



Ontario Centre of Excellence  
for Child and Youth  
Mental Health

*Bringing People and Knowledge Together to Strengthen Care.*

# Using technology to deliver mental health services to children and youth in Ontario

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We thank the policy and decision-makers who attended workshops, responded to e-mails and participated in individual interviews. We thank as well the child and youth mental health agencies in Ontario and direct service providers who contributed their practice experiences and information on their use of technology to our scan of the current landscape in Ontario and beyond.



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## MAIN MESSAGES

There is a worldwide increase in both the number of technologies used to deliver child and youth mental health (CYMH) services, and in their use. Such technologies will likely continue to grow in importance and have the potential to transform the CYMH sector.

Technology is viewed as a way to enhance access to mental health services for children, youth and their families.

Technology use is changing client-practitioner relationships and offers opportunities to empower clients. Technology can enhance service integration and inter-professional collaboration.

Live interactive telephone and videoconferencing have a substantial history in delivering mental health services and supports to children, youth and their parents and caregivers.

The evidence base in the field of tele-mental health is well established and demonstrates a high degree of practitioner/user satisfaction, enhanced capacity of practitioners and families in rural communities, and overall therapeutic success.

Evidence for e-mental health is emerging and to date demonstrates the potential to engage young people, and deliver outcomes that are as good if not better than services as usual.

Existing services in Ontario have the capacity to make increased use of e-mental health as a vehicle for service delivery.

There is a strong need to address the outstanding issues and concerns related to privacy and confidentiality when using e-mental health to deliver services and supports.

Substantial gaps exist in the evidence base underlying e-mental health programs, especially regarding mobile applications. Much of what is currently available has not been evaluated.

A solid program of education and training in the use of particular technologies is needed for practitioners and consumers. Real time, ongoing technical support is a best practice.

Ethical and regulatory guidelines or frameworks are required to keep pace with the emergence of new technologies.

Targeted knowledge exchange is essential to the demystification, uptake and integration of new service delivery technologies. Government has been recognized as an enabler for local innovation in the use of technology.

Technology is changing more quickly than our ability to properly assess its application. Practice is moving ahead of evidence, and opportunities for research are not fully realized.



## EXECUTIVE SUMMARY

### Introduction

The Internet and other technologies have great potential for delivering mental health services to children, youth and their families.<sup>1</sup> The use of technologies such as mobile applications (apps), videoconferencing and Internet-based cognitive-behavioural therapy is burgeoning and there is a critical need to take stock of the impact of this movement, consider the advantages and difficulties associated with its use and develop strategies and policies to improve the practice of technology-enabled mental health service delivery.

This policy paper:

- provides an overview of the understandings and information needs of policy and decision-makers in Ontario regarding the use of technology in child and youth mental health service delivery.
- reviews the key literature in this area.
- reports on a provincial service scan of current use, barriers and challenges.
- presents evidence-informed recommendations for moving forward in this area.

By linking current research and relevant policy implications, this paper also provides a comprehensive picture of the potential role that technology (both existing and emerging) can have in improving child and youth mental health (CYMH) services in Ontario. There are promising implications if technology can be used to:

- provide more accessible mental health services, including reduced wait lists and enhanced access to services in under-served communities.
- reduce barriers related to stigma.
- support service delivery that is cost-effective and clinically effective.

Our focus is on technology being used in a therapeutic capacity, with an intervention component, although workflow, waitlist management and other administrative approaches that address barriers are considered. Technology used for other health topics, mental health literacy, education and training, or for the identification of community resources was outside of the scope of this paper.

### Goals and objectives

- (1) To engage with policy and decision-makers to identify their perspectives on the use of technology in mental health service provision for children and youth.
- (2) To review the literature on the use of technology in mental health service provision for children and youth.
- (3) To conduct a scan of child and youth serving mental health organizations in Ontario to identify their use and perceptions of technology in mental health service provision for children and youth.

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<sup>1</sup> There are a multitude of terms used for delivering mental health services via videoconference (e.g. telemental health, telepsychiatry). The case is similar for services delivered via Internet applications (e-health, e-mental health). Appendix 1 provides definitions of terms.



- (4) To provide policy recommendations founded on the best available research evidence and informed by current practice in the field.

### **Policy and decision-maker consultations**

Policy dialogues allow research evidence to be considered together with the perspectives, experiences and tacit knowledge of those involved in, or affected by, future decisions about a high-priority issue (Lavis, Boyko, Oxman et al., 2009). We hosted a face-to-face meeting with policy and decision-makers across interested sectors in Ontario<sup>2</sup> to discuss the relevance of proven and promising uses of technology in mental health service provision for children and youth. In addition to this consultation meeting, we offered a variety of options to engage key stakeholders and ensure that they had an opportunity to contribute to the process, including teleconference calls, interviews and e-mail invitations for input and feedback.

Policy and decision-makers in the face-to-face workshop and interviews identified examples of different technologies used in mental health service delivery. They highlighted the use of videoconferencing to provide psychiatric consultations to mental health practitioners in rural communities and to provide direct mental health treatment to young people. The use of telephone support and mobile applications were also identified. Policy and decision-makers felt quite strongly overall that technology has the potential to impact CYMH service delivery, particularly in areas of early identification and intervention. They discussed benefits such as enhanced accessibility and timeliness as well as the youth-friendly, non-intimidating, and cost-saving nature of these technologies. Participants highlighted the lack of research evidence in this area and stressed the opportunity and need to conduct research in this area to determine the effectiveness of service provision via technology. Participants also noted that technology changes very quickly; the research process is slow and policy change takes even longer. In certain cases, decisions must be made in the absence of conclusive research evidence.

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<sup>2</sup>Relevant Ministries included the Ministry of Children and Youth Services, Ministry of Education, Ministry of Health and Long-Term Care, Youth Justice, as well as stakeholders from the Ontario Centre of Excellence for Child and Youth Mental Health, Centre for Addiction and Mental Health, and Lawson Research Institute.



### Key highlights from conversations with policy and decision-makers

- Technology can enhance access to services, help to reduce the stigma associated with mental health problems and addictions, and reduce barriers to service in terms of geography, culture, time and ability to access expertise.
- Some individuals and communities continue to have difficulties accessing technology and this must be addressed.
- Policy makers are concerned about the impact on relationships with clients, the reliability of technology and added workload for practitioners.
- Education, training and exposure are critical elements to alleviate agency and practitioner fears about negative impacts of technology.
- Privacy and documentation issues will require legislation or regulations to keep up with the emergence of new technology. Government and regulating bodies can provide clarity and direction.
- Policy makers are worried that legal concerns might thwart efforts to provide services and support via new technologies. Insurance coverage was also raised as an area requiring exploration, particularly clinical liability and malpractice.

### Literature review

The literature review allowed us to identify what is working well that has applicability to the policy context in Ontario and to identify the critical gaps in our knowledge base. More than 100 peer-reviewed articles were included in the review. Most focus on the use of the Internet (n=59) and videoconferencing (n=42) and the remainder focus on the telephone, mobile applications and other technologies.

The literature is permeated by findings that suggest **videoconferencing** can positively contribute to client outcomes and improved quality of life. A number of critical factors are associated with the success of programs that use tele-video to deliver mental health services to youth. They include the need for groundwork such as routine outreach visits, clear parameters and guidelines, and education and training opportunities. Key personnel such as a central co-ordinator of services, collaborating stakeholders, and a mental health champion are critical to success. Involving schools and local health providers is important to ensure local uptake of recommendations. Service users and service providers both report satisfaction with this technology, and it is an effective way to engage with children and youth.

Articles on **online delivery of mental health services** with features such as chat rooms, discussion boards, social networking and interactive games suggest some form of moderated support is extremely important when delivering a service online. Much of the literature supports the effectiveness of Internet-based programs for a variety of mental health issues including: treatment and reduction of symptoms for child and adolescent anxiety and depression, treatment of post-traumatic stress, depression prevention, assisting careers of young people with mental health issues and reduction of symptoms for eating disorders. These studies all show that Internet-delivered therapy has equal or greater efficacy when compared to face-to-face therapy.





## Service scan

We conducted a service scan to identify existing programs/models with practice-based evidence that use technology to deliver mental health services, with specific reference to practices and programs appropriate in the Ontario context. The service scan included a survey distributed to 98 child- and youth-serving mental health organizations in Ontario, which allowed us to identify enablers and barriers to using technology as well as best and promising practices. More than half responded and results show that agencies are using a wide variety of technologies (e.g. videoconferencing, telephone and Internet) in service delivery and support. Respondents believed that their use of technology allowed for increased accessibility, is often preferred by children and youth and offers a cost savings. In terms of drawbacks, respondents identified confidentiality and privacy issues, technology and equipment challenges, the need to develop a therapeutic relationship that isn't possible in the same way as in a face-to-face interaction, and cost issues related to acquiring and maintaining equipment.

## Conclusion

*Moving on Mental Health: a system that makes sense for children and youth* lays out an exciting path forward for the child and youth mental health sector, and service options that include technology will be essential for all communities in Ontario. The province's child and youth telepsychiatry program shows that Ontario is a leader in using technology to provide enhanced access to effective mental health services for children and youth. System transition is an ideal opportunity to take advantage of existing and emerging technologies to provide effective, efficient, engaging, and client-centred interventions for children, youth and families across Ontario.

Based on our review of research literature along with discussions with policy makers and direct service providers, we conclude that there is a critical need to integrate technological delivery of CYMH services and supports into mental health policy planning. There is a strong case for videoconferencing and e-mental health as priority areas given their potential in the delivery of mental health services. The Internet will play a major role in the future delivery of programs aimed at increasing community awareness and in providing prevention, assessment, diagnosis, counselling and treatment programs. Ontario is encouraged to develop leading policies in tele-mental and e-mental health by using and building on positive findings from the field.

The central implications for practice, policy and research are drawn from the three-pronged process used in this project – consultations with decision makers and key informants, a review of the literature, and a service scan of mental health agencies in Ontario. Based on input from stakeholders and key findings from the research literature, we suggest policy and decision-makers:

1. Engage in provincial policy development focused on developing standards of practice and specific guidelines for developing and sustaining the use of technology to deliver CYMH services.
2. Support systematic evaluation and research on the process of delivery as well as relevant outcomes, from both service user and service provider perspectives.
3. Focus on knowledge mobilization to promote the availability and accessibility of CYMH services provided through technology, particularly in under-served communities.



4. Develop educational and training requirements for the provision of services through technological modalities, as well as their use.
5. Facilitate access to new and enhanced technologies as they emerge.



## ABSTRACT

The Internet and other technologies have great potential to deliver mental health services to children, youth and their families. The use of such technologies is burgeoning and there is a critical need to take stock of the impact of this movement, to consider the advantages and difficulties associated with its use and to develop strategies and policies to improve the practice of technology-enabled mental health service delivery. This paper provides an overview of feedback from policy and decision-makers in Ontario regarding the use of technology in child and youth mental health service delivery, reviews the key literature in this area, and reports on a provincial service scan of current use, barriers and challenges. It concludes with policy-ready recommendations for moving forward in the field.

## INTRODUCTION

The use of technology and other emerging media in service provision represent promising approaches and have particular relevance to practice in Ontario (The Canadian Association of Paediatric Health Centres, 2010).

This policy ready paper summarizes the link between the research and policy implications and provides a comprehensive picture of the potential role that technology (both existing and emerging) can have in improving mental health services in Ontario. There are promising policy and practice implications if technology can be used to provide more accessible mental health services including reduced wait lists, enhanced access to services in under-served communities, reduced barriers related to stigma, and service delivery that is cost-effective and clinically effective.

The focus is on technology used in a therapeutic capacity, with an intervention component, although workflow or waitlist management or other administrative approaches that also address barriers are considered. Although important and emerging, technology used for other health topics, mental health literacy, education and training, or for the identification of community resources was outside of the scope of this paper.

## GOALS AND OBJECTIVES

- (1) To engage with policy and decision-makers to identify their perspectives on the use of technology in mental health service provision for children and youth.
- (2) To conduct a review of the literature on the use of technology in mental health service provision for children and youth.
- (3) To conduct a scan of child and youth serving mental health organizations in Ontario to identify their use of technology in mental health service provision for children and youth.
- (4) To provide policy-ready recommendations founded on the best available research evidence and informed by current practice in the field.



## METHODS

### Policy and decision-maker consultation methods

Policy dialogues allow research evidence to be considered together with the perspectives, experiences and tacit knowledge of those involved in, or affected by, future decisions about a high-priority issue (Lavis, Boyko, Oxman et al., 2009). A number of factors have influenced the increased interest in using policy dialogues including the recognition that:

- Policy and decision-makers and other stakeholders benefit from locally contextualised 'decision support'
- Research evidence is only one element of the decision-making processes of policy and decision-makers and other stakeholders
- A variety of stakeholders can add significant value to decision making processes
- Stakeholders, not just policy and decision-makers, can inform decisions on high-priority issues.

Consequently, we borrowed from the work of Lavis and his colleagues (2009) to engage in policy dialogues for the purposes of this paper.

#### *Engaging with policy and decision-makers*

We convened a face-to-face meeting with policy and decision-makers across relevant sectors in Ontario, including the Ministry of Children and Youth Services, Ministry of Education, Ministry of Health and Long-Term Care, and Youth Justice. Stakeholders from the Ontario Centre of Excellence for Child and Youth Mental Health, Centre for Addiction and Mental Health, and Lawson Research Institute were also included given their provincial roles in supporting the CYMH sector. Together, this group discussed the relevance of proven and promising uses of technology in mental health service provision for children and youth to current policy considerations (Appendix II). We used a participatory methodology with attendees to discuss the uses of technology in mental health service provision for children and youth in Ontario and identify priorities and challenges in supporting this use.

Because we recognized the difficulties with respect to policy and decision-makers' ability to meet face-to-face, we offered a wide variety of alternate options to engage these key stakeholders and ensure that they had an opportunity to contribute to the process. In addition to the engagement meeting we held teleconference calls, interviews and gathered electronic feedback from additional policy and decision-makers.

The goal of engaging with policy and decision-makers was to collect their input on the relevance of this topic, their experiences in technology-enabled service delivery, the questions they identify as important to address, and the types of recommendations that would be useful. These conversations also served to identify the services/organizations and key informants to include in the service scan.



## Literature review methods

The scope of the peer-reviewed and grey literature review focused on identifying evidence-informed uses of technology for mental health service provision. The technologies covered include videoconferencing (e.g. telepsychiatry, telepsychology, tele-mental health nursing), telephone support, web and computer-based interventions, mobile phone applications/interventions, and social networking. The search also identified innovative uses of technology shown to be effective in helping children, youth and their families in under-served and challenging contexts, and that provide direct intervention, therapy or support.

### *Literature review strategy*

The review was initially broad in its scope and range. Keywords were selected to reflect the scope of the work, specifically to identify literature related to telepsychiatry, telepsychology, telemental health nursing as well as telephone, online and other technologies such as mobile applications. The literature search focused on accessing both published material and grey literature related to the topics and issues identified by the lead consulting group, the Ontario Centre of Excellence for Child and Youth Mental Health and feedback from policy representatives.

Searches were conducted with the following database search engines: PsycINFO, EMBASE, and Ovid MEDLINE. The list of criteria for review and search terms was developed with our policy stakeholder group, investigative team, and librarian. To begin, search terms were used and the names of key authors/academic institutions in the field of use of technology in mental health service delivery for children and youth were searched for. Relevant articles from reference lists of other articles were retrieved and subsequently reviewed. Hand searches of relevant journals were also conducted for relevant articles, published from 2000 onwards. From these, article titles were first scanned and then a sub-set of abstracts were read to ascertain if the article was relevant. After these exercises were completed, we identified articles deemed relevant and the full articles were obtained and included in the review. All citations were entered into RefWorks software program to manage references. See Tables 1 to 11 in Appendix IV for an annotated bibliography.

### *Inclusion and exclusion criteria*

Articles were included if they were published in peer-reviewed journals dating from 2000 onwards and were in the English language. Articles were excluded if they were published in peer-reviewed journal articles before 2000, were letters to the editor, dissertations, or articles that focused on technologies used to deliver mental health services to adults, or to deliver mental health information, education and training.

### *Identifying grey literature*

Beyond the conventional route of peer-review, there is a vast accumulation of grey literature – conference reports, technical notes, institutional papers, various articles written for specific entities that enter into general circulation without peer-review. Grey literature can often be the first and only source of effectiveness evidence on a public health issue (Dobbins & Robeson, 2006). While a formal publication may follow later, in many cases this evidence is never made available to the broad public health audience. Our work in this area was guided by *The literature review process*:



*Recommendations for researchers* developed by the Thames Valley Literature Review Standards Group in the UK.<sup>3</sup> Review of the grey literature indicated that most monographs were later published in peer-reviewed articles by the research team and did not contribute any new information to the review.

#### *Analysis of the literature: central themes*

The literature review allowed us to identify what is working well that has applicability to the policy and practice context in Ontario as well as to identify the gaps in our knowledge base. We identified the central themes arising out of the literature review using the guidelines described by Braun and Clarke (2006). Specifically, a process of thematic content analysis was used, i.e. recording particular aspects of the use of technology in the delivery of mental health care. Articles were read in full, annotated, and entered into a table format using a standard data extraction form according to a number of key characteristics, including: the type of technology, author(s) and journal, country, the service/treatment delivered, details about method/design, subjects/participants, key issues or outcomes addressed and gaps in the extant knowledge base.

#### **Service scan methods**

We conducted a service scan to identify existing programs/models with practice-based evidence that use technology to deliver mental health services, with specific reference to practices and programs appropriate for the Ontario context. The service scan allowed us to identify enablers and barriers to using technology as well as best and promising practices. The service scan involved an electronic survey (using SurveyMonkey), distributed to 116<sup>4</sup> child and youth mental health agencies and hospital-based children's clinics in Ontario. The survey was supplemented by key informant telephone interviews with individuals in these identified agencies/organizations plus those at Children's Mental Health Ontario (CMHO), the Offord Centre for Child Studies, and the Ontario Centre of Excellence for Child and Youth Mental Health.

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<sup>3</sup> <http://www.oxfordradcliffe.nhs.uk/research/researchers/news/documents/LiteratureSearchingGuidelinesChecklist.pdf>

<sup>4</sup> Eighteen of these were undeliverable, leaving 98 surveys successfully distributed.



Other key stakeholders were identified via a snowball sampling process (Barwick, Boydell, Stasiulis et al., 2005). We also scanned other Canadian, American, British and Australian contexts, as they are key users of technologies.

## RESULTS

### Results—policy and decision-maker consultations<sup>5</sup>

The consultation process involved several activities:

- (1) sharing best experiences on the use of technology in child and youth mental health service delivery
- (2) discussing barriers and enablers to the use of technology
- (3) establishing priorities regarding the use of technology in mental health service delivery.

In terms of knowledge of best and promising practices in the field, a wide variety of program and service exemplars were discussed including online and telephone counselling for children and youth, telephone support provided to families by non-professionals, televideo counselling to children, youth, families and practitioners in rural areas, and mobile applications that allow young people to track their moods. Participants<sup>6</sup> were able to provide rich descriptions of these services and the key informants to contact to find out more about them.

#### *Best and promising practices*

Policy and decision-makers in the face-to-face workshop and interviews engaged in a discussion about their knowledge and perceptions of current best and promising practices in the use of technology for mental health service delivery. The majority of participants in this process identified examples of videoconferencing to provide psychiatric consultations to mental health practitioners in rural and underserved communities and to provide direct mental health treatment to young people. The use of telephone support and mobile applications were also highlighted. Participants mentioned the enhanced accessibility, timeliness and the youth-friendly, non-intimidating, engaging, participatory and cost-saving nature of these technologies. They also discussed the need to be aware of the possibility of providing too much information using social media.

Participants identified what they considered to be some exemplars of how technology has been used to provide direct services in Ontario, outlined below. Exemplars 1 and 3 have been evaluated and have a solid evidence base. Exemplar 4 has a comprehensive evaluation protocol in place and Exemplar 2 is a promising practice that has been evaluated in Australia and is currently being evaluated in Ontario.

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<sup>5</sup> Note: Policy and decision-makers involved in the consultation process are not experts in the field of technology.

<sup>6</sup> See Appendix II for list of stakeholders attending face-to-face workshop and participating in individual interviews.



### EXEMPLAR 1



#### Telephone mental health service delivery

Strongest Families was effective in treating mild to moderate pediatric mental health disorders from a distance, with no face-to-face contact, and using non-professionals. Results, based on rigorous randomized control trials (RCT), suggest that the Strongest Families intervention is generally more effective than usual care and the benefits were sustained for one year. Attrition rates were found to be very low and children actively engaged in structured, distance treatment. Although originating in Nova Scotia, child and youth serving mental health organizations in Ontario have taken up this program.

### EXEMPLAR 2



#### Kids Help Phone live chat counselling

Kid's Help Phone integrates a brief therapy approach with technology such as telephone counseling, e-mail and web chat lines to support children, youth and families throughout the province. This makes it possible to provide service to people who are isolated in remote areas and would not otherwise have access to service. Chat counseling lets young people up to age 20 connect one-on-one, real time, with a Kids Help Phone counselor, on the web or from a smartphone.

### EXEMPLAR 3



#### Telelink televideo conferencing

The TeleLink Mental Health Program has successfully recruited a stable core of consulting child psychiatrists who provide specific consultations and educational sessions, depending on their expertise and availability. An imbedded program of research indicates the viability of this program and outcomes of enhanced capacity of rural practitioners, increased access to mental health services, satisfaction of young people and their family members, and involvement of school and other community members. A knowledge-to-action framework is used in the program to ensure that research findings influence program practice.

### EXEMPLAR 4



#### The Mental Health Engagement Network (MHEN)

MHEN uses the web and mobile technology (iPhone 4S) using the Lawson SMART record to provide mental health care to individuals between the ages of 18 and 80 year olds. Preliminary findings indicate that most client participants are generally comfortable with the use of technology and that the technology improved health care and health status. The team has convened a training committee with broad representation from client and practitioner groups and provides training sessions to healthcare providers, clients and their families. The project is launching a comprehensive evaluation of the use of SMART technologies in mental health care on four levels: effectiveness, economic, ethical and policy.





### **Myth busters, barriers and benefits**

Policy and decision-makers were asked to respond to a series of potential myths regarding the evidence-base, access, quality of care, human resources and legal aspects of using technology for mental health service provision. The purpose of this exercise was to stimulate discussion of the benefits and barriers to using technology in service delivery.

**Myth #1:** *E-health websites that offer direct professional care to clients are causing harm because there is a lack of research establishing the safety or efficacy of their approaches*

Participants agreed that there is lack of research in this area but were confident that there is little evidence suggesting that e-health websites are causing harm. More evidence is required. An opportunity and need to conduct research in this area to determine the reliability of websites was stressed. They also identified an opportunity for democratization of information via open sharing between different communities. There was recognition of multiple sources of information, not just evidence published in medical journals. Two-way communication was highlighted with the notion that health professionals also learn from their patients. It was noted that while technology changes very quickly, research methodology is slow, and policy change takes even longer. Decisions, then, are not always rooted in the latest research evidence.

*“Government needs to be an enabler for local innovation in the use of technology. They need to support low cost innovation and evaluate those innovations, recognizing that not everything requires a randomized controlled trial.”*

**Myth #2:** *Technology will just create another roadblock and make access issues worse*

All participants disagreed with this statement and indicated that technology is the solution rather than the problem in terms of enhancing access. Technology was viewed as enhancing access to services when they are needed, providing a more anonymous environment that helps to reduce the stigma associated with mental health and addictions, and eliminating barriers to service in terms of geography, culture, time and expertise. According to one participant,

*“Virtual services provide a safe, accessible and less stigmatizing forum for young people experiencing mental health issues.”*

**Myth #3:** *Service providers don't have the confidence or skills to use technology. Many think they will lose their jobs because of technology*

This statement was endorsed by just over half of the participants, who acknowledged the difficulties associated with change particularly for older practitioners who may be less familiar with new technologies. They identified concerns about the impact on relationships with clients, the reliability of the technology and added workload. A need for education, training, change management and exposure were discussed as critical elements to alleviate these fears.

*“We need to enable older practitioners to increase their comfort with technologies. A solid program of training and education is required for all practitioners.”*

**Myth #4:** *Technology is so impersonal; it gets in the way of providing the best care*

All respondents disagreed with this statement and noted that technology is redefining how personal is defined. Technology is a medium that can be just as personal, depending on client preference. They were unanimous in their belief that it is a good option when services and supports cannot be provided in person and felt that technology



increases access to culturally appropriate and specialist services and reduces the need for hospitalization. Consequently, individuals remain in their own local community and do not need to travel long distances to obtain services and supports. They also added that young people have a healthy attitude towards using technology and some open up with more distance. Technology as an enabler for better communication between health care providers leading to better care for clients was also identified. Participants felt strongly that young people should be engaged in the process.

*“We really need a discussion group like today’s session with young people and their parents to talk about their views on the various uses of technology.”*

**Myth #5:** *Health care professionals are putting themselves at risk because they do not have legal protection for themselves or their clients*

Respondents were equally split in terms of their agreement with this statement. Some felt that privacy and documentation issues require legislation or regulations to keep up with some of the barriers to using technology. Thus, a strong need was identified for government and regulatory bodies to provide clarity and direction in this area.<sup>7</sup> At the same time, decision-makers were worried that legal concerns might thwart efforts to provide services and supports via new technologies. Insurance coverage was also raised as an area requiring exploration, particularly clinical liability and malpractice.

