Trends in Prevalence and Management of Childhood Anxiety by Australian Pediatricians

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Abstract

Objective: Rising anxiety rates and equity of care are ongoing concerns. Through 2 pediatric practice audits conducted 5 years apart, we aimed to determine the change in 1) anxiety diagnoses; 2) associated comorbid diagnoses; 3) variance in management by location; and 4) child, family, and pediatrician predictors of management.

Methods: Members of the Australian Paediatric Research Network (APRN) were invited to participate in patient-level prospective national pediatric practice audits in 2008 and 2013. Pediatricians were asked to complete standardized forms for 100 consecutive patients or all patients seen over 2 weeks, whichever was completed first. Demographic data, diagnoses, medications, and referrals were collected. Logistic regressions were conducted, clustered at the pediatrician level.

Results: Of eligible APRN pediatricians in 2013 and 2008, 48% and 66% participated and contributed 7102 and 8345 consultations, respectively. Anxiety diagnoses increased over the 5-year period (4.4% vs 7.6%; $P < .001$), as did proportions with comorbid autism spectrum disorder (18.4% vs 29.5%; $P < .001$) and sleep problems (5.1% vs 9.5%; $P = .02$). There was an increase in the prescription of core anxiety medications, with prescription of selective serotonin reuptake inhibitors increasing from 2.0% to 27.7% ($P = .01$). Children were more likely to be referred to a psychologist if they were seen in metropolitan practices (odds ratio = 2.0; 95% confidence interval, 1.1−3.9; $P = .03$) or had learning difficulties (odds ratio = 2.1; 95% confidence interval, 1.1−3.9; $P = .03$).

Conclusions: Prevalence of anxiety among children and adolescents attending pediatricians nearly doubled over the 5-year period. Children in regional and remote locations are less likely to be referred to psychological services, prompting concerns about inequity in access to care.

Keywords: anxiety; children and adolescents; management; mental health disorders; variation in care

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What's New

Anxiety in children and adolescents seen by Australian pediatricians nearly doubled over a 5-year period. Further research is needed to understand why children seen in regional and remote locations are less likely to be referred to psychological services.

Generalized anxiety disorder is the second most common mental health disorder in Australian children and adolescents, affecting 6.9% of 4 to 17 year olds.[1] There are concerns that rates of anxiety disorders are increasing in both Australia and the United Kingdom.[1,2] Anxiety disorders cause substantial impairment in family relationships, social functioning, and school, and management that includes pharmacological and psychological treatments could mitigate some of these adverse effects.

In children and adolescents with anxiety, the occurrence of other mental health disorders and comorbidities is high.[3] Developmental behavioral problems are more common, such as attention-deficit/hyperactivity disorder (ADHD),[4] autism spectrum disorder (ASD),[5] and learning difficulties.[6,7] Anxiety is also more common in children and adolescents from families with a single parent or caregiver or from families with lower levels of income, education, and employment and in children living outside greater capital city areas.[1] The high comorbid load and associated family disadvantage and poorer family functioning place great pressure on health service use and on the need for early recognition and management.

First-line management of anxiety includes referral for evidence-based psychological interventions followed by or in conjunction with pharmacological treatment.[8−11] However, one study found that 46.4% of children ages 4 to 11 years meeting the criteria for an anxiety disorder did

not access any services over the previous 12 months.[1] Of those who did, 31.7% attended a pediatrician at least once and 55.6% attended 2 to 4 times. Yet little is known about the care they received from pediatricians—including medications prescribed and referrals made to psychologists—and whether their care differed by family or provider location.

In our study, through 2 separate pediatrician practice audits conducted 5 years apart, we aimed to determine the change in 1) anxiety diagnoses; 2) associated comorbid diagnoses; 3) variance in management by location; and 4) child, family, and pediatrician predictors of management. We hypothesized that there would be an increase in the proportion of anxiety diagnoses and comorbidities identified and that families living in regional or remote areas would be less likely to receive services than those living in metropolitan areas.

METHOD

DESIGN AND SETTING

Two prospective clinical audits—the Children Attending Paediatricians Study (CAPS)—examined pediatricians' practices in public hospital outpatient clinics, private consulting rooms, and community health centers in Australia.

