Sexual Exploitation of Children and Youth Over the Internet: A Rapid Review of the Scientific Literature

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SEXUAL EXPLOITATION OF CHILDREN AND YOUTH OVER THE INTERNET

Information Paper

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EXECUTIVE SUMMARY

Background

The role of the Internet in the health and wellbeing of children and youth is just beginning to emerge as a priority topic in the public health research agenda. Public policy attention has recently focused on the impact of this medium on the attitudes, behaviour, and health of young people.

Among the potential risks, the sexual exploitation and abuse of children and youth over the Internet is of substantial concern. Children and youth can be abused over the Internet in many ways: Internet-initiated grooming for purposes of sexual abuse (that is, online sexual solicitation), the possession, production, and distribution of Internet-based abuse images of children and youth, Internet-based receipt by children and youth of abuse images, and Internet-initiated incitement of or conspiracy to commit sexual abuse of children and youth through activities such as sex tourism and prostitution. These Internet-related sexual exploitation activities directly or indirectly result in offline situations of sexual abuse directed toward children. The need exists to identify the most vulnerable population of children and youth who are at risk of online sexual exploitation over the Internet, and to determine whether prevention and intervention programs for online sexual exploitation have been evaluated in the scientific literature.

Objectives

The objectives of this rapid review were: 1) to provide a descriptive overview and synthesis of information regarding the state of research on the frequency, effects, and risk factors for sexual exploitation of children and youth over the Internet; 2) to identify and evaluate the evidence available in the scientific literature on the assessment tools for children and youth who have been sexually exploited via the Internet; 3) to identify and evaluate the evidence available in the scientific literature on the safety, efficacy, effectiveness, economic, social, legal, or ethical aspects of prevention and therapeutic strategies for sexual exploitation of children and youth via the Internet; and 4) to map the health care, educational, and community resources available in Alberta and Canada regarding Internet safety and prevention of child and youth abuse and exploitation via the Internet.

Results

This rapid review identified thirteen original studies published between 2003 and September 2009 that evaluated the frequency of online sexual exploitation of children and youth.

- Two main types of sexual exploitation over the Internet were evaluated in the studies: Internet-initiated grooming for purposes of sexual abuse (referred in this review as online sexual solicitation), and Internet-based receipt by children and youth of sexual images (referred in this review as

unwanted exposure to sexual material over the Internet). The results and demographic characteristics of the participants in the studies (mean age of 12.6 to 15.9 years) are consistent with claims that the victims of online sexual exploitation are not generally children but, rather, are more likely to be high-school aged youth.

- Estimates of the frequency of online sexual solicitation and unwanted exposure to sexual material varied substantially among the studies. These variations are mainly explained by differences in settings, sample sizes, survey methods and sampling frames. Therefore, these estimates should be interpreted with caution:
- Four studies based on the self-report of children and youth from the general population found that between 13% to 19% have had an experience of online sexual solicitation in the last year. Two of the studies found that in 5% of the cases, the experience of online sexual solicitation was distressful for the children and youth.
- One study based on records of law enforcement agencies found that 2% of all the cases of child sexual abuse reported to police services were cases of online-initiated sexual solicitation.
- One study based on reports of mental health professionals regarding the experiences in the Internet of a highly selected population accessing mental health services yielded a higher frequency of online sexual solicitation (26%).
- Three studies based on the self-report of children and youth from the general population found that between 14% to 34% have been exposed to unwanted sexual material over the Internet. Two of the studies found that 6% to 9% of the cases have found this experience distressful.
- One study based on the descriptions of mental health professionals found that 6% of their clients had reported experiences of unwanted exposure to sexual material over the Internet.

Studies reported a variety of demographic, psychosocial, and behavioural factors associated with sexual exploitation over the Internet:

- Factors that increase the risk of being exposed to online sexual solicitation included gender (that is, being female), being older than 14 years of age, engaging in high-risk behaviours online (such as sending out personal information to strangers or talking online to strangers about sex), the presence of other problematic Internet experiences (for example, cyberbullying), high Internet use, and Internet access from mobile devices or at computers away from home. There is evidence regarding the co-occurrence of mental health problems such as depressive symptoms and other behavioural problems among individuals exposed to experiences of online sexual solicitation. Factors related to communication problems with parents are also associated with a higher risk of online sexual solicitation. Experiences of physical and/or sexual abuse offline are described as strong predictors of online sexual solicitation.

— Factors that increase the risk of unwanted exposure to sexual material over the Internet included gender (that is, being male), being between 13 and 17 years of age, use of file sharing programs, frequent access to chat rooms, engaging in online conversations with strangers, and Internet use at computers away from home. Mental health problems such as offline interpersonal victimization, depressive symptoms, behavioural problems, parental conflicts, and a history of physical or sexual abuse were also identified as predictors of experiences of unwanted exposure to sexual material online.

No studies were identified that provided evidence on the use of assessment tools for children and youth who have been sexually exploited via the Internet. No studies were identified that provided evidence on the efficacy, effectiveness, safety, economic, social, legal, or ethical aspects of preventive and therapeutic strategies for sexual exploitation of children and youth via the Internet. A variety of resources are available to educate children, youth, parents, educators, and law enforcement agents regarding the risks of online sexual exploitation. The majority of available resources were focused on preventing the problem by educating the public on safe online practices. The effectiveness of these approaches has not been formally evaluated in scientific studies.

Conclusions

The problem of online sexual exploitation has emerged as a new field of inquiry on how the Internet influences the lives of children and youth. Research in this area is in the early stages. At the present time, the evidence from the studies included in this rapid review shows that up to one in five youth have been approached for sexual solicitation purposes over the Internet; Similar results were found for unwanted sexual material over the Internet, with up to one-third of youth reporting that they saw sexual material online that they did not want to see. Only a small proportion of youth describes these experiences as stressful or reports them to their parents or law enforcement agencies.

Research has mainly focused on identifying the characteristics of online activities that children and youth engage in, and the frequency of and risk factors related to sexual solicitation and unwanted exposure to sexual material over the Internet. Expanded research is necessary in order to develop appropriate strategies for the assessment and prevention of online sexual exploitation. Evaluation of treatment approaches in relation to their efficacy, effectiveness, and safety is also necessary. Government agencies and the new technology industries should be aware of the existence of this problem, should have a proper knowledge of its characteristics and consequences, and should understand the policy and practice challenges to which they give rise.

Methodology

A prospectively designed protocol was used to map the evidence from the scientific literature on sexual exploitation of children and youth over the Internet. Comprehensive searches of sociological and criminal justice, psychological, educational, and biomedical electronic databases were conducted from 2003 to September 2009. Electronic searches were supplemented with searches of bibliographies of relevant studies, government websites, and proceedings of relevant scientific conferences on this topic. Included were English language reports of original primary and secondary research on the frequency, effects, risk factors, assessment, prevention, or treatment strategies for online sexual exploitation of children and youth. Randomized controlled clinical trials, controlled clinical trials, observational studies (cohort studies, case control studies, cross sectional studies), case series, case reports, and qualitative research were considered for inclusion. The rapid review did not address issues related to sexual exploitation of children and youth that is initiated offline, or other situations such as online bullying and harassment. Studies were selected and data extracted by one reviewer. A quality appraisal of the included studies was not conducted. Data from the included studies was synthesized qualitatively.

ABBREVIATIONS/GLOSSARY

Abbreviations

AHS – Alberta Health Services

AHW – Alberta Health and Wellness

IM – instant messaging

IQR – interquartile range

ISP – Internet service provider

IHE – Institute of Health Economics

NR – not reported

RR – response rate

SD – standard deviation

US – United States

yr – year(s)

YISS – Youth Internet Safety Survey

Glossary

Aggressive sexual solicitation: Sexual solicitation that involves offline contact with an adult through the mail, by phone or in person, or attempts to establish offline contact through the Internet.[1]

Avatar: A computerized representation of an Internet user, whether in the form of a three-dimensional model used in computer games, a two-dimensional icon used in online communities, or the screen name of an Internet user.

Chat room: A website, part of a website, or part of an online service that provides a venue for communities of users to communicate in real time.

Child online sexual exploitation: Situations that encompass any forms of sexual abuse, violence, and exploitation directed toward children and youth that are facilitated through the use of the Internet or other file-sharing and mobile communication technologies.

Child pornography: Any representation, by whatever means, of a child engaged in real or simulated explicit sexual activities or any representation of the sexual parts of a child for primarily sexual purposes.[2]

Child sexual abuse: An umbrella term that encompasses all forms of sexual abuse, violence, and exploitation directed toward children and youth in which an individual abrogates a child's or youth's human rights to dignity, equality, autonomy, and physical and mental wellbeing. The term child sexual abuse is used in this review to refer to any form of sexual abuse or exploitation affecting either children or youth.

Children: Individuals newborn to 14 years.[3]

Cybersex: A form of sexual arousal that involves chat interaction in which participants describe sexual acts and sometimes disrobe and masturbate.

Flashing: Brief exposure of one's body, usually in a sexual way, acceptable or not depending on the context.

High-risk behaviour over the Internet: A term broadly used in the literature of online sex exploitation to refer to Internet-related behaviours that put individuals at a higher risk of being victims of online sexual exploitation, such as sending out personal information to strangers or talking online to strangers about sex.

Instant messaging: Often shortened to simply "IM," it is a form of real-time communication between two or more people based on the exchange of text messages through a software application.

Internet: A global network of interconnected computers enabling users to share information along multiple channels.

Internet-based receipt by children and youth of sexual images: Also referred in this review as unwanted exposure to sexual material. A situation where a child or a youth has been exposed to any multimedia material depicting naked people or people having sex, without the child or youth seeking it or expecting it. The images can involve or not involve children and youth.[4,5]

Internet-initiated grooming for the purposes of sexual abuse: Also referred in this review as online sexual solicitation. A situation where an individual has used the Internet to initiate contact with a child or a youth for the purposes of grooming and sexual abuse.[4,5] Grooming implies a process of desensitization that predators use on children and youth to prepare and trick them into situations of sexual abuse.

Internet hebephile: An adult with a sexual and erotic preference for pubescent young people (commonly aged 11 to 14 years for girls and 15 to 16 years for boys).[6]

Online sexual solicitation: Unwanted requests made by an adult to engage in sexual activities or sexual talk or to provide personal sexual information.[1] See also *Internet-initiated grooming for the purposes of sexual abuse.*

Prevalence: The proportion of individuals in a given population having a characteristic of interest.

Unwanted exposure to sexual material: See *Internet-based receipt by children and youth of sexual images.*

World Wide Web: A term that refers to all the resources and users that use the Hypertext Transfer Protocol–a set of rules for transferring files (by text, graphic images, sound, video, or other multimedia files) on the Internet.

Youth: Individuals 14 years to 18 years.[3]

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INTRODUCTION

This Information Paper has been produced in response to a request from Alberta Health Services (AHS) – Addiction & Mental Health to perform an evaluation of the scientific evidence on the topic of child sexual exploitation over the Internet.

AHS – Addiction & Mental Health is a member of the provincial committee on the Prevention of Sexual Exploitation of Children & Youth. The committee's objective is to examine issues related to education and awareness, prevention/protection and law enforcement of sexual exploitation, and sexual abuse of children and youth in Alberta. AHS – Addiction & Mental Health, along with Alberta Health and Wellness (AHW), has been leading an initiative to address services available to support children and youth who are abused as a result of online sexual exploitation.

To scope the Information Paper, the Institute of Health Economics (IHE) carefully reviewed the AHS – Addiction & Mental Health request and framed it in a way that allowed the use of a systematic approach to identify the existing scientific evidence in this area.

OBJECTIVE AND SCOPE

This Information Paper is a rapid review and summary of the published research literature concerning sexual exploitation of children and youth over the Internet. The objectives of the rapid review were:

1. To provide a descriptive overview and synthesis of information regarding the state of research on the frequency, effects of, and risk factors for sexual exploitation of children and youth over the Internet.
2. To identify and evaluate the evidence available in the scientific literature on assessment tools for children and youth who have been sexually exploited via the Internet.
3. To identify and evaluate the evidence available in the scientific literature on the safety, efficacy, effectiveness, economic, social, legal, or ethical aspects of prevention and therapeutic strategies for the sexual exploitation of children and youth via the Internet.
4. To map the health care, educational, and community resources available in Alberta and Canada regarding Internet safety and prevention of sexual exploitation of children and youth over the Internet.

A prospectively designed protocol was used to map the evidence from the scientific literature on sexual exploitation of children and youth over the Internet. The methodological approach for the study included a review of primary research studies (randomized controlled clinical trials, controlled clinical trials, observational studies (cohort studies, case control studies, cross sectional studies), case series, case reports and qualitative research) and secondary research studies (systematic reviews, health technology assessments, and economic analyses) reporting on the frequency, risk factors, effects, assessment, prevention, and/or treatment strategies for online sexual exploitation of children and youth as follows:

Population – Individuals aged less than 18 years of age, of both sexes, at risk of or who have been subjected to online sexual exploitation. For the purposes of this review, children were defined as individuals younger than 14 years and youth were defined as individuals aged 14 to 18 years.[3]

Issue – Sexual exploitation over the Internet.

Outcomes – Child and youth-related outcomes, family-related outcomes.

This rapid review does not address issues related to sexual exploitation that is initiated offline or other situations such as online bullying and harassment.

More details on the methodology used for this rapid review are provided in Appendices A and B. Appendix A provides an overview of the literature search strategy and summarizes the methodological approach used for study selection, data extraction, data analysis, and statistical methods used. Appendix B lists the excluded research studies and the reasons for their exclusion.

CHILD SEXUAL EXPLOITATION OVER THE INTERNET

Internet use and new forms of online communication

Cyberspace is a vast virtual area for the flow and communication of digital and electronic data through a network of interconnected computers. The Internet is a data communication system that provides connectivity between computers. It encompasses a variety of electronic forms of communication such as moving images, audio transmission, electronic mail, online chat, file transfer and sharing, and databases, some of which are live and in real time.[7] The World Wide Web is a part of the Internet that links sites and allows for rapid movement from one site to another within cyberspace.

The Internet has become a widespread phenomenon that facilitates access and communication between people around the world. Worldwide usage of the Internet recently topped 1.3 billion users.[8] The level of sophistication with which the Internet provides almost instantaneous access to an amazing amount of information and communication between people is rapidly increasing. The Internet has evolved in the last few years from fixed personal computer-based access to third-generation resources that offer high-speed access, instant messaging, and digital audio/video technologies in the form of mobile and wireless hand-held devices.[9]

The Internet has changed the way in which many people interact.[10] Online communications have become an integral part of life and social structure. People are able to connect to others whom they would be unlikely to meet outside of this medium, due to geographical restrictions or other factors. Interaction with other individuals through the Internet can take place in different scenarios involving both synchronic and asynchronic modalities of communication such as the following:

- *Chat rooms* are real-time, online forums where people exchange text messages and engage in virtual public or private conversations.[11] Most of the chat sites are open-access and discussions are often centered on specific subjects. Many chat sites allow users to post profiles with photographs and personal information, to send photographs or other types of files, and to use Web cameras. Typically, users create screen names, which can be real or made-up names.
- *Instant messaging (IM)* is another real-time communication tool that enables two or more people to send private text messages back and forth instantaneously while using computers, cell phones, and other electronic devices.[11] Some IM services have a member directory where users can create profiles that can include pictures and other information. These directories are searchable, and anyone with the same IM service can find another person's screen name and send them a message. Privacy settings can be set, however, to prevent messages from unknown people.[12]

- *Blogs* are online journals or postings that share the writer's thoughts, opinions, and personal details.[11] Some include contact information and many allow readers to post comments, which may prompt an asynchronic conversation between writer and readers, allowing for contact from both known and unknown people.
- *Social networking* sites integrate all of the communication tools above.[13] Users can create profiles that display personal information, upload pictures, audio or video, and use real-time chat, IM, or message boards to communicate. Profiles can be set to a private setting, thereby limiting access by unknown people. Profiles also can be public, which can allow anyone to send another person a message or view another person's profile and personal information.