*“We need to know what guidelines currently exist, if any, whether they apply, and ensure that they are properly disseminated and followed.”*

**Myth #6:** *We all use different technology platforms; it is impossible to use technology to integrate services*

All disagreed with this statement and indicated that, in fact, it is precisely the opposite; technology was viewed as allowing individuals with varied expertise to come together. There are many platforms but with some coordination it was felt that a solution for information sharing (data standards, consolidation platforms, etc.) was possible and that there was a need for acting sooner rather than later.

*“Integrating technology is actually driving services integration in many cases. Technology centres are often used to drive inter-professional collaboration.”*

**Perspectives on the use of technology (voting results)**

We used an electronic voting system to gather policy and decision-makers ratings on the potential of technology to enhance child and youth mental health service delivery in a number of areas (Table 1). Policy and decision-makers felt quite strongly overall that technology has the potential to impact child and youth mental health service delivery, particularly in areas of early identification and intervention.

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<sup>7</sup> Policies and positions on privacy and confidentiality of information exist in every institution, including the Ontario Telemedicine Network, The College of Physicians and Surgeons of Ontario, the Canadian Medical Protective Association etc. and are publicly available on their respective websites. Essentially, personal health information is to be treated the same regardless of where it occurs – paper, electronically, digitally, etc. The Canadian Medical Association has developed guidelines and rules for social engagement for members using social media (<http://www.cma.ca/advocacy/social-media-canadian-physicians>)

**Table 1: Potential of technology to enhance child and youth mental health (n=16)**

Child and youth mental health area	Disagree/strongly disagree (%)	Neutral (%)	Agree/strongly agree (%)
Prevention	6.7	13.3	80.0
Early identification	--	--	100.0
Effective intervention	--	--	100.0
Integration (within mental health)	--	21.4	78.6
Integration (mental health & other sectors)	--	15.4	84.6
Transitions (youth to adult)	--	21.4	78.6

The following quote from the face-to-face workshop reflects the general feeling on the part of policy and decision-makers present:

*“Every mental health professional resource/expert should be viewed as a provincial resource and we should be able to access their services from anywhere. Providers should be providing service to any provincial patient (face to face or virtual patients) - a virtual patient should be treated the same as a regular face to face patient.”*

## Results – literature review

We reviewed 125 peer-reviewed articles (Figure 1) and observed that overall satisfaction and a range of positive outcomes (reduced symptomatology, enhanced access to care, etc.), preferences of young people, and cost savings are significant motives for using technologies to deliver mental health services. Findings suggest that using various technologies contribute to increased access to care, enhanced practitioner capacity, positive patient and family outcomes and improved quality of life.

We organized our findings in the following thematic categories:

- positive outcomes and client satisfaction
- preferences of young people
- technology
- cost
- barriers
- research gaps

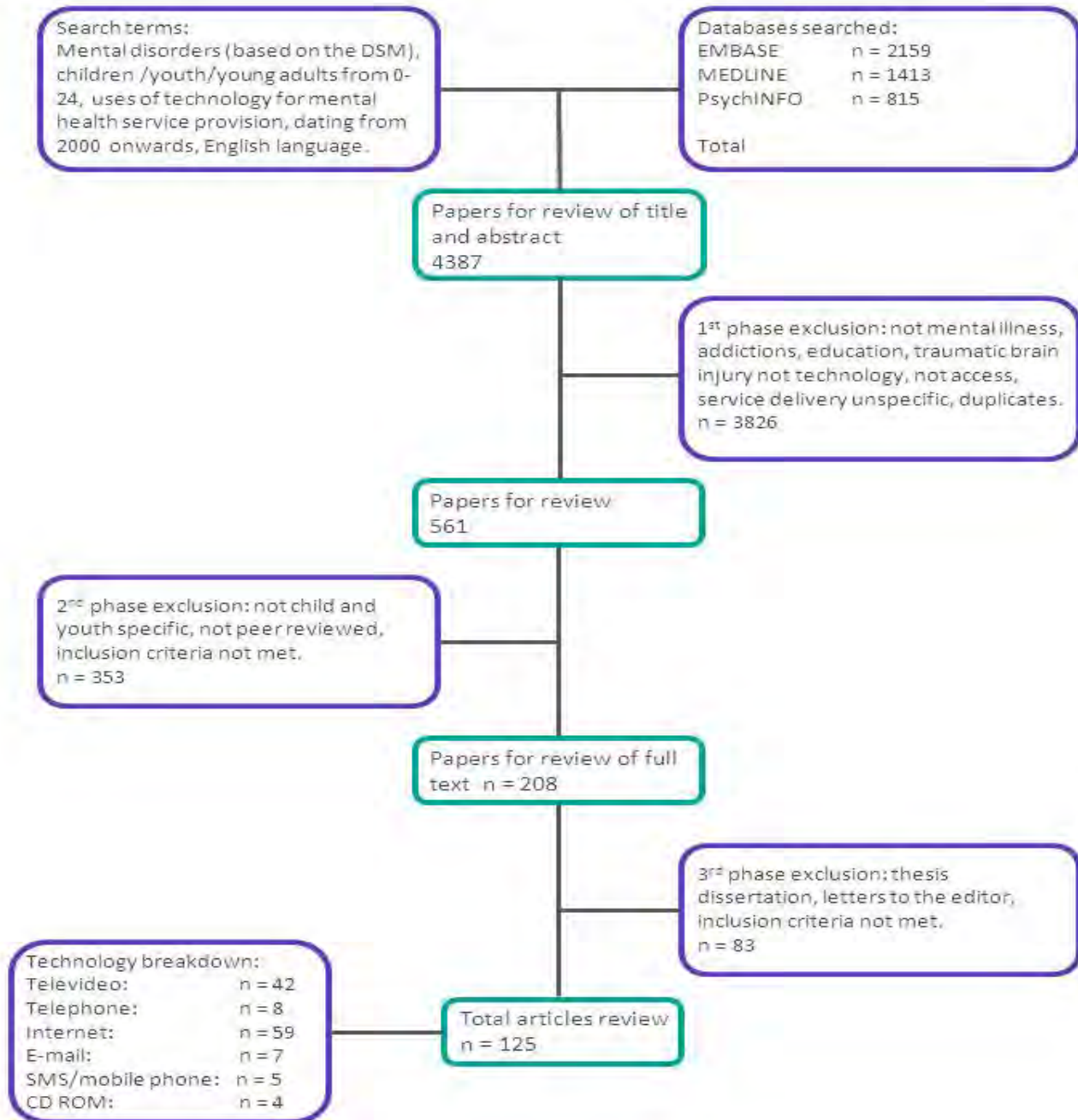
Each category has a summary of the relevant research on particular technologies, and findings in that category. A full listing of the 125 articles is provided in Appendix IV. The number of articles found that satisfied inclusion criteria illustrates the degree of research on each technology, and why there is greater evidence for some technologies in particular themes:

Televideo conferencing (n=42)  
Telephone (n=8)  
E-mail (n=7)

Mobile phone/SMS (n=5)  
The Internet (n=59)  
CD-ROM (n=4)



Figure 1: Search strategy





### **Outcomes and client satisfaction**

The 42 studies reviewed on **videoconferencing** include many positive assessments of satisfaction among practitioners, families and youth. For instance, a 10-year review of a telepsychiatry service found a high level of general satisfaction (Starling & Foley, 2006). Parents noted high satisfaction with their child's telepsychiatric care (Myers, Valentine & Melzer, 2008) and a study involving rural families found parents rated the telepsychiatry service very highly (Starling, Rosina, Nunn et al., 2003).

A study involving families involved with child welfare services found the quality and acceptance of telepsychiatry was comparable to face-to-face service provision (Keilman, 2005). Referring providers have been highly satisfied (Myers, Valentine & Melzer, 2008) and it has enhanced their capacity to deal with complex mental health issues (Greenberg, Boydell & Volpe, 2006). Rural health care workers, young people and their caregivers give the technology itself high satisfaction ratings (Koppel, Nunn & Dossetor, 2001).

*Service exemplar: The **Ontario Telemedicine Network (OTN)** is one of the largest telemedicine networks in the world. OTN uses a two-way videoconference technology so that patients can access a specialist anywhere in Ontario, in a timely manner. One of the health services in place is the provision of mental health care through consultation via videoconferencing. The network enables access to care for more than 100,000 mental health and addiction patients annually and provides video connections for the Virtual Emergency Room, a service for children and youth up to 17 years of age, who require a further in-depth consultation by a child/youth mental health specialist not available at the presenting emergency department.*

Research has also found that telepsychiatry can achieve good clinical outcomes for children and youth. A randomized control trial (RCT) of psychiatric assessments found that diagnoses and treatment recommendations made by child psychiatrists via telemedicine or face-to-face interviews were similar 96% of the time (Elford, White, Bowering et al., 2000). Another RCT using cognitive-behavioural therapy (CBT) as an intervention for children with depression found that treatment via videoconference was as effective as face-to-face therapy and parents and children preferred videoconference over face-to-face therapy (Nelson, Barnard & Cain, 2003).

*Service exemplar: Kansas University Medical Center's **TeleKidcare®** evaluated an 8-week, cognitive-behavioural therapy (CBT) intervention for childhood depression either face-to-face or over videoconferencing. The study met the central definition of success – decreasing symptoms of childhood depression over videoconferencing at rates comparable to face-to-face. Based on the study analyses, the videoconferencing and face-to-face groups had no significant difference at randomization. The CBT treatment across both delivery methods was effective in decreasing depression. Youth, parents and clinicians were extremely satisfied with the videoconferencing method of service delivery. (Nelson, Barnard & Cain, 2003; 2006)*

Pesamaa and colleagues (2004) reported successful skill implementation via telemedicine and 82% remission from depression post-treatment. In a youth justice setting, 80% of incarcerated youth were successfully prescribed



medications, leading to improved mental health status (Myers, Valentien, Morgenthaler et al., 2006). The same study showed that youth were confident in their psychiatrist's recommendations, although they also raised concern about privacy issues.

Successful outcomes have been reported in other studies of videoconferencing, many drawing upon case study methods. Alessi (2003) documented success in properly diagnosing the case of a 15 year old and the positive relationship that the therapist and client formed that contributed to service success. Miller and colleagues (2002) showed the effectiveness of telepsychiatry for a young boy in a rural school, and Savin and colleagues (2006) found that telepsychiatry enabled access to services otherwise unavailable to American Indians, with high patient and provider satisfaction and costs similar face-to-face consultation.

Pakyurek and colleagues (2010) used five examples to illustrate that telepsychiatry could be superior to face-to-face services as a psychiatric assessment and consultation process. Factors that contributed to success included the novelty of the consultation and adolescents experiencing the service as exciting. Some adolescents felt that the interaction was more visual, video-game like and less threatening. It also enhanced their ability to provide direction and they liked the sense of extra distance (psychological and physical) and the perceived authenticity of the interaction.

*Service exemplar: The **TeleLink Mental Health Program** at The Hospital for Sick Children in Toronto offers a comprehensive, collaborative model of enhancing local community systems of care in rural and remote Ontario using videoconferencing. With a focus on clinical consultation, collaborative care, education and training, evaluation and research, ready access to pediatric psychiatrists and other specialist mental health service providers can effectively extend the boundaries of the medical home. The program has incorporated an evaluative component with a Knowledge-to-Action framework that emphasizes feedback to enhance program impact. This research program has focused on developing an evaluation framework for pediatric telepsychiatry, studied service provider and family impact, highlighted the perspectives of young people, and examined longitudinally the uptake of recommendations provided in consultations.*

(Boydell, Volpe, Kertes et al., 2007; Boydell, Pignatiello & Volpe, 2010; Pignatiello, Boydell, Tehsima et al., 2010)

A series of six case studies using WebCam as a therapeutic tool showed its applicability in allowing communication between therapists and clients (Cheblowski & Fremont, 2011). One case study of a rural Hispanic youth found therapeutic success and resulted in expanding the videoconferencing practice to enable access for other clients (Nelson & Bui, 2010). Three high school students expressed that they preferred videoconferencing to all other forms of service delivery in a qualitative study (Bischoff, Hollist, Smith et al., 2004).

A systematic review concluded that practitioners can have positive experiences with videoconferencing, saving time, cost and improving service quality (Pesamaa, Ebeling, Kuusamaki et al., 2004). There is evidence that videoconference can enhance the capacity of rural practitioners and reduce their sense of professional isolation (Gelber, 2001; Greenberg, Boydell & Volpe, 2006; Pignatiello, Boydell, Teshima et al., 2010) while improving the distribution of clinical expertise (Pignatiello, Boydell, Teshima et al., 2010). Mental health clinicians have reported that videoconferencing increased their knowledge and skills and strengthened relationships with colleagues (Gelber, 2001) and they tend to be



satisfied with mental health service delivery using videoconferencing technologies (Greenberg, Boydell & Volpe, 2006; Koppel, Nunn, Dossetor et al., 2001; Savin, Garry, Zuccaro et al., 2006).

In terms of access to services, there is evidence that telepsychiatry enhances access to mental health care in general and to specialty care for practitioners and to mental health services for children, young people and their families (Spaulding, Belz, Delurgio et al., 2010). One study involving rural primary care providers found that telepsychiatry allowed them to see more patients (Hilty, Yellowlees & Nesbitt, 2006).

The research also shows that services provided through the **Internet** can achieve good client outcomes, particularly for providing cognitive-behavioural therapy (CBT) to address anxiety issues. Young people participate actively, most comply with session schedules and they form an effective therapeutic alliance (Spence, Donovan, March et al., 2011). March et al. (2009) demonstrated that at post-treatment assessment, children in an Internet treatment group had small but significantly greater reductions in anxiety symptoms and increases in functioning than wait-list participants. These improvements were enhanced during the six-month follow-up period, with 75% of the children who received Internet services free of their primary diagnosis.

Other studies support the success of Internet based programs for treatment and reduction of symptoms for anxiety and depression (Calear & Christensen, 2010; Grover, Naumann, Mohammaddar et al., 2011; O’Kearney, Kang, Christensen et al., 2009; Seth, Campbell & Ellis, 2010; Stephens-Reicher, Metcalf, Blanchard et al., 2011), treatment of posttraumatic stress (Lange, van de Ven, Schrieken et al., 2001), depression prevention (van Voorhees, Vanderplough-Booth, Fogel et al., 2008), assisting caregivers (Jang, Dixon, Tarbox et al., 2012; van Voorhees, Vanderplough-Booth, Fogel et al., 2008; Currie, McGrath & Day, 2010), and reducing eating disorder symptoms (Grover, Naumann, Mohammaddar et al., 2011).

*Service exemplar: **MoodGYM** is a website developed by the Australian National University Centre for Mental Health Research. It provides a free online self-directed CBT program for depression to prevent adolescent anxiety and depression and using modules to directly address symptoms. It has nearly 700,000 registered users and has been translated into Chinese, Dutch and Norwegian. MoodGYM has been evaluated in scientific trials, which indicate that use of two or more modules by users is associated with significant reductions in depression and anxiety symptoms. These reductions have been sustained after 12 months.*

*The **YouthMood** project aims to evaluate the effectiveness of MoodGYM in preventing depression and increasing resilience skills in youth aged 15-16 years. Three randomized trials comparing MoodGYM with routine health class participation and wait list controls found that male participants receiving the intervention had reduced depressive symptoms compared to wait-list controls immediately post-intervention and at a six-month follow-up. However, the reduced depressive symptoms were not found in females receiving the intervention. (Calear, Christensen, Mackinnon et al., 2009; Calear & Christensen, 2010)*



*Service exemplar: **SPARX** (Smart, Positive, Active, Realistic, X-factor thoughts) is an interactive fantasy game that uses a computerized self-help, cognitive-behavioural therapy intervention for adolescents seeking help for depression. The program was developed by a team of specialists from the University of Auckland to provide an intervention with wide appeal to young people in New Zealand and elsewhere that is enjoyable, thus resulting in good adherence rates. Potential benefits are the lower cost and the improved reach to young people who currently cannot access help. A multi-centre randomized controlled non-inferiority trial was carried out with 187 adolescents aged 12-19 seeking help for depressive symptoms. Use of the program resulted in a clinically significant reduction in depression, anxiety, and hopelessness and an improvement in quality of life. Results are impressive when considered that SPARX was entirely a self-help resource, the only contact being with a clinician at recruitment. The only input from health professionals during the course of treatment was a brief phone call after one month. The intervention was at least as good as treatment as usual in primary healthcare sites and was more effective than treatment as usual for those most depressed at the start. Adherence rates were high. (Merry, Stasiak, Shepherd et al., 2012)*

Similar to videoconferencing, one principle advantage of Internet based approaches is the opportunity to increase access in rural communities (Heinicke, Paxton, Mclean et al., 2007). The Internet and videoconferencing both improve capacity to provide services for more people and respond to the mental health needs of those who may not otherwise receive treatment (Shandley, Austin, Klein et al., 2010; Currie, McGrath & Day, 2010). For providers, computer screening reduces administration burden, scoring, and report writing (Diamond, Levy, Bevans et al., 2010). The Internet provides availability 24/7 and allows clients to pause and continue a program, an assessment or treatment plan as they please (Steenhuis, Serra, Mohammaddar et al., 2011).

*Service exemplar: **Master Your Mood (MYM)** is an online prevention intervention that uses a CBT-based group course for adolescents and young adults with depressive symptoms. The face-to-face version (based on Lewinsohn's Coping with Depression) of the Master Your Mood course was adapted for use on the Internet.*

*Participants in a randomized control trial showed a larger reduction in depressive symptoms compared to wait-list controls three months post-intervention, with reductions sustained at six months. (Gerrits, van der Zanden, Visseher et al., 2007; van der Zanden, Kramer, Gerrits et al., 2012)*

Six studies focusing on **e-mail** suggest it might be a viable alternative to face-to-face and telephone encounters for some clients (Cartwright, Gibson, McDermott et al., 2005; Lyneham & Rapee, 2006). One potential benefit of using e-mail to deliver services is that it gives clinicians increased frequency and amount of time available for contact with clients (Mehta & Chalhoub, 2006). The frequency of e-mail interaction helps clients feel that the clinician is present, listening, and thinking about them (Yager, 2003b). Much less clinician time is required for reading and responding to messages than is required over the telephone (Yager, 2003a).





Research on **Compact Disc Read-only Memory (CD-ROM)** is limited to only four studies. This research found that adolescents consider using CD-ROM in therapy acceptable (Cunningham, Wutherich, Rapee et al., 2009) and are generally satisfied, finding the treatment process beneficial (Brosnan, Sharry & Fitzpatrick, 2005; Cunningham, Wutherich, Rapee et al., 2009; Cunningham & Wutherich, 2008.) A randomized control trial supports the effectiveness of CD-ROM delivered interventions (Wuthrich et al., 2012). Adolescents showed significant reductions in the number of anxiety disorders, the severity of the primary anxiety disorder, and the average severity for all disorders compared with those on the wait list (Cunningham & Wuthrich, 2008). Advantages to using CD ROMs include increased confidentiality, reduced barriers resulting from stigma, cost effectiveness (reduced therapist time), convenience from not needing to use time to travel to services, reaching those reluctant to make face-to-face contact, and broader service availability for rural clients (Cunningham, Wuthrich, Rapee et al., 2009; Cunningham & Wuthrich, 2008).

Eight studies in our review focused on **telephone counselling**, mostly help lines. Several used pre-post measures to compare telephone to online support (Fukkink & Hermanns, 2009; King, Babling, Reid et al., 2006). Counselling via telephone can be effective and it is possible to form a strong therapeutic alliance, reduce stigmatization, and provide a convenient way to access services for families, children and youth. All studies involving help lines found decreased distress reported by clients.

Telephone help lines provide anonymity that is perceived as non-threatening support (Fukkink & Hermanns, 2009). A comparison study found that single-session telephone support was superior to online counselling although both achieved a significant reduction in distress (King, Babling, Reid et al., 2006). Similarly, pre-post and follow up of telephone versus online chat for children with severe emotional problems documented improved well-being in both treatment approaches (Fukkink & Hermanns, 2009; King, Babling, Reid et al., 2006). Telephone-based treatment has resulted in significant diagnosis decreases among children with disruptive or anxiety disorders compared to face-to-face treatment (Lingley-Pottie & McGrath, 2008; McGrath, Lingley-Pottie, Thurston et al., 2011), and telephone support can help to reduce suicidality and improve mental state (King, Nurcombe, Bickman et al., 2003). In one study, a 16-session telephone CBT intervention reduced obsessive-compulsive syndrome symptoms in young people (Turner & Heyman, 2009).

*Service exemplar: **Strongest Families** is a psychologically informed 12-week distance education program which provides support to families of children from ages 3 to 12 over the phone and Internet in the privacy of their own home. It focuses on treating the most common child mental health disorders – anxiety and disruptive behaviour. Non-professional coaches are trained to deliver the service. Research shows that clients form a strong therapeutic alliance with their telephone coach. Participants described feeling comfortable and safe in their own home, did not feel stigmatized or judged, had little apprehension about self-disclosure and felt that treatment was delivered at their convenience. Compared with usual care, telephone-based treatments resulted in significant diagnosis decreases among children with disruptive behaviour or anxiety. These interventions hold promise to increase access to mental health services. Drop-out rates have been reduced to 10% from the usual 40-60 percent and Strongest Families costs less than one-third of conventional care. The program began in Nova Scotia and has expanded to Ontario and British Columbia. (Lingley-Pottie & McGrath, 2006, 2008)*



We found five studies that focused on **mobile phone applications** (apps). They suggest that it is possible to use apps to monitor symptoms and functioning in real time and allow for personalized early intervention and relapse prevention (Reid, Kauer, Hearps et al., 2011; Whittaker, Merry, Stasiak et al., 2012). Apps can also be used to prompt users to perform specific therapeutic tasks tailored to and contingent on individual needs (Trochel, Manber, Chang et al., 2011). Mobile phone programs are ideally suited to early intervention programs for depression because they are used as an immediate, portable, accessible and non-threatening self-monitoring tool (Kauer, Reid, Crooke et al., 2012) where information is transmitted easily. Paediatricians have reported that apps assist in better understanding of patient functioning and consequently a high percentage of their clients felt that their doctor understood them better (Reid, Kauer, Khor et al., 2012).

### ***Preferences of young people***

In the videoconferencing literature, children aged 4 to 12 are very positive about videoconferencing and prefer a 'television' doctor to a 'real' doctor. Adolescents also prefer seeing a psychiatrist via videoconference rather than in person (Elford, White, St. John et al., 2001; Elford, White, Bowering et al., 2000), and report that they feel a sense of empowerment, find sessions are helpful, and report that interacting with the psychiatrist is positive (Boydell, Volpe & Pignatiello, 2010). High school students appreciate the privacy the technology affords (Bischoff, Hollist, Smith et al., 2004).

Qualitative research shows that adolescents and their families feel they are 'spoken to, rather than at' (Grealish, Hunter, Glazex et al, 2005) when they participate in services provided through videoconferencing. Adolescents report that telemedicine promotes a sense of power and control by allowing them to feel more comfortable about terminating the consultation or walking out (Grealish, Hunter, Glazex et al, 2005). Also, the process can be more structured and consequently they feel better informed, resulting in a better understanding, sense of shared responsibility and better decision making (Grealish, Hunter, Glazex et al, 2005).

Social networking over the Internet is integral to the lives of many youth and young people tend to be very computer literate (Gowen, Deschaine, Gruttadara et al., 2012; Christensen et al., 2011). Social networking and online interaction is appealing due to its intuitive structure for young people to engage with each other and with a moderator (Gleeson, Alvarez-Jimenez & Lederman, 2012). Anonymity is an important aspect of the technology that engages young people (Pretorius, Rowlands, Ringwood et al., 2010; Richards, 2009) and youth are generally more open and confident when online, providing more personal details because of the perceived distance between client and therapist (Burns, Morey, Lagelee et al., 2007; Diamond, Levy, Bevans et al., 2010; Read, Farrow, Jaanimagi et al., 2009). University students are likely to seek help online first, highlighting the importance of using the Internet to engage with youth in need (Radhu, Daskalakis, Arpin-Cribbie et al., 2012).

Young people prefer an informal delivery format (Shandley, Austin, Klein et al., 2010) and have reported that completing therapy and assessments online is easier than paper-and-pencil (Read, Farrow, Jaanimagi et al., 2009), with ease of understanding and readability (Van Voorhees, Ellis, Stuart et al., 2005). Younger children and their parents have shown high levels of compliance in completing Internet-based cognitive behavioural therapy sessions for anxiety and associated homework tasks (Spence, Holmes, March et al., 2006).



Young people who received a web-based intervention for bulimia nervosa or atypical bulimia appreciated the flexibility and sense of control of online treatment (Pretorius, Rowlands, Ringwood et al., 2010). Participants in a study using online sessions to reduce anxiety rated it as interesting and engaging and said that it stimulated motivation and facilitated learning (March et al, 2009). Research shows that it is possible to develop a comprehensive program of engagement and motivation using online service delivery, and it may enhance participation (Landback, Prochaska, Ellis et al., 2009). Young people feel empowered by using e-mail and readily engage in use of this medium (Mehta & Chalhoub, 2006) and they also respond positively to the multimedia aspects of CD-ROM (Brosnan, Sharry & Fitzpatrick, 2005; Cunningham, Wuthrich, Rapee et al., 2009).

