

REVIEW

Telemental health for children and adolescents

Nicole E. Gloff¹, Sean R. LeNoue^{2,3,4}, Douglas K. Novins^{4,5,6} and Kathleen Myers^{7,8}

¹Division of Child and Adolescent Psychiatry, University of Maryland School of Medicine, Baltimore, Maryland, ²Denver Health Medical Center, Colorado, ³Children's Hospital Colorado, University of Colorado Hospital, University of Colorado School of Medicine, Aurora, Colorado, ⁴Department of Psychiatry, University of Colorado School of Medicine, ⁵Division of Child and Adolescent Psychiatry, University of Colorado School of Medicine, ⁶American Indian and Alaska Native Health, Colorado School of Public Health, Aurora, Colorado, ⁷School of Medicine, University of Washington, and ⁸Telemental Health Service, Seattle Children's Services, Seattle, Washington, USA

ABSTRACT

Most children and adolescents across the USA fail to receive adequate mental health services, especially in rural or underserved communities. The supply of child and adolescent psychiatrists is insufficient for the number of children in need of services and is not anticipated to grow. This calls for novel approaches to mental health care. Telemental health (TMH) offers one approach to increase access. TMH programmes serving young people are developing rapidly and available studies demonstrate that these services are feasible, acceptable, sustainable and likely as effective as in-person services. TMH services are utilized in clinical settings to provide direct care and consultation to primary care providers (PCPs), as well as in non-traditional settings, such as schools, correctional facilities and the home. Delivery of services to young people through TMH requires several adjustments to practice with adults regarding the model of care, cultural values, participating adults, rapport-building, pharmacotherapy and psychotherapy. Additional infrastructure accommodations at the patient site include space and staffing to conduct developmentally appropriate evaluations and treatment planning with parents, other providers, and community services. For TMH to optimally impact young people's access to mental health care, collaborative models of care are needed to support PCPs as frontline mental health-care providers, thereby effectively expanding the child and adolescent mental health workforce.

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Introduction: child and adolescent telemental health

Disparities in children's and adolescents' access to evidence-based care

As noted in other articles, the “aging-out effect” of the current supply of psychiatrists and the projected inadequate supply of new psychiatrists has called for novel approaches to mental healthcare (American Medical Association, 2010; Insel, 2011). This disparity is especially poignant for child and adolescent mental health specialists (American Psychological Association, 2008; Thomas & Holzer, 2006). Therefore, children and adolescents living outside major metropolitan areas have particular difficulties in accessing needed services, particularly evidence-based interventions (American Psychological Association, 2008; Comer & Barlow, 2013; Muskie School of Public Service, 2009; Sandler et al., 2005). These current and projected disparities are occurring at the same time as the broadening implementation of federal and state mental health parity laws, such as the Patient Protection and Affordable Care Act

(ACA) (US 111th Congress, 2010), raising the risk that we will be unable to meet the increase in demand for child specialist mental health services.

Telemental health (TMH) offers one approach to improve access to evidence-based mental health care for young people and their families. This article presents an overview of TMH services to children and adolescents based on the available evidence base and current experience. We specifically address the practices of child and adolescent psychiatrists (telepsychiatrists) and use the term TMH to include the broad array of services that telepsychiatrists provide.

Telemental health to reduce disparities and to improve the quality of child and adolescent mental health care

Programmes using TMH to deliver services directly to young people and their families have developed rapidly across the country but the evidence base supporting their effectiveness is emerging more gradually. Table 1 summarizes the current evidence base; in sum, these



Table 1. Summary of clinical outcome studies for child and adolescent telemental health (2000 to 2015).