Internet use by children and youth

Children and youth today are the first generation raised in a society in which technological literacy is essential for effective citizenship.[14] It has been estimated that in the United States (US) two-thirds of households with children use the Internet[15] and that between 84% and 97% of children and youth aged 12 to 18 years connect to the Internet.[16, 17] The explosive growth of Internet use and other forms of electronic communication has also been observed in Canada, with more than 16.8 million Internet users in over two thirds of all Canadian households.[18]

The role of the Internet in the health and wellbeing of children and youth is just beginning to emerge as a relevant issue in the public health research agenda. Public policy attention has recently focused on the impact of this medium on the attitudes, behaviour, and health of young people.[19] Internet accessibility has provided children and youth with extraordinary opportunities for education, entertainment, and communication. However, the Internet is largely uncensored and only partially regulated,[20] thus creating a new context in which children and youth can be exposed to different forms of violence, harm, and abuse.[14, 21, 22]

Among the potential risks, sexual exploitation of children and youth over the Internet is of substantial concern. The Internet provides adults who have sexual interests in children and youth with opportunities for solicitation, exploitation, harassment, production of abuse images, and participation in abusive acts.[10, 21, 23] The Internet can facilitate these activities by providing simple and quick means of communication that allows individuals to remain anonymous, to create false identities, or to misrepresent themselves.[22]

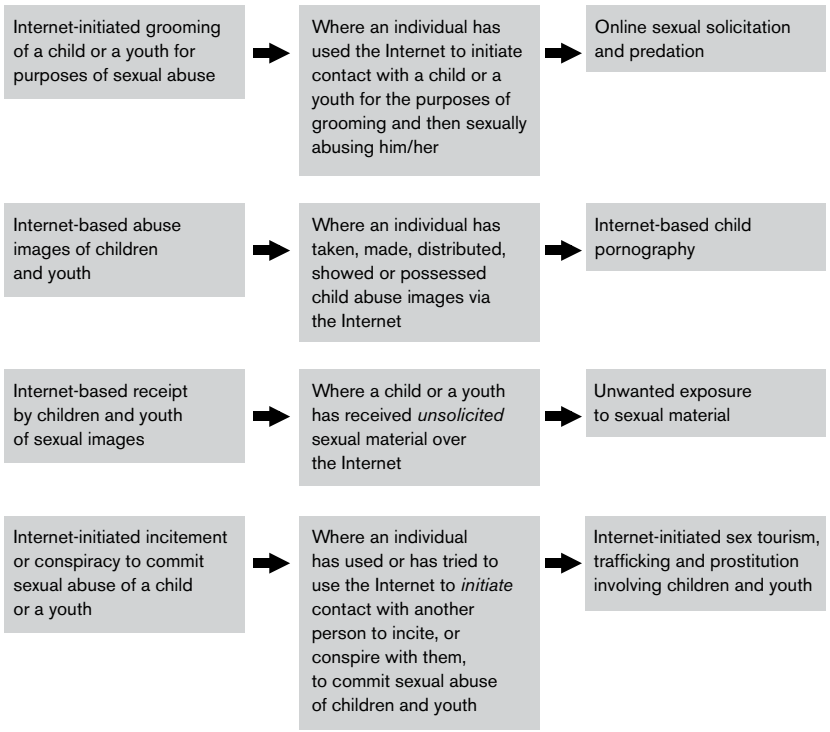
Sexual exploitation of children and youth over the Internet: definition, characteristics, and types

Child sexual abuse (CSA) is an umbrella term that encompasses all forms of sexual abuse, violence, and exploitation directed toward children and youth through which an individual (usually an adult) can achieve sexual gratification or financial gain. By doing this the individual abrogates child's or youth's human rights to dignity, equality, autonomy, and physical and mental wellbeing.[24] Online sexual exploitation refers to situations in which these abusive practices occur or are facilitated through the use of the Internet or other file-sharing and mobile communication technologies.

Although the term "victimization" is used frequently, many of the negative experiences of children and youth over the Internet do not rise to the level of criminal incidents. Some of the molestations are not necessarily criminal, but they can be emotionally distressing.[25] Misuse of the Internet to exploit children and youth generally constitutes a violation of the criminal laws. Depending on the country, and the age specifications in the country's laws to define who is a juvenile victim,[26] charges can be laid for possessing CSA images, no matter how they were received or stored. Additional offenses might arise from sending CSA images, from enticing children and youth for sexual exploitation, or even from communicating with children and youth using sexual words or images aimed at sexually gratifying the individual.[27, 28] In September 2000, Canadian federal, provincial, and territorial justice ministers proposed an amendment to the Criminal Code making it an offense to use the Internet to lure individuals under the age of eighteen for criminal purposes. Then, less than two years later, the Canadian government enacted Bill C-15A to bring into force child exploitation laws dealing with two main issues: child pornography and luring of children (defined as individuals under the age of eighteen) on the Internet.[29, 30]

Children and youth can be abused over the Internet in a variety of ways. Each type of online exploitation involves, directly or indirectly, a sexual contact between the abuser and the child or youth. Gallagher et al.[4, 5] have developed a comprehensive typology to classify CSA cases that occur on the Internet (Figure 1):

Figure 1: A typology of Internet child sexual abuse



Adapted from Gallagher et al.(4;5)

Briefly, the typology characterizes cases of online sexual solicitation and predation of children and youth in which Internet-initiated grooming takes place; Internet-based child pornography in which an individual takes, makes, distributes, shows, or possesses CSA images via the Internet; unwanted exposure to sexual material over the Internet; and Internet-initiated incitement or conspiracy crimes that include sex tourism, trafficking, and prostitution involving children and youth. These exploitation activities have been similarly characterized by other researchers as online sexual solicitation and predation, child pornography, and child sex tourism and prostitution.[23, 31-33]

Online sexual solicitation and predation

Online sexual solicitation includes requests by individuals to a child or a youth to engage in sexual activities or sexual talk or to give personal sexual information.[13, 34, 35] Sexually-oriented interactions with children and youth initiated by individuals occur through various methods of contact including chat rooms, instant messages, and email.[12, 36] The types of solicitation can be differentiated by the degree to which the encounter evolves to sexually explicit discourse and actions. Online solicitation can be aimed to produce self-generated CSA material, to engage children and youth in sexual chat or other online abusive sexual activity (for example, cybersex), or to lure the child or youth online to arrange for an offline meeting for sexual purposes.[37]

Typically after initiating contact, the adult involved in cases of online sexual solicitation starts a nonsexual relationship with the child or youth to gain his/her affection or interest and trust, thereby initiating a process known as "grooming."[10, 38] Grooming is often characterized as seduction–a slow and gradual process of active engagement and a desensitization of the child's inhibitions–with an increasing gain in power and control over the young person. In addition to attention and friendship, the grooming process includes the sharing of gifts and pictures. The adult in question becomes familiar with what is popular amongst the targeted age group. Therefore, information on popular bands, films, television shows, books, and so on, is used to initiate conversation with the child or youth. The adult, by pretending to care, listen, and understand what the child or youth is experiencing, is also able to use this information to exploit the feelings of alienation many children and youth experience. A close bond between child and adult is created, which facilitates compliance with the adult's sexual advances.[21] Children and youth are subsequently lured into sexual interactions that involve anything from exposure to pornographic material and requests of visual material of the child or youth in sexually seductive poses, to phone conversations and then to face-to-face meetings, with the subsequent risk of direct sexual abuse.[21, 35] In a great majority of cases, victims are aware they are conversing online with adults.[25, 37, 39] It has been reported that only 5% of online molesters represented themselves as peers of victims by claiming they were age 17 or younger.[25, 37] Crimes that derive from contacting individuals under 18 years of age through the Internet more often fit a model of statutory rape (that is, adult offenders who meet, develop relationships, and openly seduce minors) than a model of forcible sexual assault.[39]

Internet-based child pornography

The term Internet-based child pornography is often used to describe a form of CSA in which an individual has taken, made, distributed, showed, or possessed CSA images via the Internet, and the unwanted exposure of children or youth to pornography or sexually abusive images via the Internet. The Internet is thus used to produce, download, and/or distribute audio, visual, or written materials that depict children (under the age of 18 years) in situations of sexual abuse, or of images that emphasize children's sexual organs or the anal regions, whether or not such images were made by electronic or mechanical means.[40, 41] Sometimes innocuous pictures of children can be digitally transformed (or "morphed") into pornographic material and distributed across the Internet without the children's knowledge until they begin surfacing online.

According to the Canadian Criminal Code,[30] the possession, consumption, and distribution of child pornography is illegal. The production of child pornographic material necessarily requires the exploitation of a child and such an image is evidence of a severe sexual offense.[42] These criminal offenses transcend jurisdictional boundaries, often involving victims from different communities, states, and countries.[43] Over recent years, public concern has increased over the amount of child pornography that is available over the Internet.[9] There is no question that the Internet is a medium that has caused more explosive growth in child pornography than at any other medium at other time in history, and that it has facilitated a number of sexual offences against children and youth.[43, 44] There is a lot of concern regarding the image as a permanent record of the abuse. The subsequent and indefinite distribution of such images through the Internet provides a source for repeated, long-term victimization of a child or youth.[44] There is some evidence that children and youth recognize the permanence of such an image and, although the majority of victims are able to heal from the wounds of sexual abuse over time, there is no way of hiding from a permanent image.[9, 45]

Internet-initiated incitement or conspiracy to commit child sexual abuse: sex tourism, trafficking and prostitution involving children and youth

Exploitation of children and youth can also take place through illicit activities that are initiated through the Internet for CSA purposes. Children and youth can become the objects of commercial transactions via websites that sell them online, either for sexual abuse offline or for live sexual abuse online. These websites are also used to advertise products and illicit services such as sex-for-hire services with minors, escort and prostitution services provided by minors, and child sex tour packages. Likewise, they often offer information about places or countries in which laws protecting against CSA may be lax or not enforced.

Characteristics of individuals that sexually exploit children and youth online

Several attempts have been made to generate a more differentiated view of the kinds of activities performed over the Internet that are sexual in their orientation and which might cause harm to children and youth.

Several researchers and law enforcement agencies[9,33,46-48] have described five ways in which individuals with a sexual preference for children and youth initiate and maintain situations of sexual abuse through the Internet:

- collection and traffic of child pornography, thereby providing a market for the further abuse of children (*traders*);
- establishment and engagement in social networks with other individuals who have a sexual interest in children (*networkers*);
- engagement in inappropriate sexual communication with children (*groomers*);
- locating children to abuse (*travelers*); and
- recruitment, transport, transfer, harbour, or reception of children across state lines and/or international boundaries for sexual exploitation purposes (*traffickers*).

Individuals who sexually abuse children and youth online come from diverse backgrounds, countries, cultures, and levels of society. Research on the profiles of Internet child molesters suggests that the stereotype portrayed in the media of individuals that use trickery, deception, and violence to lure and ultimately assault their victims online is largely inaccurate.[25,28,39] Internet molesters rarely have a history of physically violent behaviour, do not usually target pre-pubescent victims, are not usually pedophiles, often operate locally, rarely abduct, and exploit the normal sexual curiosity of young people to entice them into sexualized contact with adults, following typical patterns of seduction and abuse.[25,28,39] Internet sex offenders are often family members or acquaintances rather than strangers that use the Internet as a vehicle to facilitate abuse situations that occur offline.49 Studies conducted by law enforcement agencies about individuals that have been charged and convicted of any sexual offense toward children, both offline and online sex offenders,[32,40,50] suggest that this group is constituted of people in positions of authority to the child (such as professional, teacher, clergy, or military).[32,50] The overwhelming majority of cases (94% to 99%)[32,50] involve male offenders between 30 and 40 years of age (53%)[32] who have some college education (58%)[50] and are less likely to have a criminal record (79%).[50]

Characteristics of children and youth at risk of being exploited online

Many of the media stories and much of the Internet-safety information currently available provide competing images of the population most vulnerable to online sexual exploitation. On the one hand it is suggested that children and youth are vulnerable to CSA initiated via the Internet because they are naïve and inexperienced and thereby unable to identify or understand the

sexual matters that may come across on the Internet.[11,39] In contrast are images of technologically savvy youth whose Internet use involves risk-taking behaviours–such as sending out personal information to strangers or talking online to strangers–that increase the chances of being the subject of negative experiences.[51] Although both images have their reality, they have different implications for policy and prevention.[52]

All children and youth are vulnerable to exploitation over the Internet; however, some of the characteristics associated with this problem depend on the mechanisms of abuse. For example, research indicates that youth, rather than children, seem to be the more likely targets of online sexual solicitation[10, 11] due in part to their greater mobility, sexual curiosity, and autonomy.[53, 54] Youth are at a stage of life in which they have an intense interest in expanding their social networks, taking risks, forming emotional bonds with others, and acquiring knowledge about sex. These normal developmental factors make youth vulnerable to seduction and put them at risk for responding to online sexual advances initiated by adults.[25, 45, 55] Certain patterns of Internet behaviour may put youth at a higher risk of being sexually exploited online: the sharing of personal information over the Internet, interacting with strangers online via instant messaging or chat rooms, emailing or posting photos online, visiting adult-content websites and chat rooms, and agreeing to meet with someone in person whom they met online.[11, 14, 56, 57] The threat can also come from online gaming; children or youth meet strangers online to play games and may be solicited through this route.

The ability of children and youth to distinguish which online behaviours pose little or no risk and which ones can have severe negative consequences depends on the interplay of a variety of factors, including their cognitive and emotional developmental level, the amount of time spent online in certain networking activities, and the extent of adult supervision of their online activity.[58] Identifying the vulnerable population of children and youth is an important first step in the development of effective prevention and intervention programs for online sexual exploitation.

Literature on CSA in real-world situations has identified a number of factors that seem to predispose children and youth toward being sexually victimized:[10, 20, 22, 59-62]

- exposure to prior maltreatment experiences or having witnessed the assault of a family member;
- emotionally immaturity;
- depressive symptoms;
- introversion;
- social or learning difficulties;
- love or attention deprivation;
- strong respect for adults; and
- low self-esteem.

