

Use of Direct-to-Consumer Telemedicine for Attention-Deficit Hyperactivity Disorder



J Gen Intern Med 35(11):3392–4
DOI: 10.1007/s11606-020-05891-2
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BACKGROUND

Attention-deficit/hyperactivity disorder (ADHD) is increasingly prevalent.^{1, 2} Commonly a childhood-onset disorder, its symptoms frequently persist into adulthood.² Untreated ADHD is associated with significant impairment, and there is growing unmet need for treatment—especially among adults.³ Although stimulants are the mainstay of pediatric therapy, management of ADHD in adults is less well-established, with studies suggesting roles for stimulants, non-stimulants, and therapy.^{1, 4}

Internists' limited comfort with ADHD and the dearth of behavioral health providers represent significant barriers to treatment for patients transitioning to adult care or moving residence.^{3, 5} Innovative care models are needed. Direct-to-consumer (DTC) telemedicine—a platform connecting patients and providers via on-demand mobile/web applications—has been proposed to increase access to care. Little is known about how patients with ADHD use DTC telemedicine.

METHODS

We performed a retrospective cross-sectional study of encounters for ADHD conducted on the American Well DTC telemedicine platform from July 2016 to July 2018. Patients were identified by associated International Classification of Diseases, Tenth Revision, diagnostic codes. This study was approved by Cleveland Clinic's Institutional Review Board.

We described patient, provider, and encounter characteristics. Patients rated satisfaction with their providers on a scale of 0 to 5 stars, dichotomized as 5 stars versus fewer. We also examined the most frequently prescribed medications based on National Drug Codes. Finally, accounting for physician clustering, a mixed effects logistic regression model was used to estimate the association between prescription receipt and the above characteristics.

RESULTS

The volume of ADHD visits grew by over 500% from 2016 to 2018 (Table 1). Of 618 total encounters for ADHD, 247 (40.0%) were with therapists and 274 (44.3%) with psychiatrists; 97 (15.7%) visits occurred with non-behavioral health clinicians. Patients were primarily young and male, and over half had comorbid psychiatric disorders. Most patients provided insurance information, and the majority accessed the platform during evenings or weekends. Although 73.3% of patients had only one visit, 46.5% of patients who sought counseling had ≥ 1 follow-up encounter. The median visit length was 48 (IQR 42–53) minutes for counseling, 18 (IQR 11–33) minutes for psychiatry, and 6.5 (IQR 4–9) minutes otherwise. The mean satisfaction rating was 4.9/5.

Overall, 43.7% of encounters resulted in a prescription, most frequently atomoxetine and bupropion (Table 2). No controlled substances were prescribed. Medications were more likely to be prescribed by psychiatrists vs. non-psychiatrists (aOR 7.09, 95% CI 2.53–19.89), for patients reporting insurance vs. not (aOR 2.56, 95% CI 1.32–4.95), and in visits involving comorbid psychiatric illness vs. not (aOR 3.47, 95% CI 1.69–7.1).

DISCUSSION

We found rapid growth in patients seeking care for ADHD using DTC telemedicine from 2016 to 2018. Patients accessed both psychiatry and counseling. Many had multiple visits, often outside business hours. Although no stimulants could legally be prescribed, evidence-based non-stimulant therapies were common.⁴ Comorbid psychiatric illness was also frequently treated. Prescribing rates for ADHD were lower than those seen for other psychiatric disorders and common complaints such as respiratory tract infections; nonetheless, patients were generally highly satisfied.

To our knowledge, our study is the first to describe DTC telemedicine use for ADHD. The increasing prevalence of ADHD—accompanied by widespread use of stimulants among children—has created a population of patients who desire to continue pharmacotherapy into adulthood.^{1, 2} However, patients often encounter interruptions in treatment as they transition out of pediatric care.⁵ Reasons include shortages of psychiatrists, generalist discomfort with managing ADHD, insurance coverage, and restrictions around controlled substance prescribing.^{2, 5}

DTC telemedicine offers one potential solution. Most encounters were one-off visits and likely reflect bridging to