### ***The technology***

High quality audio is one of the most important factors that influences caretaker and psychiatrist satisfaction with videoconferencing (Elford, White, Bowering et al., 2000). Technical quality issues, referred to as “growing pains”, have essentially disappeared from the literature with refinement of videoconferencing technology and as practitioners have become more comfortable and accepting of new technologies (Boydell, Volpe, Kertes et al., 2007). The technology itself has moved over time from being a barrier due to technical difficulties to being a facilitator in terms of preferred mode of communication (Boydell, Volpe & Pignatiello, 2010).

The breadth and flexibility of online applications ensures that technology can be used to deliver mental health services successfully and innovatively with few differences between online and face-to-face delivery (Richards, 2009; Spence, Donovan, March, et al., 2008, 2011). The Internet supports social networks and existing social connections, both online and offline. It encourages community participation and increases the likelihood of help seeking (Burns, Morey, Lagelee et al., 2007).

Chat-based services facilitate community and therefore allow therapeutic counselling interventions for an online user community (Richards, 2009). Alongside social networking functions, interactive therapy modules can address psycho-education, relapse prevention, stigma and social anxiety, early warning signs of relapse, depression, and identification and use of personal strengths (Gleeson, Alvarez-Jimenez & Lederman, 2012). Another beneficial feature of social networking sites is the “wall” function that organizes discussion threads into relevant themes where moderators can encourage clients to share successful approaches and personal victories (Gleeson, Alvarez-Jimenez & Lederman, 2012). Online games present clients with engaging scenarios, serving as a catalyst for raising issues and discussing difficulties experienced by adolescents (Burns, Webb, Durkin et al., 2010).

### ***Cost issues***

Cost data in the literature has not been collected in a systematic, controlled, prospective way so is of limited quality (Hilty, Yellowlees, Sonik et al., 2009). What literature exists suggests that total travel cost for clients is less using telepsychiatry than the cost of travelling for face-to-face psychiatry (Elford, White, St. John et al., 2001), so clients realize savings for travel time (Spaulding, Belz, Delurgio et al., 2010). In terms of the effect of cost on the sustainability of videoconference services, infrastructure costs and low reimbursement by public payers are a challenge (Myers, Valentine & Melzer, 2008).



The Internet reaches a wide audience cost effectively and may help manage health delivery costs, including by reaching individuals at an early stage to prevent symptoms from developing into disorders that require more costly services (Christensen, Reynolds & Griffiths, 2011). Screening and assessment websites are reported to have ease of administration and low costs (Steenhuis, Serra, Minderaa et al., 2009) and can help solve problems associated with administration, interpretation, and data integration (Diamond, Levy & Bevans, 2010; Steenhuis, Serra, Minderaa et al., 2009). In a study of Internet-based therapy for anxiety, therapists spent an estimated 15 minutes per week reviewing session activities and preparing e-mail responses for each family, translating into a significant cost reduction in terms of therapist time (March, Spence & Donovan, 2009).

The use of e-mail is also recognized as cost-effective (Trockel, Manber, Chang et al., 2011). Concerns have been raised that enhanced client awareness due to Internet promotion might lead to an increased demand on an already overburdened health system, but there is no systematic empirical evidence on this issue (Christensen, Reynolds & Griffiths, 2011).

### ***Barriers to using technology to deliver mental health services***

The research on using videoconferencing to provide mental health services reports few disadvantages, and technical quality issues are no longer an issue (Boydell, Volpe, Kertes et al., 2007). One potential problem for community service providers is that consultation on difficult cases that does not include follow-up may lead to frustration and potential burn-out (Diamond & Block, 2010).

Barriers to using Internet-based interventions include difficulty in engaging young people in their use, perceptions that programs have low adherence, and clinician concerns about value, effectiveness and safety (Christensen, Reynolds & Griffiths, 2011). Chat rooms and online environments hold potential dangers, including the possibility of attracting adults who may take advantage of vulnerable adolescents (Webb, Burns & Collin, 2008). Also, online treatment or assessment has greater risk for misinterpretation than in-person treatment or assessment (Gerrits, van der Zanden, Visseher et al., 2007; Steenhuis, Serra, Minderaa et al., 2009) and discussion boards without a professional therapist moderator generally lack evidence-based therapeutic content (Gleeson, Alvarez-Jimenez & Lederman, 2012).

Technical difficulties with online technology are a potential issue (Pretorius, Rowlands, Ringwood et al., 2010). One review of three semirural counties in Pennsylvania found problems with firewalls, out-dated computers, and resistance to incorporating an online screening tool (Steenhuis, Serra, Minderaa et al., 2009). Participants in one study felt that the program was impersonal and reported inability to express feelings to a computer, or lack of motivation to turn to a computer in times of stress/crisis. However, they indicated at the same time that they liked the flexibility and support and used it as a stepping stone to further treatment (Pretorius, Rowlands, Ringwood et al., 2010).

Christensen (2011) identified few training schemes and highlighted a lack of developed standards, despite initiatives to address ethical guidelines. She addressed concerns that Internet therapy might encourage a “digital divide” due to inequitable access and create a risk of voyeurism and dependency. She noted other obstacles in developing online therapy including the lack of evidence of effectiveness of Internet interventions and the inadequate pace at which professional organizations are responding to online therapy.



Disadvantages of using e-mail include concerns about potential breach of confidentiality, boundary violations, clinician failure to recognize the urgency of some e-mails, unwanted disclosure, security issues, slow responses, misinterpretation of content, and absence of text-based training (Cartwright, Gibbon, McDermott et al., 2005; Yager, 2003a, 2003b). Other potential problems include loss of non-verbal and observational data inherent in face-to-face work (Roy & Gillett, 2008). Also, the technology is limited by individual client ownership, usage and phone plans.

E-mail in the workplace can produce increased negative effects on employees, who may have to cope with large numbers of e-mails and different communication styles (Cartwright, Gibbon, McDermott et al., 2005). Research has identified the need for formal staff training in how to use e-mail for service delivery and for specific procedures and guidelines if working with children and youth (Cartwright, Gibbon, McDermott et al., 2005).

Adolescents identified barriers to using CD-ROM, including technical problems and finding the time to participate (Cunningham, Wuthrich, Rapee et al., 2009; Cunningham & Wuthrich, 2008). In Cunningham et al.'s (2009) case series evaluating clinical outcomes, only two of five participants completed all eight set modules within a 12-week time frame. Disadvantages with using CD-ROMs for treatment include requiring extensive time and resources to develop evidence-based programs, difficulty monitoring program use, potential technical problems, and lack of suitability for some clients (Cunningham, Wuthrich, Rapee et al., 2009; Wuthrich, 2012).

### **Research gaps**

Articles on videoconferencing tend to cover child and youth mental health in general, while few studies focus on a specific diagnostic category. The literature on Internet delivered services, on the other hand, is more focused on particular diagnostic categories. While a generalist focus is important, it is also essential to understand which service delivery method is best for certain disorders when providing services, for instance via videoconferencing. The literature points to the need for further research in telemental health, particularly for new theory and conceptual frameworks to guide development and evaluation of telemental health interventions (Pesamaa, Ebeling, Kuusamaki et al., 2004).

While an accurate diagnosis or treatment recommendation can be made via technology, the literature lacks follow-up information on how effectively recommendations are carried out (Lau, Way & Fremont, 2011). Christensen et al.'s (2011) qualitative review of research literature reports that more research is needed to understand why more young people do not engage with online mental health applications. More research, including qualitative inquiry, is needed to understand the nuances and impact of the service delivered (Boydell, Volpe, Kertes et al., 2007; Boydell, Volpe & Pignatiello, 2010).

The importance of qualitative research is specifically highlighted in helping to design and develop effective Internet based interventions for young people (Pretorius, Rowlands, Ringwood et al., 2010). Longitudinal studies are needed to demonstrate whether using technology to provide direct service can achieve good long-term mental health outcomes (Boydell, Volpe & Pignatiello, 2010) and better-designed controlled trials are also needed to evaluate clinical value (Pesamaa, Ebeling, Kuusamaki et al., 2004). Also, our review found limited studies of social networking and online games.



## Results – service scan

Drawing on findings from a survey of key informants from child and youth serving mental health organizations across Ontario, this scan provides a snapshot of the current use of technology in the service delivery practice landscape. The service scan was expanded through the practice knowledge of the authors, who have been involved in delivering and researching telemental health over many years and who have built significant informal networks with practitioners and sector leaders who use a variety of technologies to deliver mental health services. Additional phone calls and e-mails were made to select individuals in Australia, the United States and other provinces in Canada to add practical context to this paper (Appendix II).

### *Survey demographics*

One hundred and sixteen surveys were e-mailed to child and youth serving mental health organizations across the province. Eighteen of these were returned as undeliverable, leaving a total of 98. After three weeks and three reminders, fifty-one surveys were returned by community agencies and hospitals, constituting a 52% response rate, adequate for e-mail surveys (Dillman, 2000). The majority of respondents served children and youth in urban communities (67.4%), with 35 percent serving rural communities and the remaining 18 percent serving suburban settings.<sup>8</sup> Agencies in urban and suburban communities often also provide mental health services to rural and suburban children, youth and families.

### *The use of technology to deliver child and youth mental health services*

Child and youth mental health service agencies in Ontario use a variety of technologies in their day-to-day operations. The costs to organizations vary according to the differing technologies and can be a barrier to incorporation.

All survey respondents indicated that they used the telephone to deliver mental health services to children and youth, followed closely by televideo conferencing. However, the figures reported by respondents are misleading as they took a very liberal view of the definition of delivery of mental health services and supports. Although they identified using the technology for mental health service delivery and support, in actuality it was often being used for communication, information or scheduling purposes.

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<sup>8</sup>Totals more than 100% as some agencies served multiple areas.



Figure 1: Technologies used and research/evaluation conducted (n=48)

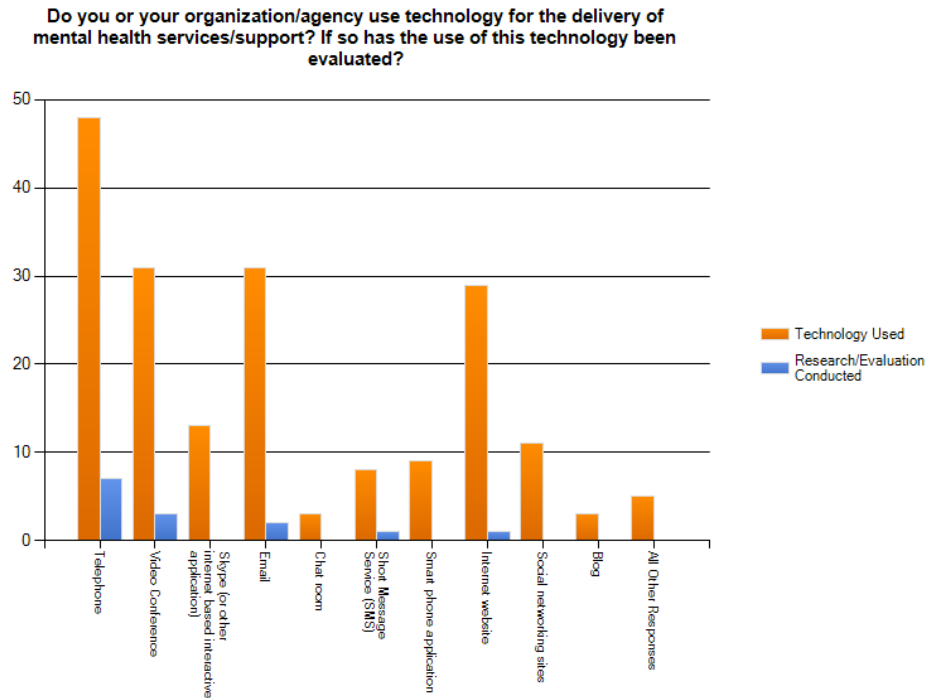


Table 2: Technologies used in child and youth mental health organizations (n=48)

Technology	Percentage
Telephone	100.0
E-mail	64.6
Videoconference	63.3
Internet website	60.4
Skype or other internet based application	27.0
Mobile phone applications	18.8
SMS	16.7
Chat room	6.3

*Telephone:* All respondents indicated that they used the telephone in their day-to-day work serving children, youth and families, but was mostly focused on client inquiries and scheduling, intake and assessment, sharing information with clients and carers, and case and administrative teleconferences. Many also used the telephone for brief counselling, de-escalation and problem solving with parents and youth in crisis situations, and to support parents.



*Videoconference:* Close to two-thirds of respondents (63.3%) used videoconferencing to deliver child and youth mental health services and support<sup>9</sup> for psychiatric assessments, consultations, interventions and case conferences. Televideo was also used for education and training.

*E-mail:* Close to two-thirds (64.6%) of survey respondents stated that they used E-mail to deliver services to children and youth. However, this figure is misleading, as only three respondents indicated that it was used for counselling and support when describing the ways in which they used e-mail. E-mail was used most frequently to assist with making appointments, communicate among staff or with other service agencies. One organization explicitly indicated that they were only allowed to use e-mail for making appointments.

*Internet website:* Although a large percentage of respondents indicated that they had a website that was used for mental health service delivery (60.4%), like e-mail it was used to communicate information about the services offered rather than to actually provide services and/or support. In one case, it was used to administer a self-administered toolkit, but there were no reports of actual service delivery.

*Skype or other internet based application:* Twenty-seven percent of respondents used Skype or similar form of internet based application. For most, it was used for training, case conferences, meetings, and supervision. For a few, it was used for counselling. One respondent identified the difficulties associated with getting a secure connection using Skype.

*Mobile phone applications (apps):* Although 18.8 percent identified that they used mobile phone apps, none were using them to deliver services and supports. Rather, they were using mobile phones for communication, such as e-mail to schedule appointments. One agency was exploring using mobile apps for mood disorders.

*SMS (text messaging):* With the exception of one agency that used SMS to actually counsel clients, all reported use of SMS (16.7%) was for scheduling contacts with clients or for staff communication.

*Chat room:* Only three organizations (6.3%) indicated that they used a chat room – one for e-counselling, one for use with staff and one that was experimenting with its use for counselling.

For all forms of technology used, respondents were asked whether or not there was a research or evaluative component attached to the use of these technologies. As indicated in Figure 1 above, very little research/evaluation is conducted with the various technologies in practice. Of those that are researched, telephone and videoconference are the most likely to have an evaluation component, followed by e-mail and SMS. These evaluations are typically general consumer satisfaction surveys and fail to offer any specific outcome data.

The service scan of child and youth serving organizations involved two open ended questions asking respondents to identify the key benefits and challenges of using technology to deliver mental health services and supports to children and youth. Of the 51 respondents, 49 identified at least one advantage and 48 identified at least one disadvantage.

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<sup>9</sup> This is not surprising given the existing Ontario-wide telemental health service, currently being expanded and enhanced.





### **Advantages in using technology to deliver child and youth mental health services**

Survey respondents identified four main benefits to using technology to provide mental health services:

1. increased accessibility
2. acceptability
3. preferred by children and youth
4. cost savings

These benefits were supported by the main findings described in our literature review.

#### **a) Increased accessibility**

The most prominent benefit discussed in the survey responses was the impression that information and communication technologies (ICT's) increase service accessibility for clients. Many of the technologies reviewed in the literature and listed by survey respondents are innovative in their ability to reach and facilitate communication with a wide array of clients, providing fast and efficient information transfer. By using telephones, mobile phones, the Internet and e-mail, services can "increase the number of client-counsellor contacts" and "apply specialized and limited resources" across large geographical areas. The services that can be provided using technology are those that many communities "do not have locally and would never have received without (the technologies)" such as specialist psychiatric and psychological consultations.

Respondents also valued the ability to use technology to tie service provision to other, related activities. One respondent indicated that the information collected using ICT is "excellent for use with (a) database to log data and produce reports for research". Many of the technologies are designed to enable prompt access to contact information, research options and data collation features. Connected to this is the paperless aspect, which was viewed as another benefit to using technology to deliver services. The flexibility afforded when using technology is a perceived benefit with applications and information available 24/7.

#### **b) Accepted and preferred by children and youth**

Another perceived benefit to using information and communication technologies when delivering mental health services is the sense that young people prefer to communicate via technology rather than face-to-face. Children and young people are comfortable with using social networking websites, e-mail and smartphones on a daily basis and in many cases have grown up familiar with technology. Respondents have found that young people enjoy using the technology and are more engaged and strongly identify with those methods of communication. This is a view that is complemented by the research literature (Boydell, Volpe & Pignatiello, 2010; Elford, White, St. John et al., 2001; Iloabachie, Wells, Goodwin et al., 2011; Van Voorhees, Ellis, Stuart et al., 2005).

The privacy afforded by communicating online over a perceived long distance is also seen as a benefit for older youth. This is also concurrent with much of the literature, which has revealed that adolescents prefer to reveal personal information on computers and via video-conferencing rather than in face-to-face interviews (Cheblowski & Fremont, 2011; Diamond, Levy, Bevans et al., 2010).

#### **c) Cost saving**

Cost-effectiveness, particularly for clients, was another benefit highlighted in the survey. Many respondents identified that using communication technologies reduces the travel, parking and accommodation costs for rurally located clients



to access specialist services that are only available in larger cities. By reducing costs, services become more accessible and more children and youth are able to receive treatment.

There are also costs savings for organization's use of ICT to deliver mental health services. The limited literature focusing on cost to organizations is generally positive, indicating the cost benefits of service delivery using technology (Elford, White, St. John et al., 2001; Spaulding, Belz, Delurgio et al., 2010; Steenhuis, Serra, Minderaa et al., 2009). However the service scan also highlighted the cost of technology and upkeep as a potential barrier to its use.

### ***Difficulties in using technology to deliver child and youth mental health services***

Survey respondents identified four main challenges to using technology in the delivery of mental health services:

1. confidentiality/security/privacy issues
2. issues with technology and equipment
3. challenges in establishing relationships
4. cost

The issues identified by survey respondents were only minimally identified in the literature review.

#### **a) Confidentiality/security/privacy issues**

The perception that privacy is protected is critical to the uptake and use of technology-enabled mental health services and supports. Most respondents identified the issues of client confidentiality, privacy and security of content and information as key barriers, particularly online technologies. Some noted that they did not have adequate resources to support encryption to ensure confidentiality and prevent outside access to sensitive or personal material. This concern includes accidental transmission of sensitive information or deliberate attempts at acquiring sensitive information "...inadvertent forwarding of texting, e-mail, etc. or (access to information) by hacking". Participants were concerned about the financial and intellectual cost of acquiring and installing encryption software and firewalls to improve security. Video conferencing software, such as Skype, was perceived as being susceptible to security breaches from the potential for recording to be carried out on the clients end with easily acquirable recording software or even by an unseen third party.

The Internet is not perceived to be secure and information may reside on social networking websites or other websites "forever". Respondents felt that most people do not know where the information they are writing is stored on the Internet or how to clear it. There is also concern that clients are unaware that their information is being preserved and that they do not information cannot be removed once it is uploaded. There is potential liability regarding who is know who is on the other end of an e-mail or chat room communication and how written information may be used or interpreted.

#### **b) Technology and equipment issues**

Difficulty using the technology itself is another perceived barrier. The challenges include set-up, maintenance and the availability of the technology, such as "(the) challenges of setting up and arranging (an) OTN (Ontario Telemedicine Network) session". Some respondents felt that there needs to be a higher level of technology proficiency within



agencies. As one individual stated, there needs to be “support for the oversight and skills to effectively utilize technological tools”.

Ensuring technology is maintained and up-to-date was a concern, with information technologies advancing at a rapid pace and requiring the necessary hardware and software. One respondent also highlighted the potential “resistance from older staff and possibly families who are not connected (to the) Internet”. There is apprehension about the ability for the technology to reach the more remote and rural northerly regions within an acceptable time frame. This information highlights the importance of making informed decisions across all purveyors.

#### c) Challenges in establishing relationships

The ability, or inability, to develop strong therapeutic relationships between practitioners and clients is another perceived challenge when using technology to deliver mental health services. While much of the research indicates that therapeutic outcomes are equal or greater in some cases when comparing face-to-face delivery with Internet and telephone delivery (Elford, White, St. John et al., 2001; Read, Farrow, Jaanimagi et al., 2009; Steenhuis, Serra, Minderaa et al., 2009; Pakyurek, Yellowlees & Hilty, 2010), some respondents felt that technology is impersonal and eliminates subtle communication.

Factors associated with this barrier include building trust and maintaining engagement, factors viewed as vital to creating positive therapeutic relationships. Another respondent highlighted the absence of body language in some technologies, which can greatly impact the communication between two parties. “Most of what we communicate is not communicated through language; it is through tone, body language, intensity etc. So, when the technology makes therapy about words only and content only, it is much less effective and useful”.

#### d) Cost

Several respondents also highlighted the cost to organizations, particularly telemedicine, as a potential barrier to using technology to deliver services. As one individual highlighted, “the first barrier is lack of adequate funding despite technology becoming so essential and critical to the work we do”. While concerns regarding cost were included in responses, some of the articles reviewed pointed to a decrease in overall costs for providers and clients when using technology (Elford, White, St. John et al., 2001; Spaulding, Belz, Delurgio et al., 2010; Steenhuis, Serra, Minderaa et al., 2009). However, the quality of cost data in the literature is too limited to draw conclusions from and there is little information that has been collected in systematic, controlled, prospective ways (Hilty, Yellowlees, Sonic et al., 2009). Interestingly many participants commented on decreases in cost, particularly for the client, when responding to the subsequent question in the survey “In your opinion what are the benefits in using technology to deliver mental health services?”



## CONCLUSIONS

Ontario is positioned to take a leading role in developing policy in tele-mental and e-mental health and is encouraged to capitalize on positive findings from the field. There is a critical need for technological delivery of services and supports to be integrated into mental health policy planning. There is a strong case for tele-mental health and e-mental health to be established as priority areas given the supporting research and their importance in the current delivery of mental health services. The Internet will play a major role in the future delivery of programs to provide prevention, assessment, diagnosis, counselling and treatment programs and to increase community awareness.

*The technological delivery of mental health services represents the wave of the future of health care, if we really want to reach people who are underserved. It is not whether, but how to apply it securely and safely.<sup>10</sup>*

Participants in the policy and decision-maker consultation process expressed a strong desire for more forums and discussion on the use of technology in the delivery of mental health services and supports to children and youth. The potential strategies outlined in the next section provide pillars for a comprehensive plan to implement technology-delivered mental health services within a coordinated system of care for children and youth in Ontario.

### Implications for policy, practice and research

The central implications for policy, practice and research are drawn from the three-pronged process used in this project – the empirical literature, consultations with decision makers and key informants, and a service scan of mental health agencies in Ontario. Based on input from stakeholders and key findings from the research literature, we recommend the following strategies for policy and decision makers:

#### Engage in provincial policy development

##### *Establish a provincial advisory group*

An important first step in moving toward a provincial e-mental health policy is the establishment of a provincial advisory group on using technology to provide child and youth mental health services. This advisory group should be trans-disciplinary and include all stakeholders, particularly youth and their families. It represents an opportunity to improve the research-policy interface by promoting partnerships among policy and decision-makers, researchers, service providers and consumers. It would also provide a forum for discussion that stakeholders in our consultation process identified as being critical. It will also be important to connect with the current e-mental health initiative of the Mental Health Commission of Canada to ensure consistency and develop a framework to guide and inform practice in Canada.<sup>11</sup>

##### *Develop guidelines for the use of technology in child and youth mental health*

Guidelines on using technology to deliver mental health services are enablers to build online approaches that are effective, efficient and engaging. Guidelines regarding ethical principles and liabilities, confidentiality and privacy,

<sup>10</sup> Policy maker, consultation interview

<sup>11</sup> This needs to be aligned with the current project of the Mental Health Commission of Canada, the goal of which is to produce a framework for e-mental health (see [www.mentalhealthcommissionofcanada.ca](http://www.mentalhealthcommissionofcanada.ca))



(evaluation, and education and training will help to encourage good practice and promote high quality mental health information for clients accessing services through the Internet. Available service guidelines and standards (e.g. those used by Canadian College of Physicians and Surgeons, Ontario Telemedicine Network) will help in this process and in the development of future guidelines and standards.

Guidelines developed together with agencies and practitioners will enable them to participate in this sphere. There is a need to develop guidelines for professional and non-professional practice on the use of technology in mental health service delivery. Societies and professional organizations need to educate their members about the ethical and legal implications of interacting with patients on the Internet and through text and e-mail. Community centres, mental health services and other organizations within the mental health and related communities need to identify procedures for handling Internet inquiries and requests. Without clear practices and protocols, mental health professionals and children and youth may be at risk and clients may develop unrealistic expectations.

Government, working with key stakeholders, should develop:

(i) *Guidelines with respect to ethical principles and liabilities*

- Promote the highest standard ethical code of conduct in all e-mental health interactions.
- Facilitate the development, implementation and monitoring of ethical guidelines and standards for e-mental health intervention;
- Identify and examine relevant legal issues, and in particular, professional liability issues associated with online service delivery;

(ii) *Guidelines with respect to confidentiality and privacy*

- Protect confidentiality and privacy of e-mental health interactions while improving accessibility and continuity of care through the use of e-records.
- Identify any legal issues associated with confidentiality and privacy that are specific to the area of mental health and to children and young people.

