abuse has been increasing during the last decade and therefore the search strategy will include only studies from the last 10 years.
Literature search strategy for identification of appropriate studies

Bibliographic databases:
1. Psychological Abstracts (PsycINFO, PsycLIT, ClinPsyc-clinical subset)
2. MEDLINE
3. EMBASE
4. Database of reviews of effectiveness (DARE online),
5. ChildData (child health and welfare)
6. ASSIA (applied social sciences)
7. Caredata (social work)
8. Social Work Abstracts
10. Cochrane Collaboration
11. C2-SPECTR
12. Social Sciences Abstracts
13. Social Service Abstracts
14. Dissertation Abstracts International (DAI)

Search Engines
1. Biblioline
2. Google

To ensure maximum sensitivity and specificity, subject headings and word text will be searched in a systematic process. Searches for MEDLINE are as follows (search will be modified according to the specific database).

1. Child/
2. Internet/
3. “exp” Internet
4. Child Abuse/
5. "exp" Child Abuse
6. Prevention/
7. “exp” Prevention
8. Intervention/
9. “exp” Prevention
10. “3” AND “5”
11. “3” AND “7”
12. “3” AND “9”
13. ((cyber$.mp. or comput$.mp. or internet.mp. or online.mp. or MSN.mp. or blog.mp. or web$.mp. or www.mp. or world wide web.mp. or surf$.mp. or post$.mp. or chat$.mp. or email.mp. or e.mp. NEAR1 mail.mp. or net$.mp. or virtual.mp. or electronic$.mp. or software.mp. or digital.mp. or messag$.mp. or e-mess$.mp. or e.mp. NEAR1 message.mp. or
A Systematic Information Retrieval Coding Sheet (SIRC, Saini, 2006) has been developed (see Appendix A) to record each search for the review. The SIRC will be used to log results for each database (including grey literature clearinghouses) searched and will include:

1) The date(s) of the search;
2) The name of the researcher;
3) The database used for the search;
4) The specific search terms used in combination (including limiters and expanders); and
4) The number of results for each search strategy.

The SIRC will allow for replication of the search strategy because each search will be recorded. Furthermore, the search strategy will be saved and “copied and pasted” into the review to avoid editing errors.
In addition to C2-SPECTR and other bibliographic databases noted above, the following sources will also be searched for relevant studies:

Reference lists
Reviewers will check the reference lists of all relevant articles that are obtained. Potentially relevant articles that are identified will be retrieved and assessed for possible inclusion in the review.

Personal communication
Face-to-face discussions at meetings, emails, requests on list-servs, and formal letters of request for information from authors, presenters and experts will be solicited to assist the review team to locate relevant studies. A list of the inclusion criteria for the review, along with a sample of relevant articles, will be sent to these key informants along with the request for studies.

Handsearching journals
Journals relevant to the wellbeing of children and technology will be handsearched by researchers who will be trained to conduct handsearching to uncover relevant studies not found by electronic database searches.

Grey Literature
Special attention will be made to search and collect relevant studies captured in the grey literature. Specifically, the review will include the following strategies to locate articles: 1) Conference Proceedings; 2) Research Reports; 3) Government Reports; 4) Book Chapters; 5) Dissertations; 6) Policy Documents; 7) Personal Networks; and 8) Research Organizations’ Web Sites. Grey Literature web-based sites will also be searched to uncover this unpublished literature, such as Grey.Net (http://www.greynet.org/index.html) and GrayLit Network (http://graylit.osti.gov/).
Methods of the review

Selection of studies
Titles and abstracts of studies yielded by the searches will be screened by two independent reviewers to determine their eligibility for inclusion in the review. To facilitate this screening, we will use TrialStat!’s Systematic Review System (SRS) version 3.0, which is an online tool designed to facilitate and accelerate the execution of systematic reviews. This tool, which is being used by several Evidence-based Practice Centres in Canada and the United States, enables rapid generation of forms, virtual collaborative communities, automated management of the progression of studies, and real-time data monitoring and reporting [http://www.trialstat.com/srs.htm].

