Child and Adolescent Emergency and Urgent Mental Health Delivery Through Telepsychiatry: 12-Month Prospective Study

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Abstract

Background: *The significant gap between children and adolescents presenting for emergency mental healthcare and the shortage of child and adolescent psychiatrists constitutes a major barrier to timely access for psychiatric assessment for rural and remote areas. Unlike remote areas, urban emergency departments have in-house psychiatric consultation. Telepsychiatry may be a solution to ensure the same service for remote areas. However, there is a paucity of studies on the use of telepsychiatry for child and adolescent emergency consults. Thus, the aim of our study was to (1) assess patient satisfaction with telepsychiatry and (2) compare clinical characteristics and outcome of telepsychiatry with face-to-face emergency child and adolescent assessments.*

Methods: *This is a prospective study of telepsychiatry emergency assessments of children and adolescents referred by emergency physicians. The comparison group was age- and gender-matched patients seen for face-to-face urgent assessments. Data were gathered on demographic and clinical variables. Telepsychiatry satisfaction was assessed using a questionnaire. Descriptive statistics and chi-square tests were used to assess group differences for each variable. Logistic regression was used to assess impact of the variables on outcome after the consult. A* p *value <0.05 was used to determine statistical significance.*

Results: *Sixty (*n = *60) assessments were conducted through telepsychiatry in 12 months. Among the telepsychiatry group, Aboriginal patients were over-represented (50% vs. 6.7%,* p *< 0.001), a higher proportion received a diagnosis of adjustment disorder (22% vs. 8.3%,* p = *0.004) or no diagnosis (27% vs. 6.7%,* p = *0.004) compared with controls. There was no statistically significant difference between groups on other clinical variables. Patients reported a high degree of satisfaction with telepsychiatry.*

Conclusions: *Telepsychiatry is acceptable to patients and families for safe emergency assessment and follow-up, reducing unnecessary travel to urban centers. Longer time outcomes are needed to establish validity of telepsychiatry for emergency assessments.*

Keywords: *telemedicine, telepsychiatry, e-health, emergency medicine/teletrauma, behavioral health, pediatrics*

Introduction

Most children and adolescents in Canada and the United States fail to receive adequate and timely mental health services. The prevalence of psychiatric disorders among children and adolescents in Canada ranges from 15% to 25% with only one in five receiving mental health services.[1] The plight of those living in remote communities is far worse because of the severe shortage of psychiatric expertise and mental health practitioners.[2] The gap in service is a function of a number of factors including (1) timely access and geographical distance from specialized services and (2) the perennial lack of an adequate number of child and adolescent psychiatrists for the number of children in need of services.[3]

The use of telepsychiatry for child and adolescent mental health issues represents an innovative approach to timely service delivery. Telepsychiatry may serve as a user-friendly, efficient, and cost-effective method of providing mental health services to rural and remote communities.[4–6] The Canadian Senate and the Canadian Academy of Child and Adolescent Psychiatry have approved telepsychiatry for consultation, education, and training.[7] However, there is limited research on telepsychiatry in children and adolescents, mostly consisting of case reports and project descriptions.

A review of the literature from 1996 to 2009 reported three studies that had comparison groups and only one treatment study. The authors concluded that despite the limitations of the existing evidence, there was no data suggesting negative

 DOI: 10.1089/tmj.2016.0269

outcomes and recommended further studies focusing on outcome.[8] Recently, a small feasibility study of telepsychiatry services for patients in a rural area in the United States examined parental satisfaction with a two-session model consisting of a psychiatric evaluation session and recommendation session, which was followed by provision of a treatment plan to the primary care provider. Results indicated high parental satisfaction with telepsychiatry.[9]

A Canadian study used videoconferencing for psychiatric consultation to enhance staff capacity in the diagnosis, formulation, and management of mental health problems among Nunavut children through delivery of regular professional-to-professional program consultations and continuing education seminars. The results showed that videoconferencing was an innovative and effective way of delivering specialized mental health services to professionals working in remote areas of Nunavut.[10] An Australian study evaluated a telepsychiatry program, Mental Health Emergency Care-Rural Access Program (MHEC-RAP), for emergency mental healthcare of remote communities, with 22% of the population served as children and adolescents. Results showed that availability of this program helped build confidence in emergency physicians to manage and care for emergency mental health patients locally. In addition, emergency physicians valued access to specialists who are able to conduct assessments and provide relevant and responsive advice for patients presenting with emergency mental health concerns. The experience of these providers before MHEC-RAP is consistent with what has been reported in other rural and remote populations, which suggests that similar programs could address limitations in access to specialist care and change the provision of emergency mental healthcare.[11]

