Journal of the Academy of Consultation-Liaison Psychiatry 2022:63:463–473

Original Research Article

Characteristics of Primary Care Providers' Consultations With a Statewide Child Psychiatry Access Program Regarding Autism Spectrum Disorder

Shauna P. Reinblatt, M.D., Kelly Coble, L.C.S.W.-C., Jami-Lin L. Williams, M.A., Aronica M. Cotton, M.D., Amie F. Bettencourt, Ph.D.

Background: *Child Psychiatry Access Programs (CPAPs) provide consultative support for pediatric primary care providers (PCPs) to treat co-morbid mental health (MH) symptoms among patients with Autism Spectrum Disorder (ASD).* **Objectives:** *We examined differences in illness severity, comorbidity, and psychotropic medication use between patients with and without ASD for whom primary care providers sought consultation from Maryland's CPAP.* **Methods:** *We examined N = 3641 Maryland's CPAP consultations from 2012 to 2019; n = 311 were consultations for ASD. Demographics, treatment recommendations, diagnoses, and Clinical Global Impression-Severity scores were collected. Patients who received psychotropic medication or psychotherapy by any mental health provider were defined as comanaged. Descriptive statistics and logistic regression were conducted. Sample size for regression was N = 1854.* **Results:** *Compared with non-ASD, patients with consults for ASD were more often male ($P < 0.001$), aged 0–5 years ($P < 0.001$), severely ill (Clinical Global Impression-Severity > 4) ($P < 0.001$), and prescribed stimulants, nonstimulant attention-deficit hyperactivity disorder medications, and antipsychotic medications ($P < 0.001$). Controlling for key covariates, consultations for youth displaying aggression were 3.02 times ($P < 0.001$) more likely, with Clinical Global Impression-Severity > 4 were 2.36 times ($P < 0.001$) more likely, and prescribed antipsychotics were 4.30 times more likely to concern an ASD patient ($P < 0.001$). A larger proportion of ASD patients (vs. non-ASD) had comorbid psychiatric diagnoses of attention-deficit hyperactivity disorder, a learning disability, and disruptive behavior disorder vs. a smaller proportion with major depressive disorder.* **Conclusions:** *ASD patients for whom primary care providers sought Maryland's CPAP consultation were more severe and complex than non-ASD patients in terms of comorbid diagnoses and medication regimen.*

(Journal of the Academy of Consultation-Liaison Psychiatry 2022; 63:463–473)

Key words: autism spectrum disorder, child psychiatry access program, pediatric mental health care, collaborative mental health care, psychiatric consultation.

INTRODUCTION

Approximately 1 in 54 children has autism spectrum disorder (ASD).[1–3] Early identification and ongoing treatment of ASD and co-occurring physical and mental health (MH) conditions is critical to the health of individuals with ASD.[4,5] However, there remain significant gaps in access to essential diagnostic and specialty care, including MH services.[6,7]

Pediatric primary care providers (PCPs) can play an important role in treating youth with ASD,

Received July 7, 2021; revised January 8, 2022; accepted January 15, 2022. From the University of Maryland (S.P.R., K.C.) School of Medicine, Department of Psychiatry, Division of Child and Adolescent Psychiatry, Baltimore, MD; Johns Hopkins School of Medicine (J.L.L.W., A.F.B.), Department of Psychiatry, Baltimore, MD; and Medstar Montgomery Medical Center (A.M.C.), Olney, MD. Send correspondence and reprint requests to Shauna P. Reinblatt, MD, DFAACAP, DFAPA, University of Maryland SOM, Department of Psychiatry, Division of Child and Adolescent Psychiatry, 737 W. Lombard Street, Rm 465, Baltimore, MD, 21201; e-mail: SReinbla@som.umaryland.edu

particularly with collaborative care approaches.[8] PCPs are often the first-line and, at times, the main care providers of pediatric MH care, especially in underserved areas, with up to a third of youth receiving outpatient MH care from their PCP.[9] In addition, youth with ASD often present to PCPs with complex MH problems[10] underscoring the need to enhance PCP capacity to effectively care for youth with ASD. In view of regional shortages of specialists, clinical guidelines recommend collaborative approaches to caring for youth with ASD, with medical and MH care provided by both PCPs and specialists (e.g., child psychiatrists).[11]

The American Academy of Pediatrics recommends that PCPs only prescribe psychotropic medications with which they have sufficient expertise.[12,13] However, there is limited information regarding how to prepare PCPs to provide MH services for children with ASD. In addition, little is known about the United States workforce of ASD-related health care although current evidence suggests decreased availability of care and major gaps in care quality.[14] Increased complexity of ASD patients further complicates care availability (particularly in rural areas) leading to significant unmet needs.

Child Psychiatry Access Programs (CPAPs) were developed to address the gap between the need for and availability of pediatric MH services.[15–19] CPAPs help address this gap by providing a range of supports to PCPs in managing common MH problems, including case-based telephone consultation, resource/referral networking, and continuing education.[20] Although CPAPs were developed to help PCPs manage mild to moderate pediatric MH problems, research indicates that many PCPs are actually managing severely ill patients alone in their practices.[21,22] These findings highlight difficulties with access to MH care and the presence of severe mental illness among children presenting to PCPs. Owing to the complexity of MH problems among ASD patients, experts have recommended PCPs consult with CPAPs regarding treating ASD.[12,13,23]

Given the paucity of data regarding the role CPAPs play in ASD treatment, we examined PCP consultative calls to the Maryland CPAP (MD-CPAP) about patients with and without ASD, to inform collaborative psychiatric care of patients with ASD. We examined differences in (1) demographic and clinical characteristics, (2) clinical severity, (3) comorbid diagnoses and presenting concerns, (4) reason for calling MD-CPAP, and (5) psychotropic medication use. We hypothesized that although there might be few demographic differences, consultations about ASD (vs. non-ASD) would concern more clinically severe patients with many psychiatric comorbidities and prescribed multiple medications to treat psychiatric symptoms.

