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Attention-Deficit/Hyperactivity Disorder and Telemental Health

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Abstract

Attention-deficit/hyperactivity disorder (ADHD) is one of the most prevalent psychiatric disorders diagnosed in children and adolescents (youth). ADHD is equally distributed geographically, but services are not. Access to expert evaluation and treatment remains limited for youth with ADHD living in rural areas, as well as for ethnic and racial minority youth. Telepsychiatry is a service delivery model with the potential to reach these youth and to develop collaborative models of care among local primary care physicians, remote telepsychiatrists, and local families. Care delivered through telepsychiatry can readily adhere to the practice parameters of the American Academy of Child and Adolescent Psychiatry. Work to date indicates that ADHD is the most common disorder treated through telepsychiatry. This article reviews the status of child and adolescent telepsychiatry, with particular focus on its potential to improve the care and outcomes of underserved populations of youth diagnosed with ADHD.

Keywords

Telemental health; Telepsychiatry; ADHD; Rural youth

Introduction

Attention-deficit/hyperactivity disorder (ADHD) is one of the most common and chronic disorders of childhood. Children diagnosed with ADHD present with diverse cognitive and motor symptoms that produce morbidity in academic, social, and personal functioning across the course of their development [1]. Their chronic impairments require a disproportionate amount of health care and school resources, making ADHD a serious public health issue [2,3].

Although children with ADHD are equally distributed geographically, the resources needed to treat them are not. In particular, youth living in rural communities and ethnic minority youth often lack access to evidence-based treatments for ADHD [4]. The question then becomes how to provide these youth with equitable access to care. We propose that telepsychiatry is a compelling and effective means of reaching these youth. Telepsychiatry offers the opportunity for psychiatrists and other specialists to collaborate through videoconferencing with local primary care physicians (PCPs) to provide evidence-based care and improve the health care and outcomes for underserved children diagnosed with ADHD.

In this article, we review the status of ADHD treatment in the community and consider service models designed to improve such treatment, including collaborative care models. We then review the literature regarding child and adolescent telepsychiatry, with a particular focus on ADHD applications, including recent studies and current clinical trials investigating the application of telepsychiatry to youth with ADHD. Finally, we present vignettes illustrating the value of telepsychiatry to youth and communities and suggest future directions for research.

Community Treatment of ADHD

Children diagnosed with ADHD are predominantly treated by their PCPs. This is particularly true for children living in nonmetropolitan communities and racial and ethnic minority youth, as these youth typically lack access to child and adolescent psychiatrists [4–6]. Pediatricians are in a unique position to identify and treat ADHD, as they routinely screen for developmental, behavioral, and educational difficulties, and they maintain long-term relationships with families. These factors increase the likelihood that parents will discuss their children's behaviors and that pediatricians will screen for ADHD.

Although PCPs assume most of the care for children with ADHD, the landmark Multimodal Treatment of ADHD (MTA) study has shown that the treatment of ADHD in primary care is suboptimal [7,8]. This seminal study found that the best outcomes in ADHD treatment are achieved by establishing an accurate diagnosis, including disorders comorbid with ADHD; titrating medication to an optimal individual dose; carefully monitoring treatment; and consistently adjusting medications according to responses of parents and teachers on standardized behavior rating scales. The MTA study in turn informed the development of guidelines by the American Academy of Pediatrics (AAP) for the evaluation and treatment of children with ADHD in primary care [9,10]. Although these guidelines have been widely disseminated and promoted and are routinely reviewed and revised, many PCPs are unaware of them or do not follow them consistently [11–13].