Evidence from the aforementioned studies suggest that emergency physicians specifically could benefit from psychiatry consultation through telepsychiatry, as emergency physicians are the first-line contact for most mental health crises in children and adolescents, especially in rural and remote communities. Community agencies, including the local police, bring adolescents in crisis to the nearest emergency department (ED). ED physicians have to manage these patients without having adequate training for dealing with mental health problems and scarcity of community mental health resources such as walk in crisis clinics, which are available in larger urban centers.

Although there are some studies of successful telepsychiatry assessments and treatment by child psychiatrists,[12] and specific treatment for depression using cognitive-behavioral therapy in depressed adolescents,[13,14] there are no studies on delivering emergency mental healthcare through telepsychiatry, specifically for children and adolescents. Additional research is needed specifically on the effectiveness of telepsychiatry in the ED setting.

We present the results of a 12-month prospective study of urgent telepsychiatry assessment and brief intervention for children and adolescents referred by emergency physicians, primary care physicians, from rural and remote communities in Eastern and Northern Ontario. The Child and Adolescent Mental Health Urgent Consult Clinic (CAMHUCC) acquired its own telepsychiatry suite, linked through the Ontario Telemedicine Network, allowing telepsychiatry assessment for patients and direct consultation to the ED physicians in remote emergency rooms and clinics within 24 h of patient presentation. The service model incorporates both provider- and patient-centered service.

The purpose of this study was to (1) examine physician and patient satisfaction with emergency psychiatric consult through telepsychiatry and (2) compare clinical characteristics and outcome of telepsychiatry emergency consults with face-to-face emergency consults of children and adolescents from rural and remote communities.

Methods

The population consisted of children and adolescents under 18 years of age, who were assessed by the CAMHUCC at a university hospital from November 2015 to November 2016. The CAMHUCC team includes a full time child and adolescent psychiatrist, a social worker, and a nurse who provides urgent psychiatric assessment within 48 h for children and youth presenting to the ED, primary care physicians, school boards, and children's mental health agencies (CMHAs). When needed, brief intervention (4 weeks) for medication initiation and stabilization, individual and family crisis intervention, and behavior management are also provided. Assessments and interventions are conducted through face-to-face appointment for those who live locally or through telepsychiatry over the Ontario Telehealth Network (OTN), if located in rural or remote communities.

STUDY SAMPLE

The sample for this study was derived from the 389 patients assessed by CAMHUCC in a 12-month period. The study group (SG) comprised 60 patients who were assessed through telepsychiatry and completed the telepsychiatry satisfaction questionnaire. The matched comparison group (MCG) consisted of 60 patients who had face-to-face assessment in the clinic over the same 12-month period.

DATA COLLECTION

The clinic gathers information on the following variables: age, gender, referral source, reason for referral, special

Table 1. Patient Characteristics of Study Group and Matched Comparison Group

	MCG ($n=60$)	SG ($n=60$)	OVERALL SAMPLE ($n=120$)
Aboriginal, %	6.7	50*	28
Referral source, %			
Emergency physician	63	62	63
Primary care	15	20	20
School	22	18	20
Reason for referral, %			
Suicidal	8.3	63	33
Anxiety	1.7	10	5.8
Aggression	47	22	34
Other (Psychosis)	43	5	24
Family psychiatric history, %	95	93	94
ASPD	75	53	64
Mood disorders	3.3	3.3	3.3
Anxiety disorders	1.7	3.3	2.5
Psychotic disorders	0	1.7	0.8
Multiple diagnoses	15	32	23
IEP, %	37	23	30
Bullying, %	50	33	42
Substance use, %			
Alcohol	3.3	9.6	6.2
Marijuana	13	12	12.5
Polysubstance	17	31	23
Physical abuse, %	13	12	13
Sexual abuse, %	17	15	16
Past admission, %	5.0	13	9.2
Repeat admissions	1.7	1.7	1.7
Diagnosis, %			
No diagnosis	6.7	27*	17
Adjustment disorder	8.3	22*	15
ADD/ADHD/ODD/CD	52*	27	39
Anxiety disorder	25	13	19
Mood disorder	5.0	6.7	5.8
Substance use disorder	0	1.7	0.8
Other	3.3	3.3	3.3
Outcome, %			
Brief follow-up	62	43	53
Referral to CMHA	32	37	34
Admission	5.0	18	12
Referral to internal OP	1.7	1.7	1.7