METHODS

Sample

The MD-CPAP, called Behavioral Health Integration in Pediatric Primary Care Program, is centrally located at two universities in Baltimore, Maryland. MD-CPAP provides clinical consultation, resource/referral networking, telepsychiatry evaluation, and continuing education free of charge to Maryland pediatric PCPs. The "warmline" is staffed by master's-prepared behavioral health specialists who attend field calls from pediatric PCPs seeking (1) answers to general behavioral health questions, (2) clinical consultation, (3) assistance with identifying resources/referrals for their patients, or (4) one-time telepsychiatry evaluation. When clinical consultation or one-time telepsychiatry evaluation is requested, the request is triaged to the child and adolescent psychiatrist on service.

Data on case-specific calls/evaluation requests (n = 3641) to MD-CPAP between October 2012 and June 2019 were included in this study. During MD-CPAP calls/telepsychiatry evaluations, the consultant completes a consultation form based on the PCP's verbal report, including reason for calling, patient demographics, working diagnosis, type and severity of patient symptoms, and current and past pharmacological and nonpharmacological treatments received. After the call/evaluation, dispositional information, including consultant diagnostic impressions, recommendations and resources provided, and the consultant-rated severity score, is entered into the consultation form.[24]

PCPs requesting MD-CPAP services were primarily Doctors of Medicine. or Doctors of Osteopathy specializing in pediatrics (Table 1). PCP practice locations included urban/suburban, semirural, and rural settings in all 24 Maryland counties. Study procedures were approved by the institutional review boards at the two universities, and the Maryland Department of Health.

TABLE 1. Characteristics of Calls About Patients With and Without ASD for Whom PCPs sought consultation from the MD-CPAP

Characteristics	Total sample N = 3641, n (%)	ASD diagnosis N = 311, n (%)	No ASD diagnosis N = 3330, n (%)	Chi square	*P* value
Patient characteristics					
Patient gender				145.131	<0.001
Male	1815 (49.8)	256 (83.4)	1559 (47.4)		
Female	1776 (48.8)	51 (16.6)	1725 (52.4)		
Unknown	50 (1.4)	4 (1.3)	46 (1.4)		
Patient race/ethnicity				7.43	0.11
African American	695 (19.1)	59 (24.3)	636 (19.1)		
Hispanic	269 (7.4)	14 (4.5)	255 (7.7)		
White	1661 (45.6)	159 (51.1)	1502 (45.1)		
Other	160 (4.4)	10 (3.2)	150 (4.5)		
Unknown	856 (23.5)	69 (22.2)	920 (23.6)		
Patient age				43.55	<0.001
0–5 years old	354 (9.7)	57 (18.3)	297 (8.9)		
6–12 years old	1471 (40.4)	144 (46.3)	1327 (39.8)		
13–18 years old	1560 (42.8)	97 (31.2)	1463 (43.9)		
19 and older	234 (6.4)	12 (3.9)	222 (6.7)		
Unknown	22 (0.6)	1 (0.3)	21 (0.6)		
Patient insurance				10.37	0.006
Private or both private and public	1963 (53.9)	143 (46.0)	1820 (54.7)		
Public only	1264 (34.7)	120 (38.6)	1144 (34.4)		
None/unknown	414 (11.4)	48 (15.4)	366 (11.0)		
Taking medications?				44.68	<0.001
Yes	1364 (37.5)	171 (55.0)	1193 (35.8)		
No	1627 (44.7)	98 (31.5)	1529 (45.9)		
Unknown	650 (17.8)	42 (13.5)	608 (18.3)		
Average number of medications, M (SD)	0.53 (0.86)	1.01 (1.23)	0.48 (0.80)	−10.67	<0.001
Current medications					
Stimulant	625 (17.2)	81 (26.0)	544 (16.3)	18.86	<0.001
Nonstimulant ADHD medications	255 (7.0)	61 (19.6)	194 (5.8)	83.03	<0.001
Mood stabilizers	65 (1.8)	15 (4.8)	50 (1.5)	17.90	<0.001
Sedatives/antihistamines	81 (2.2)	16 (5.1)	65 (2.0)	13.33	<0.001
SNRIs and other antidepressants	69 (1.9)	7 (2.3)	62 (1.9)	1.34	0.25
SSRIs	539 (14.8)	50 (16.1)	489 (14.7)	0.44	0.51
Antipsychotics	132 (3.6)	53 (17.0)	79 (2.4)	175.18	<0.001
Comanaged with mental health provider				39.389	<0.001
Managed alone	2032 (55.8)	121 (38.9)	1911 (57.4)		
Comanaged	1609 (44.2)	190 (61.1)	1419 (42.6)		
Reason for calling MD-CPAP				42.83	<0.001
Psychiatric consultation	1612 (44.3)	189 (60.8)	1423 (42.7)		
Telepsychiatry evaluation	76 (2.1)	8 (2.6)	68 (2.0)		
Seeking resource/referral	1918 (52.7)	109 (35.0)	1818 (54.3)		
Not appropriate for MD-CPAP	35 (1.0)	5 (1.6)	30 (0.9)		
Primary concern calling about					
ADHD or learning disability	910 (25.0)	114 (36.7)	796 (23.9)	24.67	<0.001
Aggression	414 (11.4)	101 (32.5)	313 (9.4)	150.30	<0.001
Anxiety	1477 (40.6)	91 (29.3)	1386 (41.6)	18.03	0.01
Behavior problems	859 (23.6)	120 (38.6)	739 (22.2)	42.40	<0.001
Mood problems	1219 (33.5)	49 (15.8)	1170 (35.1)	47.97	<0.001
Average number of comorbid diagnoses, M (SD)	1.37 (1.01)	1.40 (1.16)	1.37 (1.00)	−0.41	0.68
Patient comorbid diagnoses					
ADHD	1165 (32.0)	146 (46.9)	1019 (30.6)	34.92	<0.001
Anxiety	1462 (40.2)	93 (29.9)	1369 (41.1)	14.87	<0.001
Comorbid developmental disorder	95 (2.6)	31 (10.0)	64 (1.9)	72.46	<0.001
Comorbid medical disorder	51 (1.4)	13 (4.2)	38 (1.1)	19.02	<0.001
Disruptive behavior disorder	293 (8.0)	44 (14.1)	249 (7.5)	17.10	<0.001
Eating disorder	83 (2.3)	4 (1.3)	79 (2.4)	1.51	0.22
Learning disability	87 (2.4)	15 (4.8)	72 (2.2)	8.64	0.003
Major depressive isorder	853 (23.4)	16 (5.1)	837 (25.1)	63.36	<0.001