Improving Treatment of ADHD

Quality Improvement and Process Improvement

Several approaches have been undertaken to improve the treatment of ADHD in primary care. Quality improvement efforts have focused on intensive didactic training of PCPs regarding the AAP guidelines and the provision of toolkits to help them sustain adherence to these guidelines (<http://www.nichq.org>). However, studies to date have shown that these approaches have not been widely adopted [11,13,14], largely because of multiple barriers to their implementation, including inadequate time provided to complete these behavioral health appointments, the burden of extra steps outside usual appointments (eg, contact with teachers and scoring of behavior rating scales), and lack of reimbursement for the time involved. Also, PCPs often cannot find the mental health resources needed to provide the parent training and/or behavioral interventions that are recommended by the AAP guidelines [9,10]. An alternative approach has focused on process improvement. To render care more efficiently and without burden on the primary care office, procedures have been developed to streamline patient flow, structure time for appointments, contact teachers, and use office staff to collect and score ADHD and other rating scales [12,15]. These approaches have been shown to improve PCP practices [15] and seem to produce positive health outcomes, as demonstrated by decreases in parents' and teachers' ratings of ADHD symptoms [16]. Unclear is how well these procedures are sustained over time, as they have been shown to work better for initial assessment than for monitoring follow-up responses [12,15]. Furthermore, although these quality improvement and process improvement approaches seem helpful in improving youth's care and outcomes in the short term, they do not address the chronic and impairing nature of ADHD with the need for treatment modifications as youth mature. They also do not address the need for better identification and treatment of ethnic minority children diagnosed with ADHD, who the Surgeon General has noted are particularly underserved [17].

Collaborative Care Models

Considering that ADHD is a chronic and for many a lifelong condition, alternative or additional approaches need to consider the manifestations of ADHD during the course of development. The Institute of Medicine (IOM) has noted that it is not a deficit in knowledge but rather a deficit in models of health care service delivery that impedes optimal care for chronic illnesses, and the treatment of ADHD is no exception [18]. The IOM's report, *Crossing the Quality Chasm*, emphasizes that collaboration among PCPs, medical specialists, and patients allows for the implementation of multimodal strategies designed to do the following: 1) improve patient activation and education so that they can become "self-managers" and collaborators in care; 2) improve physician adherence to guidelines for care; and 3) change the process of care to use specialists and evidence-based care appropriately, incorporate proactive follow-up, and track health outcomes [18]. The goal of this collaboration is for providers and patients to come together to implement proactive, non-crisis-oriented illness management and patient-centered treatment. Such collaborative care models place a mental health expert in the PCP's clinic to provide the PCP with collaboration in treatment planning and ongoing patient care. These models have demonstrated improved health care and outcomes for adults with chronic medical and psychiatric disorders [19–21]. Although these models are intuitively appealing, they have not been well-examined with pediatric populations. However, Richardson and colleagues [22] recently examined this model with depressed adolescents. In a small, 6-month pilot study of 40 teens, a nurse provided care management, conducted problem-solving psychotherapy in the pediatrician's office, and facilitated collaboration between the pediatrician and a consulting psychiatrist regarding medication management. This study

found the collaborative care model to be feasible, acceptable, and associated with improved depression outcomes for 74% of youth [22].

This model seems readily adaptable to the treatment of ADHD in primary care. The challenge is the paucity of child and adolescent psychiatrists to provide such collaboration, particularly in rural and other communities that are distant from metropolitan centers.

Child and Adolescent Telepsychiatry

The President's New Freedom Commission on Mental Health has recommended the use of telecommunications technologies to address the health care needs of underserved communities [23]. When telecommunications uses interactive videoconferencing between a patient and health care provider to render care in real time that is usually conducted in person, it is termed *telemedicine*. When telemedicine services are provided for psychiatric care, they are termed *telepsychiatry*, or *telemental health* when such care involves more general mental health and behavioral health services such as psychotherapy or behavioral training. As most mental health and behavioral health services rendered through videoconferencing have involved psychiatric care, we use the term telepsychiatry to encompass all telemental health applications unless specifically noted otherwise. This venue for health service delivery offers an innovative approach to building collaborative models of evidence-based mental health care by redistributing the workforce of child and adolescent mental health specialists.