*$p<0.01$.

ADD, attention deficit disorder; ADHD, attention deficit hyperactivity disorder; ASPD, antisocial personality disorder; CD, conduct disorder; CMHA, children's mental health agency; IEP, individualized education program; MCG, matched comparison group; ODD, oppositional defiant disorder; OP, child and adolescent outpatient clinics; SG, study group.

education at school, bullying, substance use, physical and/or sexual abuse, family history of mental health issues, previous admissions, diagnosis, and outcome after assessment. Outcomes included no further mental health services required, brief (up to 4 weeks) follow-up in CAMHUCC, referral to the local CMHA, referral to other outpatient clinics in the child and adolescent division, or hospital admission. All those who were assessed through telepsychiatry completed the satisfaction questionnaire provided by the OTN after the consults.

STATISTICAL ANALYSIS

All questionnaires and clinical data were anonymized before analysis. Descriptive statistics and chi-square tests were used to assess for differences between the two groups for each variable. Logistic regression was used to assess the impact of the variables on outcome after the consult. A p value <0.05 was used to determine statistical significance. If several pairwise comparisons were used, a Bonferonni correction was applied. Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 20.0 (IBM Corp., Armonk, NY).

Results and Materials

Patient characteristics for the SG versus MCG are shown in *Table 1*. The average age of patients was 14 ± 0.36 years and 67% were females. There was no significant difference between the two groups for referral source, reason for referral, family psychiatric history, special education program at school, bullying, substance use, physical abuse, sexual abuse, previous hospital admission, and outcome after the consult. Among the patients in the telepsychiatry group, there was a higher proportion of Aboriginal children and adolescents (50% vs. 6.7%, $p<0.001$), a higher proportion with no

Table 2. Telepsychiatry Patient Satisfaction Questionnaire Responses

STATEMENTS	LIKERT SCALE* MEANS ± SD ($n=25$)
I was agreeable to have my assessment through telepsychiatry.	4.38 ± 0.49
It was no different to communicate than in person.	3.88 ± 1.08
The telepsychiatry equipment was user friendly.	4.67 ± 0.48
I knew that the assessment was confidential.	4.58 ± 0.58
I was satisfied with the quality of the picture.	4.46 ± 0.59
Telepsychiatry saved me and my family time and/or money.	4.58 ± 0.65
I would use telepsychiatry services again if needed.	4.54 ± 0.66
My telepsychiatry appointment was available within 48 h.	4.17 ± 0.92
I was comfortable with having my treatment on telepsychiatry	4.17 ± 0.82
I would rather have telepsychiatry than travel to the clinic in Kingston	4.00 ± 1.22

*Where 1, strongly disagree; 2, disagree; 3, neither agree nor disagree; 4, agree; 5, strongly agree.

SD, standard deviation.

assigned diagnosis (27% vs. 6.7%, $p=0.004$), and a higher proportion diagnosed with adjustment disorder (22% vs. 8.3%, $p=0.004$). A higher proportion of patients in the face-to-face group were diagnosed with attention deficit hyperactivity disorder (ADHD) and disruptive disorder than the telepsychiatry group (52% vs. 27%, $p=0.004$). None of the variables were found to be significant predictors of patient outcome after the consult ($p>0.05$ for all).

Table 2 shows the results of the patient satisfaction questionnaire, completed by the SG. Overall, patients reported a high degree of satisfaction with the use of telepsychiatry and the majority stated they would use the service again in the future. Telepsychiatry was noted to be user friendly and helped save patient's family time and money by enabling the opportunity to access assessment without long distance travel.