Citation	Design	Sample	Assessment	Findings
Elford et al., 2000	RCT	25 children Various diagnoses	Diagnostic interviews	96% concordance between video and in-person evaluations; no difference in satisfaction
Elford et al., 2001	Descriptive	23 children	Routine clinical	Diagnosis and treatment recommendation – equal to usual, in-person care
Glueckauf et al., 2002	Modified RCT Pre versus post	22 adolescents 36 parents	Issue-specific measurement of family problems (ISS, IFS, ICS) Teen functioning (SSRS) Working Alliance Inventory Adherence to appointments Diagnostic interview and scale	Improvement for problem severity and frequency in all conditions. Therapeutic alliance high; teens rated alliance lower for video
Nelson et al., 2003	RCT	28 children Depression	Comparison of patients evaluated through TMH versus FTF in clinic	Video = in-person for improvement of depressive symptoms in response to therapy
Myers et al., 2004	Descriptive	159 young people (age 3–18)		Video basically similar to in-person outpatients demographically, clinically, and by reimbursement
Greenberg, 2006	Descriptive	NS children, 35 PCPs, 12 caregivers	NS Focus groups with PCPs, interviews with caregivers	Video > adverse case mix PCP and caregiver satisfied video; frustrated with limitations of local supports Family caretakers and service providers frustrated with limitations of the video
Myers et al., 2006	Descriptive	115 incarcerated adolescents (age 14–18)	11-item satisfaction survey	80% successfully prescribed medications and they expressed confidence in the psychiatrist by video
Myers et al., 2007	Descriptive	172 patients (age 2–21) 387 visits	11-item provider/PCP satisfaction survey	Young people expressed concerns about privacy
Fox et al., 2008	Pre-post	190 young people in juvenile detention	GAS	Video to patients at 4 PCP sites: high satisfaction with services; paediatricians > family physicians
Myers et al., 2008	Descriptive	172 patients Parental satisfaction	12-item parent satisfaction survey	Improvement in the rate of attainment of goals associated with family relations and personality/behaviour
Yellowlees, 2008	Pre-post	41 children in rural primary care	CBCL	Satisfaction of parents with school-aged children higher than those with adolescents Adherence high for return appointments At 3 months, improvements in the Affect and Oppositional Domains of the Child Behavior Checklist
Myers et al., 2010	Descriptive	701 patients, 190 PCPs	Collection of patient demographics, diagnoses, and utilization of services	Video feasible; psychiatrists adjust practice from in-person well
Pakyurek et al., 2010	Descriptive	12 children Autism spectrum in primary care	Routine clinical	Video might actually be superior to in-person for consultation
Lau et al., 2011	Descriptive and advanced assessment	45 children/adolescents	Patient characteristics, reason for consultation, and treatment recommendations	Video reaches a variety of children, with consultants providing diagnostic clarification and modifying treatment
Stain et al., 2011	Descriptive and RCT	11 adolescents/young adults	DIP-DM	Strong correlation of assessments done in person versus video
Storch et al., 2012	RCT	31 children and teenagers	Routine clinical and measures 1. ADIS-IV-C/P 2. Clinician-administered CY-BOCS 3. CGI 4. Others: obsessive, anxiety, depression inventory.	Video was superior to in person on all primary outcome measures, higher percentage meeting remission. Consultants providing diagnostic clarification and modifying treatment
Himle et al., 2012	RCT	20 children Tourette's disorder or chronic motor tic disorder	DIP-DM Assessment with YGTSS; PTQ; CGI-S and CGI-H	Both treatment delivery modalities resulted in significant tic reduction with no between group differences
Nelson et al., 2012	Service utilization chart review	22 children	Routine clinical	No factor inherent to the video delivery mechanism impeded adherence to national ADHD guidelines

(continued)