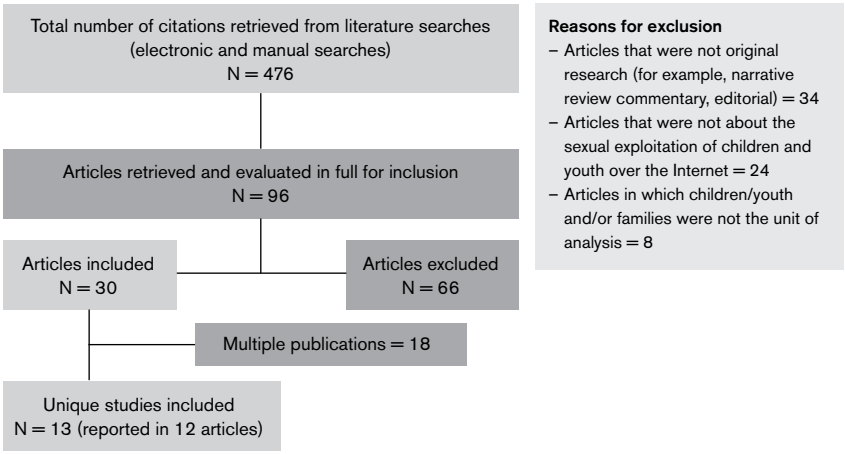
GUIDELINES AND CONSENSUS STATEMENTS

No clinical practice guidelines or scientific position papers were identified that specifically addressed issues related to assessment, prevention, or treatment of sexual exploitation of children and youth over the Internet.

AVAILABLE EVIDENCE

The systematic literature search (see Appendix A) resulted in the identification of 476 citations. After screening titles and abstracts, 96 references were selected for further examination. The full text of these 96 potentially relevant articles was retrieved and evaluated for inclusion in the review. Application of the selection criteria resulted in the inclusion of 30 of these articles and the exclusion of 66. Figure 2 outlines the study selection process for the rapid review. Among the 30 articles selected for the review, there were 13 unique studies reported in 12 articles, and 18 multiple publications[12, 34, 49, 52, 63-76] associated with the unique studies. Data from the multiple publications were incorporated in the analysis of the individual unique studies.

Figure 2: Flow diagram for study retrieval and selection



Description of selected research studies

This rapid review includes 13 unique studies[1,4,37,59,77-82a,82b,83,84] reported in 12 articles. The studies evaluated the frequency and/or risk factors of online sexual victimization. None of the studies provided evidence on the safety, efficacy, effectiveness, economic, social, legal, or ethical aspects of prevention, and/or of therapeutic strategies for children and youth who have been sexually exploited via the Internet. The studies were published between 2000 and 2009, with a

median year of publication of 2007 (interquartile range [IQR]: 2006, 2008). Authors of primary studies were from the USA (nine studies),[1,37,78,80-82a,82b,83,84] and from Australia,[77] Canada,[79] and Sweden[59] and the United Kingdom[4] (one study each). Ten studies[1,4,37,77,80,82a,82b,81,83,84] used a cross-sectional design to evaluate the frequency of online sexual victimization. Two studies[59,79] used a qualitative approach to analyze the data on a variety of aspects related to online sexual victimization. One study[78] was a retrospective cohort study based on secondary data analysis.

Nine studies[1,77,79-82a,82b,83,84] approached the problem of online sexual exploitation of children and youth from a psychosocial perspective. Four studies[4,37,59,78] approached the problem from a justice and legal system perspective. Six studies surveyed samples from the general population and were conducted in community settings (that is, households[1,82a,82b,83,84] and school[77]). Four studies[4,37,59,78] were conducted in law enforcement agencies, in which data from victims of Internet-related sex crimes were collected to describe the characteristics of these incidents. Three studies were conducted in clinical settings: one study[79] accessed data from a Web-based counselling service, one study[81] recruited participants from child protective service agencies, and another study[80] was conducted in a clinical setting in which mental health therapists provided information on the types of problematic Internet experiences that their clients had reported.

Eight studies[4,37,59,78,79,81,82a,82b] used non-probabilistic methods to assemble their samples and four studies[1,80,83,84] randomly selected the samples from the target population. One study[77] did not report on the sampling methods employed.

All but two[4,78] of the included studies described the characteristics of the population. Study sample sizes ranged from 68 to 1588 (median number of participants per study = 311; IQR, 177 to 1096). Males and females were evenly represented in the studies (median number of males per study = 49%; IQR 32% to 55% and median number of females per study = 51%; IQR = 45% to 48%). The majority of participants in the studies were youth. The age of study participants ranged from 10 to 18 years, with a median chronological age of 14.5 years (IQR, 14.2 years to 15.6 years; data from 9 studies). No subgroup analyses by race were reported in the studies included in the review.

The studies used a variety of data collection techniques, such as questionnaires[1,4,37,77,78,80-82a,82b,83,84]), interview techniques,[4,59] and file reviews.[4,79] Among the studies that used questionnaires for data collection purposes, six[1,4,37,78,83,84] reported the response rate.

Lastly, seven studies[1,37,59,80,81,83,84] reported funding from government agencies, one study[4] received funding from a foundation, and five studies[77-79,82a,82b] did not explicitly disclose their funding sources.

Results reported by the selected research studies

The following sections summarize the findings from the included studies. Appendix C presents detailed information extracted from the studies, the main characteristics of the studies, populations, and outcomes and conclusions reported by the authors of studies.

Frequency and risk factors of online sexual exploitation

Two main types of online sexual exploitation-related problems were described in the studies: online sexual solicitation and unwanted exposure to sexual material.

a. *Studies conducted in samples from the general population – households*

Five studies[1,82a,82b,83,84] were conducted in samples of children and youth (age range: 10 to 17 years) from the general population (households).

Finkelhor et al.[1] conducted a cross-sectional national survey in the United States (the Youth Internet Safety Survey-1; YISS-1) to assess the variety of disconcerting experiences young Internet users say they have had online and the methods they use to cope with them. A telephone survey, conducted between August 1999 and February 2000, recruited a random sample of English speaking children and youth from the general population, aged between 10 and 17 years, who had accessed the Internet more than six times over the six months prior to the survey (n = 1501; mean age: 14.2 years; males = 53%, females = 47%). The response rate of the survey was 57%. The study and associated reports[34,52,63-67] provided data on the frequency of unwanted sexual solicitation and unwanted exposure to pornography, and evaluated the risk factors associated with unwanted Internet experiences.

Rosen et al.[82a] conducted a cross-sectional study in the United States to assess the frequency of Internet dangers and their connection to pre-adolescent and adolescent MySpace behaviours. An online survey was conducted in June 2006 and recruited a convenience sample of MySpace users younger than 18 years of age (n = 266; mean age: 15.9 years; males = 44%, females = 56%). The survey response rate was not reported. The study provided data on the frequency of uncomfortable experiences of a sexual nature while using MySpace, and the risk factors associated with these incidents.

Rosen et al.[82b] conducted a cross-sectional online survey in the United States to assess the frequency of sexual solicitations, harassment, and exposure to unwanted sexual material among pre-adolescent and adolescent MySpace users. The study used a similar methodology to that of Rosen et al.[82a] and was conducted in September 2006 in a convenience sample of MySpace users (aged less than 18 years) from the general population (n = 341; mean age: 15.9 years; males = 38%, females = 62%).

The survey response rate was not reported. The study provided data on the frequency and risk factors of potential problems associated with the use of MySpace, particularly regarding sexual solicitations and exposure to unwanted sexual material. Wording of questions was identical to that used by Wolak et al.[83] in their YISS-2 study, including an assessment for each problem occurrence, how it was handled, and how it made the children or youth feel.

Wolak et al.[83] conducted a cross-sectional national survey in the United States (the Youth Internet Safety Survey-2; YISS-2). The study replicated the methodology used by Finkelhor et al.1 in 2000; it reassessed the extent to which young Internet users encounter problems online, explored emerging technologies involved in these experiences, ascertained the effect those technologies have on the issue, and assessed the frequency of threats directed to children and youth. A telephone survey was conducted between March 2005 and June 2005; it recruited a random sample of English-speaking children and youth aged 10 to 17 years who had accessed the Internet more than six times over the six months prior to the survey (n = 1500; mean age: 14.2 years; males = 49%, females = 51%). The survey response rate was 45%. The study and associated reports[70-76] provided data on the frequency of unwanted sexual solicitations and unwanted exposure to pornography, and evaluated the risk factors associated with online sexual victimization.

Ybarra et al.[84] conducted a national cross-sectional online survey (the Growing Up with Media survey) to examine the co-occurrence of online sexual solicitation and harassment. The study was conducted between August 2006 and September 2006 in a random sample of English-speaking children and youth aged 10 to 15 years who had accessed the Internet at least once over the six months prior to the survey (n = 1588; mean age: 12.6 years; males = 52.2%, females = 47.8%). The survey response rate was 26%. The study and associated report[12] provided data on the frequency of unwanted sexual solicitations, the characteristics and dynamic of these incidents, and associated risk factors.

b. *Studies conducted in samples from the general population – high schools*

One study[64] was conducted in a sample recruited from a high school setting.

Fleming et al.[77] conducted a cross-sectional survey in Australia to examine aspects of Internet use among youth, particularly their exposure to inappropriate material, online behaviours, and safety practices. The study dates were not reported. A self-reported questionnaire was administered to a sample of students in grades 8, 9, and 10 who attended four high schools in the Australian Capital Territory (n = 692; mean age: 14.7 years; males = 67%, females = 33%). Data on the selection criteria for the study and the sampling methods for the survey were not reported. The study provided data on the frequency of exposure to inappropriate material online.

c. *Studies conducted in data collected from law enforcement agencies*

Four studies[4,37,59,78] were conducted in law enforcement agencies based on data collected from cases associated with Internet-related sex crimes.

Gallagher et al.[4] conducted a study that incorporated a national cross-sectional survey, interviews with police officers and organizations, and a chart review of police crime records. One of the objectives of the study was to evaluate the extent of cases of Internet CSA (that is, cases of Internet-initiated grooming of children for sexual abuse). Data for the study were collected from searches of CSA-related reports to Computer Examination Units in three police services in the United Kingdom. The study period was from 1999 to 2002. The study did not report the characteristics of the children who were victims of Internet-initiated grooming; it provided data on the extent of cases of Internet-initiated grooming that were reported to police services in the United Kingdom during the study period. Caution must be exercised in interpreting the figures from this research as they are based upon only those cases known to police services.

Leander et al.[59] conducted a qualitative study to investigate how female youth, who had been sexually deceived and abused by an Internet hebephile, reported these acts to the Criminal Investigation Department in Malmö (Sweden) in the course of investigations for online-initiated sexual abuse. The dates of the study were not reported. Data for the study were collected from transcriptions of police interviews with a convenience sample of female youth (n = 68; mean age: 15.3 years) who had been victims of Internet-initiated sexual abuse by the same offender. The study provided data on the characteristics of the acts that were reported regarding the victims' experience of online sexual abuse. Caution must be exercised in interpreting the figures from this research, as they are based upon only those cases known to the police.

McCabe et al.[78] conducted a secondary analysis of two datasets that contained information from governmental agencies within the United States about commercial sexual exploitation of children. The objective of the study was to identify the extent to which specific crimes of child pornography and sexual exploitation through prostitution were reported to law enforcement agencies by Internet service providers (ISPs). Data reported by governmental law enforcement agencies (n = 182) between April 2004 and December 2004 were used for the analysis. The study analyzed data on the number of cases of suspected online child abuse reported by ISPs to law enforcement agencies, and on the characteristics of these reports. Caution must be exercised in interpreting the figures from this research as they are based upon only those cases known to the law enforcement agencies.

Wolak et al.[37] conducted a national cross-sectional study in the United States to examine the characteristics of Internet-related sex crimes involving child and youth victims (the National Juvenile Online Victimization Study). The study was conducted between October 2001 and July 2002 and included a convenience sample of federal, state, county, and local law enforcement agencies that provided information on the number of Internet-initiated crimes involving the attempted or completed sexual exploitation of a minor (a person less than 18 years of age), defined as sexual assault or child pornography. The study response rate was 88%. The units of analysis in the study were the victims in cases prosecuted for attempted or completed sexual exploitation of a minor (n = 129; age range: 12 to 17 years; males = 25%, females = 75%). The study provided data on the characteristics and dynamics of the Internet-initiated crimes, such as place of encounter, type of communication between the offender and the victim, and frequency of family and acquaintance involvement in the offences.

d. *Studies conducted in clinical settings*

Three studies[79-81] were conducted in clinical settings.

Mishna et al.[79] conducted a qualitative study to understand the phenomenon of cyber abuse from the perspective of children and youth. The study was conducted in Canada and analyzed anonymous posts sent by children and youth to a Web-based counselling service. The study collected data between March 2004 and September 2005 from 344 posts that were sent by children and adolescents (mean age = 14.5 years; males = 22%, females = 78%) describing their experiences of abuse (including sexual abuse) via the Internet. Five major categories emerged through the analysis of the posts: extent and importance of online interactions, online dating, awareness of potential online dangers, cyber abuse, and not telling parents.

Noll et al.[81] conducted a cross-sectional survey to determine the risk factors for Internet-initiated victimization of female youth. The study was conducted in the United States and included a convenience sample of female youth (n = 104) aged 14 to 17 years who were referred to child protective and service agencies for substantiated abuse in their childhood. Abuse experiences included physical abuse, physical neglect, and CSA. A comparison group (n = 69) of female youth recruited from a large, hospital-based, primary care youth health center was matched by ethnicity, family income, and age to the abused group. The study provided data on factors such as Internet usage, maternal and paternal caregiver presence while using the Internet, substance use, sexual attitudes, and involvement with peers who exhibited high-risk behaviours (such as smoking, substance use, multiple sex partners) that may be associated with the experience of Internet-initiated victimization.

Mitchell et al.[80] conducted a cross-sectional study in the United States to examine the types of problematic Internet experiences mental health professionals reported as clients' primary or secondary presenting problems. A self-reported questionnaire was completed by a random sample of health care professionals in the areas of psychology, psychiatry, and social work, who identified cases (both children and adults) in which mental health services were provided for Internet-related problems. Problematic Internet experiences included overuse of the Internet, Internet pornography use, sexual exploitation and abuse, online infidelity, gambling, harassment, fraud or deception, isolative-avoidant behaviour, and failed online relationships. The dates of the study were not reported. The study reported separate data for a population of individuals aged 6 to 17 years of age that received mental health services for any of the Internet-related problems mentioned above (n = 512; mean age: 14.3 years; males = 57%, females = 43%). The survey response rate was not reported. The study and associated reports[68,69] provided data on the frequency of online sexual solicitations and unwanted exposure to pornography, and evaluated the risk factors for these negative Internet experiences. Caution must be exercised in interpreting the figures from this research as they are based upon only those cases known to the mental health professionals.