(iii) *Guidelines with respect to education and training*

- Encourage professional organizations to develop guidelines and future training and accreditation requirements for the practice of professional online therapy and other e-mental health approaches.
- Support comprehensive and mandatory training in the use of technology to deliver child and youth mental health services, across all sectors (health, education, youth justice, training, colleges and universities, and child and youth mental health agencies).
- Include education and training in the use of technology in academic programs for child and youth mental health practitioners to shift attitudes and build skills of the emerging workforce sectors.

(iv) *Guidelines with respect to evaluating the effectiveness of Internet sites*

- Internet interventions and information sites in mental health should be evaluated for their effectiveness. There is a special need to evaluate the effectiveness of support groups in mental health since these are growing, popular and often cater to specific needs. Although many mental health websites are available, very few are evaluated. Without such evaluation it is difficult to know whether they are useful, satisfying for consumers and mental health professionals, or even harmful.



## **Support systematic evaluation and research on the use of technology in child and youth mental health in Ontario**

A comprehensive review (including a thorough environmental scan) of all tele-mental and e-mental health services and programs that serve children, youth and their families across the province would provide a picture of the current landscape. This would include:

- Identification of the range of the types of interactions that occur online
- Current Internet-based mental health interventions as a function of type of intervention strategy and funding source, including a description of services, who provides them, the modes of delivery, target groups and service users
- Telemedicine and e-mental health services including Web-based counselling, Web psychiatry and Internet and other e-technology assisted therapy, in particular Web based 'call centres' which offer online advice and counselling
- Available and emerging e-mental health technologies
- Internet crisis services, support groups and chat groups in Ontario
- Initiatives that aim to provide physical access to the Internet and to other e-mental health services for those with mental health symptoms
- The attitudes and expectations of consumers and professionals about the role of e-mental health
- Research and evaluation across sectors to identify best practices and ensure integration of research and practice.

### **Focus on knowledge mobilization**

There is a need for a knowledge mobilization strategy to share the successes in the field in Ontario and beyond. An example of one strategy being used is the Beacon portal ([www.beacon.anu.edu.au](http://www.beacon.anu.edu.au)) that provides users with a comprehensive directory of e-health applications (websites, mobile applications and Internet support groups), and includes reviews, expert ratings and user comments. The reviews are specific to mobile apps and internet support groups. The portal provides information about a range of online interventions used in the prevention or treatment of mental health disorders. Beacon's health applications for generalised anxiety disorder, social anxiety disorder, panic disorder, post-traumatic stress disorder and depression are described by Christensen and her colleagues.<sup>12</sup>

### **Develop an education and training strategy**

Continuing education programs should be developed that target CYMH practitioner training programs and existing service providers to encourage and educate future and current practitioners to integrate e-mental health initiatives into their practices. A mechanism for credentialing individuals to engage in this type of work would also be worthy of consideration.



## Ensure access to technology

Access to videoconferencing and Internet technologies should be improved for those communities that are not currently served. Initiatives that are currently underway to improve Internet access for all Ontarians should continue, but there is a need to develop specific access strategies for those with mental health symptoms since mental health may differ substantially from other areas of health. In particular, there is greater stigma and less openness about mental health problems and the evidence suggests that mental health consumers are taking to technologies very quickly.

- Investigate strategies for improving access to mental health information, treatment and support for those not currently served by the technology.
- Identify factors such as lack of physical access, lack of interest and lack of information literacy that contribute to the digital divide among mental health stakeholders and serve as barriers to the use of technology within Ontario.
- Together with relevant government, non-government and practitioner organizations, plan strategies for public education of mental health consumers, carers and providers in mental health technologies.

With close to 80 percent of all Canadians using the Internet or social media on a daily basis, there is an opportunity to expand the availability of effective mental health services and supports for children and youth. As indicated in the Ontario Centre of Excellence for Child and Youth Mental Health report<sup>13</sup> on access and wait times (2010), tele- and e-mental health programs were identified as the most innovative strategies to enhance access to mental health services and supports for children and youth and one approach to enhance access to mental health services for children, youth and their families.

## System transition and service enhancement

*Moving on Mental Health: a system that makes sense for children and youth* lays out an exciting new path forward for the child and youth mental health sector, and service options that include technology will be essential for all communities in Ontario. The province's child and youth telepsychiatry program has already shown that Ontario is a leader in using technology to provide enhanced access to effective mental health services for children and youth. Ontario has the capacity to make increased use of a wide variety of technologies as vehicles for service delivery. Moving forward to establish common guidelines, a strong evidence base and to mobilize this knowledge are important next steps.

Globally, a range of technologies are being used to deliver mental health services, and they will likely continue to grow in importance, transforming the child and youth mental health sector. System transition is an ideal opportunity to take advantage of existing and emerging technologies to provide effective, efficient, engaging, and client-centred interventions for children, youth and families across Ontario.

<sup>12</sup> Christensen, H., Murray, K., Calear, A. L., Bennett, K., Bennett, A. & Griffiths, K. M. (2010). Beacon: a web portal to high-quality mental health websites for use by health professionals and the public. *Medical Journal of Australia*, 192(11): S40-S44.

<sup>13</sup> [http://www.excellenceforchildandyouth.ca/sites/default/files/policy\\_access\\_and\\_wait\\_times.pdf](http://www.excellenceforchildandyouth.ca/sites/default/files/policy_access_and_wait_times.pdf)



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## APPENDIX I

### Definitions

**e-Health:** an emerging field at the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology.<sup>14</sup>

**E-mental health:** mental health services and information delivered or enhanced through the internet and related technologies.<sup>15</sup> Two types of e-mental health are referred to – web interventions and mobile applications.<sup>16</sup>

**Telemental health:** a subset of telehealth that uses videoconferencing technology to provide mental health services from a distance. It includes telepsychology, telepsychiatry, telemental health nursing and telebehavioural health.

**Telemedicine:** the use of medical information exchanged from one site to another via electronic communications to improve patients' health status.<sup>17</sup>

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<sup>14</sup> Eysenbach, G. What is e-health? *Journal of Medical Internet Research*, 2001; 3(2): e20.

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<sup>16</sup> Christensen, H. and Petrie, K. (2013). State of the e-Mental Health field in Australia: Where are we now? *Australian and New Zealand Journal of Psychiatry*, 47(2), 117-120.

<sup>17</sup> American Telemedicine Association, [www.americantelemed.org](http://www.americantelemed.org)



## APPENDIX II

### Face-to-face workshop

Facilitator: Sheila Cook  
Infacilitation

### Policy and decision-maker consultation participants

Anne Bowlby

Ministry of Health and Long-Term Care

Pamela Brown

Children and Youth at Risk Branch, Ministry  
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Simon Hatcher

Vice-Chair of Research, Faculty of Medicine  
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David Kreindler

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Sunnybrook Health Sciences Centre

Carolyn Mak

Director, Knowledge Mobilization & Program Development  
Kids Help Phone Counseling Services

Kathleen Myers

Clinical Program Director, Consultation/Liaison Service;

Program Director, Telepsychiatry and Behavioral  
Health, Seattle Children's Hospital



## APPENDIX III

### Library search strategy

#### Search strategy

Hospital Library Cheri Nickel Reference & Instruction Services Librarian 416-813-7520 <a href="mailto:cheri.nickel@sickkids.ca">cheri.nickel@sickkids.ca</a>	January 22, 2013	<i>Question: use of technology in the delivery of mental health services to children/youth/</i>  <i>Limited to English publications only and from 2000 – current.</i>
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Database: PsycINFO <1967 to January Week 3 2013>

Search Strategy:

- 
- 1 exp mental disorders/ (393811)
  - 2 community mental health services/ or community mental health/ or community mental health centers/ or community psychiatry/ (9799)
  - 3 exp mental health programs/ or primary mental health prevention/ or psychiatric clinics/ (11653)
  - 4 mental health services/ or exp psychiatric hospital programs/ (28167)
  - 5 exp psychiatry/ (33221)
  - 6 or/1-5 (449977)
  - 7 teleconferencing/ or telemedicine/ or computer assisted diagnosis/ or computer assisted therapy/ or computer mediated communication/ or internet/ (24778)
  - 8 (telepsychiatry or telepsychology or "telemental health").mp. (317)
  - 9 electronic communication/ or exp social media/ (4000)
  - 10 exp computer peripheral devices/ or exp internet usage/ or messages/ or online social networks/ or online therapy/ (9276)
  - 11 mobile devices/ or cellular phones/ (1384)
  - 12 websites/ (2220)
  - 13 exp computers/ or computer assisted therapy/ (12330)
  - 14 ("social media" or facebook or twitter or youtube or you-tube).mp. (1427)
  - 15 or/7-14 (45918)
  - 16 6 and 15 (2905)
  - 17 limit 16 to (100 childhood <birth to age 12 yrs> or 120 neonatal <birth to age 1 mo> or 140 infancy <age 2 to 23 mo> or 160 preschool age <age 2 to 5 yrs> or 180 school age <age 6 to 12 yrs> or 200 adolescence <age 13 to 17 yrs> or 320 young adulthood <age 18 to 29 yrs>) (706)
  - 18 (infan\* or newborn\* or new-born\* or neonat\* or baby or babies or child\* or youth or kid or kids or toddler\* or boy\* or girl\* or adolescen\* or teen\* or juvenile\* or p?ediatric\*).mp. (658785)
  - 19 16 and 18 (525)
  - 20 17 or 19 (920)
  - 21 limit 20 to english language (877)
  - 22 limit 21 to yr="2000 -Current" (815)

Hospital Library Cheri Nickel Reference & Instruction Services Librarian	January 22, 2013	<i>Question: use of technology in the delivery of mental health services to children/youth/</i>
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<p>416-813-7520 <a href="mailto:cheri.nickel@sickkids.ca">cheri.nickel@sickkids.ca</a></p>		<p><i>Limited to English publications only and from 2000 – current.</i></p>
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Database: Embase Classic+Embase <1947 to 2013 Week 03>  
Search Strategy:

- 
- 1 exp mental disease/ (1596352)
  - 2 mental health care/ or home mental health care/ or mental health service/ (57400)
  - 3 psychiatric nursing/ or community psychiatric nursing/ (13889)
  - 4 psychiatric treatment/ or exp psychiatry/ (115224)
  - 5 or/1-4 (1677567)
  - 6 telemedicine/ or telehealth/ or telemonitoring/ or telepsychiatry/ or teletherapy/ (11046)
  - 7 e-mail/ or internet/ or mobile phone/ or social media/ or telephone/ or text messaging/ or videoconferencing/ or webcast/ (100116)
  - 8 computer/ or exp computer network/ or microcomputer/ or personal digital assistant/ (93643)
  - 9 ("social media" or facebook or twitter or youtube or you-tube).mp. (1702)
  - 10 (telepsychology or "telemental health").mp. (77)
  - 11 or/6-10 (196759)
  - 12 5 and 11 (14783)
  - 13 limit 12 to (infant <to one year> or child <unspecified age> or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>) (2632)
  - 14 exp adolescent/ or exp child/ or exp newborn/ (2850823)
  - 15 12 and 14 (2753)
  - 16 13 or 15 (2753)
  - 17 limit 16 to english language (2545)
  - 18 limit 17 to yr="2000 -Current" (2159)

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<p>Hospital Library Cheri Nickel Reference &amp; Instruction Services Librarian 416-813-7520 <a href="mailto:cheri.nickel@sickkids.ca">cheri.nickel@sickkids.ca</a></p>	<p>January 22, 2013</p>	<p><i>Question: use of technology in the delivery of mental health services to children/youth/ young adults</i></p> <p><i>Limited to English publications only and from 2000 – current.</i></p>
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Database: Ovid MEDLINE(R) 1946 to Present with Daily Update  
Search Strategy:

- 
- 1 mental health services/ or community mental health services/ or emergency services, psychiatric/ or social work, psychiatric/ (42377)
  - 2 exp Mental Disorders/ (874799)
  - 3 psychiatry/ or exp community psychiatry/ (31657)
  - 4 or/1-3 (912553)
  - 5 Telemedicine/ (9686)
  - 6 (telepsychiatry or telepsychology or "telemental health").mp. (316)
  - 7 videoconferencing/ or webcasts as topic/ (803)
  - 8 electronic mail/ or telephone/ or cellular phone/ or text messaging/ (13340)



- 9 computer communication networks/ or internet/ or blogging/ or social media/ or exp computers/ (120073)
- 10 ("social media" or facebook or twitter or youtube or you-tube).mp. (1065)
- 11 or/5-10 (138923)
- 12 4 and 11 (5733)
- 13 limit 12 to ("all child (0 to 18 years)" or "young adult (19 to 24 years)") (1864)
- 14 adolescent psychiatry/ or child psychiatry/ (5637)
- 15 11 and 14 (53)
- 16 13 or 15 (1890)
- 17 limit 16 to english language (1783)
- 18 limit 17 to yr="2000 -Current" (1425)

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## APPENDIX IV

### Literature review summary tables

**Table 1: The use of televideo conference (n=42)**

Reference No.	Country	Participants & Methods	Objective	Study Results
1. ALESSI, N.E. (2003). Quantitative documentation of the therapeutic efficacy of adolescent telepsychiatry. <i>Telemedicine Journal and e-Health</i> , 9(3), 283-290.	USA	Case report of a 15-year-old adolescent who was evaluated and treated via telepsychiatry as part of an ongoing project at the University of Michigan Health System and the Hiawatha Community Mental Health Center in Michigan	To provide a case example of the application of standardized instruments to characterize and track the result of the treatment intervention.	Provision of care via teleconferencing allowed proper diagnosis of an adolescent who suffered from posttraumatic stress disorder and poly-substance abuse. This allowed the discontinuation of medications and a return of the patient to her previous level of functioning. Most importantly in this case was the relationship that developed between the psychiatrist and the patient that led to a more accurate assessment of her psychopathology.
2. BISCHOFF, R.J., HOLLIST, C.S., SMITH, C.W., FLACK, P. (2004). Addressing the mental health needs of the rural underserved: findings from a multiple case study of a behavioral telehealth project. <i>Contemporary Family Therapy</i> , 26(2), 179-198.	USA	Qualitative multiple case study of three high school students in rural community	To 1) identify therapist, client, and technology factors affecting service delivery; 2) articulate characteristics of service delivery via this tele-communications strategy; and 3) identify treatment recommendation.	All rural participants indicated that they would choose the BTH program over all other options; negative influences of technology can be compensated for with appropriate accommodations to the technology and modes of communication. The privacy afforded by this means of service provision was appreciated.
3. BOYDELL, K.M., VOLPE, T., KERTES, A. GREENBERG, N. (2007). A review of the outcomes of the recommendations made during paediatric telepsychiatry consultations. <i>Journal of Telemedicine and Telecare</i> , 13, 277-281	CANADA	Reviewed 100 telepsychiatry consultations, chosen randomly from a paediatric telepsychiatry program serving rural communities in Ontario. Case managers of 54 of the cases were interviewed to determine whether recommendations implemented and to examine barriers and facilitators to implementation.	To determine uptake of recommendations made during psychiatric consultation via televideo.	Results indicated that cooperation of both child and parent, clear communication of recommendations, involvement of the school and local health providers, stability of the agencies and availability of services were key components in the successful implementation of recommendations. The matter of technology or technological difficulties acting as a barrier to telepsychiatric consultations was not mentioned by case managers, suggesting that it was not a problem.
4. BOYDELL, K.M., VOLPE, T., PIGNATIELLO, A. (2010). A qualitative a study of young people's perspectives on receiving psychiatric services via televideo. <i>J Can Acad Child Adolesc Psychiatry</i> , 19,1, 5-11.	CANADA	Interpretive interactionism was used to qualitatively interview 30 young people who had received psychiatric consultation via televideo; immediately following the consultation and four to six weeks later. Analysis occurred via steps in keeping with the interpretive interactionist framework.	To understand the experience of young people receiving telepsychiatry.	Four themes: the encounter with the psychiatrist and experience of having others in the room; the helpfulness of the session; a sense of personal choice during the consultation; and, the technology. Participants highlighted the importance of their relationship with the psychiatrist. Participant's narratives were replete with examples of ways that they actively took responsibility and exerted control within the session itself. Strong desire by young people to have a more extended relationship with the psychiatrist, suggests the need to further explore this option; longitudinal study needed.



<p>5. BOYDELL, K.M., VOLPE, T., PIGNATIELLO, A. (2010). A qualitative a study of young people’s perspectives on receiving psychiatric services via televideo. <i>J Can Acad Child Adolesc Psychiatry</i>, <b>19</b>,1, 5-11.</p>	<p>CANADA</p>	<p>Interpretive interactionism was used to qualitatively interview 30 young people who had received psychiatric consultation via televideo; immediately following the consultation and four to six weeks later. Analysis occurred via steps in keeping with the interpretive interactionist framework.</p>	<p>To understand the experience of young people receiving telepsychiatry.</p>	<p>Four themes: the encounter with the psychiatrist and experience of having others in the room; the helpfulness of the session; a sense of personal choice during the consultation; and, the technology. Participants highlighted the importance of their relationship with the psychiatrist. Participant’s narratives were replete with examples of ways that they actively took responsibility and exerted control within the session itself. Strong desire by young people to have a more extended relationship with the psychiatrist, suggests the need to further explore this option; longitudinal study needed</p>
<p>6. CHLEBOWSKI, S., FREMONT, W. (2011). Therapeutic uses of the WebCam in child psychiatry. <i>Academic Psychiatry</i>, <b>35</b>, 263–267</p>	<p>USA</p>	<p>Six cases illustrate the use of the WebCam in individual and family therapy.</p>	<p>To provide examples for the use of the WebCam as a therapeutic tool in child psychiatry, discussing cases to demonstrate the application of the WebCam, which is most often used in psychiatry training programs during resident supervision and for case presentations.</p>	<p>WebCam was helpful in facilitating patient communication; use of the WebCam as a mirror by which the child can see himself and reflect upon his social skills. Progress in treatment may be evident to the participants after case review; advantages of reviewing tapes with the patient or family. Recommend the WebCam for psycho-education, communication, and treatment with children and families. The applications of this technology may include cognitive-behavior therapy, dialectical-behavioral, and group therapy.</p>
<p>7. DIAMOND, J.M., BLOCK, R.M. (2010). Telepsychiatry assessments of child or adolescent behavior disorders: A review of evidence and issues. <i>Telemedicine and e-Health</i>, <b>16</b>(6), 712-716.</p>	<p>USA</p>	<p>This was a literature search using Medline via Ovid. It focused on English- language material published between 1996 and 2009. A range of search terms relating to assessment, mental health, telemedicine, and children was used. Any studies focusing on child and adolescent psychiatric assessment were included.</p>	<p>To review the literature on telepsychiatry assessment of children and adolescents.</p>	<p>The limited literature on children is related to project descriptions or case reports. Acceptance, the diagnoses and recommendations are not seen as different from in-person assessments. Practical considerations that arise in giving telepsychiatric assessments are discussed. One-time consultations on difficult cases can lead to frustration and potential burn-out. Discomfort can arise from not knowing outcomes, which could undermine the telepsychiatrist’s satisfaction or confidence. No findings suggest that telepsychiatric assessments are biased toward recognizing certain disorders over others, or that telepsychiatric assessments are not comparable to IP assessments.</p>

<p>8. ELFORD, D.R., WHITE, H., ST JOHN, K., MADDIGAN, B., GHANDI, M., BOWERING, R. (2001). A prospective satisfaction study and cost analysis of a pilot child telepsychiatry service in Newfoundland. <i>Journal of Telemedicine and Telecare</i>, <b>7</b>, 73–81</p>	<p>CANADA</p>	<p>Thirty patients (aged 5–16 years), accompanied by a parent, completed a psychiatric assessment using the videoconferencing system. One of five child psychiatrists was randomly assigned to each assessment. Satisfaction questionnaires were completed after each assessment by the psychiatrist, patient and parent. Parents also completed a cost questionnaire.</p>	<p>To evaluate user satisfaction w a PC-based video- conferencing system used for child psychiatry assessments and perform a cost analysis</p>	<p>Twenty-nine parents (97%) preferred to use the telepsychiatry system to travelling to see a child psychiatrist in person. Eleven children (aged 5–12) participated and all ‘liked’ using the telepsychiatry system. Five out of nine children (56%) liked the ‘television doctor’ better than the ‘real’ doctor; four said they had no preference. Nineteen adolescents (aged 13–16 years) participated and most were very satisfied or satisfied with the system. Seventeen of 19 adolescents (89%) prefer to see the psychiatrist via videoconferencing to travelling for assessment, and the same number would use telepsychiatry again. Estimated total travel cost for 30 patients was \$12,849, an average of \$428 per patient. The total cost of the telepsychiatry service for three-month pilot was \$12,575, or \$419 per patient.</p>
<p>9. ELFORD, D.R., WHITE, H., BOWERING, R., GHANDI, A., MADDIGAN, B., ST JOHN, K., HOUSE, M., HARNETT, J., WEST, R., BATTCKOCK, A. (2000). A randomized, controlled trial of child psychiatric assessments conducted using videoconferencing. <i>Journal of Telemedicine and Telecare</i>, <b>6</b>, 73–82</p>	<p>CANADA</p>	<p>Twenty-three patients (aged 4–16 years), accompanied by their parents, completed two psychiatric assessments, one via videoconferencing and another face to face (FTF). The order of assess- ments was randomized. Questionnaires were used to record the diagnosis, treat- ment recomm- endations and the psychiatrists’, patients’ and their parents’ satisfaction with each assessment.</p>	<p>To determine satisfaction with telepsychiatry vs. face-to-face encounters.</p>	<p>High-quality audio was found to be one of the most important factors influencing how satisfied the parents and psychiatrists were with the videoconferencing system. Children (aged 4–12 years) were very positive about the videoconferencing system; 16 out of 17 ‘liked’ using the system and five liked it better than seeing the doctor in person. One of the five adolescents preferred the telepsychiatry assessment. This is in contrast to the psychiatrists and parents, who almost unanimously preferred to have an assessment done face to face.</p>
<p>10. ELLINGTON, E., MCGUINNESS, T.M. (2011). Telepsychiatry for children and adolescents. <i>Journal of Psychosocial Nursing</i>, <b>49</b>(2), 19-22.</p>	<p>USA</p>	<p>Overview of literature and commentary.</p>	<p>To provide an overview of the implications of telepsychiatry for nursing.</p>	<p>There are as yet no specific psychiatric telehealth nursing guidelines, general telehealth nursing guidelines exist.</p>

<p>11. GELBER, H. (2001). The experience in Victoria with telepsychiatry for the child and adolescent mental health service. <i>Journal of Telemedicine and Telecare</i>, 7 (Suppl. 2):S2, 32–34.</p>	<p>AUS</p>	<p>A survey of 25 CAMHS clinicians in five rural regions who had used videoconferencing.</p>	<p>To survey clinicians to inform future telepsychiatry development. The survey was intended to discover their key experiences both positive and negative that had shaped the implementation of telepsychiatry in these services.</p>	<p>Use - Sixty-four per cent had used the technology for more than 18 months, and 20% had used it for 7–12 months. Also, 60% had used the technology on over 30 occasions, and 24% had used it on 20–29 occasions. Ninety-six per cent of respondents reported an increased level of comfort over time. Ninety-two per cent of respondents reported that they had used the technology for clinical/consultation applications and supervision, while 36% had used it for teaching. Given the paucity of specialist CAMHS in rural Victoria, this indicates that CAMHS clinicians continue to use the technology to improve their clinical work. Respondents clearly recognized its benefits in terms of their increased knowledge and skills (96%), strengthening of relationships with colleagues (92%) and decreased sense of isolation (92%).</p>
<p>12. GOLDFIELD, G.S., BOACHIE, A.M. (2003). Delivery of family therapy in the treatment of anorexia nervosa using telehealth. <i>Telemedicine Journal and E-health</i>, 9(1), 111-114.</p>	<p>CANADA</p>	<p>Case study, n=1 of F from small under-served city</p>	<p>To report the therapeutic outcome &amp; patient satisfaction of using telehealth to provide family therapy as an adjunct treatment for AN to an adolescent female admitted to large urban-based hospital treatment program</p>	<p>Following treatment, H felt closer to her family, had gained significant weight, with a BMI of 19.5; had accepted that she had an eating disorder; and was taking responsibility for her recovery. The family perceived sessions as very beneficial, evidenced by positive ratings on such indices as the setting, flexibility of scheduling, and suitability of environment and atmosphere.</p>