Table 1. Continued

Citation	Design	Sample	Assessment	Findings
Reese et al., 2012	Pre-post	8 children; Asian	Routine clinical ADHD	Families reported improved child behaviour and decreased parent distress via video format of Group Triple P Positive Parenting Program
Szeftelet et al., 2012	Descriptive Chart review	45 patients with developmental disabilities; 31 <18 years	Routine clinical – medication changes, frequency of patient appointments, diagnostic changes, symptom severity and improvement	Video led to changed psychiatric diagnosis for 70% and changed medication of 82% of patients initially, 41% at 1 year and 46% at 3 years
Heitzman-Powell et al., 2013	Pre-post	NS Age not reported 7 parents 223 young people	OASIS training programme PBR ITC Routine clinical DISC-IV, CBCL ADHD rating scales	Video helped PCPs with recommendations for developmental disabilities Parents increased their knowledge and self-reported implementation of behavioural strategies
Myers and Vander Stoep, 2013	RCT	223 young people	Routine clinical DISC-IV, CBCL ADHD rating scales	Caregivers reported improved inattention, hyperactivity, combined ADHD, ODD, role performance Teachers reported improvement in ODD and role performance
Reese et al., 2013	Descriptive and RCT	21 children; 90% Caucasian	ADOS – Module 1 ADI-R Parent satisfaction	No difference in reliability of diagnostic accuracy, ADOS observations, ratings for ADI-R parent report of symptoms, and parent satisfaction
Rockhill et al., 2013	RCT	223 children with ADHD ± ODD ± anxiety	Caregiver distress assessed with Patient Health Questionnaire-9, Parenting Stress Index, Caregiver Strain Questionnaire, Family Empowerment Scale	Parents of children with ADHD and a co-morbid disorder had significantly more distress than those with ADHD alone
Xie et al., 2013	RCT	22 children Behavioral disorder	Routine clinical PCQ-CA, VAS, CGAS, CGIS	Parent training through video was as effective as in-person training and was well accepted by parents
Comer & Barlow 2014	Pre-/post	5 children (age 4–8)	Behavioural intervention with child, facilitated by parent; OCD rating scale by parent	Child OCD symptoms and diagnoses declined; child global functioning improved
Myers et al., 2015	RCT	223 children ADHD ± ODD ± anxiety	CBCL screening, DISC-IV diagnostic assessment, ADHD rating scales (inattention, hyperactivity, combined, ODD, role performance) and CIS	Caregivers reported significantly greater improvement for inattention, hyperactivity, combined ADHD, ODD, role performance for video versus those treated in primary care
Tse et al., 2015	RCT subsample	37 caregivers of children with ADHD ± ODD ± anxiety	CaBT delivered via CBCL screening, DISC-IV diagnostic assessment, ADHD rating scales (inattention, hyperactivity, combined, ODD, role performance) and CIS	Teachers reported significantly greater improvement in ODD and role performance for video group, too
Rockhill et al. (2015)	Descriptive; Telepsychiatrists in RCT	223 children with ADHD ± ODD ± anxiety, the telepsychiatrists and PCPs	Telepsychiatrists' adherence to guideline-based care, ADHD outcomes by prescriber based on co-morbidity status	Caregivers reported comparable improvements for children's outcomes whether CaBT video = in person; no improvement in caregivers' distress when CaBT provided through video. Telepsychiatrists adhered to guideline-based care, used higher medication doses than PCPs, and their patients reached target of 50% reduction in ADHD symptoms more often than with PCPs

ADHD, attention deficit hyperactivity disorder; ADI-R, Autism Diagnostic Interview – Revised; ADOS, Autism Diagnostic Observation Schedule; CaBT, Caregiver Behavior Check List; CGAS, Children's Global Assessment Scale; CGH Clinical Global Impressions scale – Improvement; CGI-S Clinical Global Impressions scale – Severity; CIS, Columbia Impairment Scale; CY-BOCS, Children's Yale–Brown Obsessive Compulsive Scale; DIP-DM, Diagnostic Interview for Psychosis; Diagnostic Module; GAS, Goal Attainment Scale; ISS, Internal State Scale; IFS, internal family systems model; ICS, Interpersonal Communication Scale; ITC, Incentive Teaching Checklist; NS, not specified; OASIS, Overall Anxiety Severity and Impairment Scale; OCD, obsessive–compulsive disorder; ODD, oppositional defiant disorder; PBR, problem behaviour recording; PCP, primary care provider; PCQ-CA Parent Child Relationship Questionnaire; PIQ, Parent Tic Questionnaire; RCT, randomized controlled trial; SSRS, social skills rating system; VAS, Vanderbilt Assessment Scales; YGTSS, Yale Global Tic Severity Scale.

studies show that services delivered through TMH are feasible, acceptable, have been delivered across developmental status, and to young people with varied disorders. Early work suggests that outcomes are comparable to services delivered in person.