Online sexual solicitation

Seven studies[1,4,77,80,82b,83,84] reported the frequency of online sexual solicitation or grooming (Table 1). The four studies conducted in samples of children and youth from the general population (age range: 10 to 17 years) yielded prevalence estimates for online sexual solicitation that ranged from 13.3%[83] to 19%.[1] The study by Fleming et al[77] that surveyed students in eight to 10 grades in Australian high-schools provided a higher estimate, calculated at 75.8%. To note, this study was aimed to identify whether individuals had been exposed to "sexual comments." Therefore, the prevalence estimate of 75.8% does not represent all cases of sexual solicitation online, but includes exposure to other situations that do not translate into an incident of sexual solicitation per se. The Fleming et al.[77] study did not provide sufficient data on the selection criteria for inclusion of participants in the study, nor did the study detail the sampling methods. The study of Mitchell et al.[80] reported an online sexual solicitation frequency of 25.7%, based on reports of mental health professionals regarding their clients' experiences on the Internet. Caution must be exercised in interpreting the figures from this research as they are based upon a highly selected population that accessed mental health services. Finally, the study by Gallagher et al.[4] evaluated the extent of Internet-initiated grooming among CSA cases reported to police services. Overall, of all reported cases of sexual abuse, 2.1% (2.3% in metropolitan police services, 3.8% in one county police service, and 0% in another county police service) involved Internet-initiated grooming of children and youth for these purposes.

Table 1: Summary of frequency estimates of online sexual solicitation

Study	Frequency estimate (%)	95% CI	N	Type of sample/setting
Finkelhor 2000[1]	19	17 to 21	1501	Community samples (general population)
Fleming 2006[77]	75.8	72.7 to 78.9	692	Community samples (high school)
Gallagher 2006[4]	2.1	1.2 to 3.6	571	Law and enforcement (based on cases reported to police services)
Mitchell 2007[80]	25.7	22.1 to 29.7	512	Clinical settings (based on reports of mental health professionals)
Rosen 2008[82b]	14.7	11.3 to 18.8	341	Community samples (general population)
Wolak 2006[83]	13.3	11.7 to 15.1	1500	Community samples (general population)
Ybarra 2007[84]	15	13.3 to 16.8	1588	Community samples (general population)

95% CI = 95% confidence interval

Three studies[1,82b,83] reported the frequency of online sexual solicitation that caused distress (Table 2). The three studies were conducted in samples of children and youth (age range: 10 to 17 years) from the general population and provided estimates of distressing online sexual solicitation that ranged in frequency from 4%[83] to 19%.[82b] The study with the highest prevalence estimate, by Rosen et al.,[82b] was based on a small convenience sample of MySpace users (n = 341) from the general population; therefore, differences in the sample composition of this study from that of the other two community-based studies (by Finkelhor et al.[1] and Wolak et al.[83]) may explain the differences in the estimates of the frequency of distressing online sexual solicitation.

Table 2: Summary of frequency estimates of distressing online sexual solicitation

Study	Frequency estimate (%)	95% CI	N	Type of sample/setting
Finkelhor 2000[1]	5	4 to 6.2	1501	Community samples (general population)
Rosen 2008[82b]	19	15.2 to 23.5	341	Community samples (general population – MySpace users)
Wolak 2006[83]	4	3.1 to 5.1	1500	Community samples (general population)

95% CI = 95% confidence interval

Unwanted exposure to online sexual material

Five studies[1,77,80,82b,83] provided data on the frequency of unwanted exposure to sexual material among children and youth (age range: 10 to 17 years) (Table 3). Three studies conducted in samples from the general population yielded prevalence estimates of unwanted exposure to sexual material that ranged from 14%[82b] to 34%.[83] The study by Fleming et al.[77] that surveyed students in grades 8 to 10 in Australian high-schools provided a higher prevalence estimate, at 82.2%. The survey questions used in this study are not comparable to the questions used in the other studies. In the Fleming et al. study,[77] exposure to sexual material included incidental (both wanted and unwanted) findings of pornographic material on the Web. Another potential reason for the high prevalence of exposure to sexual material in the Fleming et al. study may be related to an overrepresentation of males in the study population (67% of the sample).

The study by Mitchell et al.[80] reported a frequency estimate of unwanted exposure to sexual material of 5.8%, based on reports of mental health professionals regarding their clients' experiences on the Internet. Caution should be exercised in interpreting the data from Mitchell et al.[80] as they are based upon only those cases known to the mental health professionals.

Table 3: Summary of frequency estimates of unwanted exposure to online sexual material

Study	Frequency estimate (%)	95% CI	N	Type of sample/setting
Finkelhor 2000[1]	25	22.8 to 27.2	1501	Community samples (general population)
Fleming 2006[77]	82.2	79.1 to 84.8	692	Community samples (high school)
Mitchell 2007[80]	5.8	4.1 to 8.2	512	Clinical settings (based on reports of mental health professionals)
Rosen 2008[82b]	14	10.7 to 18.1	341	Community samples (general population)
Wolak 2006[83]	34	31.6 to 36.4	1500	Community samples (general population)

95% CI = 95% confidence interval

Three studies[1,82b,83] reported the frequency of exposure to sexual material that caused distress (Table 4). Two studies conducted in samples of children and youth (age range: 10 to 17 years) from the general population provided prevalence estimates of distressing unwanted exposure to sexual material of 6%[1] and 9%,[38] respectively. The study with the highest prevalence estimate (19.9%), by Rosen et al.,[82b] was based on a convenience sample of MySpace users from

the general population. Differences in the sample composition of Rosen et al.,[82b] compared with that of the other two community-based studies (by Finkelhor et al.[1] and Wolak et al.[83]) may explain the differences in the prevalence estimates.

Table 4: Summary of frequency estimates of distressing exposure to online sexual material

Study	Frequency estimate (%)	95% CI	N	Type of sample/setting
Rosen 2008[82b]	19.9	16 to 24.5	341	Community samples (general population – MySpace users)
Wolak 2006[83]	9	7.6 to 10.5	1500	Community samples (general population)
Finkelhor 2000[1]	6	4.9 to 7.3	1501	Community samples (general population)

95% CI = 95% confidence interval

Risk factors for online sexual exploitation

a. *Factors associated with online sexual solicitation*

Six studies[1,80-82b,83,84] provided evidence on a number of risk factors associated with the occurrence of sexual solicitation of children and youth via the Internet (Table 5).

The studies reported that certain sociodemographic characteristics, patterns of Internet use, and the co-occurrence of mental health problems, parental conflict, or experiences of sexual victimization offline, were associated with a higher risk of sexual solicitation. Sociodemographic factors associated with online sexual solicitation included gender (being female)[1,80,83,84] and older ages (being greater than 14 years of age).[1,82b] Internet practices associated with online sexual solicitation included the use of chat rooms,[1,83] talking to and sending personal information online to strangers,[1,81,83] engagement in sexual behaviour or other high-risk behaviours online,[1,81,83] other problematic Internet experiences,[1] high Internet use,[1] and Internet access from mobile devices[83] or from other households.[1] There is evidence regarding the co-occurrence of mental health problems such as depressive symptoms,[1] substance abuse,[1,81] delinquent behaviour,[1] association with high-risk peers (engaging in substance abuse; having multiple sexual partners),[81] and somatic complaints or insomnia[80] among individuals exposed to experiences of online sexual solicitation. The presence of parental conflict,[80] poor emotional bonds with caregivers,[84] and lack of sufficient monitoring of Internet use from caregivers[84] are also associated with a higher risk of online solicitation. Finally, experiences of physical and/or sexual abuse[80,81,83,84] have been consistently described as strong predictors of further abuse perpetrated over the Internet.

b. *Factors associated with unwanted exposure to sexual material*

Two studies[1,83] provided evidence on the risk factors associated with experiences of unwanted exposure to sexual material over the Internet. They included being a male aged 13 to 17 years, use of file sharing programs, frequent access to chat rooms, engagement in conversations online with strangers, and Internet use elsewhere than in the home.[1,83] Mental health problems–such as offline interpersonal victimization, depressive symptoms, behavioural problems, parental conflicts, and a history of physical or sexual abuse–were also identified as predictors of experiences of unwanted exposure to sexual material online.[83]

Table 5: Risk factors for online sexual exploitation

	Sexual solicitation	Unwanted exposure to sexual material
Sociodemographic factors	• Being female • Being older (greater than 14 years of age)	• Being male • Being between 13 and 17 years of age
Patterns of Internet use	• Chat room use • Talking to and sending personal information online to strangers • Engaging in sexual or other high-risk behaviours online • High Internet use • Internet access from mobile devices or while away from home	• Use of file sharing programs • Frequent access to chat rooms • Engagement in online conversations with strangers • Use of the Internet elsewhere than in the home
Mental health and behavioural problems	• Depressive symptoms • Substance abuse • Delinquent behaviour • Somatic complaints • Insomnia	• Offline interpersonal victimization • Depressive symptoms • Behavioural problems
Past history/ experiences	• Experience of other problematic Internet experiences • Parental conflicts • Poor emotional bond with caregivers • Lack of sufficient monitoring of Internet use by caregivers • Prior experiences of physical and/or sexual abuse	• Parental conflicts • History of physical or sexual abuse

95% CI = 95% confidence interval

Other characteristics related to online sexual exploitation

Methods and dynamics of online sexual solicitation

Two studies[83,84] provided data on the most frequent methods of encounter for online sexual solicitation as reported by children and youth (age range: 10 to 17 years). Wolak et al.[83] reported that methods of encounter for sexual solicitations included the use of chat rooms (37%) and instant messaging (IM) (40%). Ybarra et al.[84] reported that IM (42.5%), chat rooms (31.7%), social networking sites (27.1%), emails (21.6%), online games (17.9%), and blogs (5.5%) were frequently used to contact young people for sexual solicitation purposes. Ybarra et al.[84] also reported on the type of sexual requests that study participants received. They included being asked to do something sexual (11.4%), to engage in sexual talk (11.2%), and to share personal sexual information (7.2%).

A qualitative study by Mishna et al.[79] provided data on the type of online sexual solicitations that preadolescents and adolescents (mean age: 14.2 years) receive. The authors found that female and gay or bisexual male youth were the most likely targets of older men trying to engage youths in cybersex or in flashing. In some instances, online encounters between the youth and the adult progressed to actual in-person meetings. Children and youth who were vulnerable to these situations were those who struggled with serious family or school problems, emotional problems or substance use. Overall, they were afraid to tell their parents about any of these incidents.

Reports of cases of online sexual exploitation to authorities

Studies based on general population samples

Two studies conducted among samples of children and youth (age range: 10 to 17 years) from the general population1,[83] provided data on the frequency of reporting of online sexual exploitation experiences to authorities. Finkelhor et al.[1] found that in 2000 only 10% of all online sexual solicitation episodes and 3% of cases of unwanted exposure to sexual material were reported to any type of authority (that is, parents, teachers, or law enforcement agencies). Twenty-four percent of the incidents of online sexual solicitation and 43% of all episodes of unwanted exposure to sexual material were not disclosed to anyone. Using the same methodology, Wolak et al.[83] found that in 2005 only 5% of all episodes of online sexual solicitation and only 2% of cases of unwanted exposure to sexual material were reported to any type of authority.

Studies based on data collected by law enforcement agencies

Wolak et al.[37] reported the characteristics of Internet-initiated crimes that were reported by law enforcement agencies responsible for investigating and prosecuting criminal cases. The authors reported that 76% of encounters between the offender and the victim took place in chat rooms. The study also reported the time of communication between offender and victim.

The majority of the incidents involved communication time that elapsed over one to six months (48%). In 74% of Internet-initiated crimes, an offline encounter between the offender and the victim took place. In 18% of the crimes, a member of the family or an acquaintance was involved.

McCabe et al.[78] evaluated the role of ISPs in the identification of online CSA cases. The authors of the study found that 25.3% of the law enforcement agencies surveyed have had referrals of online child abuse cases by an ISP. The type of reports included incidents of child pornography (78.3%), exposure to child pornography (71.7%), and sexual exploitation through prostitution by local pimps (26%), as well as identification of trans-national groups that operate through the Internet (19.6%).[78]

Finally, a qualitative study by Leander et al.[59] described how female victims of Internet-initiated sexual abuse reported their experiences about these incidents in interviews with law enforcement agencies. The authors found that victims are more willing to report the less severe online sex-related activities than the more severe activities: provision of personal information to the offender (94%); sending of facial photographs (84%) or nude photos (40%); discussing sexual preferences (65%); discussing the opportunities to meet for sex (84%); performing Web show strip (19%) or sexual Web shows (28%); meeting and engaging in sex offline (40%); meeting and not engaging in sex offline (7%); and meeting several times with the offender (23%).[59]

Caution should be exercised in interpreting this body of evidence as it is based upon only those cases known to the law enforcement agencies and ISP.

Assessment tools for online sexual exploitation of children and youth

No studies were identified that provided evidence on the use of assessment tools for children and youth who have been sexually exploited via the Internet.

Evidence on the effectiveness of prevention and therapeutic strategies for online sexual exploitation of children and youth

No studies were identified that provided evidence on the efficacy, effectiveness, safety, economic, social, legal, or ethical aspects of prevention and therapeutic strategies for sexual exploitation of children and youth via the Internet.

PROGRAMS, SERVICES, AND RESOURCES AVAILABLE FOR THE PREVENTION OF SEXUAL EXPLOITATION OF CHILDREN AND YOUTH OVER THE INTERNET

The programs and services highlighted in the following section are only a short list of a variety of public and private Internet safety initiatives currently in effect to keep children and youth safe online. The following section is not meant to be an exhaustive catalogue of all the existing resources. Indeed, so many independent efforts are underway that it has become difficult to keep track of them all. The objective of this section is to provide some information about where the information, assessment, prevention, treatment, and support efforts for dealing with the problem of online sexual exploitation in children and youth have been oriented, and what type of health care, educational, and community strategies and resources have been implemented in Alberta and Canada to deal with children and youth who have been sexually exploited via the Internet. The effectiveness of these programs has not been evaluated in scientific studies.

Education and awareness initiatives, and law enforcement and therapeutic resources, in Alberta, for addressing the problem of online sexual exploitation of children and youth

In 2006, the government of Alberta, through Alberta Children's Services, announced that financial resources of about $6.2 million would be committed to activities aimed at addressing the problem of sexual exploitation of children and youth in the province.[85] Particularly, public awareness activities about online safety have been undertaken through advertisements in movie theatres and through the creation of a website.

In May 2006, the website, **www.weron2u.ca** was launched by Alberta Children's Services to provide children and youth with information on predator tactics, safety tips, and stories written from a peer-to-peer perspective, to empower them to stay safe online. Shortly after, Alberta Children's Services launched another site at **www.badguypatrol.ca** that provides children aged 5 to 10 years with information and strategies on how to safely navigate through the Internet.

The government of Alberta, through the Alberta Children and Youth Initiative (ACYI), has created a webpage, **www.getwebwise.ca**, aimed at helping parents, children, and youth learn how to use the Internet safely.

The Calgary Police Services have implemented an Internet safety page within its website (**www.calgarypolice.ca**) to provide recommendations for individuals and families on how to stay safe online.