Technological Aspects

The technology underlying telepsychiatry is inherently interesting and complicated, but a comprehensive understanding is not critical to its use. Multiple technologies of varying sophistication and cost are available to establish connectivity between sites. Most often used are digital systems, such as ISDN (integrated service digital networks) and T1 lines. These means of connectivity provide bandwidth sufficient to approximate an in-person clinical experience, and their secure point-to-point connectivity ensures compliance with regulations established by the Health Insurance Portability and Accountability Act (HIPAA). However, they are expensive for widespread use outside major institutions. Broadband connectivity is becoming popular, as it provides rapid transmission with high resolution at lower connectivity costs. However, encryption protocols are needed to ensure confidentiality. This may be provided through mechanisms such as virtual private networks. Increasingly, entrepreneurial psychiatrists have explored the use of lower-end technologies, such as webcams. Controversy persists regarding the ability of their encryption protocols to comply with HIPAA standards. Another concern in using the public airways is that sufficient bandwidth for clinical work may not be available on demand. More information on connectivity protocols can be found at the website for the Telemedicine Information Exchange (<http://tie.telemed.org/default.asp>) and the website for the American Telemedicine Association (<http://www.americantelemed.org>).

The main point in using this or any health care technology is that it is a vehicle for reaching the large number of children with ADHD who do not receive expert services. The technology now provides high bandwidth (386 kilobyte/s to ≥ 1 MB/s), with synchronized video and audio transmission, and excellent resolution that approximates an in-person visit. As psychiatry relies predominantly on conversation and observational skills, telepsychiatry provides a reasonable alternative to an office visit for patients who cannot readily access care. Furthermore, the increasing availability of videoconferencing capability in multiple settings allows telepsychiatrists to reach youth in naturalistic settings. For example, schools have K20 networks that can bring psychiatrists and teachers together to collaborate in developing individualized education plans, behavioral management plans, and other services

for ADHD youth, who make up a large proportion of students receiving special services [24–26]. Similarly, specialty settings such as correctional facilities also have videoconferencing equipment that allows telepsychiatrists to reach ADHD youth who are overrepresented among incarcerated populations [27]. In addition, telepsychiatry can be combined with other electronic and computer-based technologies to provide innovative approaches to treatment. For example, secure patient portals can be used to provide educational materials or to communicate with patients and thus activate them in their care—a goal outlined by the IOM [18].

The skill set needed to practice telepsychiatry includes familiarity with the equipment and ability to troubleshoot minor difficulties, as well as development of a clinical style that maximizes communication through this medium (also known as *videoconferencing etiquette*). Rapport in telepsychiatry is established within a space that does not physically exist and in which participants do not have access to all the surrounding stimuli or to the nuances of the others' presentation. Preliminary work on how the lack of physical presence affects the relationship suggests that a more casual clinical style optimizes rapport [28]. Therefore, in general, communication is more deliberate and animated to overcome impediments to perception that might occur over the telemonitor. For example, hand gestures should be broader than in usual practice to ensure that the youth accurately detects the telepsychiatrist's communications. Motor gestures should not be too rapid, or they will produce pixilation of the image. Verbalizations must be more deliberate than in person, as the slight delay in the visual and auditory signal may compromise the fluidity of conversation [28]. Youth will not be able to see the telepsychiatrist's space at a glance, and it is helpful to scan the room for youth to get a sense of the telepsychiatrist as a real person in a real setting. It is important to adjust communication style to optimally ascertain a patient's status.

As noted in the "Practice parameter for telepsychiatry with children and adolescents," there are some challenges to assessing the mental status examination through videoconferencing [28]. In particular, eye contact may be difficult to discern due to camera placement, which may make participants appear to be looking to the side or looking down or up. Thus, the telepsychiatrist may obtain a skewed perception of the child's ability to make eye contact and must query the caregiver and child regarding the child's relatedness.

Care provided through telepsychiatry to youth diagnosed with ADHD should comply with the American Academy of Child and Adolescent Psychiatry's "Practice parameter for the psychiatric assessment of children and adolescents with attention-deficit/hyperactivity disorder" [29]. To adhere to the parameter's guidelines for obtaining behavior rating scales from parents and teachers, the telepsychiatrist may personally send the indicated forms to these adults; have staff at the patient site provide this service; or may develop a website with patient portals to obtain, complete, score, and submit these forms. Behavioral training and other nonpharmacologic interventions may be provided through videoconferencing or by collaborating with local therapists.

