

Telepsychiatry with Children and Adolescents: Are Patients Comparable to Those Evaluated in Usual Outpatient Care?

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ABSTRACT

Several studies have described successful applications of telepsychiatry with children and adolescents. However, there has been little examination of the populations served by telepsychiatry and the ability to evaluate youth accurately through this medium. In this article, we examined whether telepsychiatry patients are representative of those in usual outpatient care. Participants included 369 patients 3–19 years old evaluated at two clinics. A new telepsychiatry clinic (TPC) developed to provide services to under-served communities, and a child and adolescent psychiatric outpatient clinic (CAPOC) that served youth from predominantly metropolitan areas were included in the study. The telepsychiatry sites were linked using ISDN lines at 384KB/sec. We examined these two samples regarding demographics, payor status, and diagnostic profiles. 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. The similarity of diagnoses further suggests that telepsychiatry provides adequate technical resolution and doctor–patient rapport to detect psychopathology of youths. These findings suggest the need for further systematic investigation of telepsychiatry as a tool for providing psychiatric care to young people.

INTRODUCTION

THERE IS A GROWING BODY OF EVIDENCE supporting the notion that telemedicine can enhance care to selected populations. One of the most popular applications of telemedicine is psychiatry, or telepsychiatry. Technological advances have made interactive video conferencing with adults comparable to face-to-face visits in eliciting a psychiatric history, con-

ducting a mental status examination, and making reliable diagnoses.^{1–10} A physical examination is often not needed, or it can be easily arranged by the local primary care physician (PCP). Preliminary studies also suggest the effectiveness of psychotherapy using telepsychiatry,^{10–12} and numerous studies have documented high acceptance of telepsychiatry by both patients and providers.^{1,7–9,13–15} With the beginning of reimbursement for medical and

psychiatric services, telepsychiatry is well positioned to be integrated into mainstream mental health-care system in the United States,¹⁶ much as it has already been in other countries such as Australia,¹⁷ Scandinavia,^{15,18} and England.^{1,19}

Despite these advances, reported applications in child and adolescent psychiatry have been limited.²⁰⁻²⁵ Nevertheless, these initial efforts indicate that telepsychiatry may be used to make reliable diagnoses²⁰ and deliver effective psychotherapy.²⁵ Furthermore, both youth and their parents have expressed high satisfaction with telepsychiatry. Thus, telepsychiatry may address some of the unique challenges in the delivery of psychiatric services to underserved youth. The first challenge is the availability of and access to child and adolescent psychiatry services. Child and adolescent psychiatry is among the most limited and most maldistributed of the medical specialties.^{26,27} Nationally, there is an average of 13.3 mental health clinics in metropolitan areas, but only 1.9 in rural areas.²⁸ In the Pacific Region, there are 14.3 psychiatrists per 100,000 population in metropolitan counties versus only 5.6 per 100,000 in nonmetropolitan counties.²⁹ This maldistribution is even more pronounced when only child and adolescent psychiatric services are considered. By allowing providers in distant locations to evaluate patients in real time using interactive videoconferencing, telepsychiatry offers an exciting mechanism to redistribute scarce resources to rural communities.

The second challenge in delivering child and adolescent psychiatric services in rural areas is the behavioral health infrastructure. Psychiatric needs of youths are often overshadowed by the pressing needs of the adult chronically mentally ill, particularly in poorly funded rural areas.²⁶ This troubling situation is dire for ethnic minority youths, who are highly represented amongst rural agricultural communities. Language, culture, social alienation, and travel to metropolitan areas impede these families' efforts in seeking needed specialty care, especially outside of their communities. Even when rural youth do obtain psychiatric services by traveling to metropolitan areas or through itinerant psychiatrists in their communities,

these services are generally only consultative in nature. Rarely are ongoing services available. The "best-case scenario" is that the mental health needs of youths are treated by predoctoral level therapists in conjunction with PCPs, or by PCPs without any mental health support at all. Both approaches lack formal psychiatric care.

Telepsychiatry offers improved care for these young people by bringing needed psychiatric consultation and ongoing services to rural communities, by collaboration with local therapists, and by support of PCPs. Collaboration with local PCPs readily allows needed physical examinations and laboratory testing. Thus, care of these youths by PCPs is supported by telepsychiatry. Furthermore, telepsychiatry allows school personnel, case managers, probation officers, and other relevant adults to participate in the youths' psychiatric care because the sessions occur in the home community.