TMH services are being provided in traditional clinical settings to collaborate with PCPs in the management of children's mental health needs (Goldstein & Myers, 2014; Greenberg et al., 2006; Lau et al., 2011; Myers et al., 2007; Yellowlees et al., 2008), and to provide ongoing treatment to young people and their families (Duncan et al., 2014; Glueck, 2011; 2013b; Myers et al., 2008, 2010; 2015; Reese et al., 2012; Tse et al., 2015; Xie et al., 2013). TMH also allows care to be delivered outside traditional clinical settings to reach young people in naturalistic settings such as schools (Grady et al., 2011b; Stephan et al., 2014), correctional settings (Bastastini, 2013; Kaliebe et al., 2011), day care (Spaulding et al., 2011) and the home (Comer & Barlow 2014).

Considerations for providing telemental health services to children and adolescents

The delivery of services to children and adolescents through TMH requires a number of adjustments to practice with adults. For example, referrals to child and adolescent psychiatrists often entail the assessment of developmental and cognitive disorders, such as autism, or the consideration of early trauma. The telepsychiatrist needs to consider parent/guardian status and the ability to meet the child's needs and participate in treatment. Collaboration with community stakeholders is a standard expectation that involves the participation of teachers, therapists and other professionals in addition to parents and often other family members. Psychotherapy includes interventions such as parent management training and play therapy that involve other participants in treatment, the use of developmentally appropriate therapeutic aids, and modification of space and staffing. Pharmacotherapy involves medication choices, outcomes and side effects that may differ from adult treatment, and frequently include stimulants, Schedule II medications with special regulation when prescribed online (US Department of Justice Drug Enforcement Administration, 2009).

As guidelines for providing evidence-based care to young people through TMH are evolving (Hilty et al., in press; Myers & Cain, 2008), child and adolescent telepsychiatrists must utilize knowledge from the practice parameters developed by the American Academy of Child and Adolescent Psychiatry for usual patient care (aacap.org/aacap/families_and_use/resource_centers/home.afpx), apply skills from in person practice settings, and extrapolate from guidelines developed for general

TMH service delivery (Turvey et al., 2013; Yellowlees et al., 2010).

Models of care and sites of service for children and adolescents

Models of care to provide services to young people through videoconferencing

Many non-metropolitan communities allocate their limited mental health care resources to the adult chronically mentally ill leaving few resources for young people. Therefore, the first step in selecting the model of care is to determine whether a TMH service for young people is needed, feasible, easily integrated and sustainable based upon community services and resources (Glueck, 2011; Grady et al., 2011a). The next step is to determine the site of care, which may be either a clinical (e.g. outpatient mental health clinic, primary care clinic) or a non-clinical setting (e.g. educational, juvenile corrections, home). The treatment setting has implications regarding available resources, patient monitoring, emergency planning, and capabilities of available staff (Carlisle, 2013; Glueck, 2013a). A successful model of care and TMH services partner with the community stakeholders (Jones et al., 2014).

A clear model of care is often established at the time of designing services. Three models utilized in TMH with young people and families include direct, consultative, or collaborative care (Carlisle, 2013). In the direct care model the telepsychiatrist provides ongoing treatment of the patient. This model does not expand the pool of child and adolescent psychiatrists, but redistributes the workforce and may be most relevant to more serious disorders or selected settings. This contrasts with the consultation model in which the telepsychiatrist provides expertise to a provider who, in turn, maintains ongoing care of the patient (Glueck, 2013a; Kriechman & Bonham, 2013; Myers & Cain, 2008). Consultation models may be consultee-centred or client-centred. In the consultee-centred approach, the telepsychiatrist consults with the referring provider about a patient either with or without the patient being present and offers suggestions to the referring provider. In client-centred consultation the young person and caregiver(s) participate in the session and the telepsychiatrist then makes recommendations to the referring provider; however, this provider is often not present during the session. In the collaborative care model, the telepsychiatrist works alongside and follows patients jointly with a PCP (Fortney et al., 2013; Glueck, 2013a; Kriechman & Bonham, 2013). The collaborative care model is promising as an approach to integrating telepsychiatry services into the paediatric medical home

(McWilliams, unpublished). Consultation and collaborative models seek to increase the expertise of local providers in providing mental health care. Models of direct care and consultation are most commonly described with young people and families.