Similarly, the American Academy of Child and Adolescent Psychiatry's "Practice parameter on the use of psychotropic medication in children and adolescents" notes the requirement for assessing side effects [30]. This is readily accomplished over the telemonitor, as bandwidth used in most clinical work (≥ 386 kilobytes/s) is excellent for assessing mental status, including motor activity, affect, tics, and thinking. Staff at the patient site may provide vital signs, or the psychiatrist can collaborate with the PCP to obtain these parameters and any laboratory studies.

Prescribing medications, particularly stimulants for ADHD, may be accomplished in several ways [28]. The telepsychiatrist may make recommendations to the referring PCP, who then will prescribe. In other situations in which the telepsychiatrist works with a nurse practitioner at the patient site, the nurse practitioner writes the prescriptions. This approach will depend on state regulations regarding nurse practitioners' privileges to prescribe stimulants. In a third model, the telepsychiatrist prescribes. Prescriptions for stimulants will then have to be mailed to the family or pharmacy. Clear procedures should be established regarding methods for obtaining initial and subsequent prescriptions. Telepsychiatry sites located in nonmedical or non-mental health sites such as schools require individualized approaches.

Financial and Billing Issues

Although child and adolescent telepsychiatry offers one approach to rectifying the disparities in access to care for ADHD, this approach to service delivery creates a new set of financial and billing issues that are only gradually being resolved on a state-by-state basis. One issue is that many—perhaps most—rural and underserved patients are uninsured or are covered by Medicaid-related programs. As Medicaid programs usually do not contract with private practitioners for mental health services, a psychiatrist seeking to establish a telepsychiatry service within a private practice must be diligent in conducting a needs assessment and in developing a financially sustainable model. A fee-for-service model may not be sustainable with a rural or otherwise underserved site.

Medicaid-related programs usually contract for services with a local county-designated organization. That organization may not reimburse for services outside its purview (eg, a telepsychiatry program in another county offered through a university or a children's hospital), thus curtailing the telepsychiatry program's ability to reach the very population that it seeks to serve. If a Medicaid-related program does reimburse across counties, reimbursement may be insufficient to sustain a program. However, unlike a private practitioner, some medical facilities may be willing to accept such adverse reimbursement to make inroads into a community with other health care services.

Better reimbursement is generally available for commercially insured patients. We recently examined this issue at Seattle Children's Hospital. The reimbursement rate for a commercially insured patient obtaining services through telepsychiatry was the same as the reimbursement rate for an on-site visit. However, the overall collection rate for telepsychiatry was lower due to the higher proportion of patients who were insured by Medicaid-related programs. An organization must determine its level of tolerability for an adverse case mix.

Other billing issues include the fact that many commercial insurers will not pay for telepsychiatry; others state that they will not but then do so when the case is contested. Finally, many insurers are uninformed regarding the nature of telepsychiatry care, believing that authorization is being sought for treatment over the telephone. It is important that the individual seeking authorization for telepsychiatry be well-educated in navigating these issues.

Currently, financially sustainable telepsychiatry programs, especially those in the private sector, are contractually based. They contract for a specified block of time that an agency uses according to mutually agreed upon services (eg, medication management, psychotherapy, community meetings, or staff training and supervision). A particularly appealing model has been developed by Zia Behavioral Health in New Mexico. Zia offers its 20 partner community mental health centers two contractual, shared-risk options. In both options, an hourly rate for the psychiatrist is established. Then, in the first option, the partner

site bills for the facility/overhead costs and the professional fee for the psychiatrist and recoups from third-party payers any possible reimbursement. In the second option, the partner site bills for the facility fee, and Zia bills for the psychiatrist's time directly, assuming the risk for any nonreimbursed professional fees [31]. Other models should be individualized to meet the needs of the community, the partner site, and the telepsychiatry practice.

Literature Review: Child and Adolescent Telepsychiatry

Because of telepsychiatry's capacity to bring services to the large population of youth with ADHD who are not adequately served in primary care, telepsychiatry programs are now sited in a diversity of settings, including medical centers [32], community mental health centers [26], urban day care centers [26], rural schools [24,25], correctional facilities [27], and private practice [31,33]. These successful programs attest that telepsychiatry with children and adolescents is feasible, acceptable, and sustainable.