<p>13. GREALISH, A., HUNTER, A., GLAZEZ, R., POTTERZ, L. (2005). Telemedicine in a child and adolescent mental health service: participants' acceptance and utilization, <i>Journal of Telemedicine and Telecare</i>, <b>11</b> (Suppl. 1): S1:53–55.</p>	<p>UK</p>	<p>Quantitative and qualitative methods used. Three sites were linked to the inpatient service in Edinburgh. Data were collected via questionnaires and diary logs. During a 24-month study, a total of 65 adolescents were admitted for inpatient care, of whom only five had their cases reviewed and monitored in a total of 20 teleconsultations.</p>	<p>The aim of the study was to examine the quality of service from both the adolescents' and the referrers' perspectives, with particular focus on empowerment and enablement.</p>	<p>Adolescents and carers involved in the study expressed great satisfaction with telemedicine and were keen to use it. All five adolescents and their carers reported that telemedicine was at least as good as in-person consultation. Telemedicine was preferable to travelling to see clinician, less disruptive to school and home routine. Telemedicine was felt to be as private as in-person consult. Adolescents found it easy to take part in teleconsultations. Clinicians were initially apprehensive and hesitant about using telemedicine for their clinical consultation, but took one session, supported by technical training from researcher, to reduce anxieties. Clinicians expressed great satisfaction with teleconsultation as they found it increased collaboration between sites, and facilitated peer reviews and more rapid feedback from inpatient staff. They found telemedicine useful for discussing case histories, current presentation and treatment plans. Inpatient staff noted that telemedicine improved communication and efficiency between all parties involved in the adolescent's care, as they did not have to go into lengthy discussion updating other clinicians about the inpatient treatment and progress. In addition, all parties involved in the adolescent's care were able to attend the consultation, and this was identified as a further strength. Adolescents and their families felt they were 'spoken to, rather than at'. Adolescents found that telemedicine promoted the transfer of power and control, by making them feel more comfortable about terminating the consultation or walking out. They found the process more structured, and consequently felt they were better informed, which resulted in them understanding their problems better. Adolescents experienced increased participation in, and a sense of shared responsibility for, decision-making regarding their health care.</p>
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<p>14. GREENBERG, N., BOYDELL, K.M. VOLPE, T. (2006). Pediatric telepsychiatry in Ontario: Service provider and caregiver perspectives. <i>Journal of Behavioral Health Services &amp; Research</i>, 105-111.</p>	<p>CANADA</p>	<p>Qualitative, exploratory methods were utilized because of the complex nature of mental health services needs and provision in rural communities. Focus groups with rural mental health service providers and interviews with family caregivers of children receiving a telepsychiatry consultation were conducted.</p>	<p>To evaluate the benefits and limitations of providing pediatric psychiatric services via video-technology to inform future program development and health policy.</p>	<p>Concerns expressed about limitations of available services, in terms of extent of services available via the technology and in terms of support and management services available locally. A major concern of caregivers and service providers was on need for more local support and medical services to oversee implementation of treatment recommendations resulting from telepsychiatry consults; Two key functions served by availability of telepsychiatry services, namely, enhanced capacity for service providers and reduced burden on caregivers, as well as a key frustration with the limitations of available telepsychiatry and support services, described by both service provider and caregivers.</p>
<p>15. HILTY, D.M., YELLOWLEES, P.M., NESBITT, T.S. (2006). Evolution of telepsychiatry to rural sites: changes over time in types of referral and in primary care providers' knowledge, skills and satisfaction. <i>General Hospital Psychiatry</i>, 28, 367-373</p>	<p>USA</p>	<p>Data with regard to patient demographics, diagnoses, reason for consultation, medication dosing and satisfaction were prospectively collected on the first 200 and the subsequent 200 telepsychiatric initial consultations.</p>	<p>To assess changes over time in utilization of telepsychiatric services by individual primary care providers (PCPs) and clinics in rural areas, specifically: (a) types of referrals for telepsychiatry service; (b) PCPs' knowledge and skills related to medication dosing; and (c) PCPs' satisfaction with telepsychiatry.</p>	<p>Rural providers and clinics appear to use telepsychiatric consultations differently over time, and they are very satisfied with the service. Over time, PCPs were significantly more likely to seek help with new treatment plans and current treatment plans, rather than with diagnosis, helping them provide more care in the medical clinic without delay. PCPs' satisfaction also improved over time and was the driving force for these changes. PCPs significantly improved medication dosing over time, perhaps due to education interventions. Rural PCPs' perception of being able to treat more patients over time.</p>
<p>16. HILTY, D.M., YELLOWLEES, P.M., SONIK, P., DERLET, M., HENDREN, R.L. (2009). Rural child and adolescent telepsychiatry: Successes and struggles. <i>Pediatric Annals</i>, 38, 4, 228-232.</p>	<p>USA</p>	<p>Review of existing literature.</p>	<p>To review current state of the art in pediatric telepsychiatry.</p>	<p>Many models of service delivery have been researched and summarized. Literature indicates that telepsychiatry has many improved outcomes. If rural PCPs have adequate, customized telepsychiatric support, they appear better able to diagnose and manage mental health issues. The quality of cost data in the literature is suboptimal and little information has been collected in a systematic, controlled, prospective fashion.</p>

<p>17. HOCKEY, A.D., YELLOWLEES, P.M., MURPHY, S. (2004). Evaluation of a pilot second-opinion child telepsychiatry service. <i>Journal of Telemedicine and Telecare</i>, <b>10</b>(Suppl. 1), S1:48–50.</p>	<p>AUS</p>	<p>To evaluate the service, patient medical history, dates when a referral was received by the service and when consultation was performed, duration of each videoconference, and the sub-specialties attending the videoconference were collected. To identify barriers to use of the service, a questionnaire was administered to referring and non-referring CYMHS teams.</p>	<p>To pilot a second-opinion child psychiatry service for six months.</p>	<p>The mean time between a referral being made and a consultation being performed was 4.7 days. Major barriers to service implementation included the limited allied health applications that were offered, a perceived lack of communication during the implementation phase of the service, and the creation of a new referral network that did not conform to traditional referral patterns in the north of Queensland. Considerable groundwork is required to engender confidence about the utility of such a service in rural and remote areas.</p>
<p>18. KEILMAN, P. (2005). Telepsychiatry with child welfare families referred to a family service agency. <i>Telemedicine and e-Health</i>, <b>11</b>(1), 98-101.</p>	<p>USA</p>	<p>Participants received formal written consult reports after the videoconference sessions, which included recommendations. Participants completed an anonymous questionnaire to rate various aspects of videoconferencing</p>	<p>To investigate whether the quality and acceptance of telemedicine consultations were comparable to face-to-face interactions in a group referred by a state child welfare agency.</p>	<p>Participants rated the university staff as involved, enjoyed the Family Resource Center staff's presence, felt the procedure was useful for evaluation purposes, found the format allowed for discussions of problems, and felt that the format was useful when compared to face-to-face consultations. The participants also said they had followed up on many of the recommendations. Videoconferencing appears to be a viable approach for providing consultation for families referred by a state child welfare agency. Several participants rated the session as both educational and consultative compared to simply therapeutic.</p>
<p>19. KOPEL, H., NUNN, K., DOSSETOR, D. (2001). Evaluating satisfaction with a child and adolescent psychological telemedicine outreach service. <i>Journal of Telemedicine and Telecare</i>, <b>7</b> (Suppl. 2): S2, 35–40.</p>	<p>AUS</p>	<p>Three separate evaluation packages were designed for CHW clinicians, rural clinicians, and young people and their families or carers. Objectives were to evaluate satisfaction with the telepsychiatry service and to evaluate the effect of the technology on consultations and service provision. The project evaluator was responsible for the distribution and collection of packages to each rural area</p>	<p>To measure satisfaction with the service and in so doing demonstrate the successes and failures of telepsychiatry services for rural New South Wales (NSW).</p>	<p>Results of the evaluation study showed high satisfaction ratings by rural health workers, young people and their parents/carers of the telepsychiatry service provided by child psychiatrists from the CHW. This undoubtedly was the overwhelming and surprising success of the CAPTOS. CHW clinicians were astonished that rural families responded so positively to being provided with a child psychiatry consultation via videoconferencing. In addition, rural clinicians evidently experienced the videoconferencing service as helpful and supportive.</p>

<p>20. LAU, M.E., WAY, B.B., FREMONT, W.P. (2011). Assessment of SUNY upstate medical university's child telepsychiatry consultation program. <i>Int'l. J. Psychiatry In Medicine</i>, <b>42</b>(1) 93-104.</p>	<p>USA</p>	<p>Data for 45 patients was extracted from pre-consultation forms completed by the referring clinic and post-consultation summaries completed by the upstate psychiatrists.</p>	<p>assesses the child telepsychiatry services provided by SUNY Upstate psychiatrists to several county mental health clinics in central New York State</p>	<p>The child telepsychiatric program at Upstate seemed effective. It reached a large variety of children with significant mental disorders. The consultants provided diagnostic clarification and recommended modification of treatment for most. However, this assessment is limited as examined as it did not include follow-up information on whether consultant recommendations were followed and, if they were, whether they were effective.</p>
<p>21. MILLER, T.W., KRAUS, R.FOTTO KAAK, O., SPRANG, R., BURTON, D. (2002). Telemedicine: A child psychiatry case report. <i>Telemedicine Journal and e-Health</i>, <b>6</b>(1), 139.</p>	<p>USA</p>	<p>Case study of a young boy in a rural school in Kentucky.</p>	<p>To describe how a child psychiatrist in a rural health care setting provided the necessary comprehensive consultation and clinical services through the use of telemedicine technology</p>	<p>Telemedicine provided needed clinical diagnostic and case management consultation for rural school system and rural clinical consultant for 9-year-old. Clinical consultations for school personnel, in rural school districts consulting psychologists, and rural pediatricians viable option for telemedicine services. Need for specialized clinical evaluations and subsequent conferences involving parents, school officials, counselors, school psychologists, physician specialists, sometimes criminal justice professionals via through telehealth consultation.</p>
<p>22. MITCHELL, S.A., MACLAREN, A.T., MORTON, M., CARACHI, R. (2009). Professional opinions of the use of telemedicine in child and adolescent psychiatry. <i>Scottish Medical Journal</i>, <b>54</b>(3), 13-16.</p>	<p>UK</p>	<p>Twenty-four CAMHS professionals with experience of the telemedicine facility were asked to complete questionnaires outlining their opinions on the strengths and weaknesses of the facility; 19 responded.</p>	<p>To examine the experience of CAMHS professional users of Telemedicine in Scotland, describing the major uses of the Telemedicine facility.</p>	<p>Results showed a wide variety of professionals use the facility and clinical work makes up majority of use. An advantage to rural populations in Scotland was considered the most important benefit. Saving time and an improved method of communication also highlighted as important. Failure of technology and problems w sound quality were drawbacks. Seventy nine percent stated they preferred Telemedicine to Telephone conferencing.</p>
<p>23. MYERS, K.M., SULZBACHER, MELZER, S.M. (2004). Telepsychiatry with children and adolescents: Are patients comparable to those evaluated in usual outpatient care? <i>Telemedicine Journal and e-Health</i>, <b>10</b>(3), 278-285.</p>	<p>USA</p>	<p>Participants included 369 patients 3–19 years evaluated at two clinics. A telepsychiatry clinic developed to provide services to underserved communities, and a child and adolescent psychiatric outpatient clinic serving youth from metropolitan areas were included in the study. Examined these 2 samples regarding demographics, payer status, and diagnostic profiles.</p>	<p>To examine whether telepsychiatry patients are representative of those in usual outpatient care.</p>	<p>Results indicated that youth evaluated through the TPC were broadly comparable to youth evaluated in the CAPOC. Therefore, telepsychiatry appears to serve youth that are representative of those seeking psychiatric care, and it is not restricted to youth with no medical insurance or with selected diagnoses.</p>

<p>24. MYERS, K.M., VALENTINE, J., MORGANTHALER, R., MELZER, S. (2006). Telepsychiatry with incarcerated youth. <i>Journal of Adolescent Health</i>, <b>38</b>, 643–648</p>	<p>USA</p>	<p>Interactive video conferencing was used to connect a minimum-security correctional facility with a regional telemedicine program. Clinical records were reviewed to examine utilization, demographics, diagnoses, pharmacotherapy, and patient satisfaction.</p>	<p>To describe the use of telepsychiatry to incarcerated youth.</p>	<p>During the 29-month study period, 115 youth were treated over 275 sessions. Substance-use, behavioral, and emotional disorders were highly prevalent. Eighty percent (80%) of the youth were successfully prescribed medications. Youth expressed confidence with the psychiatrist’s recommendations but expressed concerns about privacy.</p>
<p>25. MYERS, K.M., VALENTINE, J.M., MELZER, S.M., (2007). Feasibility, acceptability, and sustainability of telepsychiatry for children and adolescents. <i>Psychiatric Services</i>, <b>58</b>(11), 1493-1497.</p>	<p>USA</p>	<p>Review of one-year utilization provided feasibility data. Surveys of referring physicians examined acceptability of telepsychiatry. Reimbursement records provided sustainability data.</p>	<p>To examine the feasibility, acceptability, and sustainability of a telepsychiatry service for children and adolescents living in nonmetropolitan communities</p>	<p>Referring providers endorsed high satisfaction with telepsychiatric care, although pediatricians were consistently more satisfied than family physicians. Sustainability of telepsychiatry is challenged by infrastructure costs and low reimbursement by public payers.</p>
<p>26. MYERS, K.M., CAIN, S. (2008). Practice parameter for telepsychiatry with children and adolescents. <i>J. Am. Acad. Child Adolesc. Psychiatry</i>, <b>47</b>, (12)</p>	<p>USA</p>	<p>Literature search covered 1986-2007 and yielded 438 articles, which were reviewed. Second, searched known Web sites addressing tele- medicine and telepsychiatry such as the Telemedicine Information Exchange (tie.telemed.org). Queried coworkers and members of the special interest group of the American Telemedicine Association (ATA) regarding source material. Consulted with telemedicine clinicians at various centers nationally and internationally.</p>	<p>To identify best practices for telepsychiatric care. This parameter is the first attempt to develop such guidelines with children and adolescents and is intentionally flexible for adaptation to both current and future technology and resources. Because telepsychiatry is a fast-evolving field, periodic updates may be needed.</p>	<p>A list of 14 guideline parameters were identified:  The Need for Child and Adolescent Psychiatric Services and Whether Telepsychiatry Is an Option for Meeting That Need Should Be Determined  Sustainability of the Telepsychiatry Service Should Be Determined  The Patient Population, the Model of Health Service Delivery, and Services to Be Offered Should Be Determined  The Infrastructure Needed to Support the Services Provided Should Be Determined  Legal and Regulatory Issues Should Be Determined  Management Strategies for the Telepsychiatry Service Should Be Established  Appropriate Equipment and Technological Specifications Should Be Determined  Quality and Clinical Outcome Indicators Should Be Developed  Rapport, Confidence, and Collaboration With Staff at the Patient Site Should Be Fostered  Consent and Assent Procedures Should Be Established  The Physical Setting Should Be Arranged, and the Virtual Relationship Should Be Established to Produce an Optimal Clinical Encounter  It Should Be Determined Whether the Youth Can Be Interviewed Alone; If Not, Potential Alternative Means to Conduct a Mental Status Examination Should Be Identified  Procedures for Prescribing Medications Should Be Established  Families Should Be Informed About Procedures for Care Between Telepsychiatry Sessions, Including Procedures for Emergency or Urgent Care.</p>



<p>27. MYERS, K.M., VALENTINE, J.M. MELZER. S.M. (2008). Child and adolescent telepsychiatry: Utilization and satisfaction. <i>Telemedicine and e-Health</i>, <b>14</b>(2), 131-137.</p>	<p>USA</p>	<p>Twelve-month review of billing records provided utilization data. Surveys of parents' satisfaction over 12 months examined whether parents would accept and be satisfied with the care rendered to their children.</p>	<p>To examine whether telepsychiatry could be successful in providing needed services.</p>	<p>Parents endorsed high satisfaction with their children's telepsychiatric care, with an indication of increasing satisfaction upon return appointments. Parents demonstrated some differential satisfaction, tending to higher satisfaction with their school-aged children's care and lower satisfaction with their adolescents' care. Telepsychiatry offered through a regional children's hospital was well utilized and parents were highly satisfied with their children's care.</p>
<p>28. MYERS, K.M., VANDER STOEP, A., MCCARTY, C.A., KLEIN, J.B., PALMER, N.B., GEYER, J.R., MELZER, S.M. (2010). Child and adolescent telepsychiatry: variations in utilization, referral patterns and practice trends. <i>Journal of Telemedicine and Telecare</i>, <b>16</b>,128–133</p>	<p>USA</p>	<p>Service utilization data, patient demographics and diagnoses were collected for the period from the service</p>	<p>To identify variations in utilization referral patterns and practice trends.</p>	<p>Paediatricians referred to the service more frequently than family physicians. Utilization varied across referring sites and was largely dependent upon the availability of telepsychiatrists. Telepsychiatry with young people is feasible, acceptable and increases access to mental health care. Four core components necessary to a successful telepsychiatry programme: psychiatrists interested in exploring new ways to reach underserved young people; clearly identified stakeholders who can collaborate with one another to make good use of the telepsychiatry service; a children's mental health 'champion' who represents these stakeholders and wants services for their community; and a stable administration that perceives telepsychiatry as valuable for their patients and their doctors.</p>
<p>29. NELSON, E.L., BARNARD, M. &amp; CAIN, S. (2003). Treating childhood depression over videoconferencing. <i>Telemedicine Journal and e-Health</i>, <b>9</b>(1), 49-55.</p>	<p>USA</p>	<p>Children were assessed for childhood depression using the mood section of the Schedule for Affective Disorders and Schizophrenia for School Age Children– Present Episode (K-SADS- P). Twenty-eight children randomized to F2F or VC treatment. The participants completed the K-SADS-P and the Children's Depression Inventory (CDI) at pre- and post- treatment.</p>	<p>To evaluate an 8-week, cognitive-behavioral therapy (CBT) intervention for childhood depression either face-to-face (F2F) or over VC.</p>	<p>Attendance rates did not significantly vary between the VC and F2F conditions, <math>t(26) = 5.20, 27</math>. Within the VC group, both parents and children reported high satisfaction with the telemedicine condition as assessed by the questionnaire (Table 1). The most common concern was not being able to hear well over the video, expressed by four out of 14 parents and three out of 14 children. All participants in the VC condition (14 parents and 14 children) were satisfied with the consultation, and most (11 parents and 14 children) preferred VC to seeing the therapist in person. Decreasing symptoms of childhood depression over VC at rates comparable to F2F.</p>

30. NELSON, E.L., BARNARD, M., CAIN, S. (2006). Feasibility of telemedicine intervention for childhood depression. <i>Counselling and Psychotherapy Research</i> , <b>6</b> (3), 191-195.	USA	Twenty-eight children with depression and their caregivers completed an eight-session, empirically supported CBT course for parent and child.	To evaluate the same CBT for childhood depression in two different settings face-to-face (F2F) or over interactive televideo (ITV).	Parents and children were very satisfied with services over ITV. All parent and child CBT skills were implemented successfully over telemedicine. An 82% remission from depression was observed immediate post-treatment and this rate did not significantly differ across groups.
31. NELSON, E.L., BUI, T. (2010). Rural telepsychology services for children and adolescents, <i>Journal of Clinical Psychology: In Session</i> , <b>66</b> (5), 490-501.	USA	A case report of a rural Hispanic teen and her family presenting through the teen's primary care clinic.	To provide a descriptive case study of telepsychology services.	The therapeutic success with client and her family encouraged the rural primary care office to expand referral to the telepsychologist clinic for internalizing and externalizing disorders. The telepsychologist and the rural clinic have been successful in completing third payer reimbursement, and this has further encouraged the growing telepsychology practice. As the telepsychology clinic has grown, new challenges arise related to recruiting additional psychologists to meet increasing clinic interest. Referrals have expanded from not only the rural primary care practice but also client's school. The case was also an excellent training opportunity for the psychology graduate students participating in the telepsychologist's service.
32. PAKYUREK, M., YELLOWLEES, P., HILTY, D. (2010). The child and adolescent telepsychiatry consultation: Can it be a more effective clinical process for certain patients than conventional practice? <i>Telemedicine and e-Health</i> , <b>16</b> (3), 289-292.	USA	Reviewed hundreds of child and adolescent psychiatry cases seen via videoconferencing by psychiatrists at UC Davis Medical Center.	To review the process of telepsychiatry with children, and illustrate relevant issues with five case studies of patients, that there is a valid case for arguing that in certain children and adolescents, telepsychiatry, as a consultation process, might actually be a superior method of psychiatric assessment to face-to-face consultation.	Four factors stand out supporting this view. These are the novelty of the consultation - adolescents reported that the experience was fun and exciting. Others felt that the interaction itself was more visual, video-game like, and, as a result, less threatening., the capacity to provide direction, the extra distance involved (both psychological and physical), and the authenticity of the interaction. More research in child and adolescent telepsychiatry is indicated.
33. PESAMAA, L., EBELING, H., KUUSAMAKI, M.L., WINBLAD, I., ISOHANNI, M., MOILANEN, I. (2007). Videoconferencing in child and adolescent psychiatry in Finland – an inadequately exploited resource. <i>Journal of Telemedicine and Telecare</i> , <b>13</b> , 125-129.	FINLAND	Sent a 16-item questionnaire to all providers of child and adolescent psychiatry services in specialised health care in Finland, i.e. the 42 child and adolescent units in 21 hospital districts. All service providers responded. Quantitative and qualitative.	To assess the current role of videoconferencing and the purposes for which it has been used in child and adolescent psychiatry in Finland.	Although the workers' experiences of and attitudes towards videoconferencing were favourable, it has not been widely used in child and adolescent psychiatry. According to the opinions of the 26 respondents, videoconferencing had the benefits of saving time, costs and work (100% of respondents), improving the quality of services (35%) and enhancing co-operation between units (35%). Need adequate education and opportunities to learn the new skills needed to control the technical therapeutic environment and new ways to interact in it.

<p>34. PESAMAA, L., EBELING, H., KUUSAMAKI, M.L., WINBLAD, I., ISOHANNI, M., MOILANEN, I. (2004). Videoconferencing in child and adolescent telepsychiatry: a systematic review of the literature. <i>Journal of Telemedicine and Telecare</i>, <b>10</b>, 187–192</p>	<p>FINLAND</p>	<p>Search of the electronic databases MEDLINE and PsycINFO covering the period 1966 to June 2003. Studies were selected for review if they concerned videoconferencing for patient care or consultation, evaluated a clinical service or education, or assessed satisfaction with videoconferences. Twenty-seven articles were identified that fulfilled the selection criteria. These comprised two reports of randomized controlled experiments, 10 of descriptive questionnaire studies or observational surveys, seven case studies and eight other reports. Only three of the studies presented some calculations of cost-effectiveness.</p>	<p>To conduct a systematic review of child and adolescent telepsychiatry.</p>	<p>Most studies of child and adolescent telepsychiatry examined satisfaction with videoconferencing or described programmes or care regimens. Most of the 27 studies found in the literature search were descriptive reports (10; 38%) or case studies (7; 26%); six were research papers (6; 23%) and only two were randomized controlled trials (8%). Videoconferencing seemed to improve the accessibility of services and served an educational function. Some papers also mentioned savings in time, costs and travel. Problems with non- verbal communication and the audiovisual quality of the videoconference were mentioned as drawbacks. Telepsychiatry therefore seems to offer several benefits, at least in sparsely populated regions. Well designed and properly controlled trials are required to evaluate the clinical value of this promising method in child psychiatry, where there is a constantly increasing need for services.</p>
<p>35. PIGNATIELLO, T., BOYDELL, K.M., TESHIMA, J., VOLPE, T. (2010). Supporting primary care through pediatric telepsychiatry. <i>Canadian Journal of Community Mental Health</i>, <b>27</b>(2), 139-151.</p>	<p>CANADA</p>	<p>Qualitative program of research involving assessment of lived experience of service providers, families and young people.</p>	<p>To describe a pediatric telepsychiatry program serving communities in rural Ontario, Canada</p>	<p>Enhanced capacity of service providers in rural areas; telepsychiatry is well positioned to enhance—not replace—face-to-face delivery of health care, reduce professional isolation, and improve distribution of clinical expertise. Consultant recommendations lend extra weight in advocating for interventions that can be instituted locally. Providing education to multiple sites simultaneously is very cost-effective</p>
<p>36. RYAN, V., STATHIS, S., SMITH, A.C., DENISSE BEST, D., WOOTTON, R. (2005). Telemedicine for rural and remote child and youth mental health services. <i>Journal of Telemedicine and Telecare</i>. <b>11</b> (Suppl. 2): S2, 76–78</p>	<p>AUS</p>	<p>Six month services activity review.</p>	<p>To review the first six months of activity of an E-CYMHS program providing a specialist mental health service to rural and remote locations likely to have a shortage of professional expertise.</p>	<p>Preliminary data indicate that the service has been well accepted by the targeted districts, as evidenced by increasing referrals during the study period. Further, results are promising and suggest that access barriers identified in previous studies have been minimized.</p>