TABLE 1. (*Continued*)

Characteristics	Total sample N = 3641, n (%)	ASD diagnosis N = 311, n (%)	No ASD diagnosis N = 3330, n (%)	Chi square	*P* value
Other mood disorder (e.g., bipolar)	289 (7.9)	17 (5.5)	272 (8.2)	2.84	0.09
Trauma and related disorders	140 (3.8)	10 (3.2)	130 (3.9)	0.37	0.55
All other disorders (e.g., adjustment, psychotic)	471 (12.9)	45 (14.5)	426 (12.8)	0.71	0.40
CGI rating*				73.90	<0.001
Normal, not ill	9 (0.5)	1 (0.5)	8 (0.5)		
Borderline mentally ill	40 (2.1)	0 (0.0)	40 (2.4)		
Mildly ill	195 (10.4)	10 (4.5)	185 (11.2)		
Moderately ill	1017 (54.5)	88 (40.0)	929 (56.4)		
Markedly ill	484 (25.9)	86 (39.1)	398 (24.2)		
Severely ill	104 (5.6)	29 (13.2)	75 (4.6)		
Extremely ill	18 (1.0)	6 (2.7)	12 (0.7)		
Recommendations from MD-CPAP					
Medication evaluation/change	1324 (36.4)	159 (51.1)	1165 (35.0)	32.02	<0.001
Tests/labs	101 (2.8)	14 (4.5)	87 (2.6)	3.76	0.05
Conduct mental health screening	651 (17.9)	56 (18.0)	595 (17.9)	0.004	0.95
Provide handouts to family	196 (5.4)	20 (6.4)	176 (5.3)	0.73	0.39
In-office behavioral intervention	195 (5.4)	13 (4.2)	182 (5.5)	0.93	0.34
Refer to community resource	2723 (74.8)	234 (75.2)	2489 (74.7)	0.04	0.85
Types of referrals provided†				1.75	0.63
Community services (e.g., outpatient therapy)	2389 (93.8)	193 (92.8)	2196 (93.9)		
Day treatment or IOP	75 (2.9)	6 (2.9)	69 (2.9)		
Inpatient/Residential	29 (1.1)	2 (1.0)	27 (1.2)		
ER/Crisis	54 (1.5)	7 (3.4)	47 (2.0)		
Provider characteristics					
Provider type				1.53	0.22
MD/DO	2703 (74.2)	240 (77.2)	2463 (74.0)		
Other (NP, RN, PA, SW, unknown)	938 (25.8)	71 (22.8)	867 (26.0)		
Provider specialty				3.04	0.22
Pediatrician	3155 (86.7)	274 (88.1)	2881 (86.5)		
Family practice	179 (4.9)	9 (2.9)	170 (5.1)		
Other/Unknown	307 (8.4)	28 (9.0)	279 (8.4)		
Provider urbanicity				10.44	0.01
Urban/suburban	3373 (92.7)	275 (88.4)	2098 (93.1)		
Semirural	208 (5.7)	26 (8.4)	182 (5.5)		
Rural	58 (1.6)	10 (3.2)	48 (1.4)		

ADHD = attention-deficit hyperactivity disorder; ASD = autism spectrum disorder; CGI = Clinical Global Impression; DO = Doctor of Osteopathy; ER = emergency room; IOP = Intensive Outpatient Program; M = mean; MD, Doctor of Medicine; MD-CPAP = Maryland Child Psychiatry Access Program; NP = Nurse Practitioner; PA = physician assistant; PCP = primary care provider; RN = registered nurse; SD = standard deviation; SNRI = Serotonin-Norepinephrine Reuptake Inhibitor; SSRI = Selective Serotonin Reuptake Inhibitor; SW = social worker.

* Comparisons on CGI ratings are based on N = 1867 calls with CGI information.

† Referral types based on N = 2547 calls with referral information.

Variables

Provider characteristics were self-reported by PCPs during their first contact with MD-CPAP. As enrollment is not required to use MD-CPAP services, a review of the National Plan and Provider Enumeration System[25] was used when necessary to identify provider type and specialty. Provider urbanicity was determined by the county where the practice was located and categorized as urban/suburban, semirural, or rural based on Rural-Urban Commuting Area codes.[26] For this study, counties with all parts designated as rural were categorized as rural while counties with some parts designated as rural were categorized as semirural, and all others were categorized as urban/suburban.

PCP reports of patient demographic and clinical characteristics were documented on the consultation form. Patient insurance information fell into one of three categories: (1) private or both public and private, (2) public, and (3) none/unknown/missing. Medication

number prescribed was a continuous variable created from a count of the psychotropic medications currently prescribed for each patient. Medications were grouped into comprehensive categories to simplify reporting and analysis (Table 1). Each medication type was dichotomized to indicate "yes" if the patient was currently taking at least one medication in that category and "no" if they were not taking any medications in that category. Case severity was based on consultant-rated Clinical Global Impression-Severity score (CGI-S), a single item capturing clinical impressions of patient severity (i.e., level of distress, illness severity, functional impairment) on a seven-point scale from normal to extremely ill.[24,27] The CGI-S has good psychometric properties and is used in many FDA trials.[27] For this study, CGI-S scores were dichotomized into mild/moderate (CGI-S score: 1–4) or severe (CGI-S score: 5–7). A case was coded as "comanaged" if the patient was (1) currently receiving medication prescribed by a MH care provider or an MH provider and PCP, (2) currently receiving outpatient psychotherapy, (3) currently receiving school-based therapy, or (4) currently receiving services at an early childhood MH clinic. This information was based on the PCP report during the consultation. However, no information is available about the nature or quality of the collaboration.