Preliminary data suggest that telepsychiatry is readily applied to and accepted by young people and their parents.^{1,14,20-23} However, despite the great promise of telepsychiatry in improving access and care for youth in rural settings, there are limited data describing the demographic and clinical characteristics of the children and adolescents who are referred for telepsychiatry services, especially in relation to youth referred for face-to-face care. In this paper, we describe our experience with children and adolescents referred for telepsychiatry services, and explore their similarities and differences with patients receiving face-to-face care in a university-affiliated child and adolescent psychiatry clinic located at a tertiary children's hospital.

BACKGROUND: CHILDREN'S HEALTH ACCESS REGIONAL TELEMEDICINE

Telemedicine program

Telemedicine services were provided as part of the Children's Health Access Regional Telemedicine (CHART) project at Children's Hospital and Regional Medical Center (CHRMC) in Seattle, Washington. CHRMC is a

regional hospital for a four-state region in the northwest, including Washington, Alaska, Montana, and Idaho (WAMI). This area encompasses over 20% of the continental United States, but only 5% of its population. CHRMC is the major tertiary hospital for children's services. CHRMC also provides specialty medical services throughout the WAMI area through a network of regional clinics. Despite this network, there are unmet clinical needs due to geography, personnel shortages, frequency of regional consultations, and reimbursement for outreach services.

In 1999, the Northwest Congressional Delegation supported the development of a regional pediatric telemedicine program to serve the WAMI region, with funding through the Office for Advancement of Telehealth (OAT) within HRSA. The CHART network offers a wide array of subspecialty medical services at 10 WAMI sites. Child and adolescent psychiatry services are offered at four of these sites as well as at a remote juvenile justice facility. This study focuses on psychiatric evaluations provided at the two sites that initially participated in the CHART project: Olympia and Wenatchee, Washington.

Telepsychiatry clinic sites

Wenatchee, Washington, is a city of 25,000, located 200 miles east of Seattle across the Cascade Mountains. The closure of mountain passes in the winter often precludes travel. Wenatchee is a primarily agricultural community with a diverse population of Caucasian, Mexican-American, and Native American families. The local hospital, Central Washington Hospital (CWH), participates as one of CHRMC's regional network clinics for specialty medical care. Additionally, for several years one of the authors (S.S.) has provided psychological consultation to CWH. Therefore, Wenatchee provided an excellent site for the implementation of telepsychiatry services.

Olympia, Washington, is a city of 210,000 residents. Although it is the state capital and located only 60 miles from Seattle, pediatric subspecialty services, especially psychiatry, are very limited there. Despite the relative closeness to Seattle, families are reluctant to travel

to obtain needed services. However, the community has a long relationship with CHRMC, because many of the pediatricians trained at CHRMC, and CHRMC offers selected specialty services at its local satellite clinic. Therefore, Olympia also provided an excellent site to pilot the telepsychiatry services.

Telepsychiatry clinic model

Two child and adolescent psychiatrists and a licensed clinical child psychologist provided telepsychiatry services. Letters and brochures were sent to all pediatricians and family physicians in the two identified communities inviting them to refer patients less than 19 years of age for telepsychiatric services. Referral requirements included an expectation that PCPs would resume care of their patients upon completion of telepsychiatric care. Written consent was obtained to receive care through telepsychiatry, including consent to release evaluation results to the PCP.

Psychiatric consultation was provided at the CHRMC Olympia site or the CWH site using interactive video conferencing (Polycom FX) using linked ISDN lines or T1 lines providing at least 384 KB/sec. The camera scans 180 degrees to follow a youth's movements or play around the room, and can zoom in to screen for facial and cranial dysmorphology. Complete technical details about this equipment and video examples of its use can be found at one of the authors' Web site.³⁰

A parent or guardian was required to attend all initial evaluations. Often, more than one family member participated, and occasionally a therapist, case manager, or school personnel also participated at the family's request. Referring physicians were also invited to attend the sessions, although this was not required. Initial appointments occurred over 60 to 90 minutes and comprised a typical initial child and adolescent psychiatric evaluation.

The clinical model for telepsychiatry consisted of an initial evaluation with treatment planning regarding subsequent care and interaction with other relevant providers or agencies. This generally included obtaining school records, contact with pre-existing therapists, requesting physical examination, laboratory

testing, or imaging studies from the PCP, referrals to therapists in the community, recommendations to the referring PCP, and follow-up appointments through telepsychiatry.