<p>37. SAVIN, D. GARRY, M.T., ZUCCARO, P., NOVINS,.D. (2006). Telepsychiatry for treating rural American Indian youth. <i>J. Am. Acad. Child Adolesc. Psychiatry</i>, <b>45</b>, 4, 484-488.</p>	<p>USA</p>	<p>Description of a telepsychiatry service for American Indians.</p>	<p>To use case study to illustrate issues experienced by children involved in telepsychiatry consults.</p>	<p>During the first 12 months of operation from October 2003 to October 2004, 21 evaluations were performed. Many of the cases were quite complicated and had more than one diagnosis. Initial parental anxiety followed by preference to driving long distances. Telepsychiatry consultants did not believe that decreased rapport with patients compromised their ability to provide accurate and effective consultation. Telepsychiatry allows access to child and adolescent psychiatric services to American Indian children for whom such services would not otherwise be available. The necessary technology is readily available and easy to use. The high patient and provider satisfaction we observed supports the use of telepsychiatry. The cost is similar to and considerably more convenient than the cost of providing face-to-face psychiatric services to this population.</p>
<p>38. SPAULDING, R., BELZ, N., DELURGIO, S., WILLIAMS, A.R. (2010). Cost savings of telemedicine utilization for child psychiatry in a rural Kansas community. <i>Telemedicine and e-Health</i>, <b>16</b>(8), 867-871.</p>	<p>USA</p>	<p>For analysis, two types of cost data were collected. The first were the costs of operating the two service sites. The second was the cost of travel time of the accompanying parent or parents in cases in which more than one parent accompanied the child or adolescent.</p>	<p>The purpose of this study was to examine the costs of operating the Crawford County site relative to accessing services at KUMC, the likely alternative service location. The cost of travel time to parents who accompanied a dependent to either location also was estimated.</p>	<p>Data suggest substantial average or mean cost savings to the patients and families of \$137.62 per consult. If this figure is multiplied over the 257 study consults, it suggests that the average savings to patients of this service over 6 months was \$35,369.</p>
<p>39. STAIN, H.S., PAYNE, K., THIENEL, R., MICHIE, P., CARR, V., KELLY, B. (2011). The feasibility of videoconferencing for neuropsychological assessments of rural youth experiencing early psychosis. <i>Journal of Telemedicine and Telecare</i>, <b>17</b>, 328–331</p>	<p>AUS</p>	<p>All participants (n = 11) completed assessments both face-to-face and by videoconference at a bandwidth of 384 kbit/s. Assessments included confirmation of diagnosis, quality of life and neurocognitive functioning.</p>	<p>To conduct a pilot study of the feasibility of videoconferencing as a mode of neuropsychological assessment in young people (14–30 years) from a rural area of New South Wales experiencing early psychosis.</p>	<p>The majority of cognitive tasks completed by young people with early psychosis demonstrated equivalence of face-to-face and videoconference methods of administration. This is important because it suggests that these clients can perform equally well on cognitive tasks, whether administered by a clinician in the same room or by videoconference.</p>

<p>40. STARLING, J., ROSINA, R., NUNN, K., DOSSETOR, D. (2003). Child and adolescent telepsychiatry in New South Wales: moving beyond clinical consultation. <i>Australasian Psychiatry</i>, 11S, S117-S121.</p>	<p>AUS</p>	<p>The evaluation investigated patients', rural clinicians' and CAPTOS psychiatrists' satisfaction with the quality of the service and the technology.</p>	<p>This paper describes the initial evaluation of the Child and Adolescent Psychological Telemedicine Outreach Service (CAPTOS) in New South Wales and the changes made to the service after the initial evaluation.</p>	<p>There were 136 rural families, 20 rural clinicians and eight psychiatrists. Overall, satisfaction was high with the rural families and clinicians being the most satisfied (95–99% very or mostly satisfied). CAPTOS psychiatrists felt that they were usually able to perform an adequate consultation (87%) but few (16%) felt consultations were as satisfactory as a face-to-face consultation. Because of the initial evaluation, and ongoing collaboration with rural clinicians, further services were developed using the technology and the developing professional networks. These initiatives included telenursing, professional skills development, sabbaticals for rural clinicians and a clinical skills workshop for rural clinicians.</p>
<p>41. STARLING, J. AND FOLEY, S. (2006). From pilot to permanent service: ten years of paediatric tele- psychiatry. <i>Journal of Telemedicine and Telecare</i>, 12 (Suppl. 3): S3, 80–82</p>	<p>AUS</p>	<p>Semi-structured qualitative interviews with hub and rural clinicians about Child and Adolescent Psychological Telemedicine Outreach Service (CAPTOS) in Sydney - providing telepsychiatry services (NSW) for 10 years. Services provided to over 40 sites in remote and rural NSW. There are 8 telepsychiatry clinics weekly, providing 600 consultations a year. As well as telepsychiatry, 3 additional services are provided: professional supervision, education and training, and Aboriginal child and adolescent mental health traineeships.</p>	<p>To re-evaluate service in 2004 to obtain information about service satisfaction and effectiveness from hub and rural clinicians.</p>	<p>High level of satisfaction with telepsychiatry service and other telemedicine services, such as clinical supervision and teaching. Videoconferencing appears to be a highly effective and well-accepted method of providing mental health care to remote and rural children, adolescents and families. There are more potential applications for videoconferencing in both child psychiatry and the CAPTOS service. Rural paediatricians and general practitioners are requesting direct psychiatry consults, without needing to go through the local mental health team. There is also the opportunity to provide various treatments, such as CBT, directly to older children and adolescents.</p>
<p>42. SULZBACHER, S.. VALLIN, T., WAETZIGW, E.Z (2006). Telepsychiatry improves paediatric behavioural health care in rural communities. <i>Journal of Telemedicine and Telecare</i>, 12, 285–288</p>	<p>USA</p>	<p>Descriptive study.</p>	<p>To describe the planning and implementation of a telepsychiatry program.</p>	<p>An introductory guide to interactive videoconferencing for children with special healthcare needs is available on the Web at <a href="http://www.depts.washington.edu/wwami">http://www.depts.washington.edu/wwami</a>.</p>

43. WOOD, J., STATHIS, S., SMITH A., KRAUSE, J. (2012). E-CYMHS: an expansion of a child and youth telepsychiatry model in Queensland <i>Australasian Psychiatry</i> 20(4), 333-337.	AUS	N/A - descriptive	The purpose of this study was to describe the evolution of the E-Child and Youth Mental Health Service (E-CYMHS), which supports regional and rural mental health services by providing access to consultant child and adolescent psychiatrists to isolated staff in regional areas, where access to specialist psychiatric services is limited.	CYMHS provides a level of parity in mental health care between metropolitan, regional and remote services through the provision of regular videoconferencing services with child and adolescent psychiatrists and senior allied health clinicians. The three key features underpinning success of the service are: 1. A central co-ordinator of services; 2. Provision of support outside regular videoconference times; and 3. Routine outreach visits foster community capacity-building. E-CYMHS well received by regional mental health services it supports, and total provision of services has more than doubled over the last three years.
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**Table 2: The use of telephone (n=8)**

Reference No.	Country	Participants & Methods	Objective	Study Results
44. FUKKINK, R.G., HERMANN, J. Children's experiences with chat support and telephone support. (2009). <i>Journal of Child Psychology and Psychiatry</i> , 50(6), 759-766	NETH	The design included a concise pretest and a posttest (n = 902) of Dutch children 8-18 years. The study also comprised a follow-up test (n = 213), which included the Strengths and Difficulties Questionnaire.	To conduct a comparative study between telephone service and one-on-one online chat service of Dutch Kindertelefoon.	Children experienced a higher sense of well-being and reduced severity of problems after consulting Kindertelefoon. Results were slightly more favorable for the chat service than for telephone service. The follow-up survey showed that many of the children who contact the Kindertelefoon suffer from relatively severe emotional problems. Both telephone and web-based support improved children's well-being and decreased perceived burden of problem. The anonymous ('faceless' and 'voiceless') nature of chat support provides children with a non-threatening type of support, which may be of importance for children who wish to discuss their personal problems

<p>45. KING, R., BAMBLING, M., REID, W., THOMAS, I. (2006). Telephone and online counselling for young people: A naturalistic comparison of session outcome, session impact and therapeutic alliance. <i>Counselling and Psychotherapy Research</i>, <b>6</b>(3), 175-181</p>	<p>AUS</p>	<p>Used a naturalistic design and standardized measures. The study used identical measurement procedures with non-equivalent independent samples of young people using either telephone or online counselling provided by a national youth counselling service.</p>	<p>To compare outcomes, session impact, therapeutic alliance for 100 young people receiving a single session of telephone counselling and 86 young people receiving a single session of online counselling, provided by Kids Help Line.</p>	<p>Counselling had positive effect in both telephone and online conditions and young people significantly less distressed at end of counselling session than at beginning. Telephone counselling group showed a larger counselling effect (greater reduction in distress as measured by GHQ scores) than did online counselling group; telephone counselling was superior to online counselling. While duration of telephone and online sessions was equivalent, fewer counselling interactions between therapist and client in online condition because mechanics of text exchange, necessarily slows exchange of information relative to vocal exchange. It is possible that, in the time available, young people using telephone were able to address problems more effectively, because of greater speed of communication. Possible that with greater duration of sessions, or use of a counselling approach designed to compensate for reduced speed of exchange, the impact of online counselling, relative to telephone counselling, might be enhanced.</p>
<p>46. KING, R., NURCOMBE, B., BICKMAN, L., HIDES, L., REID, W. (2003). Telephone counselling for adolescent suicide prevention: Changes in suicidality and mental state from beginning to end of a counseling session. <i>Suicide &amp; Life - Threatening Behavior</i>; Winter 2003; <b>33</b>(4), 400-411.</p>	<p>AUS</p>	<p>Field investigation of impact of telephone counselling. Subjects were 101 callers to Kids Help Line who indicated suicidal ideation or intent. Measures taken pre and post call.</p>	<p>To explore the extent of change in suicidal ideation, suicidal intent and mental state for youth calling Kids Help Line and indicated suicidality.</p>	<p>Ratings of mental state at end of call statistically significant for better mental state. Telephone counseling had immediate impact on suicidality.</p>
<p>47. LINGLEY-POTTIE, P., MCGRATH, P.J. (2008). Telehealth: a child and family-friendly approach to mental health-care reform. <i>Journal of Telemedicine and Telecare</i>, <b>14</b>, 225–226</p>	<p>CANADA</p>	<p>Descriptive review of the Family Help Program.</p>	<p>To describe the Family Help program, which employs manualized, distance treatment by telephone.  NOTE: Now called Strongest Families.</p>	<p>Participants in Family Help program (adults &amp; children) reported a strong therapeutic alliance with their telephone coach. Participants described feeling comfortable and safe in their own home; did not feel stigmatized or judged; had little apprehension about self-disclosure and felt that treatment was delivered at their convenience. Treatment calls were often scheduled after typical working hours. Attrition rates found to be very low and children actively engaged in structured, distance treatment.</p>

<p>48. LOGSDON, M.C., PINTO FOLTZ, M., STEIN, B., USUI, W., JOSEPHSON, A. (2010). Adapting and testing telephone-based depression care management intervention for adolescent mothers. <i>Arch Women's Ment Health</i>, <b>13</b>, 307–317.</p>	<p>USA</p>	<p>97 adolescent mothers were entered into phase 1 clinical trial which combined qualitative and quantitative methods</p>	<p>To determine the acceptability, feasibility, and initial efficacy of the intervention in a sample of adolescent mothers recruited from a teen parent program.</p>	<p>Results of the study demonstrated the acceptability of the New Mother Program, telephone-based depression care management, to adolescent mothers. In terms of initial efficacy, depression scores for the adolescent mothers in the intervention group improved from baseline.</p>
<p>49. MCGRATH, P.J., LINGLEY-POTTIE, P., THURSTON, C., MACLEAN, C., CUNNINGHAM, C., WASCHBUSCH, D.A., WATTERS, C., STEWART, S., BAGNELL, A., SANTOR, D, CHAPLIN, W., (2011). Telephone-based mental health interventions for child disruptive behavior or anxiety disorders: randomized trials and overall analysis. <i>Journal of The American Academy of Child &amp; Adolescent Psychiatry</i>, <b>50</b>(11), 1162-1172.</p>	<p>CANADA</p>	<p>In three practical RCTs, 243 children (80 w oppositional-defiant, 72 w attention-deficit /hyperactivity, and 91 w anxiety disorders) were stratified by <i>DSM-IV</i> diagnoses and randomized to receive Strongest Families intervention (treatment) or usual care (control). Assessments blindly conducted and evaluated at 120, 240, and 365 days after randomization. The intervention consisted of evidence-based participant materials (handbooks and videos) and weekly telephone coach sessions. The main outcome was mental health diagnosis change.</p>	<p>To determine whether distance interventions provided by nonprofessionals could significantly decrease the proportion of children diagnosed with disruptive behavior or anxiety disorders compared with usual care.</p>	<p>In the overall analysis significantly more children were not diagnosed as having disruptive behavior or anxiety disorders in the treatment group than the control group. Compared with usual care, telephone-based treatments resulted in significant diagnosis decreases among children with disruptive behavior or anxiety. These interventions hold promise to increase access to mental health services.</p>
<p>50. SCHARER, K., COLON, E., MONEYHAM, L., HUSSEY, J., TAVAKOLI, A., SHUGART, M. (2009). Comparison of two types of social support for mothers of mentally ill children. <i>Journal of Child and Adolescent Psychiatric Nursing</i>, <b>22</b>(2), 86–98</p>	<p>USA</p>	<p>A randomized, controlled, quantitative investigation under way to test two support interventions, using the telephone or Internet. Qualitative description used to analyze data generated during telehealth interventions.</p>	<p>To compare social support offered by two telehealth nursing interventions for mothers of children with serious mental illnesses.</p>	<p>In conversations between mothers and nurses, informational, emotional, and appraisal support were noted. Social support can be offered effectively over the phone or through an Internet chat room.</p>



51. TURNER C., HEYMAN, I. (2009). A pilot study of telephone cognitive-behavioural therapy for obsessive-compulsive disorder in young people. <i>Behavioural and Cognitive Psychotherapy</i> , <b>37</b> , 469–474.	UK	Ten participants aged 13-17, and their parents received up to 16 sessions of telephone CBT (TCBT). Measures of OCD symptoms were obtained using multiple informants and repeated measures design. Assessments were conducted at pre-treatment, post-treatment, and at 6- and 12-mo FU	To describe outcomes (feasibility and clinical outcome) for a telephone-based CBT for obsessive-compulsive disorder (OCD) in young people.	Improvements were found for OCD symptoms across all informants. Family satisfaction with treatment over the telephone was high. Randomized, controlled trials are required to establish whether telephone-administered therapy can increase access to an effective treatment for paediatric OCD, and offer further choice to service users with regard to mode of treatment delivery.
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**Table 3: The use of e-mail (n=7)**

Reference No.	Country	Participants & Methods	Objective	Study Results
52. CARTWRIGHT, M., GIBBON, P., MCDERMOTT, B.M. and BOR, W., 2005. The use of email in a child and adolescent mental health service: Are staff ready? <i>Journal of Telemedicine &amp; Telecare</i> , <b>11</b> (4), 199-204.	AUS	All staff members of a child & adolescent mental health service invited to participate in survey about use of email	To describe staff attitudes to the use of email in a child and youth mental health service.	Clinicians ambivalent re incorporating email into therapy and worry about increased workload. Poor understanding of legal and ethical issues involved; need to formulate guidelines and procedures to ensure confidentiality of information and safety of clients/staff.
53. LYNEHAM, H. J. and RAPEE, R. M., 2006. Evaluation of therapist-supported parent-implemented CBT for anxiety disorders in rural children. <i>Behaviour Research and Therapy</i> , <b>44</b> (9), 1287-1300.	AUS	100 anxiety-disordered children and their parents from rural and remote communities participated in a randomised trial using a waitlist control.	To examine the efficacy of supplementing bibliotherapy for child anxiety disorders with therapist-initiated telephone or email sessions, or with client-initiated contact.	All treatment conditions resulted in improvement on self-report measures and clinician rated severity. Telephone sessions produced superior outcomes with 79% of children being anxiety disorder free post-treatment compared with 33% of email and 31% of client-initiated participants. The results suggest that therapist-supplemented bibliotherapy could provide an efficacious treatment option for families isolated from traditional treatment services.
54. MEHTA, S. and CHALHOUB, N., 2006. An E-mail for your thoughts. <i>Child and Adolescent Mental Health</i> , <b>11</b> (3), 168-170.	UK	Discussion article; no participants and methods	To explore the use of e-mail as a method of engaging adolescents and detail the advantages and disadvantages of e-mailing patients To provide recommendations for its safe use.	E-mail is a rapid, inexpensive, and convenient way of communicating with patients. It can function as a hook to engage a patient as well as an adjunct to usual treatment. E-mail may provide a medium to deliver a brief intervention where traditional methods failed. Precautions needed to ensure safe application of e-mail and to do no harm.

<p>55. ROY, H. and GILLET, T., 2008. E-mail: A new technique for forming a therapeutic alliance with high-risk young people failing to engage with mental health services? A case study. <i>Clinical Child Psychology and Psychiatry</i>, <b>13</b>(1), 95-103.</p>	<p>UK</p>	<p>Case study of a teen. Therapy involved weekly e-mails over a 3-month period and ended with transfer to adult services. The article focuses on how e-mail enabled engagement to occur.</p>	<p>To describe e-mail therapy with a teenager whom professionals found difficult to communicate with and understand</p>	<p>Communicating by e-mail appeared to have helped enormously, the dis-inhibitory effect of anonymity, invisibility and the leveling of status that occurs, sense of control for youth. Lack of non-verbal feedback noted with need to build trust over time. Should be considered a viable alternative to f2f.</p>
<p>56. TROCKEL, M., MANBER, R., CHANG, V., THURSTON, A. and TAYLOR, C.B., 2011. An e-mail delivered CBT for sleep-health program for college students: effects on sleep quality and depression symptoms. <i>Journal of Clinical Sleep Medicine</i>, <b>7</b>(3), 276-281.</p>	<p>USA</p>	<p>Students in one residence hall (n = 48) participated in Refresh and students in another residence hall (n = 53) participated in a program of equal length (Breathe) designed to improve mood and increase resilience to stress. Both programs were delivered by e-mail in 8 weekly PDF files.</p>	<p>Examined the effects of a cognitive behavioral self-help program (Refresh) to improve sleep, on sleep quality and symptoms of depression among first-year college students.</p>	<p>Among students with poor sleep at baseline, participation in Refresh was associated with greater improvement in sleep quality and reduction in depressive symptoms. A cognitive behavioral sleep improvement program delivered by e-mail may be a cost effective way for students with poor sleep quality to improve their sleep and reduce depressive symptoms.</p>
<p>57. YAGER, J., 2003a. E-mail therapy for anorexia nervosa: Prospects and limitations. <i>European Eating Disorders Review</i>, <b>11</b>(3), 198-209.</p>	<p>USA</p>	<p>Three case series of outpatients with anorexia nervosa</p>	<p>To determine whether e-mail can offer a useful adjunct to treatment.</p>	<p>Frequent e-mail contact provides patients w control, experience of greater contact with clinicians and requires them to be more attentive to therapeutic tasks. E-Mail not entirely secure mode of communication.</p>
<p>58. YAGER, J. 2003b. Monitoring patients with eating disorders by using e-mail as an adjunct to clinical activities. <i>Psychiatric Services</i>, <b>54</b>(12), 1586-1588.</p>	<p>USA</p>	<p>Reflections on patient accounts</p>	<p>To identify the benefits and drawbacks of using E-Mail as an adjunct to therapy.</p>	<p>With patients who have eating disorders, frequent e-mails offer easy boost to ongoing behavioral monitoring programs and rapidly inform patients' capacities and motivations to participate seriously in treatment.</p>

**Table 4: The use of mobile phones/SMS (n=5)**

Reference No.	Country	Participants & Methods	Objective	Study Results
59. KAUER, S., REID, S., CROOKE, A., KHOR, A., PATTON, G., JORM, A. and JACKSON, H., 2011. Emotional self-awareness: Preliminary analyses of a RCT using a cellular phone self-monitoring program (mobiletype) to decrease early symptoms of depression. <i>Journal of Adolescent Mental Health</i> , <b>48</b> (2), 91-92.	AUS	110 young people between the age of 14 and 21 identified by their GP as being at risk of depression were randomly assigned to either the self-monitoring group (61 Participants) or the comparison group without self-monitoring (48 participants).	To assess whether self-monitoring using a mobile phone increases young people's awareness of their moods and reduces depressive symptoms.	Preliminary analysis suggested the use of mobile phones to aid self-monitoring as an early intervention strategy has the ability to increase emotional self-awareness and decrease depressive symptoms.
60. KAUER, S., REID, S., CROOKE, A., KHOR, A., HEARPS, S., JORM, A., SANCI, L. and PATTON, G., 2012. Self-monitoring using mobile phones in the early stages of adolescent depression: randomized controlled trial. <i>Journal of Medical Internet Research</i> , <b>14</b> (3), 67-87.	AUS	Participants aged between 14 and 24 were recruited from rural and metropolitan GPs participated in a randomized control trial of a daily mobile phone delivered program to assist monitoring of mood stress and daily activities.	To determine whether using mobile phones for self-monitoring (noting mood, stress and daily activities) increases emotional self-awareness and helps reduce depressive symptoms.	The study found that the mobile phone delivered program helped increase emotional self-awareness and decrease depressive symptoms.
61. REID, S., KAUER, S., HEARPS, S., CROOKE, A., KHOR, A., SANCI, L. and PATTON, G., 2011. A mobile phone application for the assessment and management of youth mental health problems in primary care: a randomised controlled trial. <i>BMC Family Practice</i> , <b>12</b> , 131-144.	AUS	A single-blind randomized control trial was conducted with 128 young people identified as having mild or more mental health symptoms. The participants were randomly allocated to either the intervention group, who received the mobile type program, or the comparison group.	To determine the effectiveness of a mobile type program in aiding assessment and management of mental health concerns and to investigate the impact of the mobile type program on young people's mental health symptoms.	Study found that barriers in the uptake of the technology in the mental health care system reduced the impact of the technology, however a mobile program may assist young people in managing their symptoms.
62. REID, S., KAUER, S., KHOR, A., HEARPS, S., SANCI, L., KENNEDY, A. and PATTON, G., 2012 Using a mobile phone application in youth mental health: An evaluation study. <i>Australian Family Physician</i> , <b>41</b> (9), 711-714.	AUS	Patients from an adolescent outpatient clinic participated in the analysis of a self-monitoring tool via mobile phone over a 2-4 week period. Quantitative data was collected as well as qualitative interviews following the completion of the program.	To evaluate a mobile phone self-monitoring tool to help paediatricians gain a better understanding of their patients and for the assessment and management of youth mental health	The majority of paediatricians reported that the mobile program helped the m to gain a better understanding of their patients. The study also found that the mobile tool saved time, focused consultation sessions and established rapport between the participant and the paediatricians.

63. WHITTAKER, R., MERRY, S., STASIAK, K., MCDOWELL, H., DOHERTY, I., SHEPHERD, M., DOREY, E., PARAG, V., AMERATUNGA, S. and RODGERS, A., 2012. MEMO- A mobile phone depression prevent/intervention for adolescents: development process post program findings on acceptability from a randomized controlled trial. <i>Journal of Medical Internet Research</i> , <b>14</b> (1), 169-179.	NZ	A double-blind randomized controlled trial was undertaken assessing a CBT depression prevention program delivered via SMS every day for 9 weeks to high school students in New Zealand.	To determine the effectiveness of a mobile phone delivered depression intervention for adolescents improving subjective and objective scores of depression symptoms.	The majority of participants found messages helped them be more positive and reduced negative thoughts - significantly more so than proportions in the control group.
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**Table 5: The use of the internet (n=59)**

Reference No.	Country	Participants & Methods	Objective	Study Results
64. ALVAREZ-JIMENEZ, M., GLEESON, J., LEDERMA, R., WADLEY, G., KILLACKEY, E. and MCGORRY, P., 2010 Horizons study: Online recovery for youth onset psychosis. <i>Early Intervention in Psychiatry Conference</i> , <b>4</b> (25).	AUS	Patients, clinicians and carers participated in focus groups to examine their views on technology-based interventions. Also a systematic review focused on user characteristics and e-health interventions was conducted.	To assess the feasibility and effectiveness of an advanced web-based interactive psychosocial intervention for relapse prevention and promotion of global recovery in first episode psychosis.	The study describes the creation of an interactive, web- and mobile-based social networking program based on the data, which incorporates therapeutic techniques, social networking and online problem solving.
65. BREZINKA, V., 2008, Treasure Hunt - A serious game to support psychotherapeutic treatment of children. <i>Studies in Health Technology and Informatics</i> , <b>136</b> , 71-76.	Netherlands	Description article: no participants or methods.	To describe "Treasure Hunt" a psychotherapeutic game based on the principles of cognitive behavior modification targeted to children eight to twelve.	Evaluation of whether the program can successfully support the treatment of children is yet to be completed however preliminary playability tests found that children appreciate the game and also that it helps young and inexperienced therapists structure therapy sessions and explain important cognitive-behavioral concepts.
66. BURNS, J., DURKIN, L. and NICHOLAS, J., 2009. Mental health of young people in the United States: What role can the internet play in reducing stigma and promoting help seeking? <i>Journal of Adolescent Health</i> <b>45</b> (1), 95-97.	AUS	The study assessed the results of one year's (2008) annual online survey in which 1006 individuals participated. The survey was conducted to assess user behaviours and attitudes and the degree to which the internet service "Reach Out!" improves knowledge about mental health and promotes help seeking.	To discuss "Reach Out!" and its role in reducing stigma and increasing help seeking in young people aged 16-25 and to assess user behaviours and attitudes and the degree in which the service improves knowledge about mental health.	The preliminary research suggests that the internet service inspires trust in young people and that it is being used as a source of information and support for mental health issues. However, the study outlines several limitations including possible response bias to the survey due to voluntary participation and issues regarding representation of "Reach Out!" users.