Sites of service and providing care

Outpatient settings and general considerations for providing TMH care

Telepsychiatric care for children and adolescents most commonly occurs in outpatient settings. Multiple studies have demonstrated that parents, providers, and young people rate high levels of satisfaction with outpatient TMH care (Boydell et al., 2010; Grady et al., 2011a; Myers et al., 2007, 2008).

Crisis care may not be as readily available for children and adolescents as for adults in underserved communities, thus it is advantageous to establish procedures for crises using knowledge of local community resources prior to commencing services (Shore et al., 2007). Additionally, it is useful for the telepsychiatrist to work with parents and staff at the patient site to establish procedures for interim care.

Primary care

Due to the severe shortage of child and adolescent psychiatrists in non-metropolitan communities (Bird et al., 2001; Connor et al., 2006), PCPs have become default mental health providers (American Academy of Pediatrics, 2001). However, PCPs often want assistance in treating complex child mental health conditions that they encounter in their practices (Stiffman et al., 1997). Consultative (Boydell et al., 2007; Kriechman & Bonham, 2013; Yellowlees et al., 2008) and collaborative (Kriechman & Bonham, 2012; Fortney et al., 2013) models support PCPs in building skills to provide mental health care to their young patients, thereby increasing the pool of mental health expertise (Goldstein & Myers, 2014). Consultative and collaborative care models in primary care settings are associated with high levels of satisfaction (Boydell et al., 2010; Greenberg et al., 2006; Myers et al., 2008). TMH shows promise for integration into the paediatric medical home model of care (McWilliams, unpublished).

Educational settings

Approximately 70–80% of children and adolescents who receive mental health services access that care in the school setting (Rones & Hoagwood, 2000). School-based

mental health-care services offer the advantage of evaluating children in the familiar and ecologically valid setting of school with minimal disruptions to their classroom time or parents' workday (Goldstein & Myers, 2014; Grady et al., 2011b). TMH is a natural next step to expand the availability of psychiatric care in schools. While the evidence-base on school-based TMH is evolving, our experience indicates that both direct and consultative care models are feasible and acceptable approaches. The telepsychiatrist may provide a variety of services, including evaluations, medication management, ongoing sessions with students and families, evaluation for support services, continuing education for staff, and consultation on specific and general school issues (Grady et al., 2011b). If providing consultation, the role of the telepsychiatrist is typically broader than the role for traditional in-person services. The telepsychiatrist may consult to a multidisciplinary team including educators, school administrators, mental health clinicians and other school team members (Stephan et al., 2014) and may participate in coordination of mental health care to students via involvement in multidisciplinary planning, student evaluation and meeting with teachers, school clinicians and administrators. This enhanced coordination of care allows for improved mental health and educational progress for young people and support for teachers (Grady et al., 2011b; Sanders et al., 2012).

Challenges to implementing TMH in the school setting are privacy, adequate space and other infrastructure for the service, especially in overcrowded schools (Stephan, 2014). Schools that are able to make these accommodations have demonstrated benefit to young people and educators (Cunningham et al., 2013).

Juvenile corrections

The rates of mental illness among incarcerated young people exceed that of the general population (Wasserman et al., 2004) and psychiatric services in the Juvenile Justice System remain scarce. TMH has been successfully utilized to fill this void for young people with a range of psychiatric diagnoses (Fox, 2008; Kaliebe et al., 2011; Myers et al., 2006). TMH offers several advantages, such as eliminating the need for young people to travel outside of the correctional facility for appointments, coordination of care with onsite staff and timely evaluation and ongoing treatment (Bastastini et al., 2013).

There are some challenges when working with this vulnerable population. There is a risk of acting with dual agency to both the juvenile justice facility and to the patient. The telepsychiatrist must have knowledge of the

juvenile justice system, help correctional staff to understand how mental health conditions affect young people's behaviour while incarcerated, and ensure their privacy (Kaliebe et al., 2011).