To our knowledge, to date, there has been only one randomized controlled trial of the efficacy of telemental health with youth. Nelson and colleagues [34] examined the efficacy of cognitive-behavioral therapy for 28 depressed children randomly assigned to treatment in person or through videoconferencing. Children assigned to each group improved, and outcomes were comparable across treatment conditions. Most studies have measured satisfaction with telepsychiatry services and have found that providers [35], families [36], and youth [27] report being very satisfied with their care. Although satisfaction does not equate to efficacy, it implies a perception of improvement and informs future directions for investigation. Emerging work indicates that telepsychiatry can be used successfully with traditionally underserved populations, including African American [26], Hispanic [25], Native American [37], and Hawaiian [24] youth.

Recent Studies of Child and Adolescent Telepsychiatry and ADHD

In terms of recent research on telepsychiatry for youth diagnosed with ADHD, a search of the electronic databases PubMed, MEDLINE, and PsycINFO revealed only two recently published papers using the key phrases "ADHD and telepsychiatry" or "ADHD and telemedicine." Two other research articles were found searching the keywords "child and adolescent telepsychiatry." Of these, one study of 369 youth between the ages of 3 and 19 years presenting for evaluations in two clinics in Washington found that youth referred to telepsychiatry ($n=159$) were comparable to those evaluated in usual in-person care ($n=210$) in terms of gender, age, payer status, and diagnoses, and that ADHD was the most commonly referred disorder for both groups [32]. The second paper found that during the ensuing 7 years, ADHD continued to be the most common disorder treated in telepsychiatry clinics in Washington and Alaska [38••].

The third paper reported a prevalence study of overweight and obese children and adolescents conducted by Marks and colleagues [39••] at the University of California Davis Telemedicine Program. The researchers collected mental health data on youth who received consultations at this program's telepsychiatry clinics located in rural California and found that ADHD was the most common psychiatric diagnosis ($n=40$) among 121 patients. Although this prevalence study did not examine the use of telepsychiatry in treating children with ADHD, the paper points out the need for ADHD treatment among children struggling with weight regulation in rural communities.

The fourth paper is also from the University of California Davis Telemedicine Program group. Yellowlees and colleagues [40••] conducted a retrospective study of diagnostic and clinical outcomes for a convenience sample of 58 children and adolescents treated through

videoconferencing at 10 rural primary care clinics in northern California. Parents completed the Child Behavior Checklist (CBCL), and 41 of these parents also completed a 3-month follow-up CBCL. Results indicated that ADHD was the most common diagnosis (36%) and that telepsychiatry consultation was associated with significant improvement over 3 months in the affect domain for girls and the oppositional domain for boys on the CBCL. The authors concluded that telepsychiatry provides an effective model of service delivery for treating children's psychiatric disorders.

Current Investigations of Telemental Health for ADHD

Research on the efficacy of telepsychiatry for treating children with ADHD is just beginning. A review of <http://www.clinicaltrials.gov>, searching on the key phrases "ADHD and telepsychiatry" and "ADHD and telehealth," shows that three studies are under way.

Cincinnati Children's Hospital and Medical Clinic (Cincinnati, OH)—The Cincinnati Children's Hospital and Medical Clinic's investigation, "Disseminating a model intervention to promote improved ADHD care in the community," is a 2-year study funded by the National Institute of Mental Health to examine the impact of technology—specifically videoconferencing, a Web portal, and long-distance data collection—on improving pediatricians' adherence to the AAP guidelines for ADHD assessment and treatment. This study randomly assigns eight pediatric practices to two groups: a 6-month intervention and a control group with no intervention. Practices randomly assigned to the intervention group are provided with a redesign of office flow as well as didactics in the effective use of standardized parent and teacher behavior rating scales for initial assessment and to monitor treatment. The intervention group also receives a Web-based ADHD portal to create a patient registry and to collect and manage the standardized rating scale data.