Given that this is a secure web-based program, the reviewers will not be restricted to location of the program, thereby facilitating the ongoing collaboration between the C2 Canadian Partnership and the C2 Nordic Campbell Centre.

The screening of the studies will be carried out by a three-stage procedure. The screening points will be established in ‘level’ format whereby each level consists of increasing scrutiny of the studies based on the inclusion and exclusion criteria of the review.

1) Initial Screening (level 1)
The first stage will consist of an initial screening to quickly determine whether a study might be appropriate for the review based on the study’s title and abstract. However, full text articles will be retrieved in situations where there is not enough information provided in the title and abstract. The purpose of this initial screening will be to include all possible relevant studies related to the inclusion and exclusion criteria (see Criteria for considering studies). The screening will consist of the following questions:

- Is the study relevant to cyber abuse? Yes / No
- Is the prevention or intervention related to cyber abuse? Yes / No
- Is the prevention or intervention being evaluated? Yes / No
2) **Strict Screening (level 2)**

The second stage will consist of a strict screening process whereby two reviewers will independently review full copies of articles to determine whether studies should remain in the review based on the inclusion and exclusion criteria. Level two screening will consist of the following questions:

- Did the study evaluate a prevention or intervention administered to children and/or youth between the ages of 5 and 19 years and/or their parents? Yes / No
- Did the study use a comparison group? Yes / No
- Did the study report an outcome measure relating to cyber abuse (Internet knowledge, awareness of the risks associated with online activity, the development of online safety practices, and measures of the frequency of risky online behaviors)? Yes / No

3) **Data extraction and management (level 3)**

The third stage consists of a data extraction and management form to extract data from the articles that have passed to the third stage of the screening process. The study details will be extracted using the attached data extraction sheet by two independent reviewers (see Appendix 2). Differences between coders will be resolved to establish consistent extraction and management of the data and to establish inter-rater reliability. Any discrepancies will subsequently be resolved by referral back to the source of the material and conflicts will be resolved by a third reviewer based on the original source.

The results will be presented in standardized, structured tables. The studies will be examined to ensure that all the relevant data for that study are recorded. The coding form is structured hierarchically to recognize the nested nature of effect sizes within studies. Any number of effect sizes can be coded from each treatment/comparison contrast using this form.

The coding form will capture key features of the nature of the prevention or intervention, research participants, research methodology, outcome measures and direction and magnitude of observed effects. Specifically, the coding form will include:
1) Study: information regarding the author(s); year of publication; source; country; and language

2) Characteristics of Setting and Participants: eligibility criteria for participants; explanation of recruitment procedures, setting (country, location, clinical / non clinical); demographics features of the sample

3) Sampling: sample sizes for treatment and control; whether power analysis was used to determine sample size; allocation to the treatment and control; explanation of method used to generate the allocation

4) Research Design: nature of research design

5) Prevention and Intervention Data: nature of intervention; aim of intervention; length of intervention, whether manuals were used, whether fidelity checks were included, information on possible contamination reported. Preventions and interventions will be categorized based on the primary author’s description of the program. Technological interventions will include the use of installation of firewalls; installation of antivirus or anti-Trojan software; installation of a key logger; and installation of privacy filtrations. Psychoeducational prevention programs will include online prevention strategies and traditional “offline” strategies. Therapeutic interventions will include both online and offline strategies to help individuals who have been involved in cyber abuse as either victimized or as abusing others. It should be noted that the coding list of various approaches to reduce cyber abuse will expand as other additional approaches are found and as more precision is made regarding these various approaches to reduce cyber abuse.

6) Outcome Data: Types of instrument and measures for primary and secondary outcomes. Separate coding will be made for each primary outcome to ensure statistical independence of primary findings. These will be separately coded into the following categories: 1) Internet knowledge, awareness of the risks associated with online activity; 2) the development of online safety practices; 3) measures of the frequency of risky online behaviors).

7) Results: length of follow-up; attrition at post intervention and follow-up; number excluded from the analysis; statistical methods, type of data effect size is based on; means and standard deviations; frequency and proportions; significance tests, effects sizes.
Original investigators will be contacted to retrieve any missing information from the original reports. All studies and data extraction sheets will be stored electronically in TrialStat!, which is a web-based data extraction software that allows multiple reviewers to code studies while keeping a web-based log of all activities during the review process. Endnote will also be used as the bibliographic management system to store, locate, and track references.