Several models of care evolved on the basis of clinical need and family preference: consultation (1–2 sessions) with feedback to PCP regarding ongoing care; collaboration (2–4 sessions) with initial recommendations to the PCP and then periodic follow-up through telepsychiatry or through telephone contact with the PCP; stabilization (4–8 sessions) for clarification of treatment needs and initiation of treatment; and short-term treatment (up to 12 sessions for ongoing evaluation and assurance of treatment response). All services were provided through the telemedicine grant at no charge to families. No third-party payors were billed.

STUDY DESIGN AND METHODOLOGY

To examine the characteristics of children and adolescents participating in the telepsychiatry clinic, we conducted a naturalistic comparative study of telepsychiatry in relation to usual and customary outpatient psychiatric care. Specifically, we obtained demographic, payor, and diagnostic data for patients treated in the telepsychiatry clinic (TPC) and patients treated at CHRMC's Child and Adolescent Psychiatry Outpatient Clinic (CAPOC). As mentioned earlier, our telepsychiatry clinic offers consultation and short-term therapy by three faculty members for patients referred by their PCPs. By contrast, CAPOC is a training clinic that offers a range of services with emphasis on ongoing care by a variety of clinicians, including psychiatry and psychology residents, master's-level staff, and faculty, for patients referred through multiple sources including self-referral.

We compared all patients evaluated in TPC and CAPOC over the initial 18 months of the telepsychiatry service (October 1, 2002, to March 1, 2003). Patient registration records were used to obtain demographic and payor mix data. Diagnostic data were obtained from billing sheets. Many patients had more than one diagnosis and, therefore, multiple diag-

noses were extracted. Psychiatric diagnoses were grouped according to nomenclature of the Diagnostic and Statistical Manual, 4th Edition (DSM-IV).³¹ For example, Depressive Disorder and Bipolar Disorder were grouped under Mood Disorders. Phobias, Generalized Anxiety Disorder, and Obsessive-Compulsive Disorder (OCD) were grouped under Anxiety Disorders. Schizophrenia and other Psychotic Disorders were grouped under Psychotic Disorders. Tourette's Disorder and Chronic Motor Tic Disorder were grouped under Tic Disorders. Attention-Deficit Hyperactivity Disorder (ADHD), Conduct Disorder, and Oppositional Defiant Disorder were grouped under ADHD and Disruptive Behavior Disorders. Two exceptions were made. Various disabilities in learning, communication, and motor skills were grouped under Developmental Disorders, which is not an DSM-IV official category. Also, we referred to the DSM-IV category of Pervasive Developmental Disorders as Autism Spectrum Disorders because this is more commonly understood terminology. We then included Autism Spectrum Disorders and the group of Developmental Disorders together in the tables due to their frequent co-occurrence, the low frequencies of each diagnostic group, and their demonstrating a similar construct for detection through telepsychiatry, i.e., developmental impairment.

CAPOC provided a "convenience sample" representing usual community care. Subjects were not randomized to care, evaluations were not blinded, and standardized instrumentation was not used. Thus, the CAPOC did not comprise a formal control group. Therefore, no statistical analyses comparing the two sites were conducted because they would be misleading, suggesting a controlled study. Rather, we simply present numbers and percentages representing selected demographic and clinical characteristics of the patients at each clinic site. Additionally, as the length of treatment in the two clinics varied and was contingent upon different factors, we examined data only for the initial evaluation. In this manner, we hoped to obtain preliminary impressions as to whether patients evaluated through telepsychiatry are representative of the larger population of children and adolescents seeking psychiatric care.

TABLE 1. DEMOGRAPHIC FEATURES ACCORDING TO TREATMENT SITE

	3-6 years old		7-12 years old		13-18 years old	
	TPC n (%)	CAPOC n (%)	TPC n (%)	CAPOC n (%)	TPC n (%)	CAPOC n (%)
Patient gender						
F	7 (22%)	12 (41%)	34 (42%)	24 (24%)	21 (46%)	43 (54%)
M	25 (78%)	17 (59%)	47 (58%)	78 (76%)	25 (54%)	36 (46%)
Total patients	32 (100%)	29 (100%)	81 (100%)	102 (100%)	46 (100%)	79 (100%)

TPC, Telepsychiatry Clinic; CAPOC, Child and Adolescent Psychiatry Outpatient Clinic.

RESULTS

During the 18-month study period, 159 youth were evaluated through TPC and 210 youth were evaluated in CAPOC. Demographics of the respective samples are summarized in Table 1. Children between the ages of 7 and 12 represented half the patients at each site, comprising 51% at the TPC and 49% at CAPOC. The second largest group was adolescents 12-18 years old who comprised 29% and 36% of patients at TPC and CAPOC, respectively. Children aged 3-7 were the least frequently seen, and comprised only 20% and 15% of initial evaluations at TPC and CAPOC. These percentages across the two clinic sites are remarkably similar. The gender distribution is also similar, although, compared to CAPOC, males in TPC are somewhat overrepresented in the youngest group and underrepresented in the 7-12 year olds. The gender distribution is more comparable in adolescence.