Home-based telepsychiatry

TMH services provided directly to the patient's home is an area that is expanding with adults (Luxton et al., 2012) and emerging with children (Comer et al., 2014; 2015; Lieberman et al. 2014). The telepsychiatrist has the opportunity to observe children and their families in a naturalistic setting and services can be delivered in the context where the child's behaviors occur. This may be particularly useful for interventions that involve parent-child interactions, parent-facilitated behaviour training, or helping youngsters to implement learned skills within their home environment (Comer et al., 2014; 2015).

In the traditional outpatient TMH clinic, the telepsychiatrist has access to onsite staff who are available to tend to safety issues. Home-based TMH services may not be appropriate if there is a serious concern for patient safety. The development of a safety and crisis plan with the child and parents will help the telepsychiatrist to determine the family's ability to safely participate in care and to inform the family of conditions under which the telepsychiatrist may break confidentiality to contact an emergency provider (Luxton et al., 2012).

Other challenges to delivering services to the home include difficulty in ensuring privacy and addressing technical difficulties that may emerge during the videoconference. Children may be less manageable and engaged in sessions conducted in the familiarity of their home, and the risk of elopement is likely higher than in a clinic.

Establishing a therapeutic space for providing care through videoconferencing with young people

Infrastructure, technology, and staffing needs

Delivering services to young people and their families through videoconferencing entails practical considerations of the infrastructure, technology, and staffing not encountered during services delivered in person or through TMH with adults.

Room selection at the patient site

Rooms used for evaluation of an adult may not provide a sufficient space to evaluate a young person. The room

must be large enough to accommodate the youngster and at least two other adults. It should allow the child to move freely so that the telepsychiatrist can assess gross motor skills, activity level and engagement, but not so large that a hyperactive or agitated child strays off camera. Medical examination rooms may overstimulate children and risk damage to equipment from curious or disruptive youngsters. Ideally, the room would be set up according to the clinical focus of the session. For example, diagnostic sessions may be facilitated by providing selected toys, drawing materials, or activities, but a psychotherapy session may require a sparsely endowed room without such distractions.

Technological considerations

The assessment of children and adolescents is facilitated by selected technology features. Utilizing high bandwidth (384 kbits/s) allows the telepsychiatrist to observe subtleties in the child's speech, facial expressions and movements, e.g. prosody, affective blunting, and tics. It also allows the telepsychiatrist to respond fluidly to the patient and family so that elements of the interactions, such as empathy and emotional tone are adequately conveyed (Glueck, 2013b). Appropriate camera placement optimizes the ability of the telepsychiatrist to assess the youngster's eye contact, an important developmental skill that is crucial to conducting the mental status examination of the child (Carlisle 2013; Glueck, 2011). It is particularly helpful to have a camera that can pan the room at the patient site to follow the child's movement, zoom in to examine for dysmorphia and affect, and adjust the view to simultaneously observe both the child in play and the parent during conversation. However, such capabilities may not be possible with online videoconferencing systems, which may be a disadvantage in the context of the telepsychiatrist's clinical goals.

Clinic protocols and staffing considerations

Staff at the patient site can extend the reach of the telepsychiatrist in managing sessions and may provide tasks beyond those required for adult services (Glueck, 2011; Glueck, 2013b; Myers & Cain, 2008). For example, staff may provide collateral information regarding observations of a depressed teen while in the waiting room, or may remain with the family during the session to help manage a child while the telepsychiatrist speaks with the parent, or may structure a behavioural interaction for the child (Savin et al., 2006). Staff can also increase efficiency of services by enabling the telepsychiatrist to interview an adolescent or parent privately while the local clinician works with the other family

members. The staff may serve as a care manager to communicate with other professionals involved in the young person's care, facilitate the filling of prescriptions, coordinate interim care, and monitor treatment response. The care manager must be able to operate the videoconference equipment as well as comfortably help to manage behavioural problems with children (Myers et al., 2010). Finally, clinic protocols need to consider specific legal issues related to children and adolescents. This includes the age of majority in the state in which the young person resides as well as laws regarding child abuse reporting.