<p>67. BURNS, J., MOREY, C., LAGELEE, A., MACKENZIE, A. and NICHOLAS, J., 2007. Reach Out! Innovation in service delivery. <i>Medical Journal of Australia</i>, <b>187</b>(7), 31–34.</p>	<p>AUS</p>	<p>Discussion article; no participants and methods.</p>	<p>To describe “Reach Out!” an internet based mental health service with the aim of enhancing the mental health literacy of young people.</p>	<p>“Reach Out!” offers evidenced based content designed by young people, community forums, interactive technology, and the opportunity for self-expression. The site has managed to gain credibility with young people as a youth brand increasing its likelihood of being turned to in a time of need.</p>
<p>68. BURNS, J., WEBB, M., DURKIN, L. A. and HICKIE, I. B., 2010. Reach Out Central: A serious game designed to engage young men to improve mental health and wellbeing. <i>Medical Journal of Australia</i>, <b>192</b>(11),27-30.</p>	<p>AUS</p>	<p>Discussion article w/ independent evaluation described (Shandley, Austin, Klein, Kyrios, 2010).</p>	<p>To describe the online game, “Reach Out Central,” and discuss its development, efficacy and potential uses and improvements.</p>	<p>The article indicated that the game was successful in attracting, engaging and educating for young people. However, young women were reported to have a greater benefit from the game with no significant changes observed for young men.</p>
<p>69. CALEAR, A. L., CHRISTENSEN, H., MACKINNON, A., GRIFFITHS, K. M. and O’KEARNEY, R., 2009. The YouthMood Project: A cluster randomized controlled trial of an online cognitive behavioral program with adolescents. <i>Journal of Consulting and Clinical Psychology</i>, <b>77</b>(6), 1021-1032.</p>	<p>AUS</p>	<p>A cluster randomized controlled trial was conducted with 30 schools (N=1,477) from across Australia, with each school randomly allocated to the intervention or waitlist control condition.</p>	<p>To investigate the effectiveness of an online, self-directed cognitive–behavioral therapy program (MoodGYM) in preventing and reducing the symptoms of anxiety and depression in an adolescent school-based population.</p>	<p>Although small to moderate, the effects obtained in the current study provide support for the utility of universal prevention programs in schools. The effectiveness of booster sessions should be explored in future research.</p>
<p>70. CALEAR, A. L., CHRISTENSEN, H., 2010. Review of internet-based prevention and treatment programs for anxiety and depression in children and adolescents. <i>Medical Journal of Australia</i>, <b>192</b>(11), 12-14</p>	<p>AUS</p>	<p>Systematic search of the Cochrane Library, PsycINFO and PubMed databases conducted in June 2009 searching for internet-based programs that addressed anxiety or depression in children and adolescents. No restrictions were placed on study quality.</p>	<p>To identify and describe current internet-based prevention and treatment programs for anxiety and depression in children and adolescents.</p>	<p>The findings provide early support for the effectiveness of internet-based programs for child and adolescent anxiety and depression. More extensive and rigorous research is needed to further establish the conditions through which effectiveness is enhanced, as well as to develop additional programs to address gaps in the field.</p>

71. CHRISTENSEN, H., GRIFFITHS, K. M. and KORTEN, A., 2002. Web-based cognitive behaviour therapy: Analysis of site usage and changes in depression and anxiety scores. <i>Journal of Medical Internet Research</i> , <b>4</b> (1), e3	AUS	All visitors to the MoodGYM site over about 6 months were investigated, including 2909 registrants of whom 1503 had completed at least one online assessment.	To document site usage, visitor characteristics, and changes in depression and anxiety symptoms among users of MoodGYM, a Web site delivering a cognitive-behavioural-based preventive intervention to the general public.	Over the first almost-6-month period of operation, the server recorded 817284 hits and 17646 separate sessions. Approximately 20% of sessions lasted more than 16 minutes. For the Web-based population, both anxiety and depression scores decreased significantly as individuals progressed through the modules.
72. CHRISTENSEN, H., REYNOLDS, J. and GRIFFITHS, K. M., 2011. The use of e-health applications for anxiety and depression in young people: Challenges and solutions. <i>Early Intervention in Psychiatry</i> , <b>5</b> (Suppl 1), 58-62.	AUS	Qualitative review of the literature.	To explore the barriers to the use of E-health applications by young people and the methods by which these barriers might be overcome.	Barriers to the use of these programs included the difficulty in engaging young people in their use, perceptions that the programs have low adherence, and clinician concerns about their value, effectiveness and safety. Evidence to date suggests that more research is needed to understand the reasons more young people do not engage with them. However, adherence rates are reasonable when properly benchmarked and the applications can be appropriately implemented in clinical and educational settings.
73. CLARKE, G., KELLEHER, C., HORN BROOK, M., DEBAR, L., DICKERSON, J. and GULLION, C., 2009. Randomized effectiveness trial of an internet, pure self-help, cognitive behavioral intervention for depressive symptoms in young adults. <i>Cognitive Behaviour Therapy</i> , <b>38</b> (4), 222-234	USA	Participants, both with and without depression, aged 18 to 24 years were randomly assigned to either the internet intervention or treatment-as-usual. Participants were assessed via the PHQ-8 at enrollment and 5, 10, 16, and 32 weeks after enrollment.	To evaluate an Internet-delivered, cognitive behavioral skills training program versus a treatment-as-usual (TAU) control condition targeting depression symptoms in young adults.	Greater depression reduction was associated with two measures of lower website usage, total minutes, and total number of page hits. Although intervention effects were modest, they were observed against a background of substantial TAU depression pharmacotherapy and psychosocial services
74. CUIJPERS, P., BOLUIJT, P. and VAN STRATEN, A., 2008. Screening of depression in adolescents through the Internet. <i>European Child &amp; Adolescent Psychiatry</i> , <b>17</b> (1), 32-38.	Netherlands	1,392 adolescents completed online questionnaires. Of these, 243 (17%) were interviewed with the MINI diagnostic interview to assess the presence of a mood disorder.	To validate two Internet-based screening instruments for depression among adolescents, the major depression inventory (MDI), and the Center for Epidemiological Studies-Depression scale (CES-D).	The study found that both instruments examined—the CES-D and the MDI—proved to be reliable and valid instruments and had good sensitivity and specificity compared to a diagnosis of depression based on a diagnostic interview.

75. CURRIE, S. L., MCGRATH, P. J. and DAY, V., 2010. Development and usability of an online CBT program for symptoms of moderate depression, anxiety, and stress in post-secondary students. <i>Computers in Human Behaviour</i> , <b>26</b> (6), 1419-1426	AUS	10 participants recruited from a psychology subject pool participated in a qualitative usability testing approach with semi-structured interviews to provide feedback on how user-friendly the program was.	To describe the development and usability testing of a cognitive behavioural therapy-based program, "Feeling Better" designed to reduce symptoms of emotional distress in post-secondary students.	Participants generally reported the content to be easy to follow, liked the tone and pace of the program and found the site easy to navigate.
76. DEITZ, D., COOK, R., BILLINGS, D. and HENDRICKSON, A., 2009. A web-based mental health program: reaching parents at work. <i>Journal of Paediatric Psychology</i> , <b>34</b> (5), 488-494	USA	99 parents were randomized into either an experimental (program use) or waitlist control condition. Analysis of covariance and paired t-tests were used to compare response outcomes for the two groups.	To test a web based program for parents at work, which increases their knowledge and skills in prevention and early-intervention for children facing mental health problems.	Parents receiving the intervention had greater knowledge of youth mental health issues and greater self-efficacy in handling these issues compared to controls, improving parents' confidence in addressing mental health issues.
77. DEMASO, D. R., MARCUS, N. E., KINNAMON, C. and GONZALEZ-HEYDRICH, J., 2006. Depression experience journal: A computer-based intervention for families facing childhood depression. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , <b>45</b> (2) 158-165	USA	38 primary caregivers of children living with depression participated in two semi-structured interviews ascertaining their experiences with their child's depression and their evaluation of the intervention.	To assess the feasibility, effectiveness and safety of an internet based discussion board for sharing the personal stories of families living with a childhood depression.	The study revealed that the discussion board was a safe and useful tool for decreasing social isolation, increasing hope, increasing understanding of familial feelings about childhood depression, and fostering positive reactions in caretakers.
78. DIAMOND, G., LEVY, S., BEVANS, K., FEIN, J., WINTERSTEEN, M., TIEN, A. and CREED, T., 2010. Development, validation, and utility of internet-based, behavioral health screen for adolescents. <i>Pediatrics</i> , <b>126</b> (1), 163-170.	USA	24 young people aged 12-21 were assigned randomly to completion of the Internet-based, comprehensive screening tool (8-15 minutes) and then the validation battery (30-45 minutes) or vice versa.	To develop and to validate the Internet-based, Behavioral Health Screen (BHS) for adolescents and young adults in primary care.	With an overall accuracy ranging from 78% to 85%, the study found that the BHS is a brief but comprehensive, self-report, biopsychosocial assessment. The psychiatric scales are valid and predictive of risk behaviors, which facilitate exclusion of false-positive results, as well as assessment and triage.
79. ERCAN, S., KEVERN, A. and KROLL, L., 2006. Evaluation of a mental health website for teenagers, <i>The Psychiatrist</i> , <b>30</b> (5), 175-178.	UK	105 teenagers completed three paper-based questionnaires and the online ru-ok.com questionnaire.	To evaluate a recently developed website and compare the self-assessment questionnaire with established screening questionnaires.	The website was positively evaluated by young people. There were modest and expected correlations between the website questionnaire (RU-OK) and the Mood and Feelings (MFQ) and Strength and Difficulties (SDQ) questionnaires.

<p>80. FREEMAN, E., BARKER, C. and PISTRANG, N., 2008. Outcome of an online mutual support group for college students with psychological problems. <i>Cyberpsychology &amp; Behaviour</i>, <b>11</b>(5), 591-593.</p>	<p>UK</p>	<p>A randomized trial comparing on online support group and electronic bulletin board with a text only website was carried out with college students.</p>	<p>The objective of the study was to evaluate an online mutual support group for college students with psychological problems measuring improvement on the CORE-OM, the Satisfaction with Life Scale and the Sense of Community Index.</p>	<p>Students from both groups improved on the CORE-OM and the Satisfaction with Life Scale with no association between greater use of the support group and greater benefit. Study may be limited because of its relatively short time span (10 weeks), not allowing the support groups to be fully established.</p>
<p>81. FUKKINK, R., 2011. Peer counselling in an online chat service: A content analysis of social support. <i>Cyberpsychology, Behaviour and Social Networking</i>, <b>14</b>(4), 247-251.</p>	<p>AUS</p>	<p>A content analysis carried out on an online chat service that uses young peer volunteers (ages16-23) for confidential one-on-one chat services. The conversations with youth were sampled over a four-week period and were analysed for quality of conversation and social support offered.</p>	<p>To determine the counselling quality of the conversations conducted by the young peer volunteers and what types of social supports are offered.</p>	<p>Analysis of conversations found that the trained peer helpers were able to fulfil a counsellor type role, supporting young people with psycho-emotional problems, offering social support and high quality conversations. The study also demonstrated that peer volunteers can have an active and leading role in real-time online support.</p>
<p>82. GERRITS, R., VAN DER ZANDEN, R., VISSCHER, R. AND CONIJN, B., 2007. Master your mood online: A preventive chat group intervention for adolescents. <i>Australian e-Journal for the Advancement of Mental Health</i>, <b>6</b>(3), 1-11.</p>	<p>Netherlands</p>	<p>The participants and facilitators completed satisfaction questionnaires and qualitative interviews following the completion of the online group therapy course.</p>	<p>To describe the opportunities and the challenges of conducting an online prevention intervention for adolescents with mild and sub-clinical depression by evaluating participant satisfaction and reduction of depression symptoms.</p>	<p>The pilot study found that the online group therapy course coincided with a decline in depression symptoms and was an attractive alternative to face-to-face therapy for adolescents due to the anonymity it afforded and the positive environment created.</p>
<p>83. GLEESON, J., ALVAREZ-JIMENEZ, M. and LEDERMAN, R., 2012. Moderated online social therapy for recovery from early psychosis. <i>Psychiatric Services</i>, <b>63</b>(7), 719.</p>	<p>AUS</p>	<p>Discussion article; no participants and methods.</p>	<p>To describe the moderated online social therapy model and a subsequent web-based intervention for first episode psychosis which integrates therapy modules with online social networking functions.</p>	<p>No results. Further study of the website to be completed in 2013.</p>
<p>84. GOWEN, K., DESCHAINE, M., GRUTTADARA, D. and MARKEY, D., 2012. Young adults with mental health conditions and social networking websites: Seeking tools to build community. <i>Psychiatric Rehabilitation Journal</i>, <b>35</b>(3), 245–250.</p>	<p>USA</p>	<p>18 to 24 year olds were surveyed about their social networking habits, perceived mental health needs and their thoughts on what should be included in a social networking website designed for young people with mental illness.</p>	<p>To explore the ways in which young people living with mental illness use social networking websites to assist in the development of a tailor social networking website.</p>	<p>The study found that a large majority (94%) of young people living with mental illness use social networking websites for creating friendships and to engage in a community. The study also found that these young people want access to information about community integration.</p>



<p>85. GROVER, M., NAUMANN, U., MOHAMMADDAR, L., GLENNON, D., RINGWOOD, S., EISLER, I., WILLIAMS, C., TREASURE, J. and SCHMIDT, U., 2011. A randomized controlled trial of an Internet-based cognitive-behavioural skills package for carers of people with anorexia nervosa. <i>Psychological Medicine</i>, <b>41</b>(12), 2581-2591</p>	<p>AUS</p>	<p>Carers of people with AN (n=64) were randomly allocated to either the web-intervention, overcoming anorexia online, with limited clinician supportive guidance (by email or phone), or to ad-hoc usual support from the UK patient and carer organization, "Beat". Carer outcomes were assessed at post-treatment (4 months) and follow-up (6 months).</p>	<p>To evaluate the efficacy of a novel web-based systemic cognitive-behavioural (CBT) intervention for carers of people with AN, designed to reduce carer distress and teach skills in how to offer effective support.</p>	<p>Compared with the control intervention, web-based treatment significantly reduced carers' anxiety and depression (primary outcome) at post-treatment, with a similar trend in carers' expressed emotion. Other secondary outcomes did not favour the online intervention. Gains were maintained at follow-up.</p>
<p>86. GROVER, M., WILLIAMS, C., EISLER, I., FAIRBAIRN, P., MCCLOSKEY, C., SMITH, G., TREASURE, J. and SCHMIDT, U., 2011. An off-line pilot evaluation of a web-based systemic cognitive-behavioral intervention for carers of people with anorexia nervosa. <i>International Journal of Eating Disorders</i>, <b>44</b>(8), 708-715.</p>	<p>USA</p>	<p>27 carers were recruited. Outcomes measuring carer distress, experience of care giving, level of expressed emotion and problem solving were measured pre- and post-intervention and at follow-up. Carers also gave feedback.</p>	<p>To evaluate the feasibility and acceptability of a novel systemic cognitive behaviour therapy-based intervention for carers of people with anorexia nervosa</p>	<p>There was a significant reduction in carers' anxiety and depression, negative experiences of caregiving and expressed emotion and a significant increase in positive experiences in care-giving after the intervention. Most improvements were maintained at follow-up.</p>
<p>87. HAAS, A., KOESTNER, B., ROSENBERG, J., MOORE, D., GARLOW, S., SEDWAY, J., NICHOLAS, L., HENDIN, H., MANN, J. and NEMEROFF, C., 2008. An inter-active web-based method of out-reach to college students at risk for suicide. <i>Journal of American College Health</i>, <b>57</b>(1),15-22</p>	<p>USA</p>	<p>1,162 students completed the screening questionnaire; 981 (84.4%) were designated as at high or moderate risk. Among this group, 190 (19.4%) attended an in-person evaluation session with the counsellor, and 132 (13.5%) entered treatment.</p>	<p>To evaluate an interactive, web-based method to encourage college students at risk of suicide to seek help.</p>	<p>Students who engaged in online dialogues with the counsellor were three times more likely than were those who did not to come for evaluation and enter treatment. The method has considerable promise for encouraging previously untreated, at-risk college students to get help.</p>

<p>88. HEINICKE, B. E., PAXTON, S. J., MCLEAN, S. A. and WERTHEIM, E. H., 2007. Internet-delivered targeted group intervention for body dissatisfaction and disordered eating in adolescent girls: A randomized controlled trial. <i>Journal of Abnormal Child Psychology</i>, <b>35</b>(3), 379-391.</p>	<p>AUS</p>	<p>73 female adolescents were randomly assigned to an intervention group and a delayed treatment control group. Qualitative interviews were conducted to evaluate the efficacy of the program.</p>	<p>To evaluate an internet delivered disordered eating and body satisfaction intervention for adolescent girls.</p>	<p>The study observed that there were clinically significant improvements in body dissatisfaction, disordered eating, and depression that were maintained at follow-up. Researchers found that the adolescent girls enthusiastically endorsed the method of delivery.</p>
<p>89. HOFFMAN, W. A., 2006. Telematic technologies in mental health caring: a web-based psychoeducational program for adolescent suicide survivors. <i>Issues in Mental Health Nursing</i>, <b>27</b>(5), 461-474</p>	<p>USA</p>	<p>Instructional design evaluators (n = 7) were recruited from a group of university lecturers and instructional designers that participated in a six month (June to December 2005) full-time telematic training program. They were then provided with an open-ended electronic questionnaire that gave guidelines regarding the most important design aspects that should be evaluated for the various parts of the web-based psychoeducational program</p>	<p>To describe the development of a comprehensive web-based psychoeducational program that deals with the lived experiences of adolescent suicide survivors</p>	<p>In the development of a web-based psychoeducational program the situation analysis indicated a clear need among adolescent suicide survivors to receive effective social support and psychoeducational interventions to facilitate the progression of the bereavement process towards eventual healing, adaptation, and integration. The development, evaluation, and implementation of the web-based psychoeducational program that followed from the situation analysis established a readily accessible resource instrument for both mental health professionals and adolescent suicide survivors to consult for intervention and/or information purposes.</p>
<p>90. ILOABACHIE, C., WELLS, C., GOODWIN, B., BALDWIN, M., VANDERPLOUGH-BOOTH, K., GLADSTONE, T., MURRAY, M., FOGEL, J. and VAN VOORHEES, B. W., 2011. Adolescent and parent experiences with a primary care/Internet-based depression prevention intervention (CATCH-IT). <i>General Hospital Psychiatry</i>, <b>33</b>(6), 543-555</p>	<p>USA</p>	<p>83 adolescents and 14 parents participated in a mixed-methods approach. Qualitative analysis was done with grounded theory-based categorization of interview comments and typed program responses (adolescents only) into themes. Quantitative analysis was performed through the use of self-report surveys.</p>	<p>To understand the experience of adolescents and their parents involved in the Internet-based intervention for depression CATCH-IT. The article describes the nine themes reflecting the adolescent experience and the three themes reflecting the parent experience.</p>	<p>Overall parents and adolescents reported finding the program helpful with adolescents reporting an increasing preference for the internet-based intervention. Adolescents expressed a strong preference to be able to chat online and parents valued the self-help approach.</p>

<p>91. JANG, J., DIXON, D. R., TARBOX, J., GRANPEESHEH, D., KORNACK, J. and DE NOCKER, Y., 2012. Randomized trial of an eLearning program for training family members of children with autism in the principles and procedures of applied behaviour analysis. <i>Research in Autism Spectrum Disorders</i>,6(2), 852-856</p>	<p>USA</p>	<p>28 family members of children diagnosed with Autistic Disorder, Asperger's Disorder, or PDD-NOS participated in this randomized, waitlist- controlled, between-groups study.</p>	<p>To evaluate the effectiveness of an eLearning program for training family members of children with ASD in the principles and procedures of applied behaviour analysis treatment.</p>	<p>Differences in change scores between groups were significant, with the trained group substantially outperforming the waitlist control group at post-test. The control group then received training and also demonstrated significant gains post training.</p>
<p>92. JONES, R., SHARKEY, S., FORD, T., EMMENS, T., HEWIS, E., SMITHSON, J., SHEAVES, B. and OWENS, C., 2011. Online discussion forums for young people who self-harm. <i>Psychiatrist</i>, 35(10), 364-368.</p>	<p>UK</p>	<p>An online discussion forum for young people was monitored and analysed for themes by the research team to create a questionnaire for the participants to complete.</p>	<p>To determine what young people who self harm think about online discussion forums.</p>	<p>Findings suggest that anonymous online discussion forums, if well moderated, can be beneficial for those who self harm. The study found that the young people who participated value this service, however they do not believe it could replace face-to-face therapy.</p>
<p>93. KOBAK, K. A., STONE, W. L., WALLACE, E., WARREN, Z., SWANSON, A. and ROBSON, K., 2011. A Web-Based tutorial for parents of young children with autism: Results from a pilot study. <i>Telemedicine Journal &amp; E-Health</i>, 17(10), 804-808</p>	<p>USA</p>	<p>23 parents with a child between 18 months and 6 years with an autism spectrum disorder participated. Pre- and post-test scores of parents' knowledge were used to evaluate tutorial effectiveness. The system usability scale (SUS) evaluated technical user-friendliness and the user satisfaction questionnaire (USQ), gauged satisfaction with content.</p>	<p>To evaluate a Web-based parent training tutorial (Enhancing Interactions), based on evidence-based practices and utilizing the Web-based platform to maximize learning.</p>	<p>The mean number of correct items on the post-test significantly increased, from 12.6 to 20.4, <math>p &lt; 0.001</math>. The mean SUS score was 85 (standard deviation = 17), corresponding to a score of "excellent." All participants found the tutorial user friendly, well integrated, and 96% (all but one participant) thought it was easy to use, felt confident using the technical features, and would use a tutorial like this again. On the USQ, all participants found that the tutorial was well organized, clearly presented, and easy to understand; that it increased their knowledge about communicating with their child; and that they felt capable of applying these techniques with their child.</p>

<p>94. LANDBACK, J., PROCHASKA, M., ELLIS, J., DMOCHOWSKA, K., KUWABARA, S. A., GLADSTONE, T., LARSON, J., STUART, S., et al., 2009. From prototype to product: Development of a primary care/internet based depression prevention intervention for adolescents (CATCH-IT). <i>Community Mental Health Journal</i>, <b>45</b>(5), 349-354</p>	USA	Discussion article; no participants or methods.	To describe the prototype to product development process of a low cost, socio-culturally relevant, easily implemented Internet-based depression prevention intervention for adolescents in primary care.	Initial experiences by adolescents suggest willingness to actively engage in the intervention and favourable ratings of the program. The program is described as potentially universally available at low cost utilizing existing systems of healthcare providers.
<p>95. LANGE, A., VAN DE VEN, J. P., SCHRIEKEN, B. and EMMELKAMP, P. M., 2001. Interapy: Treatment of posttraumatic stress through the Internet: A controlled trial. <i>Journal of Behavior Therapy and Experimental Psychiatry</i>, <b>32</b>(2), 73–90</p>	USA	41 individuals who had experienced a traumatic event at least three months ago were randomly allocated to the treatment or control condition. The SCL- 90, the IES and the POMS were used to measure outcomes.	To evaluate the internet delivered program “Interapy” and its efficacy in treating posttraumatic stress and grief in students.	80% of the treated participants showed clinically significant improvement after treatment. The study suggests that it is possible to demonstrate support and commitment through the Internet.
<p>96. MANWARING, J. L., BRYSON, S. W., GOLDSCHMIDT, A. B., WINZELBERG, A. J., LUCE, K. H., CUNNING, D., WILFLEY, D. E. and TAYLOR, C. B., 2008. Do adherence variables predict outcome in an online program for the prevention of eating disorders? <i>Journal of Consulting and Clinical Psychology</i>, <b>76</b>(2), 341-346</p>	USA	College-aged Female participants (n = 209) completed the Eating Disorders Examination–Questionnaire (EDE-Q; C. G. Fairburn & S. J. Beglin, 1994) at baseline, post treatment, and one-year follow-up.	To investigate the relationship between adherence to an online eating disorder (ED) prevention programs components and outcome in a successful Internet-based intervention.	Total weeks participation and frequency of utilizing the online Web pages/journals predicted pre- to post treatment changes in EDE-Q Restraint but not in other ED symptoms. In participants with some compensatory behaviors, discussion board and booster session use were associated with increased weight/shape concerns during follow-up.
<p>97. MARCH, S., SPENCE, S. H. and DONOVAN, C. L., 2009. The efficacy of an Internet-based cognitive-behavioral therapy intervention for child anxiety disorders. <i>Journal of Pediatric Psychology</i>, <b>34</b>(5), 474-487.</p>	AUS	73 children with anxiety disorders, aged 7–12 years, and their parents were randomly assigned to either an Internet-based CBT (NET) or wait-list condition. Clinical diagnostic assessment and parent and child questionnaires were completed before and after treatment. The NET condition was reassessed at six-month follow-up.	To evaluate the efficacy of an internet-based cognitive-behavioral therapy (CBT) approach to the treatment of child anxiety disorders.	At posttreatment assessment, children in the NET condition showed small but significantly greater reductions in anxiety symptoms and increases in functioning than wait-list participants. These improvements were enhanced during the six-month follow- up period, with 75% of NET children free of their primary diagnosis.