The payor mix is shown in Table 2. Medicaid coverage ranged from 24% to 44% (overall 32%) for the TPC sample and ranged from 26% to 34% (overall 27%) for the CAPOC sample. The

greatest difference appears to be a somewhat larger representation of Medicaid patients in the 3- to 6-year-old TPC patients.

Diagnostic status stratified by age group and clinic site is shown in Tables 3-5. The TPC diagnosed a broad range of youth similarly represented in the CAPOC. The most common diagnoses across all three age groups at both clinic sites were ADHD and other Disruptive Behavior Disorders, such as Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD). Developmental Disorders including the Autism Spectrum, Developmental Disabilities, and Mental Retardation were also well represented and comparable within each age group across sites.

Mood Disorders, including Depressive Disorders and Bipolar Disorder, showed the expected low frequency in the 3-6 year olds, with an increase to 8-15% in the 7-12 year olds, followed by a surge to 40% of the adolescents. The pattern for anxiety disorders showed a good representation in younger children with increase in the 7-12 year olds, followed by a decrease among adolescents. The frequency of anxiety disorders appeared very similar in the

TABLE 2. INSURANCE COVERAGE ACCORDING TO TREATMENT SITE

	3-6 years old		7-12 years old		13-18 years old	
	TPC n (%)	CAPOC n (%)	TPC n (%)	CAPOC n (%)	TPC n (%)	CAPOC n (%)
Medicaid coverage	14 (44%)	10 (34%)	26 (32%)	27 (26%)	11 (24%)	20 (25%)
Commercial coverage	18 (56%)	19 (66%)	55 (68%)	75 (74%)	35 (76%)	59 (75%)
Total	32 (100%)	29 (100%)	81 (100%)	102 (100%)	46 (100%)	79 (100%)

TPC, Telepsychiatry Clinic; CAPOC, Child and Adolescent Psychiatry Outpatient Clinic.

TABLE 3. PATIENTS' DIAGNOSES ACCORDING TO TREATMENT SITE: 3-6 YEARS OLD

<i>Major diagnostic groups</i>	TPC n (%)	CAPOC n (%)
Autism Spectrum and Developmental Disorders	4 (12.5%)	6 (20.7%)
Mental Retardation	4 (12.5%)	0 (0.0%)
ADHD and Other Disruptive Disorders	20 (62.5%)	15 (51.7%)
Tic Disorders	1 (3.1%)	0 (0.0%)
Mood Disorders	1 (3.1%)	0 (0.0%)
Anxiety Disorders	3 (9.4%)	6 (20.7%)
Adjustment Disorders	6 (18.8%)	2 (6.9%)
Psychotic Disorders	2 (6.2%)	0 (0.0%)
Eating Disorders	0 (0.0%)	1 (3.4%)
Somatoform Related Disorders	0 (0.0%)	0 (0.0%)
Other Disorders	7 (21.9%)	1 (3.4%)
Total number of 3-6-year-olds	n = 32	n = 29

Note: Numbers and percentages represent 3-6 year olds having the indicated diagnosis. Many youths had more than one diagnosis, and percentages do not add up to 100%.

7-12 year olds across sites. However, for the younger and older groups, more youth in CAPOC than in TPC received diagnoses of Anxiety Disorders. This likely represents a specialty focus for Obsessive Compulsive Disorder at CAPOC.

The category of Other Disorders warrants comment. This category contains disorders for which two of the authors have particular expertise, such as neurodevelopmental problems or psychological problems complicating medical illness. Therefore, there appears to be either an over-referral of these patients to TPC due to these clinicians' expertise, or a bias in

their detecting these problems. This may also reflect biases in recording these diagnoses on the billing sheets from which data were extracted.