This quality improvement and process improvement investigation focuses on the barriers that have prevented implementation of guideline-driven care, such as time for appointments, use of clinical tools, and collection of data from outside sources [11,14–16]. The Cincinnati Children's Hospital and Medical Clinic's telehealth study is the next step in using technology to augment quality improvement and process improvement programs.

Oregon Health and Sciences University (Portland, OR)—The Oregon Health and Sciences University's investigation, "A randomized exploratory study of telepsychiatry outcomes in rural youth," is a 2-year clinical trial funded by the National Institute of Mental Health to examine the feasibility, acceptability, and impact of algorithm-driven child psychiatry care for patients with ADHD through telepsychiatry. This study is enrolling 50 youth 6 to 17 years of age who are receiving treatment at three mental health centers in rural counties throughout Oregon. It will then examine the equivalence of outcomes between face-to-face and telepsychiatry-delivered care, as well as the feasibility of retaining patients during a 4-month episode of child psychiatry care. The investigation is also developing mechanisms for measuring services related to the provision of child psychiatry care, including administrative support of the technology. Finally, these investigators plan to use their data to determine whether a larger multistate study is feasible.

Seattle Children's Research Institute (Seattle, WA)—The authors of this paper are conducting a large clinical trial, "Telemental health to improve mental health care and outcomes for children in underserved areas," to assess the efficacy of telemental health in treating ADHD. Overall, 250 children 5.5 to 12 years of age who live in rural areas of Washington or Oregon are randomly assigned to one of two interventions. The active intervention is modeled on the MTA study [7]. Children receive six sessions of combined telepsychiatry and parent behavioral training, both of which are based on evidence-based

treatments. The medication intervention is based on the Texas Children's Medication Algorithm Project for ADHD [41]. The parent behavioral training is based on the work of Barkley [42] and McMahon and Forehand [43]. As Hispanic children with ADHD have been underrepresented in prior studies and clinical practice, and as ethnicity seems to affect adherence to protocol and outcomes [44], Hispanic youth will comprise 30% of this study population. The study is also determining how well telepsychiatrists, therapists, PCPs, and families adhere to their treatment protocols using teleconferencing technology, as the ability to reliably deliver evidence-based care through videoconferencing has not been established.

Clinical Vignettes

Youth referred to our telepsychiatry service present with severe and/or complicated cases of ADHD, often having failed prior medication trials. Here we present three examples of cases in which telepsychiatry, in collaboration with local PCPs and family members, made major contributions to these youth's health and development.

Teenage Boy Presenting with Depression

Jamal is a 15-year-old sophomore who was failing most of his subjects and who had become alienated from his peers due to an episode of major depression with irritability (onset at the end of his freshman year). His PCP had prescribed three trials of selective serotonin reuptake inhibitors (SSRIs) of low to moderate dose, with minimal benefit. There was a putative paternal history of bipolar disorder, and the PCP referred Jamal to our telepsychiatry service for evaluation of bipolar disorder due to his increasing anger. In consultation with the PCP and the family, the telepsychiatrist noted a history of symptom evolution consistent with ADHD first noted in kindergarten, and no mood symptoms until the current depressive episode. Mother had kept Jamal's report cards from elementary school. She and the telepsychiatrist reviewed them and noted teachers' comments over many years about his distractibility, disorganization, and failure to complete tasks, but no hyperactivity or disruptiveness. The telepsychiatrist and PCP conferred and decided to conduct a trial of stimulant medication at three doses to see how this affected Jamal's functioning. The stimulants were sequentially added to his currently stable SSRI dose. The mother and teacher completed ADHD rating scales that the PCP's nurse scored and shared with the PCP and the telepsychiatrist. At the highest test dose of methylphenidate, Jamal's ADHD symptoms dropped dramatically. This dose was implemented, and during the ensuing 2 months, he caught up in school and became more hopeful. The telepsychiatrist made a plan with the PCP for Jamal's mental health care, including the frequency of appointments to follow his course, medication adjustments in response to his symptoms and functioning, new problems to monitor, and a check-in with the school in 2 months. Jamal also started psychotherapy with a local therapist. The mother met with the telepsychiatrist for four sessions related to helping Jamal manage his ADHD and cope with depression. A year later, Jamal continues to do well, with no indications of bipolar disorder.