The Edmonton Police Services website (**www.edmontonpolice.ca**) provides links to educational websites such as **www.kidsintheknow.ca**, an interactive

safety education program created by the Canadian Centre for Child Protection, which is a non-governmental organization aimed at providing programs and services to reduce child victimization in Canada. The objective of the Centre's website is to increase the personal safety of children and youth and reduce their risk of sexual exploitation.

The Edmonton Police Services website also provides links to the Sexual Assault Centre of Edmonton website (**www.sace.ab.ca**), which provides educational materials on how to identify and report situations of online sexual abuse involving children and youth.

The Sexual Assault Centre of Edmonton provides counselling to children and youth who have experienced sexual abuse, with public education presentations regarding this issue that are tailored to the audience. Edmonton's Zebra Child Protection Centre (**www.zebracentre.ca**) provides children, youth and non-offending parents and guardians with essential social, medical, and mental health services and supports. No information is posted on these websites regarding particular approaches for child and youth victims of online sexual exploitation, but it is expected that these individuals benefit from the same types of services offered to children and youth who have suffered other forms of sexual exploitation.

The Alberta Integrated Child Exploitation (AICP) team (**www.edmontonpolice.ca/ CommunityPolicing/ FamilyProtection/ ChildProtection/AlbertaICE.aspx**) is a multiagency investigative unit involving the Province of Alberta, the Royal Canadian Mounted Police (RCMP), and the Edmonton, Calgary, Medicine Hat, and Lethbridge Regional Police Services. The unit was created by the Alberta Solicitor General and Public Security as part of the Alberta Law Enforcement Response Teams (ALERT) integrated initiatives. The mandate of the AICP team is to protect Albertan children, using an integrated policing model and a collaborative approach to investigating Internet crimes of abuse and sexual exploitation. The two main objectives of the AICP unit are to find, investigate, and arrest individuals who prowl chat rooms looking to exploit children and youth for sex, and to find, investigate, and arrest individuals who are trading child pornography.

Education and awareness initiatives, and law enforcement and therapeutic resources, in Canada, for addressing online sexual exploitation

Overall, Canada has adopted a model of promotion and prevention for dealing with the problem of child online sexual exploitation. The goal of this approach has been to build public awareness about online safety issues and to educate Canadian families regarding the importance of protecting themselves online in a manner they deem most appropriate to their own particular circumstances.[86] The Government of Canada, through the Canadian Strategy to Promote Safe, Wise and Responsible Internet Use (also known as the "CyberWise Strategy"),

considers that legislation alone does not solve the problems encountered while surfing the Internet. Rather, the federal government's priorities are in the realm of supporting initiatives that educate Internet users regarding the risks of Internet, as well as promoting self-regulation, implementing hotline systems, and fostering collaboration between the public and private sectors at the provincial, federal, and international levels.[86]

In 2004 Canada established the National Strategy to Protect Children from Sexual Exploitation on the Internet. The Federal government committed approximately $43 million over five years to ensure a comprehensive, coordinated approach to protecting children and youth who use the Internet. The initiative is delivered in partnership with Public Safety Canada, Industry Canada, and the RCMP. A National Child Exploitation Coordination Centre (NCECC; **http://www.rcmp-grc.gc.ca/fs-fd/ncecc-cncec-eng.htm**) was established as the law enforcement component of the National Strategy. It was created in response to the recognition that the Internet was being increasingly used to facilitate sexual exploitation crimes against children and youth, including the exchange of sexual abuse images, and the luring and solicitation of children and youth. Therefore, the NCECC's mandate includes acting as a national clearing house and coordination centre for all international requests to conduct investigations in Canada related to the sexual exploitation of children and youth over the Internet. It also provides support to investigators involved in cases dealing with sexual exploitation on the Internet.

As part of the National Strategy, the Government of Canada has also funded the creation of an online reporting mechanism for Internet-based child pornography and other forms of sexual exploitation of children and youth: Cybertip.ca (**www.cybertip.ca**). The tip line is owned and operated by the Canadian Centre for Child Protection. Cybertip.ca works as a centralized web portal that receives and addresses any reports from the public regarding child pornography, luring, child sex tourism, and exploitation through prostitution. Cypertip.ca also provides educational material and links to other resources for enhancing child and youth safety on the Internet.

In July 2004, Cypertip.ca, along with the NCECC, the Department of Justice, and ISPs, created the Canadian Coalition Against Internet Child Exploitation, a multi-sector group of industry, government, non-governmental, and law enforcement stakeholders from across the country who work to combat the online sexual exploitation of children and youth. Activities of this coalition include: increasing public awareness of the impact and dangers of online sexual exploitation and of the protection tools available; increasing the cooperation between industry and law enforcement agencies in the investigation and prosecution of offenders; and identifying ways that technology can assist in online protection of children and youth.

The Canadian Centre for Child Protection is involved in other initiatives aimed at reducing sexual exploitation of children and youth over the Internet. It operates two websites: **www.kidsintheknow.ca** and *Zoe and Molly Online*

(**www.kidsintheknow.ca/app/en/ zoe_molly_intro**), an interactive online safety program launched in February 2009. The new *Zoe and Molly* website enables parents and educators to teach children aged 8 to 10 how to be safe when sharing personal information, pictures, and videos over the Internet. Children engage through an online game that allows them to create their own avatar and complete an online comic book.

The private industry sector has also made contributions to raising public awareness of the problems related to online safety amongst Canadian children and youth. The Be Web Aware campaign (**www.bewebaware.ca**) was developed by a steering committee composed of members from Bell, Microsoft, and Media Awareness Network. Be Web Aware is a national, bilingual public education program on Internet safety. Its goal is to raise awareness among parents regarding online safety issues and the need for parental involvement. It also provides practical information and tools to help parents effectively manage Internet use in the home.

Canadian Internet resources on child and youth online safety

A number of online resources have been produced to increase public awareness on the dangers posed to children and youth who use the Internet and to promote online safety. The programs listed in Table 6, however, have yet to undergo scientific evaluations to demonstrate they are effective at increasing safety for children and youth navigating the Internet.

Table 6: Canadian Internet resources on child and youth online safety

Name	Responsible entity	Purpose
www.bewebaware.ca	Bell, Microsoft, and Media Awareness Network	Bilingual public education program on Internet safety
www.cybertip.ca	Canadian Centre for Child Protection	Hotline to report online victimization of children
www.internet101.ca	RCMP	Promoting Internet safety for youth, in partnership with local law enforcement and community groups
www.kidica.com	Private	Online consumer information guide; educational materials on online safety
www.kidsintheknow.ca	Canadian Centre for Child Protection	Educational materials on online safety
www.rcmp-grc.gc.ca	RCMP	Links to organizations involved in online safety and online child sexual abuse (Cybertip, CETS, Virtual Global Taskforce))
www.getwebwise.ca	Government of Alberta	Educational materials on online safety
www.internetsafety4kids.ca	NPO	Educational materials on online safety
www.safecanada.ca	Government of Canada	Links to organizations involved in online safety and online child sexual abuse
www.weron2u.ca	Alberta Children's Services	Public awareness activities about online safety

CETS = Child Exploitation Tracking System; NPO = Non-profit organization;
RCMP = Royal Canadian Mounted Police

International Internet resources on child and youth online safety

A number of programs to increase children's safety while navigating the Internet have been produced outside Canada. The programs listed in Table 7 have yet to undergo scientific evaluations to demonstrate they are effective at increasing online safety for children and youth.

Table 7: International Internet resources on child and youth online safety

Name	Base of operations	Responsible entity	Purpose
www.2smrt4u.com	USA	Government	Educational materials on online safety for girls
www.ceop.gov.uk	UK	Government	Criminal (Internet child sexual abuse) investigation unit; educational materials on online safety; resources for law enforcement agencies
www.childnet-int.org	UK	Private	Educational materials on online safety
www.connectsafely.org	USA	NPO	Educational materials on online safety
www.csriu.org	USA	Center for Safe and Responsible Internet Use	Educational materials on online safety
www.cyberangels.org	USA	NPO	Educational materials on online safety for children, parents, educators, and librarians
www.cybersmart.org	USA	NPO	Educational materials on online safety; online workshops
www.ecpat.net	Thailand	ECPAT International	International centre of documentation on child prostitution, trafficking and pornography
www.enough.org	USA	NPO	Raise public awareness, and promote legal solutions in cases of online pornography, child pornography, and child stalking and sexual predation
www.eukidsonline.net	UK	London School of Economics	Research in the area of online child sexual abuse

Name	Base of operations	Responsible entity	Purpose
www.fosi.org	USA	NPO	Development of public policy, technology, education, and special events about online safety
www.getnetwise.org	USA	Private	Educational materials on online safety
www.htcia.org	USA	HTCIA	Program to train law enforcement professionals to deliver Internet safety courses to parents and children
www.ikeepsafe.org	USA	Internet Keep Safe Coalition	Educational materials on online safety for children, parents, and educators; Fun zone (Faw Paw)
www.isafe.org	USA	NPO	Educational materials on online safety for children, parents, educators, and law enforcement agencies; chat room for children
www.icactraining.org	USA	Fox Valley Technical College	Training and technical assistance program on Internet crimes against children, for law enforcement agencies
www.info.fundp.ac.be/~mapi/mapi-eng.html	Belgium	MAPI project, University of Namur	Advocacy group; information on online sexual exploitation of children
www.is4k.com	USA	NPO	Research in the area of online child sexual abuse
www.iwf.org/uk	UK	Internet Watch Foundation	Hotline to report online victimization of children
www.kids.getnetwise.org	USA	Private	Educational materials on online safety
www.missingkids.com	USA	NCMEC	Hotline to report online victimization of children
www.netsafe.org.nz	New Zealand	NPO	Educational materials on online safety
www.netsmartz.org	USA	NCMEC	Educational materials on online safety for children, parents, and teachers
www.safechild.org	USA	NPO	Educational materials on online safety

Name	Base of operations	Responsible entity	Purpose
www.safer-internet.net/	USA	Private	Educational materials on online safety for children, parents, and teachers
www.safeteens.com	USA	Private	Educational materials on online safety for adolescents
www.safekids.com	USA	Private	Educational materials on online safety for children
www.ucc.ie/en/equayle/	Ireland	COPINE Project; University College Cork	Research in the area of online child sexual abuse; links to organizations involved in online safety
www.unh.edu/ccrc/	USA	Crimes Against Children Research Center – University of New Hampshire	Research in the area of online child sexual abuse; links to organizations involved in online safety
www.virtualglobaltaskforce.com/	UK	Child Exploitation and Online Protection Centre	Law enforcement website made up of police forces from around the world working together to fight online child abuse
www.wiredkids.org	USA	NPO	Educational materials on online safety for parents and children; links to child-safe sites; links to organizations involved in online safety
www.wiredsafety.org	USA	NPO	Educational materials on online safety for parents and children; links to child-safe sites; links to organizations involved in online safety; online library for parents and educators
www.webwisekids.org	USA	NPO	Educational materials on online safety; online games to increase awareness (for example, Missing, Mirror Image, Airdogs)

COPINE = Combating Pedophile Information Networks in Europe; ECPAT = End Child Prostitution, Child Pornography and Trafficking of Children for Sexual Purposes; HTCIA = International High Technology Crime Investigation Association; MAPI = Movement Against Pedophilia on the Internet; NCMEC = National Center for Missing and Exploited Children; NPO = Non-profit organization; UK = United Kingdom; USA = United States

DISCUSSION

Evidence on the frequency, effects, and associated risk factors of sexual exploitation of children and youth over the Internet

Two main types of sexual exploitation over the Internet have been assessed in the scientific literature: sexual solicitation, and unwanted exposure to sexual material. Although there are many ways in which children and youth can be victimized online, these two problems have been considered as the more pernicious by parents, educators, and law enforcement agencies.[23]

Studies conducted in samples from the general population reported that online sexual solicitation affects 13% to 19% of children and youth aged 10 to 17 years. The proportion of cases of Internet-initiated grooming for CSA reported to law enforcement agencies was 2.1%. Frequency estimates from studies conducted in high-school settings (76%) and based on reports by mental health professionals of their clients' experiences over the Internet (26%) were substantially higher. Likewise, frequency estimates of unwanted exposure to sexual material among children and youth aged 10 to 17 years in the general population ranged from 14% to 34%. The frequency of unwanted exposure to sexual material among students sampled in high school settings was 82.2%, and the frequency based on reports by mental health professionals was 6%.

Heterogeneity in the frequency estimates of both sexual solicitation and unwanted exposure to sexual material in the ten primary studies included in this rapid review may be due to differences in survey questions, sample size and sampling methodology. The results and demographic characteristics of the participants in the studies (mean age of 12.6 to 15.9 years) are consistent with claims that the victims of Internet-initiated sex crimes are not generally children but, rather, are more likely to be high-school aged youth.[11,25]

Recognizing that the victims of online sexual exploitation are not children but rather youth has some implications in understanding the risk factors and dynamics of online communication among the youth. Many media stories and many of the Internet-safety resources currently available emphasize that naivety and lack of experience are factors that make youth more vulnerable to online exploitation experiences. Investigators in developmental psychology, however, have remarked that such messages imply that youth will not be able to understand sexual matters they come across online and will be easily deceived about the sexual motives of people who intend to exploit them, thus ignoring the possibility that youth might use the Internet to pursue their own sexual interests.[53,54] It is important to keep in mind that youth are at a stage in life at which they have an intense interest in expanding their social networks, forming close relationships, and acquiring knowledge about sex. These normal developmental factors make them more vulnerable to responding to online sexual advances from adults.[45,55]

While the subject of the type of youth who experience online exploitation is dramatically under-researched, the studies summarized in this rapid review reported a variety of demographic, psychosocial, and behavioural factors that increase the risk of being exposed to online sexual exploitation. Risk factors for online sexual solicitation included being female, being older than 14 years of age, and engaging in sexual behaviour or other high-risk behaviours over the Internet, such as posting personal information or interacting with strangers online. The mechanism by which these behaviours may lead to problems is not clear, but it has been reported that arenas such as chat rooms or instant messaging, in which the communications take place instantly and in real time, may encourage more impulsive and risk-taking behaviour and, therefore, may increase the risk of solicitation.[11]

The co-occurrence of depressive symptoms, behavioural problems, dysfunctional communication with parents, and experiences of physical and/or sexual abuse offline were also described as strong predictors of online sexual solicitation. Particularly, there are suggestions that previously victimized children are more likely to be re-victimized, both as a child and later in life, than are other children,[20] and this pattern appears to hold for sexual exploitation experiences over the Internet.

Factors that increased the chances of being exposed to sexual material included being male, being between 13 and 17 years of age, the use of file sharing programs, frequent access to chat rooms, engagement in online conversations with strangers, and Internet use in other households. Likewise, mental health problems such as offline interpersonal victimization, depressive symptoms, behavioural problems, parental conflicts, and a history of physical or sexual abuse were also identified as predictors for experiences of unwanted exposure to sexual material online.

There is a paucity of research about the impact of sexual solicitation and of unwanted exposure to sexual material over the Internet, as well as on whether, how, or under what circumstances these experiences may trigger adverse responses in children and youth. It is unknown what the effects of such exposures might be on anxieties or patterns of arousal in some individuals.