Systems, cultural and community considerations

Child and adolescent psychiatrists regularly navigate complex and varied systems of care, not only in treating the patient but also in coordinating services and accessing the myriad of individuals and resources involved in the young person's life (e.g., schools, primary care providers). In addition to a child's nuclear family, extended family members and other kinship relations may play pivotal roles in providing care to young people (Carlisle 2013; Chatters et al., 1994). These systems are embedded in the family's culture and community which present additional complexities to delivering culturally-informed, evidence-based psychiatric care (Kataoka et al., 2010; Rockhill, 2013), particularly as telepsychiatrists may be located hundreds of miles away from their patients and unfamiliar with their community, its culture and service systems. In some respects, the challenge and success of child and adolescent telepsychiatrists rests in their ability to unify these systems, community and cultural factors into a cohesive set of supports for the children and their families. Several TMH programmes have overcome these challenges to deliver high-quality care to geographically and ethnically diverse groups, including Alaska Native, American Indian, Cambodian, Chinese, and Hispanic communities across state lines and international borders (Kataoka et al., 2003; Mucic 2010; Savin et al., 2006; Shore & Manson 2005; Yeung et al., 2011).

Shore and colleagues (Shore et al., 2005) recommend the use of a six-stage process for developing TMH services that is particularly applicable for programmes focused on children and families. These include a careful evaluation of the specific needs of the population, an assessment of the existing child and family-serving system, development of a TMH service delivery structure that will take advantage of existing programmes, fill service delivery gaps, and allow for coordinated care, and then piloting services on a small scale before expanding services to full capacity. Cultural issues are addressed

throughout this process (Shore & Manson 2005, 2006; Savin et al., 2011). Child and adolescent TMH providers can cultivate their role with the youngsters by familiarizing themselves with the local community and culture, and by knowing about common recreational activities, community events, local industries, employment, and by aligning with key community supports. Site visits during the development of TMH services and periodically throughout the operation of the programme are particularly helpful in developing such knowledge and building partnerships with stakeholders. Children and adolescents often enjoy meeting in person with the stakeholders.

Clinical interventions

Evaluation and establishing therapeutic alliance

Therapeutic alliance is a strong predictor of outcome in mental health treatment and this is thought to be particularly important when working with children and adolescents (Elvins & Green, 2008). The reported high satisfaction rates with TMH services suggest that a solid therapeutic alliance develops (Elford et al., 2001; Greenberg et al., 2006; Myers et al., 2008). Telepsychiatrists employ creative approaches to establish a therapeutic alliance. It is helpful to assure young people, particularly adolescents, that there are procedures to ensure patient confidentiality and that the sessions will not be recorded or shared (Glueck, 2013b). Access to the Internet during a session allows the telepsychiatrist to engage adolescents by exploring an online site, such as YouTube or Facebook. Children enjoy drawing pictures that they then share through the camera while telling a story. Drawings also help the telepsychiatrist to assess children's attention, fine motor skills and creativity which are then integrated into their interactions with the child. Children use play figures, such as dolls or action figures, to demonstrate their ability for symbolic play and reveal their thought content regarding human interactions. Some children simply like to play hide and seek. Other helpful approaches include the ability to share the desktop for behavioural training or for the patient to share items about their school, community or favourite songs and videos. But, the single most effective means of establishing an alliance with young people is conversation, just like adult in-person treatment.

Pharmacotherapy

Prescribing medications for children and adolescents is one of the most frequently requested services in telepractice and entails a few considerations beyond care with adults. Telepsychiatrists must determine the

age at which a young person is legally required to provide his/her written consent to medication treatment. In evaluating the need for medication, as well as monitoring the patient's progress, the mental status examination (MSE) serves as the patient's 'vital signs of mental health.' Several studies have shown that the MSE performed via videoconference is comparable to that conducted in person (Elford et al., 2000; Reese et al., 2013; Stain et al., 2011). Monitoring of vital signs is routine due to the potential adverse effects of medication on growth and development and the co-occurrence of medical conditions in young people with psychiatric disorders. Prior to the initiation of TMH services it is customary for the telepsychiatrist to determine whether he/she prefers to order medications and laboratory assessments themselves or with assistance from the young person's PCP. Particular attention must be given to the use of stimulants, Schedule II medications, which have additional regulations for prescribing through TMH (US Department of Justice, Drug Enforcement Administration, 2009). The delivery of hard copy Schedule II prescriptions to the pharmacy is required and may require additional coordination with the originating site.