Both the PCP and MD-CPAP consultant indicated their diagnostic impressions of the case during the call. A patient was designated as having ASD and each of the other DSM diagnoses included in this study if either the PCP or MD-CPAP consultant indicated this diagnosis was present.

MD-CPAP consultant recommendations and referrals were provided to the PCP verbally and in writing. The consultation form included six recommendation types and 21 referral categories. Referrals were grouped into more comprehensive categories for analysis (Table 1).

Statistical Analyses

Bivariate analyses compared calls to the MD-CPAP about a patient with and without ASD based on patient, provider, and call characteristics. Next, logistic regressions were conducted with a subset of calls (clinical consultation calls, one-time telepsychiatry evaluations, and resource/referral calls handled by a Behavioral Health Integration in Pediatric Primary Care Program child and adolescent psychiatrist) for which CGI-S scores and complete data on patient gender, age, and geographic location were available (N = 1854; ASD n = 218, non-ASD n = 1636) to examine the odds of each dependent variable occurring in relation to the patient having ASD. This subset included calls about patients that were more often male ($\chi^2(1) = 10.25$, $P < 0.001$); more often from a rural or semirural area ($\chi^2(2) = 74.16$, $P < 0.001$); more often White and less often African American, Hispanic, or of unknown race ($\chi^2(4) = 342.42$, $P < 0.001$); and more often uninsured or to have unknown insurance and, less often, privately insured ($\chi^2(2) = 156.91$, $P < 0.001$). For each dependent variable, we first looked at the unadjusted odds if the PCP called about a patient with ASD. Next, we conducted a multivariate logistic regression controlling for location of the primary care practice as a proxy for the patient's geographic location and patient characteristics to estimate the adjusted odds of that variable occurring if the PCP called about a patient with ASD. Only covariates (with one exception) shown to be significantly associated with an ASD diagnosis in bivariate analyses were controlled for in multivariate logistic regressions. The one exception we opted to include was the total number of comorbid diagnoses rather than the individual diagnoses in the regressions to reduce the overall number of covariates included. SPSS 26 (IBM Corp. Released 2019, IBM SPSS Statistics for Windows, Version 26.0, Armonk, NY) was used for all analyses.

RESULTS

Characteristics of Calls About Patients With ASD

Table 1 compares characteristics of calls about pediatric patients with and without an ASD diagnosis for whom PCPs sought consultation, telepsychiatry evaluation, or resources/referrals from the MD-CPAP. Compared with non-ASD patients, a larger proportion of ASD patients were male, zero to five or six to twelve years old, and had no or unknown insurance, whereas a smaller proportion had private or both private and public insurance. There were also differences in clinical characteristics. A larger proportion of ASD patients were taking medication and prescribed more medications on average; when considering medication classes, a larger proportion of ASD patients were taking stimulants, nonstimulant attention-deficit hyperactivity disorder (ADHD) medications, mood stabilizers,

sedatives/antihistamines, and antipsychotics compared with non-ASD patients.

The reasons for which PCPs called MD-CPAP also varied; a larger proportion of ASD patient-related calls were requesting clinical consultation, and a smaller proportion were requesting resources/referrals compared with non-ASD patient-related calls. PCPs' primary concerns also varied, with a larger proportion of those calling about ASD patients had concerns about ADHD or a learning disability, aggression, or behavior problems and a smaller proportion calling with concerns about anxiety or mood problems compared with non-ASD patients. In addition, a larger proportion of ASD patients who were the subject of calls were comanaged by the PCP and an MH provider, whereas a smaller proportion of these patients were managed alone by the PCP compared with non-ASD patients. There were no differences in PCP characteristics across ASD and non-ASD calls with one exception: A larger proportion of ASD calls were from PCPs in rural or semirural areas compared with non-ASD calls. Finally, 91% of ASD calls were about unique patients while 96% of non-ASD calls were about unique patients.

A larger proportion of ASD patients were assigned comorbid diagnoses of ADHD, disruptive behavior disorder, comorbid developmental disorder, comorbid medical disorder, or a learning disability, while a smaller proportion were diagnosed with major depressive disorder, by either the PCP or the Behavioral Health Integration in Pediatric Primary Care Program consultant. In addition, a larger proportion of calls about ASD patients were rated as more severe (i.e., CGI-S score $>$ 4) by the MD-CPAP consultant compared with calls about non-ASD patients. Finally, MD-CPAP consultant recommendations and referrals did not differ across ASD and non-ASD patients with one exception: A larger proportion of consultations about patients with ASD involved recommended medication evaluation or a medication change than calls about non-ASD patients.

ASD Diagnosis as a Predictor of Patient and Call Characteristics

Predictors of calling about a particular concern (e.g., aggression, anxiety, mood problems) were examined first. Calling about a patient with ASD significantly increased the odds that a PCP would call with concerns about aggression (odds ratio [OR]: 4.74, 95% confidence interval [CI]: 3.47–6.48), ADHD or a learning disability (OR: 1.60, 95% CI: 1.20–2.13), or behavior problems (OR: 2.23, 95% CI: 1.67–2.98). Conversely, calls about ASD had significantly lower odds of the PCP calling about anxiety (OR: 0.59, 95% CI: 0.44–0.80) or mood symptoms (OR: 0.37, 95% CI: 0.26–0.53). After controlling for key covariates, the patient having an ASD diagnosis remained a significant predictor of the PCP calling about aggression (OR: 3.02, 95% CI: 2.09–4.36), ADHD or a learning disability (OR: 1.49, 95% CI: 1.06–2.09), behavior problems (OR: 1.56, 95% CI: 1.11–2.19), and mood symptoms (OR: 0.42, 95% CI: 0.28–0.63). Results for aggression are available in Table 2. The other tables are available upon request.