Evidence on the assessment tools for children and youth who have been exploited over the Internet

No primary or secondary research studies were identified about the use of assessment tools for children and youth who have been sexually exploited via the Internet. Most research to date has relied on self-reported measures and it is very likely that children and youth under-report online encounters of a sexual nature for fear of embarrassment and parental scrutiny of future Internet activity. The magnitude and characteristics of the problem are still unknown, due in part to the absence of standard protocols that provide the empirical information necessary to fully understand the true scope of this

problem. Instruments for adequately assessing the magnitude and psychosocial consequences of sexual exploitation of children and youth over the Internet are essential to implementing prevention and response strategies that are both effective and efficient.

Evidence on the efficacy/effectiveness of prevention and therapeutic strategies

No evidence in the scientific literature from primary or secondary research studies was identified regarding the efficacy, effectiveness, and safety of prevention and therapeutic strategies for sexual exploitation of children and youth via the Internet. Many educational and public awareness efforts are available online to promote safer use of the Internet and new online technologies among children and youth. These programs, however, need to go through an evaluation of their effectiveness and safety.

Sexual exploitation has existed prior to the introduction of the Internet in the lives of children and youth. Evidence from meta-analyses on the effectiveness and safety of preventive approaches to offline CSA has shown that prevention programs are effective in increasing knowledge and self-protection skills in children and youth.[87,88] Negative adverse effects such as fear or anxiety do not seem to be associated with program participation.[89] Cognitive behavioural therapy (CBT) has been shown to be effective as the treatment basis for children and youth who have been sexually abused.[90] This approach has been combined with other therapies such as group,[91] play, and art[89] therapies according to individual needs, age, and developmental stages. There is a need to evaluate and consider whether these and other preventive and therapeutic approaches are equally effective and safe for online sexual exploitation and abuse. Basing prevention and therapeutic recommendations on media reports can lead to misguided public policy.

Strengths and limitations

The strengths of this rapid review pertain to its rigour in terms of searching the literature on sexual exploitation of children and youth over the Internet. The search strategy used is likely to have identified the majority of the available published research literature on the topic.

Publication bias was not investigated in this rapid review, as the number of included studies was insufficient to produce funnel plots to statistically assess the impact of publication bias in the review findings. However, it is unlikely that the studies published in this area are biased with respect to the prevalence estimates reported.

Another limitation of this rapid review is the restriction of included studies to English language publications. The magnitude of bias that the exclusion of non-English studies may have produced in the results summarized in this rapid review is unknown.

A comprehensive strategy was used to select and summarize the scientific literature on sexual exploitation of children and youth over the Internet. A pre-defined set of selection criteria was peer-reviewed internally and applied consistently to the potentially relevant studies. Likewise, a data extraction form was pre-tested before information was summarized from the selected studies. Only one reviewer applied the selection criteria and extracted data from the selected studies; therefore, it is unknown whether selection bias was introduced in any stage of the review process.

Finally, this rapid review did not include a formal assessment of the methodological quality of the included studies. The approach to quality focused mainly on summarizing some study characteristics that are related to both the internal and external validity of studies on the prevalence of online sexual exploitation such as the method of sampling, the study response rates, the methods for data collection, and the inclusion and exclusion criteria to select participants in the studies. The lack of a formal assessment of the methodological quality of the selected studies tempers the conclusions that may be drawn from the findings reported in the individual studies.

This rapid review focuses on the problem of sexual exploitation of children and youth over the Internet and, thus does not include the potential problems associated with the use of other technologies such as mobile phones, digital cameras, and video devices. Future studies should assess how these and other new digital media technologies are being used as a medium to sexually exploit children and youth, and to determine what measures can be taken to prevent this problem.

CONCLUSIONS

This rapid review summarized the evidence from relevant research studies on the frequency of sexual exploitation of children and youth over the Internet under the form of sexual solicitation and unwanted exposure to sexual material. At the present time, the evidence from the studies included in this rapid review shows that up to one in five youth have been approached for sexual solicitation purposes over the Internet; Similar results were found for unwanted sexual material over the Internet, with up to one-third of youth reporting that they saw sexual material online that they did not want to see. Only a small proportion of youth describes these experiences as stressful or reports them to their parents or law enforcement agencies.

The recognition of the importance of the Internet in the everyday life of young people is increasing as researchers examine the impact of this medium on attitudes, behaviour, and health. The problem of online sexual exploitation has emerged as a new field of inquiry on how the Internet influences the lives of children and youth. Research in this area is in the early stages. The focus has mainly been on identifying the type and characteristics of online activities that children and adolescents engage in and the frequency and risk factors

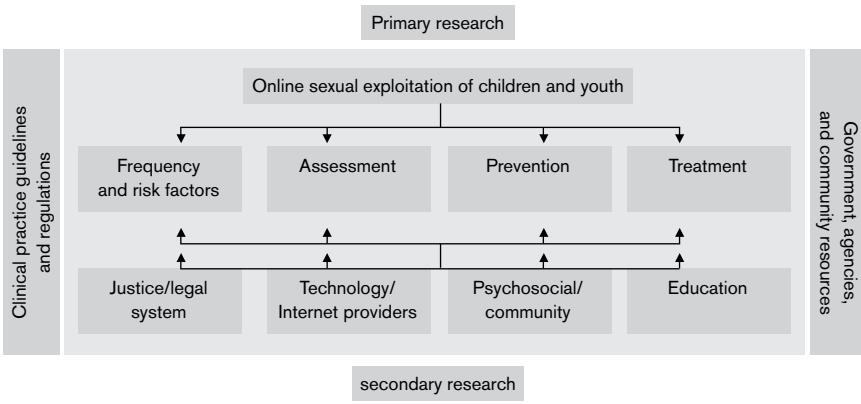
of situations in which sexual solicitation and unwanted contact with sexual material take place. Expanded research is necessary regarding the assessment, prevention, and treatment of online sexual exploitation. Given the significant mental and behavioural health burden that sexual exploitation can place on some children and youth, understanding how online behaviours may relate to this burden will help inform health professionals in their assessment procedures and treatment strategies.

While there have been some initiatives to protect children and youth from certain potential perils of Internet use, the issue of online sexual exploitation has not entered the mainstream of the research conducted in the field of child abuse and neglect. Rather, child and youth safety over the Internet has been seen as a matter which largely needs to be addressed by parents and children and youth themselves, guided by advice from the government and other organizations. Continuing research and is necessary to understand these problems and to effectively respond to them through the creation of evidence-based prevention programs. Prevention and treatment interventions should be modeled after principles and key elements of approaches supported by research. Government, agencies, and the new technology industries should be aware of the existence of this problem, should have a proper knowledge of its characteristics and consequences, and should understand the policy and practice challenges to which they give rise.

APPENDIX A: METHODOLOGY

A prospectively designed protocol was used to map the evidence from the scientific literature on sexual exploitation of children and youth over the Internet. Figure A1 presents the analytic framework outlining our approach to the Information Paper.

Figure 2: Flow diagram for study retrieval and selection



Search Strategy

Comprehensive searches of the sociological and criminal justice, psychological, educational, and biomedical electronic databases listed in Table A1 were conducted for the time period from 2003 to September 20, 2009. The search strategy was designed by an Information Specialist at IHE and comprised both controlled vocabulary and keywords. No filters by study design were used in the search strategy. In addition, Internet searches via Google and Google Scholar were carried out, and reference lists of relevant studies were perused to identify further studies. Government websites were also searched for additional information. Proceedings of relevant scientific conferences in this topic were hand-searched. Finally, primary authors and experts in the area were contacted to identify other potentially relevant studies. The search was limited to English language articles only.

Table A1: Search strategy

Database	Edition or date searched	Search Terms ††
Core Databases		
The Cochrane Library http://www.thecochranelibrary.com	Issue 3, 2009 (Sept 20, 2009)	in Title, Abstract or Keywords: (internet OR online OR cyber) and (child* OR adolescent* OR teen* OR youth*) and (abuse* OR pornography OR exploit* OR victim*) (0 results)
MEDLINE (includes in- process and other non-indexed citations) (Ovid Interface)	(Sept 20, 2009)	1. internet 2. child abuse, sexual 3. child pornography.mp 4. Pedophilia 5. exp Sex Offenses 6. (sex* and (exploit* or abuse* or victim* or prey* or predat* or harass*)).mp 7. (child* or adolescent* or teen* or youth*).mp 8. 2 or 3 or 4 or (7 and (5 or 6)) 9. 1 and 8 10. limit 9 to yr="2003-2009" (Ref ID : 1-78)

PsycINFO (Ovid Interface)	September, Week 3, 2009 (Sept 20, 2009)	1. internet 2. Pedophilia 3. sexual abuse 4. (sex* and (exploit* or abuse* or victim* or prey* or predat* or harass*)).mp 5. Pornography 6. sex offenses 7. (child* or adolescent* or teen* or youth*).mp 8. 2 or (7 and (3 or 4 or 5 or 6)) 9. 1 and 8 10. limit 9 to (english language and yr="2003-2009") (Ref ID: 128-232)
EMBASE (Ovid Interface)	2009 Week 38 (Sept 20, 2009)	1. internet 2. child sexual abuse 3. child pornography.mp 4. Pedophilia 5. sexual crime 6. sexual abuse 7. (sex* and (exploit* or abuse* or victim* or prey* or predat* or harass*)).ti,ab 8. (child* or adolescent* or teen* or youth*).mp 9. 2 or 3 or 4 or (8 and (5 or 6 or 7)) 10. 1 and 9 11. limit 10 to yr="2003-2009" (Ref ID 79-127)
Violence and Abuse Abstracts (EBSCO interface)	Sept 20, 2009	((ZU "internet") or (ZU "internet & children") or (ZU "internet & children – safety measures") or (ZU "internet & teenagers") or (ZU "internet & teenagers – safety measures") or (ZU "internet – safety measures") or (ZU "internet pornography")) AND (child* OR adolescent* OR youth* OR teen*) AND sex* (Ref ID 233-237)
Child Abuse and Neglect Digital Library http://www.ndacan.cornell.edu/NDACAN/Bibliography.html	Sept 20, 2009	Follow the CANdl link on the page to access a Refworks file Online internet (automatically "ors") (Ref ID 238-252)
CRD Databases (DARE, HTA & NHS EED)	Sept 20, 2009	(internet OR online) AND (child* OR adolescent* OR teen* OR youth*) AND (abuse* OR pornography OR exploit* OR victim* OR harass* OR prey* OR predat*) (0 relevant results)

Mental Measurements Yearbook (EBSCO Interface)	Sept 20, 2009	(online OR internet) and (abuse* OR victim* OR pornography OR exploit* OR prey* OR predat* OR harass*) and (child* OR teen* OR youth* OR adolescent*) (0 results)
ERIC (Ovid Interface)	August 2009 (Sept 20, 2009)	1. internet 2. pedophil*.mp. 3. pornography/ 4. (sex* and (exploit* or abuse* or victim* or prey* or predat* or harass*)).mp. 5. 2 or 3 or 4 6. 1 and 5 7. limit 6 to yr="2003-2009" (Ref ID 253-277)
CINAHL (EBSCO Interface)	Sept 20, 2009	(MH "Internet") 1. (pedophil* OR pornograph*) or (sex* and (offen* or exploit* or abuse* or victim* or prey* or predat* or harass*)) 2. child* or adolescent* or teen* or youth* 3. S1 and S2 and S3 Limiters - Publication Year from: 2003-2009; Language: English (Ref ID 278-328)
Web of Science	Sept 20, 2009	TS=(internet OR cyber OR online) AND TS=((pedophil* OR pornograph*) OR (sex* AND (offen* OR exploit* OR abuse* OR victim* OR prey* OR predat* OR harass*))) AND TS=(child* OR adolescen* OR teen* OR youth*) AND Language=(English) (Ref ID 329-397)

Grey Literature		
Alberta Government http://alberta.ca/home/	Issue 3, 2009 (Sept 20, 2009)	in Title, Abstract or Keywords: (internet OR online OR cyber) and (child* OR adolescent* OR teen* OR youth*) and (abuse* OR pornography OR exploit* OR victim*) (0 results)
Google Results http://www.google.ca	Oct 1, 2009	Treatment for online sexual exploitation

Note: "*" is a truncation character that retrieves all possible suffix variations of the root word, that is, surg* retrieves surgery, surgical, surgeon, etc. Searches separated by semicolons have been entered separately into the search interface

Study selection process

The research studies included in the report were selected and evaluated by one reviewer using a multistage process. First, we developed a predefined set of broad screening criteria for identifying articles that were potentially relevant to the topic of study (see Table A2). The initial selection was based only on screening of titles and abstracts. When an article met the screening criteria or when there was not enough information to definitely exclude it, the full text was retrieved.

Table A2: Screening criteria

Criteria	Yes	No	Unsure
R1: Population: Described as children and/or youth and/or their families.	1	2	3
R2: Issue: Sexual exploitation of children and youth over the Internet.	1	2	3
R3: Language: Studies published in English language only	1	2	3

Decisions: ☐ Retrieve article; ☐ Do not retrieve article

Instructions: For each title/abstract, go through the four criteria R1 to R3, in any order. Any article must clearly satisfy all of the criteria in order to be considered potentially relevant. Stop at the first "No" and classify the study as "Do not retrieve article." Otherwise, classify it as "Retrieve article." If it is unclear whether the article meets any one of the criteria, the article will be considered eligible for retrieval and further review.

The full text of manuscripts deemed relevant were retrieved for a closer inspection. One reviewer appraised the full text of potentially relevant studies using a standard form that outlined the eligibility criteria for the rapid review. Studies that did not meet the selection criteria at this stage were excluded and the reasons for exclusion were documented (Table B2, Appendix B).

Inclusion criteria

Considered for inclusion were all reports of original primary and secondary research that satisfied the following selection criteria:

Primary research

- Primary scientific studies reporting on frequency, effects, risk factors, assessment, and prevention of, or treatment strategies for, online sexual exploitation of children and youth.
- Randomized controlled clinical trials, controlled clinical trials, observational studies (cohort studies, case control studies, cross sectional studies), case series, case reports, and qualitative research will be considered for inclusion.
- Studies on individuals aged less than 18 years of age, of both sexes, at risk of or who have been subjected to online sexual exploitation. For the purposes of this review, children were defined as individuals younger than 14 years of age and youth were defined as individuals aged 14 to 18 years.

- Studies reporting child, youth, or family-related outcomes regarding the frequency, effects, risk factors, assessment, and prevention of, or treatment strategies for, online sexual exploitation.

Secondary research

- Systematic reviews reporting on issues related to incidence/prevalence, risk factors, effects, assessment, and prevention of, or treatment strategies for, online sexual exploitation of children and youth.
- A review was considered to be systematic if it met the following criteria developed by Cook et al.:[92] a) focused clinical question; b) explicit search strategy; c) use of explicit, reproducible, and uniformly applied criteria for article selection; d) critical appraisal of the included studies; e) qualitative or quantitative data synthesis.

In the case of multiple publications, that is, of instances in which the same study was published more than once or part of the data from an original report was republished,[93,94] the most recent and complete version was considered to be the main study. The multiple publications were not considered to be unique studies and any information they provided was included with the data reported in the main study.