Quality assessment
Two reviewers will independently assign each selected study to quality categories based on the following: 1) those that did and did not use random assignment; 2) the level of concealment of randomization from therapist and participants; 3) whether there were baseline differences between groups, and if so, 4) whether controls for baseline differences were used; and 5) differential attrition (i.e., drop-out rates will be recorded and examined for possible effects on both the treatment and comparison groups); 6) length of follow-up.

Criteria for determination of independent findings
Based on the preliminary review, there is evidence of statistical dependencies found within the cyber abuse literature. Evaluations have included more than one measure of the change regarding cyber abuse (Internet knowledge, awareness of the risks associated with online activity, the development of online safety practices, and measures of the frequency of risky online behaviors). We found in our preliminary review that most prevention-oriented interventions have endeavored to encourage the adoption of broad Internet safety knowledge and safer Internet behavior common to all forms of cyber abuse. As such, outcomes will not be grouped by type of cyber abuse unless a sufficient number of studies concerning each type of cyber abuse are encountered. To maintain statistical independence of study findings, the most general indicator of change of cyber abuse based on the full sample will be selected. For example, measures of knowledge of cyber abuse is more general than knowledge of specific types of cyber abuse (cyber bullying, cyber stalking, cyber sexual solicitation and cyber pornography), measures of awareness of risks associated with online activity is more general than measures of specific types of risks associated with online activities, measures of frequency of risky online behaviors is more general than specific types of risky behaviors. Where outcomes are measured in the same way, weighted mean differences will be calculated. When different
scales and measurement procedures are used to measure sub-classifications of outcome measures, the results of each scale and measurement procedure will be analyzed separately before combining the effect sizes to obtain a standardized mean difference.

For studies that include follow-up times, these will be divided into 1 month, 3 months, 6 months, 9 months, 12 months and over 2 year follow-ups. We will code separately for each of these follow-up times but for the meta-analysis, we will focus on the longest follow-up period for which there is adequate retention from the original sample (at least 70% of the original sample).

**Statistical procedures and conventions:**

*Missing data*

The researchers will contact the authors to request for missing data from included studies. Attrition will be explored as possible sources of heterogeneity and bias.

*Data synthesis*

In case of binary data, the results may be expressed in 2x2 tables with a chi-square test, an F-test or biserial correlation coefficients. We will use formulas suggested by Lipsey and Wilson (2001) to convert prevalence rates, correlation coefficients, F ratios, t-values, and chi-square values into standardised mean difference, known as Cohen's d.

For continuous data, will be inspect whether there are enough data to calculate effect sizes. If so, we will calculate standard mean differences using Cohen’s d. We will also analyze the data to ensure there is no clear evidence of skewness in the distribution.

*Meta-analysis*

Both fixed and random effects models will be considered in the meta-analysis. However, a random effects model will be used if there is significant statistical heterogeneity and if there is substantial between-study variation observed. Inverse variance methods will be used to pool SMDs so that each effect size is weighted by the inverse of its variance in an overall estimate of effect size. Confidence intervals of 95% will be used for individual study and pooled estimates.
Assessment of heterogeneity

Statistical heterogeneity in the outcome measures will be assessed using the Q-statistic and the associated p-value for each analysis and the I² statistic (Higgins, 2002). The I² statistic will determine the percentage of variability due to heterogeneity. Values greater than 50% will suggest moderate heterogeneity. In addition, both methodological and clinical heterogeneity among studies will be explored in terms of study design, participant recruitment, baseline characteristics, type of intervention, duration of intervention, setting of intervention, length of follow-up, and outcome measures.

Sensitivity Analysis

Sensitivity analysis will be performed to assess various approaches to data analysis, the quality of the data and the robustness of the results. This will be performed by reanalysis of the data by excluding studies with poor methodological quality and by excluding study variables that may be impacting study results. In addition, potential publication bias will be assessed by coding and analyzing published and non-published studies separately to examine potential bias in published reports. We will also perform attrition sensitivity analysis on the overall results to examine potential biases attributed to participants withdrawing from the studies prior to completion.