Next, we examined predictors of patients rated as severely mentally ill by MD-CPAP consultants (CGI $>$ 4). Having an ASD diagnosis was a significant predictor of the case being rated as severe. Specifically, patients with ASD for whom PCPs called the MD-CPAP were 2.92 times more likely to receive a CGI rating $>$ 4 (95% CI: 2.19–3.90). After controlling for key covariates, the odds of a patient with an ASD diagnosis receiving a CGI rating $>$ 4 decreased but remained significant (OR: 2.36, 95% CI: 1.68–3.30) (Table 3).

An ASD diagnosis was a significant predictor of antipsychotic treatment. When examined without covariates, those with an ASD diagnosis were 8.45 times more likely than those without an ASD diagnosis to be prescribed an antipsychotic medication (95% CI: 5.84–12.24). After controlling for covariates (Table 4), ASD diagnosis remained the strongest predictor of current antipsychotic use (OR: 4.30, 95% CI: 2.30–8.07).

We examined the extent to which having an ASD diagnosis was a predictor of the patient being comanaged by the PCP and an MH provider. When examined without covariates in the model, the patient having an ASD diagnosis significantly increased the odds that the patient was comanaged by the PCP and an MH provider (OR: 2.11, 95% CI: 1.67–2.68). However, after controlling for key covariates, the patient having an ASD diagnosis was no longer a significant predictor of the case being comanaged (OR: 1.17, 95% CI: 0.75–1.85).

DISCUSSION

Although there is a paucity of data regarding the availability of ASD-related health-care services,[28]

TABLE 2. Final Adjusted Logistic Regression Predicting PCP Calling With a Primary Concern About Aggression

Independent variables	Est.	SE	*P* value	Hazard OR	95% CI
PCP from urban/suburban area			0.09		Ref
PCP from semirural area	0.46	0.23	0.04	1.59	1.01, 2.49
PCP from rural area	0.38	0.39	0.33	1.46	0.68, 3.16
Male patient	0.68	0.16	<0.001	1.97	1.43, 2.71
Patient: 0–5 years old	1.17	0.20	<0.001	3.24	2.17, 4.82
Patient: public insurance only			<0.001		Ref
Patient: private or public & private insurance	0.95	0.16	<0.001	2.58	1.88, 3.54
Patient: no or unknown insurance	0.28	0.22	0.21	1.32	0.86, 2.03
CGI-S rating >4	0.97	0.15	<0.001	2.62	1.95, 3.54
No. of mental health diagnoses	0.18	0.07	0.01	1.20	1.04, 1.38
No. of psychotropic medications	−0.20	0.11	0.06	0.82	0.67, 1.01
Prescribed antipsychotic	0.74	0.30	0.01	2.10	1.17, 3.77
Prescribed mood stabilizer	1.00	0.39	0.01	2.72	1.28, 5.80
Prescribed stimulant	0.47	0.21	0.02	1.59	1.06, 2.38
Has autism spectrum diagnosis	1.10	0.19	<0.001	3.02	2.09, 4.36

N = 1854 calls (ASD n = 218 and non-ASD n = 1636) with information available on the CGI-S and patient gender, age, and geographic location.

ASD = autism spectrum disorder; CGI-S = Clinical Global Impression Score; CI = confidence interval; OR = odds ratio; PCP = primary care providers; SE = standard of error.

particularly MH services,[14] our results support that PCPs are contacting CPAPs for consultations to help care for pediatric patients with ASD. Our data also confirm that a consultation for an ASD diagnosis is a significant predictor of a youth being prescribed an antipsychotic medication. Among consultation calls for youth with an ASD diagnosis, there were more requests specifically for psychiatric consultation (rather than referrals) than for non-ASD patients. In addition, consultations about a patient with ASD were more often rated as more severe by MD-CPAP consultants. In fact, the presence of an ASD diagnosis was a significant predictor of the patient being rated as severe by the MD-CPAP consultant. This is consistent with previous work which found that 26% of all PCP calls to the MD-CPAP were regarding patients with severe MH symptoms[22] despite many PCPs lacking familiarity with specialized MH care, such as psychopharmacotherapy.[10,28–30]

Our findings support previous recommendations suggesting that PCPs should consider calling CPAPs for consultative assistance with treating comorbid MH symptoms associated with ASD.[12,13,23,31] In terms of psychiatric medications, the American Academy of Pediatrics has suggested that PCPs prescribe medication with which they have sufficient expertise.[13,23] The American Academy of Child and Adolescent Psychiatry has also recommended that some medications may be helpful to treat a specific target symptom or comorbidity.[32] Our results indicate that ASD patients were more clinically severe and taking more psychotropic medications and had higher rates of several specific comorbid psychiatric diagnoses (e.g., ADHD, disruptive behavior disorders, learning disabilities) than patients without ASD.

In our sample, pediatric ASD patients for whom PCPs called the MD-CPAP were four times more likely to be prescribed antipsychotics (than those without ASD). This appears to be consistent with evidence that indicates antipsychotics can be effective in the short term to reduce irritability and disruptive behaviors, including aggression.[32,33] Notably, there is also an FDA indication to target irritability in youth with ASD (typically associated with aggression and tantrums) with either of two second-generation antipsychotics (risperidone and aripiprazole).[32,33] Thus, it is not surprising that ASD patients about whom PCPs called were more likely to be prescribed these second-generation antipsychotic medications. Familiarity with using antipsychotics among PCPs may vary; thus, CPAP consultations may indeed help PCPs with medication management for youth with ASD. In addition, it is conceivable that PCPs are presented with more externalizing behaviors (such as aggression or

TABLE 3. Final Adjusted Logistic Regression Predicting a Patient Who Is the Subject of a Consultation Call Being Rated Severe on CGI-S