In general, it is important to develop a relationship with a local PCP and pharmacist to ensure the ability of the telepsychiatrist to draw on local expertise when needed. Indeed, some states require that telepsychiatrists share all assessments and progress notes with the patient's PCP (Conn, 2014). Prescribing via TMH is an evolving area. It is important for telepsychiatrists to stay informed regarding state and federal laws, as they remain in flux.

Rating scales are routinely used in child and adolescent psychiatry practice to monitor treatment response and side effects. The Abnormal Involuntary Movement Scale (AIMS) has been shown to be reliable for the assessment through videoconferencing of movement disorders in adults taking antipsychotic medications and is used to monitor young people as well (Amarendran et al., 2011). It is helpful to set up a patient portal for families and teachers to complete symptom-based rating scales online during TMH care (Myers et al., 2015).

Psychotherapy

Access to evidence-based psychotherapy and providers trained to treat young people are limited in non-metropolitan communities. Teletherapy studies conducted with adults through videoconferencing have consistently demonstrated outcomes that are comparable to outcomes for the same therapy delivered in person

(Day & Schneider, 2002; Morland et al., 2010; Ruskin et al., 2004). The feasibility of delivering psychotherapy to young people through videoconferencing has been demonstrated for multiple disorders, including attention-deficit/hyperactivity disorder (ADHD), bulimia nervosa, panic disorder, agoraphobia, obsessive-compulsive disorder (OCD), depression, post-traumatic stress disorder (PTSD), and adjustment disorder (Nelson et al., 2011).

However, the evidence base supporting the effectiveness of TMH-delivered psychotherapy with young people is developing incrementally (Table 1). Further randomized trials are needed comparing TMH-facilitated versus in person delivered care and demonstrating the benefits of enhancing PCP care with TMH consultation (Myers et al., 2015).

Given the current and projected disparity between the demand and supply of child and adolescent psychiatrists, novel approaches have looked to asynchronous TMH programmes. One example is BRAVE-Online, developed for the treatment of anxiety and depression in young people (Spence et al., 2008). The self-administered intervention is augmented with minimal support from a therapist which can be provided through TMH. Internet-delivered psychotherapy offers the potential to make evidence-based treatments widely available for timely, efficient, and effective care. TMH offers the opportunity to keep young people engaged in self-administered treatments and to apply new skills to daily life.

Discussion: clinical implications and future directions

Child and adolescent telepsychiatry is a feasible, acceptable and sustainable approach to address the gap in access to services for underserved populations. Over the past 15 years, the use of TMH to serve children and adolescents has moved from the realm of small proof of concept studies and niche services to randomized clinical trials and an ever-broadening array of care models. The limited available research suggests that care delivered through TMH is effective. However, more research is needed to know whether the quality of care and outcomes delivered to young people are comparable to services provided in person. Treating young people via TMH requires accommodations that are not needed when working with adults, but these can be easily met with the assistance of a coordinator at the patient site. It also requires that the provider keep up to date on state and federal laws and regulations related to providing services via TMH as these remain in flux. TMH is one approach for child and adolescent psychiatrists to expand their practice according to their specific

expertise, interests and resources. It also provides flexibility for the provider at various stages of their professional and family life.

TMH is becoming a key component of our mental health service delivery system and will likely become even more important in the years to come. In addition to refining service delivery models, particularly in non-traditional settings such as school and the home, it will be important to assess the true impact of TMH in improving the quality and accessibility of mental health services more broadly. As we note at the start of this paper, the child and adolescent mental health workforce is not anticipated to grow over the next decade, yet the need for mental health services will likely grow. For TMH to have a real impact on access to care, we will need to pay particular attention to models in which medical and mid-level providers are supported by mental health specialists and are thus able to effectively expand the child and adolescent mental health workforce. It is in this arena that the true promise of TMH lies.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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