Treatment of qualitative research

Qualitative research will not be included in this systematic review.

Timelines

<table>
<thead>
<tr>
<th>Activities</th>
<th>Date of completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Searches for studies</td>
<td>November 2007</td>
</tr>
<tr>
<td>Pilot testing of inclusion criteria</td>
<td>December 2007</td>
</tr>
<tr>
<td>Pilot testing of study codes and data collection</td>
<td>January 2007</td>
</tr>
<tr>
<td>Extraction of data from research reports</td>
<td>March 2008</td>
</tr>
<tr>
<td>Statistical Analysis</td>
<td>May 2008</td>
</tr>
<tr>
<td>Preparation of report</td>
<td>July 2008</td>
</tr>
</tbody>
</table>
6. Plans for Updating the Review

The review will be updated every two years.

7. Acknowledgements

Bell Canada and the Campbell reviewers.

8. Statement Concerning Conflict of Interest

None known.
Additional References

Aloysius 2001


Arnaldo 1998


Atlas 1998


Beran 2005


Berson 2002a


Berson 2002b


Burke 2002


Cairns 1991

Chase 2005


Chibnall 2006


Childnet 2006a


Childnet 2006b


Consumer Reports 2001


Consumer Reports 2005


Cowburn 2001


Crick 1998

Crombie 2003

Cyberspace Research Unit 2003

Curry 2001

Davidson 2005

Durkin 1998

Finkelhor 2000

Finn 2006

Germain 1999
Gray 2005


Hanish 2000


Hunter 2000


Industry Canada 1999


Kaynay 2000


Kidsmart 2000


Lipsey 2001


Livingstone 2005


Magid 1998

Mishna 2006


Mitchell 2001


Mitchell 2003


Mitchell 2005


Nansel 2001


National Center for Missing & Exploited Children 2002


National Centre for Technology in Education 2001


Nie 2002

O’Connell 2004


O’Connell 1999


Olweus 1993


Olweus 1994


Olweus 1997


Sellier 2001


Schneider 1997


Trialstat! 2003


United Nations General Assembly 1989

Venegas 2004


Wishart 2005


Wolak 2006


Wooley 1999


Ybarra 2004a


Ybarra 2004b


Ybarra 2004c


Ybarra 2004d

Ybarra 2006

Appendix A - Systematic Information Retrieval Coding Sheet (SIRC)

Project: 

Reviewer: 

Date(s) of Search: 

Search Method: 
- Electronic Database: Name: 
- Grey Literature: Name: 
- Other: Name: 

Language(s): 

Date Range: 

Description of Search: 

<table>
<thead>
<tr>
<th>Search Terms</th>
<th>Population</th>
<th>Intervention</th>
<th>Outcome</th>
<th>MOLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search Term Combinations (including all limiters and expanders)</td>
<td></td>
<td></td>
<td></td>
<td>Results</td>
</tr>
</tbody>
</table>
Appendix B - DATA EXTRACTION CODING LOG

Study Level

<table>
<thead>
<tr>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Number (Study identifier)</td>
</tr>
<tr>
<td><em>If multiple documents were used to code this study, indicate the supplemental study ID numbers</em></td>
</tr>
<tr>
<td>Cross reference document identifier</td>
</tr>
<tr>
<td>Reviewer:</td>
</tr>
<tr>
<td>Date(s) of the Review:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s):</td>
</tr>
<tr>
<td>Year of Publication:</td>
</tr>
<tr>
<td>Title:</td>
</tr>
<tr>
<td>Source:</td>
</tr>
<tr>
<td>Book</td>
</tr>
<tr>
<td>Conference Paper</td>
</tr>
<tr>
<td>Peer Review Journal Article</td>
</tr>
<tr>
<td>Non-Peer Review Journal Article</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Search Method:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic search:</td>
</tr>
<tr>
<td>Hand search:</td>
</tr>
<tr>
<td>Grey Literature:</td>
</tr>
<tr>
<td>Recommendation:</td>
</tr>
<tr>
<td>Other:</td>
</tr>
</tbody>
</table>