Independent variables	Est.	SE	*P* value	Hazard OR	95% CI
PCP from urban/suburban area			0.90		Ref
PCP from semi-rural area	−0.02	0.19	0.91	0.98	0.67, 1.43
PCP from rural area	−0.16	0.35	0.65	0.85	0.43, 1.70
Male patient	0.22	0.12	0.07	1.24	0.98, 1.57
Patient: 0–5 years old	−0.15	0.21	0.48	0.87	0.58, 1.29
Patient: public insurance only			0.57		Ref
Patient: private or public & private insurance	0.08	0.13	0.54	1.08	0.85, 1.38
Patient: no or unknown insurance	−0.09	0.15	0.55	0.91	0.67, 1.23
No. of Mental Health Diagnoses	0.31	0.06	<0.001	1.36	1.21, 1.53
No. of psychotropic medications	0.21	0.08	0.01	1.23	1.05, 1.45
Prescribed antipsychotic	0.83	0.27	0.002	2.30	1.37, 3.87
Prescribed mood stabilizer	0.08	0.35	0.83	1.08	0.54, 2.15
Prescribed stimulant	−0.61	0.17	<0.001	0.55	0.40, 0.75
Patient is comanaged w/MH professional	0.14	0.14	0.29	1.16	0.88, 1.51
Primary call concern: aggression	0.91	0.17	<0.001	2.49	1.79, 3.47
Primary call concern: behavior problems	0.50	0.14	<0.001	1.64	1.25, 2.17
Primary call concern: anxiety	0.23	0.12	0.06	1.25	0.99, 1.59
Primary call concern: mood symptoms	0.59	0.12	<0.001	1.80	1.43, 2.28
Primary call concern: ADHD/LD	−0.50	0.14	<0.001	0.61	0.46, 0.79
Has autism spectrum diagnosis	0.86	0.17	<0.001	2.36	1.68, 3.30

N = 1854 calls (ASD n = 218 and non-ASD n = 1636) with information available on the CGI-S and patient gender, age, and geographic location.

ADHD = attention-deficit hyperactivity disorder; ASD = autism spectrum disorder; CGI-S = Clinical Global Impression Score; CI = confidence interval; LD = learning disability; MH = mental health; OR = odds ratio; PCP = primary care provider; SE = standard of error.

outwardly directed problems) as these symptoms may be easier to identify and thus require medications such as second-generation antipsychotics, mood stabilizers, or stimulants (which were also found to be prescribed more to patients with ASD than to non-ASD paients).

Despite different presentations and treatment needs, recommendations by our CPAP for both ASD and non-ASD calls did not differ much although they did recommend medication management significantly more frequently. It is conceivable that this could be related to the types of comorbidities with which youth with ASD present. Furthermore, it is also possible that these patients are already receiving psychosocial services but that waitlists for specialized psychiatric medication management for ASD might be long. It is also possible that the ASD youth might need to obtain medications in a timely fashion from the PCP to keep them out of the emergency room and in outpatient care.

After adjusting for other covariates, the presence of an ASD diagnosis did not increase the odds that ASD patients were comanaged by PCPs and other MH providers suggesting that other factors more strongly influence comanagement. Perhaps the availability of MH care differs for children with ASD depending on the stage of treatment (such as the length of waitlists), or perhaps the complexity of patients with ASD and the severity of symptoms may complicate the suitability of available care.[22] Alternately, it is possible that there may be many providers caring for the patient (either at home or at school), who are not always revealed to the PCP. The ongoing comanagement of patients with ASD by telephonic consultation and telepsychiatry, similar to what is offered in our CPAP, is an area for further investigation.

Limitations

Although these findings are novel, there are some relative weaknesses. Given the structure of telephonic consultation, the reliability of patient-specific data is unknown. Specifically, diagnoses and other clinical information (including MD-CPAP consultant-assigned severity rating) was based on the PCP's symptom report. This is consistent with typical CPAP consultative work and is unavoidable given that the consultant does not see the patient directly, relying instead on PCP report. The diagnosis of ASD is based on information provided by the PCP, and we know little about the

TABLE 4. Final Adjusted Logistic Regression Predicting a Patient Who Is the Subject of a Consultation Call Being Prescribed an Antipsychotic Medication

Independent variables	Est.	SE	*P* value	Hazard OR	95% CI
PCP from urban/suburban area			0.54		Ref
PCP from semirural area	−0.39	0.51	44	0.68	0.25, 1.84
PCP from rural area	0.50	0.67	0.46	1.64	0.44, 6.12
Male patient	0.05	0.30	0.86	1.05	0.58, 1.91
Patient: 0–5 years old	−1.48	0.73	0.04	0.23	0.05, 0.95
Patient: public insurance only			0.37		Ref
Patient: private or public & private insurance	0.44	0.31	0.16	1.55	0.84, 2.87
Patient: no or unknown insurance	0.16	0.39	0.69	1.17	0.55, 2.49
No. of mental health diagnoses	−0.24	0.14	0.08	0.79	0.60, 1.03
No. of psychotropic medications	1.59	0.16	<0.001	4.90	3.61, 6.66
Prescribed mood stabilizer	0.28	0.49	0.57	1.32	0.50, 3.46
Prescribed stimulant	−2.47	0.40	<0.001	0.09	0.04, 0.19
Patient is comanaged w/MH professional	1.01	0.47	0.02	2.88	1.15, 7.21
CGI-S > 4	0.94	0.28	<0.001	2.58	1.49, 4.47
Primary call concern: aggression	0.62	0.36	0.09	186	0.91, 3.79
Primary call concern: behavior problems	0.14	0.34	0.68	1.15	0.60, 2.22
Primary call concern: anxiety	−0.79	0.31	0.01	0.45	0.25, 0.83
Primary call concern: mood symptoms	−0.09	0.30	0.77	0.92	0.51, 1.64
Primary call concern: ADHD/LD	−0.61	0.35	0.08	0.54	0.28, 1.07
Has autism spectrum diagnosis	1.46	0.32	<0.001	4.30	2.30, 8.07

N = 1854 calls (ASD n = 218 and non-ASD n = 1636) with information available on the CGI-S and patient gender, age, and geographic location.