Received November 15, 2019
Accepted April 30, 2020
Published online June 9, 2020

Table 1 Patient, Provider, and Encounter Characteristics for ADHD Visits

Variable	No. (%)
Patient characteristics (N = 307)	
Female, N (%)	137 (44.6)
Age, N (%)	
18–29	118 (38.4)
30–39	119 (38.8)
40–49	51 (16.6)
50–64	19 (6.2)
65 and over	0 (0.0)
Insurance reported, N (%)	213 (69.4)
Geographic region, N (%)	
Northeast	52 (16.9)
Midwest	58 (18.8)
South	130 (42.4)
West	67 (21.8)
Number of telemedicine visits during study period, N (%)	
One	225 (73.3)
Two	36 (11.7)
Three or more	46 (15.0)
Provider characteristics (N = 155)	
Physician specialty, N (%)	
Emergency Medicine	4 (2.6)
Internal Medicine	17 (11.0)
Family Medicine	43 (27.7)
Pediatrics	1 (0.7)
Psychiatry	35 (22.6)
Psychology/therapy/social work	53 (34.2)
Other	2 (1.3)
Geographic region, N (%)	
Northeast	29 (18.7)
Midwest	29 (18.7)
South	57 (36.8)
West	40 (25.8)
Encounter characteristics (N = 618)	
Number of encounters, by year, N (%)	
2016	50 (8.1)
2017	274 (44.3)
2018	294 (47.6)
Encounter timing*, N (%)	
After hours	344 (55.7)
Wait time (min), median (IQR)	2.6 (1.3–5.5)
Encounter length (min), median (IQR)	27.9 (10.1–48.2)
Patient out-of-pocket cost for visit (\$), median (IQR)	
Coupon used, N (%)	74 (12.0)
Prescription receipt, N (%) [†]	
Bupropion [‡]	52 (23.5)
Atomoxetine [‡]	43 (19.5)
Guanfacine [‡]	8 (3.6)
Antidepressants ^{‡,§}	60 (27.1)
Anxiolytics [‡]	16 (7.2)
Mood stabilizers ^{‡,}	37 (16.7)
Antipsychotics [‡]	3 (1.4)
Other [‡]	2 (0.9)
Referral receipt, N (%)	11 (1.8)
Two or more mental health diagnoses received, N (%)	392 (63.4)
Five-star rating, N (%)	405 (65.5)

BHSW, behavioral health social workers; PTSD, post-traumatic stress disorder; OCD, obsessive-compulsive disorder; NOS, not otherwise specified; ADHD, attention-deficit/hyperactivity disorder

*After-hours encounter timing refers to encounters that occur during the weekend or outside of traditional business hours (7a–5p) during the week

[†]Percentage reflects encounter prescribing rate among prescribers (denominator only includes prescribers, n = 371)

[‡]Percentage given reflects proportion prescribed during visits where medication was received (denominator includes only encounters with a medication prescribed, n = 162)

[§]Antidepressants include all antidepressants except for bupropion

^{||}Mood stabilizers include lithium and anticonvulsants.

Antipsychotics are noted separately

Table 2 Unadjusted and Adjusted Odds of Prescription Receipt

Variable	OR (95% CI)	aOR (95% CI)
Patient characteristics		
Female	1.38 (0.83–2.31)	0.94 (0.55–1.62)
Age		
18–29	Ref	Ref
30–39	1.78 (1.51–2.74)	1.90 (1.22–2.97)
40–49	1.13 (0.58–2.20)	1.38 (0.65–2.94)
50–64	0.82 (0.32–2.10)	0.92 (0.33–2.56)
65 and over	n/a	n/a
Insurance reported	1.27 (0.82–1.96)	2.56 (1.32–4.95)
Number of telemedicine visits during study period		
One	Ref	Ref
Two	2.89 (1.43–5.85)	0.99 (0.40–2.44)
Three or more	2.98 (1.78–5.00)	1.00 (0.45–2.25)
Provider characteristics		
Physician specialty		
Non-psychiatry	Ref	Ref
Psychiatry	7.70 (4.01–14.78)	7.09 (2.53–19.89)
Geographic region		
Northeast	Ref	Ref
Midwest	1.78 (0.50–6.41)	2.43 (0.91–6.45)
South	2.15 (0.76–6.12)	1.60 (0.64–4.00)
West	0.99 (0.29–3.42)	1.07 (0.36–3.22)
Encounter characteristics		
Encounter timing*		
After hours	1.34 (0.76–2.37)	1.10 (0.60–2.01)
Encounter length (min)	1.01 (0.99–1.03)	0.98 (0.95–1.00)
Two or more mental health diagnoses received	5.33 (2.94–9.64)	3.47 (1.69–7.11)

*After-hours encounter timing refers to encounters that occur during the weekend or outside of traditional business hours (7a–5p) during the week

longitudinal treatment rather than a substitute, yet evidence of continuity in counseling visits and overall high patient satisfaction ratings suggest that DTC could be used more widely.

Our sample was limited to one DTC telemedicine platform and may not represent the field at large. We also could not determine the quality of counseling or impact of non-stimulant prescribing on symptom control. As Congress debates changes to the Ryan Haight Act that would loosen restrictions around controlled substance prescribing via telemedicine, more studies will be needed to ensure that appropriate prescribing and monitoring occur for the treatment of ADHD.

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Compliance with Ethical Standards:

This study was approved by Cleveland Clinic's Institutional Review Board.

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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