Exclusion criteria

This rapid review did not address issues related to the incidence/prevalence, risk factors, effects, assessment, and prevention of, or treatment strategies for, sexual exploitation of children and youth that is initiated offline, or issues related to other situations such as online bullying and harassment.

Editorials, letters, commentaries, narrative reviews, overview articles, and position papers were excluded from the evaluation of the current scientific evidence. Studies in which the unit of analysis was the sex offender were excluded unless they provided information about outcomes in children, youth or their families.

Clinical practice guidelines

Clinical practice guidelines for assessment, prevention, and/or treatment for sexual exploitation of children and youth were sought.

Education and awareness initiatives, and law enforcement and therapeutic resources

An inventory of health care, educational, and community resources available in Alberta and in Canada for children, youth, and their families, relating to online sexual exploitation, was generated throughout the review process.

Data extraction

Information regarding the study design and methods, the characteristics of participants, and the outcomes of interest was extracted using a pretested data extraction form. Data collection on study design and methods included information on the country, year, funding source, study design, setting and duration of the study, inclusion and exclusion criteria, sampling and data

collection methods, and unit of analysis. Data on characteristics of the participants included information on chronological age, gender, socio-economic status, and educational level, if available. Data was obtained on outcomes of interest regarding the frequency and characteristics of the Internet-related exploitation problem. Finally, information on study conclusions was collected as reported by the authors of the primary studies. Data from the primary studies were extracted by one reviewer and then verified for accuracy and completeness of the data. Study selection and data extraction were managed with Microsoft Excel™ (Microsoft Corporation, Redmond, WA). Details of the reviewed primary research studies are summarized in Table C1 (Appendix C).

Methodological quality assessment

No formal assessment was carried out to evaluate the methodological quality of the selected research studies.

Data analysis and statistical methods

Characteristics of the included studies were summarized using descriptive statistics (that is, proportions and percentages for categorical data, means with standard deviations (SD), or medians with interquartile ranges (IQR), for continuous data). Data from the included studies was synthesized qualitatively. Evidence tables were constructed to report information on each article's source, study design, study population, and outcomes. The evidence tables also included summaries of study conclusions, as reported by the authors of the individual studies. All analyses were performed using the software Statistical Package for the Social Sciences® for Windows® (SPSS® version 17.0, SPSS Inc., Chicago, IL).

External review

External reviewers with clinical expertise in the topic of online child sexual exploitation and health technology assessment methodologies evaluated the draft report and provided feedback. In selecting reviewers, the practice of the IHE is to choose experts who are well recognized and published in peer-reviewed literature, and who can offer a provincial or national perspective on the problem of sexual exploitation of children and youth over the Internet.

APPENDIX B: EXCLUDED STUDIES

The application of the selection criteria resulted in 66 excluded studies. The primary reasons for exclusion of studies from the rapid review were as follows: 1) the study was a narrative review, commentary, or editorial (n = 34); 2) the study did not evaluate problems relating to the sexual exploitation of children and youth over the Internet (n = 24); and 3) the study did not examine a population consisting of children or youth as the unit of analysis (n = 8). Table B1 lists the references of excluded studies and the reason for their exclusion from the rapid review.

Table B1: Excluded research studies

Main reason for exclusion: Article is a narrative review, commentary, editorial (N = 34)
Alexy EM, Burgess AW, Baker T. Internet offenders: traders, travelers, and combination trader-travelers. Journal of Interpersonal Violence 2005;20(7):804-12
Anonymous. Also of note: do social networking sites expose youngsters to sexual harassment? Contemporary Pediatrics 2008;25(4):72
Protecting children and teens from cyber-harm. Certain patterns of behavior confer risk; here's what the research shows. Harvard Mental Health Letters 2008;25(1):4-5
Beech AR. The Internet and child sexual offending: a criminological review. Aggression and Violent Behavior 2008;13(3):216-28
Berson IR. Grooming cybervictims: the psychosocial effects of online exploitation for youth. Journal of School Violence 2003;2(1):5-18
Bow JN, Bailey RW, Samet C. Forensic evaluation of Internet sexual activity. Journal of Forensic and Psychology Practice 2005;5(2):1-29
Bross DC. Minimizing risks to children when they access the World Wide Web. Child Abuse & Neglect 2005;29(7):749-52
Burke MG. Which youngsters are exposed to online pornography? Contemporary Pediatrics 2007;24(4):97-8
Carr J, Hilton Z. Child protection and self-regulation in the Internet industry: the UK experience. Children & Society 2009;23(4):303-8
Chase E, Statham J. Commercial and sexual exploitation of children and young people in the UK: a review. Child Abuse Reviews 2005;14(1):4-25
Chisholm JF. Cyberspace violence against girls and adolescent females. Annals of the New York Academy of Sciences 2006; 1087:74-89
Dombrowski SC, LeMasney JW, Ahia CE, et al. Protecting children from online sexual predators: technological, psychoeducational, and legal considerations. Professional Psychology, Research and Practice 2004;35(1):65-73
Elliott IA. Understanding online child pornography use: Applying sexual offense theory to internet offenders. Aggression and Violent Behavior 2009;14(3):180-93
Genuis SJ, Genuis SK. Implications of cyberspace communication: a role for physicians. The Southern Medical Journal 2005;98(4):451-5

Godejord PA. Perspectives on awareness work in the field of sexual abuse of children in digital media. In: Smith MJ. (Ed.) Child sexual abuse: issues and challenges. Nova Science Publishers, Inc.; New York, 2008

Greenfield PM. Inadvertent exposure to pornography on the Internet: implications of peer-to-peer file-sharing networks for child development and families. Journal of Applied Developmental Psychology 2004;25(6):741-50

Guan SS, Subrahmanyam K. Youth Internet use: risks and opportunities. Current Opinion in Psychiatry 2009;22(4):351-6

Harrison C. Cyberspace and child abuse images: a feminist perspective. Affilia: Journal of Women and Social Work 2006;21(4):365-379

Iton A, Oliver MM, Torgensen K. Preventing sexual exploitation of children and teens. The Journal of Law, Medicine & Ethics 2005;33(4):38-9

Livingstone S. Children's use of the internet: reflections on the emerging research agenda. New Media Society 2003;5(2):147-66

Livingstone S, Bober M. Regulating the Internet at home: contrasting the perspectives of children and parents. In: Buckingham D, Willett R. (Eds.) Digital generations. Mahwah, NJ: Lawrence Erlbaum Associates, Inc; 2006

Livingstone S, Haddon L. Risky experiences for children online: charting European research on children and the Internet. Children and Society 2008;22(4):314-23

Mitchell KJ, Finkelhor D, Wolak J. Youth on the Internet: who is at risk? The Link: The Official Newsletter of the International Society for Prevention of Child Abuse & Neglect 2001;10(2):1-2

Newton D. Training update. Child Abuse Reviews 2005;14(6):444-6

O'Connell R. From fixed to mobile Internet: the morphing of criminal activity online. In Calder, M. (Ed.) Child sexual abuse and the Internet: tackling the new frontier. Russell House Publishing, Dorset; 2004.

Russell G. Pedophiles in Wonderland: censoring the sinful in cyberspace. Journal of Criminal Law & Criminology 2008;98(4):1467-99

Schell BH. Cyber child pornography: a review paper of the social and legal issues and remedies–and a proposed technological solution. Aggressive and Violent Behaviour 2007;12(1):45-63

Shih JL, Lee CH, Yang CS. An adult image identification system employing image retrieval technique. Pattern Recognition Letters 2007;28(16):2367-74

Slane A. Child sexual exploitation, technology and crime prevention education: keeping pace with the risks? A Research Report submitted to Public Safety Canada. Unpublished Material; 2009

Trisnadi-Rages LV. An ecological systems approach to reduce children's encounters with obscenity on the Internet. University of Missouri; Columbia (MI), 2007

Werner J, Werner MC. Child sexual abuse in clinical and forensic psychiatry: a review of recent literature. Current Opinion in Psychiatry 2008;21(5):499-504

Williams KS. Facilitating safer choices: use of warnings to dissuade viewing of pornography on the internet. Child Abuse Reviews 2005;14(6):415-29

Wolak J, Ybarra ML, Mitchell K, et al. Current research knowledge about adolescent victimization via the Internet. Adolescent Medicine 2007;18(2):325-41

Young A, Young A, Fullwood H. Adolescent online victimization. Prevention Researcher 2007;14(1):8-9

Main reason for exclusion: Not on sexual exploitation of children and/or youth over the Internet (N = 24)
Adams JA, Kaplan RA, Starling SP, et al. Guidelines for medical care of children who may have been sexually abused. Journal of Pediatric and Adolescent Gynecology 2007;20(3):163-72
Atwood JD. Mommy's little angel, daddy's little girl: do you know what your pre-teens are doing? American Journal of Family Therapy 2006;34(5):447-67
Braun-Courville DK, Rojas M. Exposure to sexually explicit Web sites and adolescent sexual attitudes and behaviors. Journal of Adolescent Health 2009;45(2):156-62
Cameron KA, Salazar LF, Bernhardt JM, et al. Adolescents' experience with sex on the web: results from online focus groups. Journal of Adolescence 2005;28(4):535-40
Crisanto A. Female adolescents and sexual behaviors on the Internet. Dissertation Abstracts International: Section B: The Sciences and Engineering 2006;66(11-B)
Finn J, Kerman B. Internet Risks for Foster Families Online. Journal of Technology and Human Services 2004;22(4):21-38
Hinduja S, Patchin JW. Personal information of adolescents on the Internet: A quantitative content analysis of MySpace. Journal of Adolescence 2008;31(1):125-46
Jacob VS, Krishnan R, Ryu YU. Internet content filtering using isotonic separation on content category ratings. ACM Transactions on Internet Technology 2007;7(1)
Malesky LA, Jr. Predatory online behavior: modus operandi of convicted sex offenders in identifying potential victims and contacting minors over the internet. Journal of Child Sexual Abuse 2007;16(2):23-32
Mesch GS. Social bonds and internet pornographic exposure among adolescents. Journal of Adolescence 2009;32(3):601-18
Mitchell KJ, Becker-Blease KA, Finkelhor D. Inventory of problematic Internet experiences encountered in clinical practice. Professional Psychology, Research & Practice 2005;36(5):498-509
Mitchell KJ, Finkelhor D, Wolak J. Protecting youth online: family use of filtering and blocking software. Child Abuse & Neglect 2005;29(7):753-65
Olson LN, Daggs JL, Ellevold BL, Rogers TKK. Entrapping the innocent: toward a theory of child sexual predators' luring communication. Communication Theory 2007;17(3):231-51
Peter J, Valkenburg PM. Adolescents' exposure to sexually explicit Internet material and sexual satisfaction: a longitudinal study. Human Communication Research 2009;35(2):171-94
Wells M, Mitchell KJ. How do high-risk youth use the internet? characteristics and implications for prevention. Child Maltreatment 2008;.13(3):227-34
Wishart J. Internet safety in emerging educational contexts. Computers & Education 2004;43(1-2):193-204
Wolak J, Finkelhor D, Mitchell K. Is talking online to unknown people always risky? Distinguishing online interaction styles in a national sample of youth Internet users. Cyberpsychology & Behaviour 2008;11(3):340-3
Wolak J, Mitchell KJ, Finkelhor D. Escaping or connecting? Characteristics of youth who form close online relationships. Journal of Adolescence 2003;26(1):105-19
Ybarra ML. Linkages between depressive symptomatology and Internet harassment among young regular Internet users. Cyberpsychology & Behaviour 2004;7(2):247-57

Ybarra ML. Linkages between internet and other media violence with seriously violent behavior by youth. Pediatrics 2008;122(5):929-37
Ybarra ML, Alexander C, Mitchell KJ. Depressive symptomatology, youth Internet use, and online interactions: A national survey. Journal of Adolescent Health 2005;36(1):9-18
Ybarra ML, Diener-West M, Leaf PJ. Examining the overlap in internet harassment and school bullying: implications for school intervention. Journal of Adolescent Health 2007;41(6 Suppl 1):S42-S50
Ybarra ML, Mitchell KJ. Online aggressor/targets, aggressors, and targets: a comparison of associated youth characteristics. Journal of Child Psychology and Psychiatry, and Allied Disciplines 2004;45(7):1308-16
Ybarra ML, Mitchell KJ. Youth engaging in online harassment: associations with caregiver-child relationships, Internet use, and personal characteristics. Journal of Adolescence 2004;27(3):319-36
Main reason for exclusion: **Children and/or youth and/or families are not the unit of analysis (N = 8)**
Bagley C. Diminishing incidence of Internet child pornographic images. Psychology Reports 2003;93(1):305-6
Burgess AW, Mahoney M, Visk J, et al. Cyber child sexual exploitation. Journal of Psychosocial Nursing and Mental Health Services 2008;46(9):38-45
Clayton R. Failures in a hybrid content blocking system. Privacy Enhancing Technologies 2006;3856:78-92
Gallagher B. Internet-initiated incitement and conspiracy to commit child sexual abuse (CSA): the typology, extent and nature of known cases. Journal of Sexual Aggression 2007;13(2):101-19
Marcum CD. Interpreting the intentions of internet predators: an examination of online predatory behavior. Journal of Child Sexual Abuse 2007;16(4):99-114
Mitchell KJ, Wolak J, Finkelhor D. Police posing as juveniles online to catch sex offenders: is it working? Sex Abuse 2005;17(3):241-67
Walsh WA, Wolak J. Nonforcible Internet-related sex crimes with adolescent victims: prosecution issues and outcomes. Child Maltreatment 2005;10(3):260-71
Wolak J, Mitchell K, Finkelhor D. Internet sex crimes against minors: the response of law enforcement. Alexandria, VA: National Center for Missing & Exploited Children; 2003

APPENDIX C: RESULTS REPORTED BY PRIMARY RESEARCH STUDIES

Table C1: Studies on the frequency and associated risk factors of child sexual exploitation over the Internet

Study	Topic/Objective	Study characteristics
Finkelhor D, [20001,34,52,63-67] Country: USA Funding: Government	1) To evaluate the frequency of unwanted sexual solicitations and unwanted exposure to pornography 2) To evaluate the association between depressive symptomatology and unwanted Internet experiences	**Design:** Cross-sectional survey **Setting:** Community **Study dates:** Aug 1999 to Feb 2000 RR = 57% **Sampling method:** Random **Data collection:** Telephone survey

	Population characteristics	Measures of interest	Author conclusions
	Selection criteria: 1) Ages 10 to 17 yr; 2) Internet access ≥ 6 times in the past 6 mo; 3) English speakers; 4) Resided in the household ≥ 2 weeks in the last yr **Unit of analysis:** Youth N = 1501 Male = 53% Female = 47% Age (mean) = 14.2 yr; SD = 1.9	**Online sexual solicitation = 19%** - Among males = 12% - Among females = 27% - Aggressive online sexual solicitation = 3% - Distressing online sexual solicitation = 5% - Solicitations by offline friends and acquitances = 3% **Unwanted exposure to sexual material = 25%** - While surfing the web = 73% - While opening email or IM =27% - Distressing exposure to sexual material = 6% - Cases reported to authorities: solicitation (10%); unwanted exposure (3%) - Episodes not disclosed to anyone: solicitation (24%); unwanted exposure (43%) **Risk factors for online sexual solicitation:** being female, being older (≥14 yr) , chat room use, talking online to strangers, high-risk online behaviour, mental problems (depressive symptoms, delinquent behaviour, substance abuse), high Internet use, use of Internet at other households **Risk factors for unwanted exposure to sexual material:** being male, being older (≥15 yr), high-risk online behaviour, email use, depressive symptoms, use of Internet at other households, mental health problems, chat room use, high Internet use, talking online with strangers	1) A large proportion of youth encounter offensive experiences on the Internet. 2) Most sexual solicitations fail, but the quantity is potentially alarming. 3) Unwanted exposure to sexual material is more frequent than sexual solicitation.