ADHD = attention-deficit hyperactivity disorder; ASD = autism spectrum disorder; CI = confidence interval; CGI-S = Clinical Global Impression Score; LD = learning disability; MH = mental health; OR = odds ratio; PCP = primary care provider; SE = standard of error.

diagnostic process. In addition, the reliability of the data on MH symptoms and diagnosis provided by the PCP during their contact with the CPAP might vary depending on the PCP's background and training. There are few studies available that examine how PCP characteristics (e.g., prior training) influence their MH practices; future studies should evaluate these factors.

It is also unknown whether there may be some selection bias (for example, if the PCPs self-selected to call for consultation about more complex cases), which might influence rates of severe illness in this sample (vs. other PCP practices). In addition, the reported demographic differences between the ASD and non-ASD categories may have been influenced by PCP-reported data. Given the CPAP's reliance on PCP-reported information, we also do not have information regarding comorbid disorders such as intellectual disability diagnoses or severity level of the ASD. Moreover, there is scant literature regarding the prevalence of ASD in other CPAPs, so we cannot draw conclusions regarding generalizability of our sample. However, overall, our sample appears to include patients similar to those for whom PCPs have contacted other CPAPs.[15,18] We report a prevalence of 8.5% in this study, which is only slightly lower than that with other CPAPs in different states (10% and 14% in Michigan and Washington state CPAPs, respectively).[15,18]

Finally, given the cross-sectional, descriptive nature of this study, we cannot establish causality related to relations among study variables. This also limits our ability to determine whether and how consultation with the CPAP influences PCP practices related to caring for ASD youth with complex MH problems.

CONCLUSIONS AND FUTURE DIRECTIONS

Future studies should include examining the influence of provider training and characteristics on PCP management of pediatric patients with ASD including case-based clinical training such as Project ECHO.[34,40] Given the high use of antipsychotic medications in this population, ASD clinical symptoms (e.g., aggression) may help direct future research into ways to facilitate MH consultations, as well as inform clinical monitoring programs for antipsychotic side effects or training efforts in this area. Future studies might also

examine geographically oriented ASD-specialist service availability, including barriers and supports to accessing such specialty care when required.[35] Patients with ASD who were the subject of PCP consultations tended to have greater proportions of some specific comorbid psychiatric illnesses (rather than the mean number of comorbid disorders) and were more severely ill than non-ASD patients. Future research should examine other models of integrated care (e.g., colocated pediatric integrated care; telecounseling; and ongoing medication management via telepsychiatry) beyond CPAPs that might be adopted to help provide psychiatric consultations and help PCP's manage the MH needs of their patients with ASD, including those that can be adopted with minimal changes in infrastructure.[12,22,36–40] Finally, future studies should examine the longitudinal impact of using CPAP services on PCP's capacity to meet the MH needs of their pediatric patients with ASD.

PCPs often manage ASD patients with comorbid MH concerns, both with and without psychiatric specialist help. This study enhances the literature by specifically examining consultative calls to CPAPs about pediatric patients with ASD. Our findings suggest that such programs specifically help PCPs address medication management for ASD patients presenting to primary care. As expected, youth with ASD who PCPs called about were more likely to be prescribed second-generation antipsychotics, which are one of the few data-supported and FDA-indicated treatments for irritability in ASD. Given that PCPs' experience prescribing antipsychotic medications may vary, CPAPs can help PCPs provide medication management for these youth with ASD. Our findings also underscore the need to expand the training and support provided to PCPs to increase their comfort and skill in prescribing psychotropic medications and address the complex MH needs of pediatric ASD patients.

Funding: Behavioral Health Integration in Pediatric Primary Care Program is supported by funding from the Maryland Department of Health, Behavioral Health Administration (BHA), and operates as a collaboration between the University of Maryland School of Medicine, the Johns Hopkins University School of Medicine, Salisbury University, and Morgan State University. BHIPP and this manuscript are also supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling $433,296 with approximately 20% financed by nongovernmental sources (U4CMC32913). The contents of this manuscript are those of the authors and do not necessarily represent the official views of, nor an endorsement, by BHA, HRSA, HHS, or the US Government. For more information, visit www.hrsa.gov.

Disclosures: None of the authors have any conflicts of interest to declare.

Acknowledgments: The authors thank Dr. David Pruitt and Dr. Mark Riddle for mentoring and feedback during the preparation of this manuscript. The authors thank Riley Difatta for preparing the references for this manuscript. A poster presentation of these findings was exhibited at the Annual Meeting of the American Academy of Child and Adolescent Psychiatry in Chicago, Illinois (October 2019).

References

1. Community report on Autism. Available from: https://www.cdc.gov/ncbddd/autism/addm-community-report/documents/addm-community-report-2020-h.pdf; 2020
2. Maenner MJ, Shaw KA, Baio J, et al: Prevalence of autism spectrum disorder among children aged 8 years - autism and developmental disabilities monitoring network, 11 sites, United States, 2016. MMWR Surveill Summ 2020; 69:1–12
3. Shaw KA, Maenner MJ, Baio J, et al: Early identification of autism spectrum disorder among children aged 4 years — early autism and developmental disabilities monitoring network, six sites, United States, 2016. MMWR Surveill Summ 2020; 69:1–11
4. Stahmer AC, Mandell DS: State infant/toddler program policies for eligibility and services provision for young children with autism. Adm Policy Ment Health 2007; 34:29–37
5. Pierce K, Carter C, Weinfeld M, et al: Detecting, studying, and treating autism early: the one-year well-baby check-up approach. J Pediatr 2011; 159:458–466
6. Liptak GS, Benzoni LB, Mruzek DW, et al: Disparities in diagnosis and access to health services for children with autism: data from the national survey of children's health. J Dev Behav Pediatr 2008; 29:152–160
7. Broder Fingert S, Carter A, Pierce K, et al: Implementing systems-based innovations to improve access to early screening, diagnosis, and treatment services for children with autism spectrum disorder: an autism spectrum disorder