School-Age Boy Presenting with Anxiety

Enrique is a 10-year-old boy who had been treated for 4 years by his PCP for ADHD, combined type. The medication seemed to help his functioning during the school day, but at other times, he had many problems that were worsening. He did not come out of his room to eat with his family and avoided other people and had angry outbursts with his mother. In telepsychiatry sessions, Enrique would readily converse but sat with his face to the side or even turned away from the camera so as to avoid direct face-to-face contact with the telepsychiatrist. Enrique met criteria for social anxiety disorder and separation anxiety disorder. However, 1 year of psychotherapy and two trials of SSRI medications yielded only mild and temporary improvements in his symptoms. Enrique bonded very well with the

telepsychiatrist. As his symptoms escalated, he asked his mother to bring him in to talk with the telepsychiatrist. Finally, one day he revealed that he had auditory hallucinations. He then had a frank manic episode. He asked to go into the hospital, but the telepsychiatrist arranged that each day Enrique would have an appointment with his PCP or the telepsychiatrist while they adjusted his medications. Enrique was diagnosed with bipolar disorder, prior medications were discontinued, and a trial of lithium and quetiapine was initiated. During the next month, the PCP obtained appropriate laboratory monitoring and adjusted medications under the telepsychiatrist's supervision. Enrique's symptoms abated, including the hallucinations and all the anxiety. During the next year, he had only occasional breakthrough hallucinations and mood instability, both of which responded to adjustments of the lithium and/or quetiapine. He had semiannual check-in appointments with the telepsychiatrist, who continued to consult with the PCP.

Preschool Girl with Complicated ADHD

Sunshine was a 5-year-old girl who presented for consultation with our telepsychiatry service 1 month after her fifth birthday, accompanied by 15 community members who were concerned about her functioning. In collaboration with her PCP, her family, and her other providers, the telepsychiatrist found that Sunshine had a history of intrauterine toxicities followed by neglect and abuse but had been in a stable, loving home with her adoptive family for 2 years. She had been suspended from her fourth preschool 3 months earlier. She required restraint by three preschool staff members to prevent property destruction and harm to others. Despite this, her teachers and her therapist of 2 years described her to the telepsychiatrist as an endearing child of normal intelligence who wanted to do well. Due to state Medicaid rules that would not allow for payment for psychiatric medications for children younger than 5 years of age, Sunshine had not had a medication trial. Then, for 1 month after Sunshine turned 5 years old, her PCP gave her a trial of regular methylphenidate for her appropriately diagnosed ADHD. Sunshine became much more violent and would not sleep. Her PCP was concerned about doing more for such a young child. The telepsychiatrist collaborated with the PCP to treat Sunshine according to the evidence-based Texas Children's Medical Algorithm Project for the Pharmacological Treatment of ADHD With Comorbid Aggression. They chose risperidone, given its approval for the treatment of children with autism. The PCP treated Sunshine for the next 4 months. She reintegrated into preschool, made friends, and flourished. However, the PCP then reported that she had difficulty focusing sufficiently to complete age-appropriate tasks. The telepsychiatrist collaborated with the PCP to step up her treatment to include low-dose methylphenidate added to the risperidone. The telepsychiatrist also made recommendations to the PCP and the family to change her individual therapy from an attachment-disorder therapy to an evidence-based, parent training intervention. Sunshine stabilized, and her care has been fully returned to her pediatrician. She is now in a regular second-grade classroom.

Conclusions

Technological advances, the large population of underserved youth with ADHD, and the maldistribution of child and adolescent psychiatrists make telepsychiatry a reasonable alternative to an office visit to provide evidence-based care for this large population of youth who are at risk of failure in multiple domains of life. Telepsychiatry further provides a vehicle for developing collaborative models of care that empower PCPs to manage ADHD youth within their practices while also providing consultative expertise to step up care for youth with more severe and complicated illness. Research studies are now needed to examine the efficacy of telepsychiatry, and telemental health in general, in improving the care and outcomes of young people diagnosed with ADHD.

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