Number of different “modules included in the report”
Is the same control/comparison group used in different modules (1 = Yes; 0 = No)

---

1 Adapted from Mitchell, Wilson & MacKenzie (2005)
<table>
<thead>
<tr>
<th>Program Description</th>
</tr>
</thead>
</table>

**Primary Treatment Type:**

1. Technological interventions (sub-classification will be built based on included reviews)
2. Psychoeducational prevention program for children and/or youth (sub-classification will be built based on included reviews)
3. Psychoeducational prevention program for parents (sub-classification will be built based on included reviews)
4. Therapeutic interventions for children and/or youth (sub-classification will be built based on included reviews)

**In what format or social setting is the treatment delivered:**

1. One-on-one
2. Group setting
3. Family setting
4. Internet-based
5. Mixed (any combination of the above
6. Unclear

**Who delivers the treatment?**

1. Mental health professional
2. Academic Educator
3. Internet Educator
4. Nonprofessional
5. Other

**Length of treatment type in months:**

a. Minimum [ ]
b. Maximum [ ]
c. Mean [ ]
d. Fixed (same for all subjects) [ ]

Length of follow-up program component (in weeks) [ ]

**Details of the intended treatment type included:**

1 = Yes; 0 = No

**Details on the implementation of the treatment type included:**

1 = Yes; 0 = No

**Manuals used for implementation of the treatment type:**

1 = Yes; 0 = No

**Fidelity checklist used for the implementation of the treatment type:**

1 = Yes; 0 = No

**Information on possible contamination reported**

1 = Yes; 0 = No
Describe the program for the comparison group if other than no treatment or treatment as usual:

What happens to the comparison group?

- No treatment
- Waiting list (treatment begins at post)
- Waiting list (treatment begins at follow-up)
- Waiting list (treatment begins after study)
- Minimal treatment
- Alternate treatment

Where is the comparison drawn from:

Methodological Rigor

Use of control variables in statistical analyses to account for initial group differences (1 = Yes; 0= No)

Use of random assignment to conditions (1= Yes; 0= No)

If not random assignment, use of subject level matching (1= Yes; 0= No)

Matching variable(s) appropriate (1= Yes; 0=No)

Measurement of prior knowledge of cyber abuse (1= Yes; 0= No)

Measurement of prior awareness of risky behaviors (1= Yes; 0= No)

Measurement of prior risky online behaviors (1= Yes; 0= No)

Rating of initial group similarity (7 = highly similar; 1= dissimilar)

Anchors: 7 Randomized design large N or small N with matching
5 Nonrandomized design with strong evidence of initial equivalence
1 Nonrandomized design, comparison group highly likely to be different or known different that are related to future risk of future cyber abuse.

Was attrition discussed in the study reported? (1= Yes; 0= No)
Sample Level Coding Sheet

<table>
<thead>
<tr>
<th>Characteristics of Setting and Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Description:</td>
</tr>
<tr>
<td>Sample description treatment group:</td>
</tr>
<tr>
<td>Sample description comparison group</td>
</tr>
<tr>
<td>Explanation of recruitment procedures:</td>
</tr>
<tr>
<td>Are the subjects included in the study clearly defined in terms of demographic features (age, sex, ethnicity, presence/absence of condition for eligibility criteria)?</td>
</tr>
<tr>
<td>Yes  No  Not Clear</td>
</tr>
<tr>
<td>Population Characteristics:</td>
</tr>
<tr>
<td>Comment:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of individuals at beginning of the study:</td>
</tr>
<tr>
<td>Treatment Group   N=</td>
</tr>
<tr>
<td>Control Group     N=</td>
</tr>
<tr>
<td>Total Sample      N=</td>
</tr>
<tr>
<td>Use of power analysis to determine sample size:</td>
</tr>
<tr>
<td>Yes  No  Not Clear</td>
</tr>
</tbody>
</table>
Outcome Level Code Sheet