pediatric, early detection, engagement, and services network study. Autism 2019; 23:653–664
8. American Psychiatric Association: Diagnostic and statistical manual of mental disorders, 5th ed. Washington, DC: American Psychiatric Association; 2013
9. Anderson GM: Autism biomarkers: Challenges, pitfalls and possibilities. J Autism Dev Disord 2015; 45:1103–1113
10. Morris R, Greenblatt A, Saini M: Healthcare providers' experiences with autism: a scoping review. J Autism Dev Disord 2019; 49:2374–2388
11. Hyman SL, Levy SE, Myers SM: Identification, evaluation, and management of children with autism spectrum disorder. Pediatrics 2020; 145:e20193447
12. Foy JM, Green CM, Earls MF: Mental health competencies for pediatric practice. Pediatrics 2019; 144:e20192757
13. Vasa RA, Mazurek MO, Mahajan R, et al: Assessment and treatment of anxiety in youth with autism spectrum disorders. Pediatrics 2016; 137(suppl 2):115
14. McBain RK, Kofner A, Stein BD, et al: Growth and distribution of child psychiatrists in the United States: 2007-2016. Pediatrics 2019; 144:e20191576
15. Hilt RJ, Romaire MA, McDonell MG, et al: The partnership access line: Evaluating a child psychiatry consult program in Washington state. JAMA Pediatr 2013; 167:162–168
16. Sarvet B, Gold J, Straus JH: Bridging the divide between child psychiatry and primary care: the use of telephone consultation within a population-based collaborative system. Child Adolesc Psychiatr Clin N Am 2011; 20:41–53
17. Kaye DL, Fornari V, Scharf M, et al: Description of a multiuniversity education and collaborative care child psychiatry access program: New York state's CAP PC. Gen Hosp Psychiatry 2017; 48:32–36
18. Marcus S, Malas N, Dopp R, et al: The Michigan child collaborative care program: Building a telepsychiatry consultation service. Psychiatr Serv 2019; 70:849–852
19. Van Cleave J, Holifield C, Perrin JM: Primary care providers' use of a child psychiatry telephone support program. Acad Pediatr 2018; 18:266–272
20. National network of child psychiatry access programs: National network of child psychiatry access programs Web site. Available from: https://www.nncpap.org
21. Olfson M, Kroenke K, Wang S, et al: Trends in office-based mental health care provided by psychiatrists and primary care physicians. J Clin Psychiatry 2014; 75:247–253
22. Platt R, Pustilnik S, Connors E, et al: Severity of mental health concerns in pediatric primary care and the role of child psychiatry access programs. Gen Hosp Psychiatry 2018; 53:12–18
23. McGuire K, Fung LK, Hagopian L, et al: Irritability and problem behavior in autism spectrum disorder: a practice pathway for pediatric primary care. Pediatrics 2016; 137(suppl 2):136
24. Guy W: Clinical global impressions (CGI) scale, Modified. In: Rush JA. Task Force for the Handbook of Psychiatric Measures (eds.). Handbook of Psychiatric Measures. (1st ed.). Washington, DC: American Psychiatric Association; 2000, p. 93-116
25. National plan and provider enumeration system National provider identifier registry. Available from: https://npiregistry.cms.hhs.gov/; 2017
26. Defining rural population. U.S. Health resources & services Administration Web site. Available from: https://www.hrsa.gov/rural-health/about-us/definition/index.html; 2017
27. Busner J, Targum SD: The clinical global impressions scale: Applying a research tool in clinical practice. Psychiatry (Edgmont) 2007; 4:28–37
28. McBain RK, Kareddy V, Cantor JH, et al: Systematic review: United States workforce for autism-related child healthcare services. J Am Acad Child Adolesc Psychiatry 2020; 59:113–139
29. Ghaderi G, Watson S: "In medical school, you get far more training on medical stuff than developmental stuff": Perspectives on ASD from Ontario physicians. J Autism Dev Disord 2019; 49:683–691
30. Riddle MA: Pediatric psychopharmacology for primary care, 2nd ed. Illinois: American Academy of Pediatrics; 2018
31. Wissow LS, Platt R, Sarvet B: Policy recommendations to promote integrated mental health care for children and youth. Acad Pediatr 2020. https://doi.org/10.1016/j.acap.2020.08.014
32. Volkmar F, Siegel M, Woodbury-Smith M, et al: Practice parameter for the assessment and treatment of children and adolescents with autism spectrum disorder. J Am Acad Child Adolesc Psychiatry 2014; 53:237–257
33. Loy JH, Merry SN, Hetrick SE, et al: Atypical antipsychotics for disruptive behaviour disorders in children and youths. Cochrane Database Syst Rev 2017; 2017:CD008559
34. Komaromy M, Bartlett J, Manis K, et al: Enhanced primary care treatment of behavioral disorders with ECHO case-based learning. Psychiatr Serv 2017; 68:873–875
35. Bird DC, Dempsey P, Hartley D: Addressing mental health workforce needs in underserved rural areas: Accomplishments and challenges. Portland, Maine: Maine Rural Health Research Center; 2001
36. Mazurek MO, Brown R, Curran A, et al: ECHO autism: a new model for training primary care providers inn best-practice care for children with autism. Clin Pediatr 2017; 56:247–256
37. Spencer AE, Platt RE, Bettencourt AF, et al: Implementation of off-site integrated care for children: a scoping review. Harv Rev Psychiatry 2019; 27:342–353
38. Platt RE, Spencer AE, Burkey MD, et al: What's known about implementing co-located paediatric integrated care: a scoping review. Int Rev Psychiatry 2018; 30:242–271
39. Van Cleave J, Holifield C, Neumeyer AM, et al: Expanding the capacity of primary care to treat Co-morbidities in children with autism spectrum disorder. J Autism Dev Disord 2018; 48:4222–4230
40. Sohl K, Mazurek MO, Brown R: ECHO autism: using Technology and mentorship to Bridge gaps, increase access to care, and Bring best practice autism care to primary care. Clin Pediatr (Phila) 2017; 56:509–511