Discussion

Overall, results of our study suggest high patient and ED physician satisfaction with emergency consults through telepsychiatry, and the lack of significant difference in consultation outcome is encouraging. The results presented in our study are based on the first 12 months after the acquisition of a dedicated CAMHUCC telepsychiatry suite in 2015. Some of our results, such as the high patient and parent satisfaction with telepsychiatry, are similar to previous studies on nonurgent assessments.[6] Our study results differ from previous studies in that there was a significant difference between the face-to-face and telepsychiatry groups, where 50% of those assessed through telepsychiatry were of Aboriginal background. This difference can be explained by the catchment area of CAMHUCC, which serves the remote James Bay coastal communities.

One of these communities has been in the press since April 2016 for increased presentations for suicidality among children and adolescents.[15] In addition to this, our catchment area has a number of private group homes used by child protection services across the provinces to place hard-to-serve Aboriginal youth who have complex mental health histories. These group homes are mostly in rural areas, 1.5–3 h drive (each way) from our clinic. The second difference from previous studies was the difference between those not assigned a diagnosis in the telepsychiatry group: this may be because of an overall lower age range with a significant proportion less than age 12 who imitated older peers in the context of poor adult supervision and multiple psychosocial stressors in the telepsychiatry group compared with the face-to-face group. Another explanation may be the unreliability of collateral developmental history in telepsychiatry.

Lastly, there was a significant difference between the groups on the diagnosis of ADHD and disruptive disorder with the telepsychiatry group being under represented. This difference may be a function of the mentioned unreliability of collateral history, poor and sporadic school attendance, cultural factors, and child-rearing practices with acceptance of certain behaviors as within their cultural norms.

The lack of significant difference in patient outcome for the two groups in our study suggests that telepsychiatry may be suitable for urgent assessment; however, this result needs to be viewed with caution because of the small sample size and the short period to ascertain outcome. Larger sample size with longer duration for postconsult outcome may yield more reliable results. Although not statistically significant, the SG had more admissions to the hospital ward than the MCG. One explanation for this may be the combination of unavailability of CAMHUCC weekends and holidays and a lack of adequate resources to hold a patient for 24–48 h in the remote nursing station and ED. Another reason, specific to the northern communities, for transfer and admission, was the unavailability of a guardian for some of the SG patients and the refusal or inability of the patient to participate in the interview to allow for a diagnostic assessment.

The availability of a child and adolescent psychiatry team 7 days a week could address the weekend issue. Furthermore, ensuring the presence of a family member and a child and

youth mental health worker, at the time of consult, would allow for a comprehensive assessment. In addition, the problems of consistent and regular access to, and patient/guardian agreement to receive service from their local mental health workers, require urgent attention from local health services, the Band councils, community leaders, and mental health agencies.

A larger study is underway to study the long-term outcomes after telepsychiatry urgent consults and brief interventions: nonetheless, at the time of submitting this article, there had been no suicides or other adverse outcomes in the SG. Our preliminary results suggest that telepsychiatry may be used successfully for emergency assessment and follow-up, reducing unnecessary travel to urban centers, and is associated with a high degree of patient satisfaction.

Special Consideration

There are a number of special considerations if telepsychiatry is to be used for emergency and urgent assessments of children and adolescents. An essential consideration is the quick access to high-quality equipment capable of establishing a secure connection. Another important consideration is to replicate the face-to-face emergency consult conducted in urban EDs. This requires a child and adolescent psychiatrist who is, a) comfortable with telepsychiatry assessment and b) has flexibility in his or her schedule to accommodate urgent requests. Finally, emergency telepsychiatry requires a team experienced in emergency child and adolescent psychiatry, who have the knowledge to negotiate the system in cases where transfer for admission is needed.

The latter requires admitting privileges at the receiving hospital and familiarity with safety protocols for transfer; some patients can be transferred by the scheduled patient air shuttle with a parent or guardian while others may require the air ambulance.

Acknowledgments

The authors would like to thank Dr. Robert Nesdole, PhD, of Queens University Department of Psychology for his advice on statistical methods.

Disclosure Statement

The authors have no conflicts of interest or financial interests to declare.

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Received: December 19, 2016
Revised: February 3, 2017
Accepted: February 6, 2017
Online Publication Date: April 20, 2017