<p>98. Merry, S. N., Stasiak, K., Shepherd, M., Frampton, C., Fleming, T. and Lucassen, M. F. G., 2012. The effectiveness of SPARX, a computerised self help intervention for adolescents seeking help for depression: randomised controlled non-inferiority trial. <i>BMJ</i>, <b>344</b>(e2598), doi: 10.1136/bmj.e2598</p>	<p>NZ</p>	<p>A multicentre randomised controlled non-inferiority trial was conducted with 187 adolescents aged 12-19, seeking help for depressive symptoms, with no major risk of self harm and deemed in need of treatment by their primary healthcare clinicians: 94 were allocated to SPARX and 93 to treatment as usual.</p>	<p>To evaluate whether a new computerised cognitive behavioural therapy intervention (SPARX, Smart, Positive, Active, Realistic, X-factor thoughts) could reduce depressive symptoms in help seeking adolescents as much or more than treatment as usual.</p>	<p>Per protocol analyses (n=143) showed that SPARX was not inferior to treatment as usual. Post-intervention, there was a mean reduction of 10.32 in SPARX and 7.59 in treatment as usual in raw scores on the children's depression rating scale-revised. Remission rates were significantly higher in the SPARX arm than in the treatment as usual arm. SPARX is a potential alternative to usual care for adolescents presenting with depressive symptoms in primary care settings and could be used to address some of the unmet demand for treatment.</p>
<p>99. O'KEARNEY, R., GIBSON, M., CHRISTENSEN, H. and GRIFFITHS, K., 2006. Effects of a cognitive-behavioural internet program on depression, vulnerability to depression and stigma in adolescent males: A school-based controlled trial. <i>Cognitive Behaviour Therapy</i>, <b>35</b>(1), 43-54</p>	<p>AUS</p>	<p>78 boys age 15-16 years were allocated to either undertake MoodGYM or to standard personal development activities. Outcomes were measured before commencement, post-program and 16 weeks post-program.</p>	<p>To evaluate the effectiveness of a cognitive behaviour therapy Internet program (MoodGYM) for depressive symptoms, attributional style, self-esteem and beliefs about depression, and on depression and depression-vulnerable status in male youth.</p>	<p>Study highlighted small relative benefits for depressive symptoms, attributional style and self-esteem at post-program, although only the effect for self-esteem was sustained at follow-up. Also a small reduction in the risk of being depressed in the MoodGYM group compared with a slightly increased risk for the control group. Limitations include delivery, engagement and enhancing the sustainability of the benefits of the program.</p>
<p>100. O'KEARNEY, R., KANG, K., CHRISTENSEN, H. and GRIFFITHS, K., 2009. A controlled trial of a school-based Internet program for reducing depressive symptoms in adolescent girls. <i>Depression and Anxiety</i>, <b>26</b>(1), 65-72</p>	<p>AUS</p>	<p>157 girls, aged 15 -16 years, were undertook either MoodGYM or their usual curriculum. MoodGYM's impact on depressive symptoms, risk of depression, attributional style, depression literacy and attitudes toward depression were examined using random effect regression.</p>	<p>To evaluate the benefits of a self-directed Internet intervention for depression (MoodGYM) delivered as a part of the high school curriculum.</p>	<p>Intervention produced a significantly faster rate of decline in depressive symptoms over the trial period than the control condition. The effect size for MoodGYM was not significant immediately after the intervention but was moderate and significant 20 weeks after the intervention. Low rates of completion highlight problems in ensuring adherence to Internet programs for depression</p>
<p>101. PRETORIUS, N., ARCELUS, J., BEECHAM, J., DAWSON, H., DOHERTY, F., EISLER, I., GALLAGHER, C., GOWERS, S., et al., 2009. Cognitive-behavioural therapy for adolescents with bulimic symptomatology: The acceptability and effectiveness of internet-based delivery. <i>Behaviour Research and Therapy</i>, <b>47</b>(9), 729-736.</p>	<p>UK</p>	<p>101 participants were recruited from eating disorders clinics or from Beat, a UK-wide eating disorders charity. The program consisted of online CBT sessions, peer support via message boards, and email support from a clinician. Participants' bulimic symptomatology and service utilisation were assessed by interviews at baseline and at three and six months.</p>	<p>To assess the feasibility, acceptability, and clinical outcomes of a web-based cognitive-behavioural (CBT) intervention for adolescents with bulimic symptomatology.</p>	<p>There were significant improvements in eating disorder symptoms and service contacts from baseline to three months, which were maintained at six months. Participants' views of the intervention were positive.</p>

102. PRETORIUS, N., ROWLANDS, L., RINGWOOD, S. and SCHMIDT, U., 2010. Young people's perceptions of and reasons for accessing a web-based cognitive behavioural intervention for bulimia nervosa. <i>European Eating Disorders Review</i> , <b>18</b> (3), 197-206.	UK	Young people (N = 11) with bulimia nervosa or atypical bulimia nervosa completed a qualitative interview. Interviews were analysed and themes were identified.	To explore young people's experience of accessing and utilising a web-based cognitive behavioural intervention for bulimic disorders.	Young people liked the programme for its accessibility, flexibility, support and information. Some participants used the intervention as a stepping-stone to further treatment.
103. RADHU, N., DASKALAKIS, Z. J., ARPIN-CRIBBIE, C. A., IRVINE, J. and RITVO, P., 2012. Evaluating a web-based cognitive-behavioral therapy for maladaptive perfectionism in university students. <i>Journal of American College Health</i> , <b>60</b> (5) 357-366,	Canada	47 maladaptive perfectionists were randomly assigned to a 12-week CBT or a wait-list control group and assessed via questionnaires at pre- and post-intervention. Statistical procedures included tests, Pearson correlations, and analysis of covariance.	To assess a Web-based cognitive-behavioral therapy for maladaptive perfectionism, investigating perfectionism, anxiety, depression, negative automatic thoughts, and perceived stress.	The study found that the web-based CBT group demonstrated significant decreases in anxiety, sensitivity, and negative automatic thoughts compared to the control group. The treatment group improved on psychological outcomes, demonstrating the effectiveness of a Web-based CBT for perfectionism in a university setting.
104. READ, J. P., FARROW, S. M., JAANIMAGI, U. and OUIMETTE, P., 2009 Assessing trauma and traumatic stress via the internet: Measurement equivalence and participant reactions. <i>Traumatology</i> , <b>15</b> (1), 94-102	USA	College students (n = 38) completed a posttraumatic stress disorder (PTSD) clinical interview and paper-and-pencil and online versions of trauma and PTSD questionnaires.	To examine the reliability of the Internet compared with paper-and-pencil and interview assessments and the acceptability of this assessment modality to students	Participants reported positive reactions to the online survey. Findings suggest that the Internet can reliably and unobtrusively assess potentially sensitive topics in college students.
105. RICHARDS, D., 2009. Features and benefits of online counselling: Trinity College online mental health community. <i>British Journal of Guidance &amp; Counselling</i> , <b>37</b> (3), 231-242.	Ireland	The counselling service underwent a content analysis of submissions and an analysis of data collected on usage. Data was collected on clients' perception of satisfaction with the online counselling service.	To assess the service for its uptake and usage, the issues and benefits of online counselling to students and clients satisfaction with the experience of online counselling.	The study found that the service was used mostly for single session counselling. Richards reports that while readership of the content was high, the study was limited by its small sample sizes. The content analysis and client satisfaction inventory showed no significant difference between online and face-to-face counselling.
106. SCHARER, K., 2005. Internet social support for parents: The state of science. <i>Journal of Child and Adolescent Psychiatric Nursing</i> , <b>18</b> (1), 26-35	USA	Review of literature.	To discuss what is currently known about coping, social support and Internet social support. It proposes the use of electronic social support to meet the needs of parents of emotionally disturbed children.	Electronic forms of social support have the potential to meet the identified needs of parents for more social support.

<p>107. SETHI, S., CAMPBELL, A. J. and ELLIS, L. A., 2010. The use of computerized self-help packages to treat adolescent depression and anxiety. <i>Journal of Technology in Human Services</i>, <b>28</b>(3), 144-160</p>	<p>AUS</p>	<p>Participants (N=38) were randomly allocated to one of four conditions: online CBT, face-to-face CBT, combined face-to-face + online CBT, and control.</p>	<p>To assess the efficacy of online therapy in the treatment and prevention of adolescent anxiety and depression.</p>	<p>The study suggests that combined face-to-face + online CBT is more effective in treating symptoms of depression and anxiety compared to stand-alone online or face-to-face therapy. For those who are unable to access face-to-face therapy, computerized therapy may be a viable option</p>
<p>108. SHANDLEY, K., AUSTIN, D., KLEIN, B. and KYRIOS, M., 2010. An evaluation of 'Reach Out Central': An online gaming program for supporting the mental health of young people. <i>Health Education Research</i>, <b>25</b>(4), 563-574.</p>	<p>AUS</p>	<p>266 young people participated in a single-group, quasi-experimental design study with repeated measures of psychological wellbeing, stigma and help seeking (pre-game play, post-game play, and at 2-month follow-up).</p>	<p>To conduct an evaluation of an online gaming program and determine the benefit of playing on a variety of factors. Changes in mental health literacy, mental health stigma and willingness to seek help and program satisfaction were also investigated.</p>	<p>The results demonstrated positive improvements across all outcome measures for females; however, a non-significant worsening effect was observed for males on seeking support, avoidance and resilience.</p>
<p>109. SPENCE, S. H., DONOVAN, C. L., MARCH, S., GAMBLE, A., ANDERSON, R., PROSSER, S., KERCHER, A. and KENARDY, J., 2008. Online CBT in the treatment of child and adolescent anxiety disorders: Issues in the development of BRAVE-ONLINE and two case illustrations. <i>Behavioural and Cognitive Psychotherapy</i>, <b>36</b>(4), 411-430.</p>	<p>AUS</p>	<p>Discussion article with two case studies; one child and one adolescent living with anxiety issues.</p>	<p>To describe the rationale for and development of an online cognitive-behavioural treatment for child and adolescent anxiety and highlight the challenges involved in adapting a clinic-based intervention for delivery using the internet.</p>	<p>Case studies illustrate the practical and technical aspects of implementing the intervention, and demonstrate the feasibility of achieving successful outcomes using online delivery of CBT for child and adolescent anxiety.</p>
<p>110. SPENCE, S. H., DONOVAN, C. L., MARCH, S., GAMBLE, A., ANDERSON, R. E., PROSSER, S. and KENARDY, J., 2011. A randomized controlled trial of online versus clinic-based CBT for adolescent anxiety. <i>Journal of Consulting &amp; Clinical Psychology</i>, <b>79</b>(5), 629-642.</p>	<p>AUS</p>	<p>115 clinically anxious adolescents aged 12 to 18 years and their parent(s) were randomly assigned to online CBT, clinic CBT, or wait list control conditions. The treatment groups received equivalent CBT content. Clinical diagnostic interviews and questionnaire assessments were completed 12 weeks after baseline and at 6- and 12-month follow-ups.</p>	<p>To examine the relative efficacy of online versus clinic delivery of cognitive behaviour therapy in the treatment of anxiety disorders in adolescents.</p>	<p>The results suggested that online delivery of CBT, with minimal therapist support, is equally efficacious as clinic-based, face-to-face therapy in the treatment of anxiety disorders among adolescents.</p>

<p>111. SPENCE, S. H., HOLMES, J. M., MARCH, S. and LIPP, O. V., 2006. The feasibility and outcome of clinic plus internet delivery of cognitive-behavior therapy for childhood anxiety. <i>Journal of Consultation and Clinical Psychology</i>, <b>74</b>(3), 614-621.</p>	AUS	<p>72 clinically anxious children, aged 7 to 14 years, were randomly allocated to clinic-based, cognitive-behavior therapy, the same treatment partially delivered via the internet, or a wait-list control.</p>	<p>To explore the feasibility and efficacy of partially delivering CBT for the child anxiety disorders via the internet.</p>	<p>Children in the clinic and clinic-plus-internet conditions showed significantly greater reductions in anxiety from pre- to post-treatment and were more likely to be free of their anxiety diagnoses, compared with the wait list group.</p>
<p>112. STEENHUIS, M. P., SERRA, M., MINDERAA, R. B. and HARTMAN, C. A., 2009. An internet version of the diagnostic interview schedule for children (disc-iv): Correspondence of the ADHD section with the paper-and-pencil version. <i>Psychological Assessment</i>, <b>21</b>(2), 231-234.</p>	Netherlands	<p>Parents (n = 120) of patients visiting a child and adolescent psychiatry outpatient clinic were randomly divided into four groups, each completing one test and about two weeks later another according to one of these patterns: Internet-interview, interview-Internet, interview-interview, and Internet-Internet.</p>	<p>To assess the correspondence in diagnostic outcome between the Internet-administered and interview versions of the DISC-IV (parent version).</p>	<p>Correspondence between the Internet and interview versions at the level of symptom scores was excellent, and correspondence with respect to the presence/absence of ADHD was good.</p>
<p>113. STEPHENS-REICHER, J., METCALF, A., BLANCHARD, M., MANGAN, C. and BURNS, J., 2011. Reaching the hard-to-reach: how information communication technologies can reach young people at greater risk of mental health difficulties. <i>Australasian Psychiatry</i>, <b>19</b>(Suppl 1), S58-61.</p>	AUS	<p>Discussion paper: no participants or methods.</p>	<p>To examine the role technology can play in supporting the mental health and wellbeing of young people at increased risk of developing mental health difficulties and to explore how to best use information communication technologies (ICT) to meet the mental health needs of diverse young people aged 14-25.</p>	<p>ICT offers relevant and innovative strategies for young people at increased risk of developing mental health difficulties. Whilst many young people experience social isolation and stigma, the manifestation of these issues and the strategies required to address them vary. ICT-based programs will benefit from identifying which protective factors can be most positively influenced through the unique properties of ICT, amongst whom and how. Challenges to ICT-based health services include inadequate access and training, lower literacy levels and the need for specialized technologies for people with disabilities.</p>
<p>114. STORCH, E. A., CAPORINO, N. E., MORGAN, J. R., LEWIN, A. B., ROJAS, A., BRAUER, L., LARSON, M. J. and MURPHY, T. K. 2011. Preliminary investigation of web-camera delivered cognitive-behavioral therapy for youth with obsessive-compulsive disorder. <i>Psychiatry Research</i>, <b>189</b>(3), 407-412.</p>	Ireland	<p>31 young people with OCD (range = 7-16 years; 19 male) were randomly assigned to cognitive-behavioural therapy delivered via web-camera or a waitlist control. Assessments were conducted immediately before and after treatment, and at three-month follow-up.</p>	<p>To report the results of a waitlist controlled randomized trial of family-based cognitive-behavioural therapy delivered via web-camera (W-CBT) in children and adolescents with obsessive-compulsive disorder.</p>	<p>This preliminary study suggests that W-CBT may be helpful in reducing obsessive-compulsive symptoms in youth with OCD. When controlling for baseline group differences, W-CBT was superior to the waitlist control on all primary outcome measures with large effect sizes.</p>



<p>115. TAYLOR, C. B., BRYSON, S., LUCE, K. H., CUNNING, D., DOYLE, A. C., ABASCAL, L. B., ROCKWELL, R., DEV, P., et al., 2006. Prevention of eating disorders in at-risk college-age women. <i>Archives of General Psychiatry</i>, <b>63</b>(8), 881-888.</p>	USA	480 college-age women with high weight and shape concerns were recruited	To determine if an internet-based psycho-social intervention can prevent the onset of eating disorders (EDs) in young women at risk for developing an ED.	There was a significant reduction in Weight Concerns Scale scores in the Student Bodies intervention group compared with the control group at post-intervention. Among college-age women with high weight and shape concerns, an 8-week, Internet-based cognitive-behavioural intervention can significantly reduce weight and shape concerns for up to two years and decrease risk for the onset of EDs.
<p>116. TILLFORS, M., ANDERSSON, G., EKSELIUS, L., FURMARK, T., LEWENHAUPT, S., KARLSSON, A. and CARLBRING, P., 2011. A randomized trial of internet-delivered treatment for social anxiety disorder in high school students. <i>Cognitive Behaviour Therapy</i>, <b>40</b>(2), 147-157.</p>	Sweden	19 speech-anxious high school students with SAD were randomized either into nine weeks of internet-delivered CBT or to a waitlist control group.	To investigate whether internet-based cognitive behavior therapy can be effective for high school students suffering from social anxiety disorder and public speaking fears.	Significant improvements were found on measures of social anxiety, general anxiety, and depression maintained at one-year follow-up.
<p>117. TILLFORS, M., CARLBRING, P., FURMARK, T., LEWENHAUPT, S., SPAK, M., ERIKSSON, A., WESTLING, B. AND ANDERSSON, G., 2008. Treating university students with social phobia and public speaking fears: Internet delivered self-help with or without live group exposure sessions. <i>Depression and Anxiety</i>, <b>25</b>(8), 708-717.</p>	Sweden	University students participated in a randomized control trial of an internet-based self-help program. Students were randomized to either a group completing the online therapy coupled with five face-to-face group therapy sessions or a group completing the online therapy without group therapy sessions.	To compare outcomes of the online group therapy program on its own with outcomes of the program coupled with five face-to-face group therapy sessions.	The study found that the internet-based self-help program on its own was an efficient treatment of university students with social phobia. Adding the five group sessions did not improve outcomes significantly.
<p>118. VAN DER ZANDEN, R., KRAMER, J., GERRITS, R. and CUIJPERS, P., 2012. Effectiveness of an online group course for depression in adolescents and young adults: A randomized trial. <i>Journal of medical Internet research</i>, <b>14</b>(3), e86.</p>	Netherlands	244 young people were randomly assigned to either the online course or to a waitlist control condition. Treatment outcome after three months was the primary outcome measure.	To discuss and evaluate the effectiveness of a guided web-based group course for young people with depressive symptoms.	The participants in the online course group showed significantly greater improvement in depressive symptoms than the control group within three months. Limitations included the ability to compare groups at six months due to the control group gaining access to the group course at the three-month mark.

<p>119. VAN VOORHEES, B. W., ELLIS, J., STUART, S., FOGEL, J. and FORD, D., 2005. Pilot study of a primary care internet-based depression prevention intervention for late adolescents. <i>Canadian Child and Adolescent Psychiatry Review</i>,<b>14</b>(2), 40-43.</p>	<p>USA</p>	<p>14 late adolescents evaluated the acceptability, potential adverse effects, and benefits (pre/post measures of three risk factors for depression) of a combined primary care Internet-based depression prevention intervention.</p>	<p>To evaluate the acceptability, potential adverse effects, and potential benefits (i.e., reduction of risk factors for depression) of a primary care internet-based depression prevention intervention for late adolescents.</p>	<p>Completers reported high levels of readability and ease of understanding and low levels of negative emotions. Completers showed favourable trends for the targeted risk factors: depressive symptoms, dysfunctional thinking, and low social support.</p>
<p>120. VAN VOORHEES, B. W., FOGEL, J., REINECKE, M. A., GLADSTONE, T., STUART, S., GOLLAN, J., BRADFORD, N., DOMANICO, R., et al., 2009. Randomized clinical trial of an Internet-based depression prevention program for adolescents (Project CATCH-IT) in primary care: 12-week outcomes. <i>Journal of developmental and behavioral pediatrics</i>,<b>30</b>(1), 23-37.</p>	<p>USA</p>	<p>84 adolescents at risk for developing major depression were randomly assigned to two groups: brief advice (BA; 1-2 minutes) + Internet program versus motivational interview (MI; 5-15 minutes) + Internet program. Study compared pre/post changes and between group differences for protective and vulnerability factors (individual, family, school and peer).</p>	<p>To evaluate two approaches with varying time and complexity in engaging adolescents with an Internet-based preventive intervention for depression in primary care.</p>	<p>An Internet-based prevention program in primary care is associated with declines in depressed mood and the likelihood of having clinical depression symptom levels in both groups. Motivational interviewing in combination with an Internet behavior change program may reduce the likelihood of experiencing a depressive episode and hopelessness.</p>
<p>121. VAN VOORHEES, B. W., VANDERPLOUGH-BOOTH, K., FOGEL, J., GLADSTONE, T., BELL, C., STUART, S., GOLLAN, J., et al., 2008. Integrative internet-based depression prevention for adolescents: A randomized clinical trial in primary care for vulnerability and protective factors. <i>Journal of the Canadian Academy of Child and Adolescent Psychiatry</i>, <b>17</b>(4),. 184-196.</p>	<p>CANADA</p>	<p>84 adolescents at risk for developing major depression were randomly assigned to two groups: brief advice (BA; 1-2 minutes) + Internet program versus motivational interview (MI; 5-15 minutes) + Internet program. Study compared pre/post changes and between group differences for protective and vulnerability factors (individual, family, school and peer).</p>	<p>To determine which primary care approach (brief advice and motivational interviewing) is more efficacious in reducing vulnerability of major depressive disorder as measured by pre/post changes in vulnerability factors.</p>	<p>Both groups in the study demonstrated declines in depressed mood, increases in social support by peers and reductions in depression related impairment in school. Both forms of a primary care/Internet-based behavioral intervention to prevent adolescent depression may lower depressed mood and strengthen some protective factors for depression.</p>
<p>122. WEBB, M., BURNS, J. AND COLLIN, P., 2008 Providing online support for young people with mental health difficulties: Challenges and opportunities explored. <i>Early Intervention in Psychiatry</i>,<b>2</b>(2), 108-113.</p>	<p>AUS</p>	<p>Discussion article; no participants and methods.</p>	<p>To explore the development of the "Reach Out!" Online Community Forum, a moderated bulletin board facilitated and developed in consultation with young people aged 16–25.</p>	<p>The article suggests that the forum is a positive, unique, and helpful online experience. It describes how the forum has been set-up and the future directions of online mental health forums.</p>

**Table 6: The use of CD-ROM (n=4)**

<b>Reference No.</b>	<b>Country</b>	<b>Participants &amp; Methods</b>	<b>Objective</b>	<b>Study Results</b>
123. BROSANAN, E., SHARRY, J and FITZPATRICK, C., 2005. Working Things Out: A therapeutic interactive CD-Rom containing the stories of young people dealing with depression and other mental health problems. <i>Annual Review of CyberTherapy and Telemedicine</i> , <b>3</b> , 117-122.	Ireland	Discussion article: no participants or methods.	To describe the background and development of the 'Working Things Out' project, including samples from the stories and a description of how the CD-ROM/DVD can be used in psychotherapy.	Professionals who have used the stories with young people have found it a useful engagement tool with young people, inviting them to begin to talk about their own experience, particularly when the viewed story resonates with the particular experience of the adolescent.
124. CUNNINGHAM, M. J., WUTHRICH, V. M., RAPEE, R. M., LYNEHAM, H. J., SCHNIERING, C. A. and HUDSON, J. L., 2009. The Cool Teens CD-ROM for anxiety disorders in adolescents: a pilot case series. <i>European Child and Adolescent Psychiatry</i> , <b>18</b> (2), 125-129.	AUS	Case study: Five adolescents received a multimedia CD-ROM containing a self-help treatment program for young people with an anxiety disorder. Every 2 weeks, they received a brief telephone call from a clinical psychologist to monitor symptoms and progress and to discuss any problems with understanding content or implementing techniques.	To presents a case series on early users of the Cool Teens CD-ROM.	Based on structured interviews, two participants (40%) no longer met diagnostic criteria (self-report ADIS) for at least one clinical anxiety disorder immediately following treatment and these same participants no longer met diagnostic criteria for any clinical anxiety disorder at 3-month follow-up. Two other participants failed to make gains based on diagnostic criteria, but showed improvement in anxiety symptoms for one main fear. Participants were generally satisfied with the multimedia content, the modules, and the delivery format of the program.
125. CUNNINGHAM, M. and WUTHRICH, V., 2008. Examination of barriers to treatment and user preferences with computer-based therapy using the Cool Teens CD for adolescent anxiety. <i>E-Journal of Applied Psychology</i> , <b>4</b> (2),12-17.	AUS	Five adolescents received a multimedia computer-based self-help treatment program for young people with an anxiety disorder. They used the eight- module Cool Teens CD-ROM over a 12-week period on a home computer. A Preferences and Attitudes Questionnaire and a 10-question Barriers to Treatment Participation measure were developed and administered after 12 weeks of program use.	To access the usability of computer based therapy using the Cool Teens CD for adolescent anxiety.	Participants were generally satisfied with the multimedia content, the modules, and the delivery format of the CD- ROM. Specific likes and dislikes were reported and suggestions for improvement were made. These tended to reflect personal preferences rather than any recurring program weaknesses. Some treatment barriers were identified, with “finding time” rating highest. These findings can inform future design of treatment programs relying on multimedia delivery.

<p>126. WUTHRICH, V., RAPEE, R., CUNNINGHAM, M., LYNEHAM, H., HUDSON, J., and SCHNIERING, C. A., 2012. A Randomized Controlled Trial of the Cool Teens CD-ROM Computerized Program for Adolescent Anxiety. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i>, <b>51</b>(3), 261-270.</p>	<p>AUS</p>	<p>Forty-three adolescents with a primary diagnosis of anxiety were randomly allocated to the Cool Teens program, a 12-week computerized cognitive-behavioral therapy program for anxiety management, or a 12-week wait list. Effects on symptoms, negative thoughts, and life interference were assessed at post-treatment and 3-month follow-up, based on diagnosis as well as self and maternal report.</p>	<p>This paper describes the results of a small randomized controlled trial of the Cool Teens program for adolescent anxiety, and examines potential barriers to treatment and user preferences of computerized technology in this population.</p>	<p>Using mixed-model analyses, at post-treatment and follow-up assessments, adolescents in the Cool Teens condition, compared with those on the wait list, were found to have significant reductions in the total number of anxiety disorders, the severity of the primary anxiety disorder, and the average severity for all disorders. These results were matched by significant reductions in mother and child questionnaire reports of anxiety, internalizing symptoms, automatic thoughts, and life interference. Further few barriers to treatment were found, and user preferences indicated that the computerized treatment was well suited to adolescents with anxiety.</p>
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