DISCUSSION

This study shows that telepsychiatry can serve a broad spectrum of children and adolescents across demographic, socioeconomic, and payor status with a range of psychiatric diagnoses. Furthermore, these demographics, payor, and clinical characteristics of

TABLE 4. PATIENTS' DIAGNOSES ACCORDING TO TREATMENT SITE: 7-12 YEARS OLD

<i>Major diagnostic groups</i>	TPC n (%)	CAPOC n (%)
Autism Spectrum and Developmental Disorders	18 (22.2%)	20 (19.6%)
Mental Retardation	5 (15.6%)	2 (2.0%)
ADHD and Other Disruptive Disorders	52 (64.2%)	68 (66.7%)
Tic Disorders	6 (18.8%)	3 (2.9%)
Mood Disorders	12 (14.8%)	9 (8.8%)
Anxiety Disorders	28 (34.6%)	33 (32.4%)
Adjustment Disorders	3 (9.4%)	9 (8.8%)
Psychotic Disorders	4 (12.5%)	3 (2.9%)
Eating Disorders	0 (0.0%)	0 (0.0%)
Somatoform Related Disorders	0 (0.0%)	1 (1.0%)
Other Disorders	13 (40.6%)	2 (2.0%)
Total number of 7-12-year-olds	n = 81	n = 102

Note: Numbers and percentages represent 7-12-year-olds having the indicated diagnosis. Many youths had more than one diagnosis, and percentages do not add up to 100%.

TPC, Telepsychiatry Clinic; CAPOC, Child and Adolescent Psychiatry Outpatient Clinic.

TABLE 5. PATIENT DIAGNOSES ACCORDING TO TREATMENT SITE: 13-18 YEARS OLD

<i>Major diagnostic groups</i>	<i>Telemedicine n (%)</i>	<i>Outpatient n (%)</i>
Autism Spectrum and Developmental Disorders	2 (4.4%)	11 (14.5%)
Mental Retardation	3 (6.5%)	4 (5.3%)
ADHD and Other Disruptive Disorders	25 (54.4%)	31 (40.8%)
Tic Disorders	0 (0.0%)	1 (1.3%)
Mood Disorders	20 (43.5%)	30 (39.5%)
Anxiety Disorders	3 (6.5%)	18 (23.7%)
Adjustment Disorders	3 (6.5%)	6 (7.9%)
Psychotic Disorders	4 (8.7%)	1 (1.3%)
Eating Disorders	0 (0.0%)	4 (5.3%)
Somatoform Related Disorders	5 (10.9%)	2 (2.6%)
Other Disorders	6 (13.0%)	1 (1.3%)
Total number of 13-18-year-olds	<i>n</i> = 46	<i>n</i> = 79

Note: Numbers and percentages represent 13-18 year olds having the indicated diagnosis. Many youths had more than one diagnosis and percentages do not add up to 100%.

TPC, Telepsychiatry Clinic; CAPOC, Child and Adolescent Psychiatry Outpatient Clinic.

youth referred for telepsychiatry are very similar to youth evaluated in a "face-to-face" child and adolescent psychiatry outpatient clinic. Even children as young as 3 years of age and those with serious developmental and psychiatric disorders demonstrated patterns comparable to those youth evaluated in a usual outpatient clinic. Within the perspective of common and infrequent diagnoses made over the developmental spectrum, these findings were remarkably similar across clinics, as well as with national trends. This similarity of diagnoses suggests that telepsychiatry provides adequate technical resolution and interpersonal rapport to detect the psychopathology of children and adolescents referred for outpatient care. Overall, TPC appears suitable for assessing the spectrum of juvenile psychopathology. The few observed differences, such as those observed for Psychotic Disorders and Other Disorders, may represent the vicissitudes of referral across sites, diagnostic biases of the participating clinicians, or true differences in diagnostic capability using telepsychiatry. Clearly, further work is needed to understand these differences.

Limitations of this work relate to the naturalistic design with a convenience sample rather than a randomized, blinded design with a formal control group, the lack of standardized assessment tools, and the lack of interrater

reliability both within the TPC site and across the TPC and CAPOC sites.

These observed consistencies and discrepancies indicate the need for further systematic investigation of telepsychiatry in establishing reliable and valid diagnoses, implementing treatment, and examining outcomes. If further investigation establishes the clinical effectiveness of telepsychiatry, we will have a powerful tool for increasing underserved youth's access to psychiatric services.

CONCLUSIONS

These results suggest that telepsychiatry offers a service that evaluates children and adolescents who are broadly comparable to those evaluated in usual outpatient care. It is not simply a service for youth of restricted age range, with no other resources, with selected diagnoses, or uncomplicated psychopathology. They also suggest that telepsychiatry may offer evaluative services that are clinically comparable to usual outpatient evaluation. These encouraging results support the need for further examination of the clinical effectiveness of telepsychiatry. Ultimately, the future of telepsychiatry hinges on whether it delivers care that is superior to that rendered in primary care and is comparable to usual outpatient psychiatric care.

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