Study	Topic/Objective	Study characteristics
Fleming MJ, 2006[77] Country: Australia Funding: NR	1) To examine exposure to inappropriate material online	Design: Cross-sectional study - Setting: High schools - Study dates: NR - RR = NR - Sampling method: NR - Data collection: Self-reported questionnaire
Gallagher B, 2006[4] Country: United Kingdom Funding: Foundation	1) To evaluate the extent of Internet child abuse cases which had a link to the UK and which were known to law enforcement agencies	Design: Cross-sectional study - Setting: Law enforcement agencies - Study dates: Jan 1999 to Dec 2002 - RR = 46.2% - Sampling method: Convenience - Data collection:
Leander L, 2008[59] Country: Sweden Funding: Government	1) To investigate how victims of Internet-initiated sexual abuse report, in police interviews, about the acts in which they had been involved	Design: Qualitative - Setting: Law enforcement agencies - Study dates: NR RR = NR - Sampling method: Convenience - Data collection: Interview

	Population characteristics	Measures of interest	Author conclusions
	Selection criteria: NR Unit of analysis: Youth N = 692 Male = 67% Female = 33% Age (mean) = 14.7 yr; SD = 0.8	**Exposure to inappropriate sexual behaviour/comments online** = 75.81% - Among males = 82.5%; - Among females = 62.2% **Exposure to inappropriate sexual material online** = 82.2% - Among males = 92.5%; - Among females = 61.3%	1) There are significant differences in the amount of exposure to inappropriate material or behaviours online, according to sex and frequency of use, with males and frequent Internet users being at higher risk
	Selection criteria: NR Unit of analysis: Cases of child abuse reported to police services N = 571 Male = NR Female = NR Age (mean) = NR (age range = 12 to 16 yr)	**Extent of Internet-initiated grooming for sexual abuse among all sexual abuse cases** = 2.1%	1) The number of known cases of Internet CSA was relatively small. Most police services investigated only a few (less than five) of these cases per anuum.
	Selection criteria: Female youth victims of Internet-initiated sexual abuse by the same perpetrator Unit of analysis: Youth N = 68 Male = 0% Female = 100% Age (mean) = 15.3 yr; SD = 1.6	**Frequency of abusive acts reported to authorities:** - Provided personal info (94%); provided facial photographs (84%); provided nude photos (40%); discussed sexual preferences (65%); discussed meeting for sex (84%); performed Web show trip (19%); performed sexual Web show (28%); met and engaged in sex (40%); met and did not engage in sex (7%); met several times with the abuser (23%)	1) There is a gap between what the victims report about online sexual abuse events and what they presumably remember. 2) Victims are more willing to report the less severe online sex-related activities.

Study	Topic/Objective	Study characteristics
McCabe KA, 200878 Country: USA Funding: NR	1) To identify the extent to which specific crimes of child pornography and child prostitution are reported to law enforcement by ISPs	Design: Secondary data analysis (retrospective cohort study) - Setting: Law enforcement agencies - Study dates: Apr to Dec 2004 RR = NA - Sampling method: NR - Data collection: Questionnaire
Mishna F, 200979 Country: Canada Funding: NR	1) To increase understanding of children's and youths' online interactions and experienes of cyber abuse	Design: Qualitative study - Setting: Clinical services (Web-based counselling service) - Study dates: Mar 2004 to Sep 2005 RR = NA - Sampling method: Convenience - Data collection: Electronic search of posts in the Website

	Population characteristics	Measures of interest	Author conclusions
	Selection criteria: Law enforcement agencies identified through the 1999 National Directory of Law Enforcement Unit of analysis: Law enforcement agencies N = 182 agencies Male = NA Female = NA Age (mean) = NA	**Agencies that reported referrals by an ISP of online child abuse cases = 25.3%** Types of reports: - Child pornography (78.3%); exposure to child pornography (71.7%); child prostitution by local pimps over the Internet (26%); child prostitution by organized or national groups (19.6%)	1) The majority of cases of suspected online child victimization reported by ISPs to law enforcement agencies consist of the production/distribution of child pornography.
	Selection criteria: NR Unit of analysis: Posts sent by children and adolescents N = 346 Male = 22.3% Female = 77.7% Age (mean) = 14.2 yr; SD = 2.2	- Experiences of online solicitation directed to preadolescents and adolescents. - Female and gay or bisexual partcipants were the most likely targets of older men trying to engage youths in cybersex and flashing Children and youth were generally afraid to tell their parents about the incidents	1) Children and youth reported experiencing sexual solicitation. The majority of the incidents are not reported to parents because of fear of punishment or of reprisal by the predator

Study	Topic/Objective	Study characteristics
Mitchell KJ, 2007[68,69,80] Country: USA Funding: Government	1) To examine the types of problematic Internet experiences among youth receiving mental health treatments	Design: Cross-sectional survey - Setting: Clinical services - Study dates: NR RR = NR - Sampling method: Random - Data collection: Questionnaire completed by health professionals
Noll JG, 200981 Country: USA Funding: Government	1) To determine the risk factors for Internet-initiated victimization of female adolescents	Design: Cross-sectional comparative study - Setting: Clinical Services (Child protective service agencies) - Study dates: NR RR = NR - Sampling method: Convenience - Data collection: Questionnaire

	Population characteristics	Measures of interest	Author conclusions
	Selection criteria: Ages 6 to 17 yr; 2) Youth receiving mental health services Unit of analysis: Youth (data reported by mental health professionals) N = 512 Male = 57% Female = 43% Age (mean) = 14.3 yr; SD = 1.9	Online sexual exploitation = 25.7% - Among youth with Internet-related reported problem = 26% - Among youth without Internet-related reported problem = 25% Unwanted exposure to sexual material = 5.8% - Among youth with Internet-related problem (n = 140) = 4% - Among youth without Internet-related presenting problem (n = 372) = 11% Risk factors for online sexual solicitation: being female; experience of other problematic Internet experiences; co-occurrence of mental health issues (somatic complaints or insomnia; parent-child conflict; running away from home; sexual victimization; sexual acting out)	1) Online sexual exploitation is equally likely to be a primary persenting problem as it is to be secondary to more conventional mental health concerns. Unwanted exposure to sexual material was less likely to be a primary presenting problem. 2) One in four youth clients in treatment with an Internet-related problem had experienced one episode of online sexual exploitation. 3) Victims of Internet-related sexual exploitation have some of the same mental health characteristics as traditional sexual abuse victims. However, only a minority have a lifetime diagnosis of post-traumatic stress.
	Selection criteria: Adolescent girls who had experienced substantiated childhood abuse (such as neglect, physical or sexual abuse) Controls: Non-abused girls recruited from a primary health centre Unit of analysis: Youth N = 173 (Childhood abused group = 104; non-abused peers = 69) Female = 100% Age (mean) = NR (age range = 14 to 17 yr)	**Risk factors for sexual solicitation:** Abused girls were significantly more likely to have experienced online sexual advances ($p<0.001$) and to have met someone offline ($p = 0.03$). Protective factors: caregiver presence while on Internet. - Other risk factors: being preoccupied with sex and sexual thoughts; substance use; associating with high-risk peers (regular smokers, alcohol or illegal drug users, those enganged in risky sexual behaviours such as multiple sex partners, one-night standers, intercourse without contraception)	1) Abused adolescent girls reported higher incidences of both online sexual advances and offline, in-person encounters.

Study	Topic/Objective	Study characteristics
Rosen LD, 2008[82a] Country: USA Funding: NR	1) To examine the potential of experiences of a sexual nature on MySpace	Design: Cross-sectional survey - Setting: Community - Study dates: Jun 2006 RR = NR - Sampling method: Convenience - Data collection: Online questionnaire
Rosen LD, 2008[82b] Country: USA Funding: NR	1) To assess sexual solicitation, exposure to sexual materials, and exposure to sexual talk on MySpace	Design: Cross-sectional survey - Setting: Community - Study dates: Sept 2006 RR = NR - Sampling method: Convenience - Data collection: Online questionnaire
Wolak J, 2004[37,49] Country: USA Funding: Government	1) To describe the characteristics of episodes in which juveniles became victims of sex crimes commited by people they met through the Internet	Design: Cross-sectional survey - Setting: Law enforcement agencies - Study dates: Oct 2001 to Jul 2002 RR = 88% - Sampling method: Convenience - Data collection: Mail questionnaire and phone interviews

	Population characteristics	Measures of interest	Author conclusions
	Selection criteria: MySpace users < 18 yr of age Unit of analysis: Youth N = 266 Male = 44% Female = 56% Age (mean) = 15.9 yr; SD = NR	**Uncomfortable experience of sexual nature using MySpace= 8.2%** - Risk factors for uncomfortable experiences of sexual nature: being female; having more "friends" in MySpace; talked more often with parents; having a MySpace for more than a year	1) A very small percentage of youth reported having an uncomfortable experience of a sexual nature in MySpace.
	Selection criteria: MySpace users < 18 yr of age Unit of analysis: Youth N = 341 Male = 38% Female = 62% Age (mean) = NR; SD = NR - "older teens" (17–18 yr) = 41% - "young teens" (14–16 yr) = 42% - "pre-teens" (< 14 yr) = 17%	**Online sexual solicitation:** = 14.7% - Among males = 16% - Among females = 14% - Very or extremely upset by sexual solicitation = 19% **Exposure to unwanted sexual material** = 14% - Very or extremely upset by uwanted exposure to sexual materials = 20% **Risk factors for sexual solicitation:** 16-18 age group **Risk factors for unwanted exposure to sexual material:** being female	1) A very small percentage of youth reported having an uncomfortable experience of a sexual nature on MySpace.
	Selection criteria: 1) Internet-initiated crimes involving sexual assault or child pornography; 2) Victims ≤ 18 yr; 3) Involved in arrests made between 2000-2001 Unit of analysis: Victims of cases prosecuted N = 129 Male = 25% Female = 75% Age (ranges) = 13-15 yr = 76%, 12 yr = 1%, ≤ 12 = 0%	**Characteristics of Internet-initiated crimes:** - Place of encounter: chat room (76%); IM (10%); email (5%); other (4%) - Time of communication between offender and victim: ≤ 1 mo (26%); 1-6 mo (48%); ≥ 6 mo (16%) - Offender and victim met face-to-face = 74% - Involvement of family and acquaintances in the Internet sex offences = 18%	1) Internet use can also play a role in sexual crimes against minors by family members and acquaintances.

Study	Topic/Objective	Study characteristics
Wolak J, 2006[70-76,83] Country: USA Funding: Government	1) To evaluate the frequency of unwanted sexual solicitations, harassment, and unwanted exposure to pornography via the Internet 2) To examine risk factors associated with online sexual victimization	Design: Cross-sectional survey - Setting: Community - Study dates: Mar to Jun 2005 RR = 45% - Sampling method: Random - Data collection: Telephone survey

	Population characteristics	Measures of interest	Author conclusions
	Selection criteria: 1) Ages 10 to 17 yr; 2) Internet use ≥1 per month for the past 6 months; 3) English speaking Unit of analysis: Youth N = 1500 Male = 49% Female = 51% Age (mean) = 14.2 yr; SD = 2.1	**Online sexual solicitation** = 13.3% - Among males = 30% - Among females = 70% - Aggressive online sexual solicitation = 4% - Distressing online sexual solicitation = 4% Solicitations by offline friends and acquitances = 14% - Place of encounter: chat room (37%); IM (40%); other (23%) Online sexual solicitation among high-risk youth = 28.3% **Unwanted exposure to sexual material** = 34% Distressing exposure to sexual material = 9% Cases reported to authorities = solicitation (5%); unwanted exposure (2%) **Risk factors for sexual solicitation**: being female; use of chat room; use of Internet with a cell phone; having a close online relationship; sending personal information to people met online; engaging in sexual behaviour online; experiencing offline parental conflict; physical/sexual abuse **Risk factors for unwanted exposure**: being male; being 13-17 years of age; use of file sharing programs; offline interpersonal victimization; depressive symptoms; history pf physical or sexual abuse and parental conflict; behavioural problems	1) There is a decline in the report of online sexual solicitations since 2000. 2) Exposure to unwanted sexual material has increased over time. 3) Youth bloggers are not at a higher risk for online sexual solicitation than youth that do not blog. Posting personal information did not increase the risk.

Study	Topic/Objective	Study characteristics
Ybarra ML, 2007[12,84] Country: USA Funding: Government	1) To examine the co-ocurrence of unwanted sexual solicitation and harrassment online 2) To examine whether social networking sites are related to increased risk for Internet victimization	Design: Cross-sectional survey - Setting: Community - Study dates: Aug to Sept 2006 RR = 26% - Sampling method: Random - Data collection: Online questionnaire

CSA = child sexual abuse; IM = instant messaging; ISP = Internet service provider; mo = month(s); NR = not reported; RR = response rate; SD = standard deviation; yr = year(s)

	Population characteristics	Measures of interest	Author conclusions
	Selection criteria: 1) Ages 10 to 15 yr; 2) Internet access at least once within the past 6 months; 3) English speaking Unit of analysis: Youth N = 1588 Male = 52.2% Female = 47.8% Age (mean) = 12.6 yr; SD = 1.9	**Online sexual solicitation** = 15% Types of online sexual solicitation: - Asked to do something sexual (11.4%); asked to engage in sexual talk (11.2%); asked to share personal sexual information (7.2%) Method of encounter: - IM (42.5%); chat rooms (31.7%); social networking site (27.1%); email (21.6%); online games (17.9%); blogging (5.5%) Risk factors for online sexual solicitation: being female; poor emotional bond with caregivers; poor caregiver monitoring; offline victimization (physical and sexual)	1) Online sexual solicitation seems to have a negative impact on a minority of youth. 2) The majority of youth who are online are not targeted for sexual solicitation. 3) The majority of targeted youth are approached via IM and chat rooms. 4) Youth affected by online sexual solicitation have a variety of psychosocial problems that may put them at a higher risk to be targeted.

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This report examines the research evidence on the frequency, effects, risk factors of sexual exploitation of children and youth over the Internet. The report also provides information on available resources in Alberta and Canada regarding Internet safety and prevention of child and youth abuse and exploitation via the Internet.

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