<table>
<thead>
<tr>
<th>Outcome Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome indicator of reduction of cyber abuse:</strong></td>
</tr>
<tr>
<td>1 Internet knowledge, awareness of the risks associated with online activity;</td>
</tr>
<tr>
<td>2 the development of online safety practices;</td>
</tr>
<tr>
<td>3 frequency of risky online behaviors)</td>
</tr>
<tr>
<td><strong>Outcome measures relevant to goals of intervention</strong></td>
</tr>
<tr>
<td>Yes  No  Not Clear</td>
</tr>
<tr>
<td><strong>Explanation of measurement instrument and information regarding reliability and validity</strong></td>
</tr>
<tr>
<td>Yes  No  Not Clear</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome: ______________________________________________________________________________</td>
</tr>
<tr>
<td>Instrument: ______________________________________________________________________________</td>
</tr>
<tr>
<td><strong>Type of measurement scale</strong></td>
</tr>
<tr>
<td>(1=Dichotomy; 2= Tricotomy; 3= 4-9 discrete ordinal categories; 4= &gt;9 discrete ordinal categories or continuous</td>
</tr>
<tr>
<td><strong>Source of data</strong></td>
</tr>
<tr>
<td>(1=self-report; 2= other report (teacher, parent), 3= official report, 4= other, 5=unclear</td>
</tr>
<tr>
<td><strong>Is this a valid and reasonable measure of reduction of cyber abuse? (1 = questionable; 2= acceptable)</strong></td>
</tr>
</tbody>
</table>
### Effect Size Level Code Sheet

<table>
<thead>
<tr>
<th>Data Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identifying Information</strong></td>
</tr>
<tr>
<td>Study identifier [ ]</td>
</tr>
<tr>
<td>Module identifier [ ]</td>
</tr>
<tr>
<td>Sample identifier [ ]</td>
</tr>
<tr>
<td>Outcome identifier [ ]</td>
</tr>
<tr>
<td>Effect size identifier (number each effect size within a study sequentially) [ ]</td>
</tr>
</tbody>
</table>

**Pages where data are found**

**Effect Size Information**

Effect size type

1. Baseline (pretest; prior to start of intervention)
2. Post-test (first measurement point post intervention)
3. Follow-up (all subsequent measurement points, post intervention)

Time frame in months captured by measure

- a. Minimum [ ]
- b. Maximum [ ]
- c. Mean [ ]
- d. Fixed [ ]

**Effect Size Data**

Treatment group sample size for this effect size [ ]
Comparison group sample size for this effect size [ ]

Treatment group mean (indicate decimal points) [ ]
Comparison group mean (indicate decimal points) [ ]

Are the above means adjusted? (1=Yes; 0=No)

Treatment group standard deviation [ ]
Comparison group standard deviation [ ]

Treatment group; number successful [ ]
Comparison group; number successful [ ]
### Effect Size Information

**Effect size type**

1. Baseline (pretest; prior to start of intervention)
2. Post-test (first measurement point post intervention)
3. Follow-up (all subsequent measurement points, post intervention)

**Time frame in months captured by measure**

- Minimum [ ]
- Maximum [ ]
- Mean [ ]
- Fixed [ ]

### Effect Size Data

**Treatment group sample size for this effect size** [ ]

**Comparison group sample size for this effect size** [ ]

**Treatment group mean (indicate decimal points** [ ]

**Comparison group mean (indicate decimal points** [ ]

**Are the above means adjusted? (1=Yes; 0=No)**

**Treatment group standard deviation** [ ]

**Comparison group standard deviation** [ ]

**Treatment group; number successful** [ ]

**Comparison group; number successful** [ ]

**t-value from an independent t-test or square root of F-value from a one-way analysis of variance with one df in the numerator (only two groups)** [ ]

**Exact probability for a t-value from an independent t-test or square root of F-value from a one-way analysis of variance with one df in the numerator (only two groups)** [ ]

**Chi-square value with df = 1 (2 by 2 contingency table)** [ ]

**Correlation coefficient (point biserial)** [ ]

**Correlation coefficient (phi)** [ ]

**Computer Calculated ES** [ ]

**Hand Calculated ES** [ ]

**Hand Calculated SE of ES** [ ]