PARTICIPANTS

All members of the Australian Paediatric Research Network (APRN) were invited via email to take part in October 2008 and 2013. The APRN facilitates multisite research in secondary-care pediatric settings and is represented by all Australian states and territories.

MEASURES

The 2008 and 2013 CAPS audit data collection contained 100 forms per booklet.[12] Each form included consultation date; location; family and pediatrician practice postcodes; language spoken at home; family's health care card and Aboriginal and Torres Strait Islander statuses; consultation start and end times; diagnoses made; medications prescribed; referrals made (ie, psychology, subspecialist, multidisciplinary team, allied health); and Medicare consultation item numbers billed. Universal Medicare gives Australian citizens access to a range of medical services for free or at a lower cost, lower cost prescriptions, and free care as a public patient in a public hospital. Pediatricians also indicated on each data collection form if consultations were either new or review. For both new and review appointments, the pediatrician did not record whether the child had already received medication or psychological support, only if it was prescribed at the current consultation.

DIAGNOSIS OF ANXIETY

The top 60 diagnostic codes were provided on the back of each consultation form, or pediatricians could write out the diagnosis if it was not on the list. An anxiety diagnosis included anxiety, generalized anxiety disorder, social phobia, separation anxiety, or posttraumatic stress disorder. Obsessive-compulsive disorder was also included, as it was included in the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, anxiety disorders category when the study was conducted.

ANXIETY MEDICATIONS

We recorded all medications overall and analyzed them separately, including melatonin and other psychotropic medications (antipsychotics, alpha-2 adrenergic agonists, antiepileptics, and atypical antipsychotics). Core anxiety medications were defined based on the 27 medications listed under antidepressant medications by the Second Australian Atlas of Healthcare Variation.[13] These included selective serotonin reuptake inhibitors (SSRIs), antidepressants, and benzodiazepines.[14,15]

PROCEDURES

Email invitations were sent a month before the audit in October 2013 to all APRN members. Eligible pediatricians who did not opt out were mailed a booklet and asked to complete a data form for each patient seen over a 2-week period from November 18 to December 2, 2013, or for 100 consecutive patients, whichever came first. Reminders to send the booklets back were sent weekly for 3 weeks after the data collection period. The research team hand cleaned, scanned, and verified the data using Cardiff Teleform 10.2 (OpenText, Waterloo, Canada) software. Members of the APRN steering committee (H. H., D.E., M.D.) cross-checked and assigned codes to the original 60 diagnoses and an additional 56 diagnoses, for a total of 116 coded diagnoses.

Family postcodes were used as indicators of family socioeconomic status or social disadvantage via the Australian Socio-Economic Indexes for Areas disadvantage index (national mean = 1000; standard deviation [SD] = 100; higher values represent greater advantage).[16] Family and pediatrician postcodes were also used to ascribe the child as living or receiving care in a metropolitan versus regional or remote location, based on Australian Statistical Geography Standard remoteness area data. The Human Research Ethics Committee at the Royal Children's Hospital, Melbourne, granted ethics approval (#33197).

STATISTICAL ANALYSES

The demographic and practice characteristics of all APRN member responders were compared with APRN member nonresponders and Australian general pediatricians based on the 2013 Australian Health Practitioner Regulation Agency workforce survey (completed by approximately 96% of medical specialists), which were previously published.[12] Demographic and practice characteristics were compared for all pediatricians participating in 2008 and 2013, as well as pediatricians who completed *both* audits. Characteristics of children seen were calculated as proportions (eg, sex, number of comorbidities)

and means and SDs (eg, age). Chi-square tests, Fisher exact tests, and *t* tests were used to compare characteristics between 2008 and 2013 (Aims 1−3). We examined how management differed between metropolitan and regional/remote settings by both pediatrician (where the child received care) and family postcode (where the child lived) to understand whether management differed depending on where the child actually received care (Aim 3). Multilevel, mixed-effects, logistic regression analyses were conducted to compare predictors of anxiety treatment, including medication and psychology referrals in 2008 and 2013, clustered by pediatrician (Aim 4). The unadjusted predictors evaluated included child/family characteristics (child sex, parent rating of child's overall health, comorbidities, family socioeconomic status, and region where the family lived) and pediatrician characteristics (age, sex, practice setting, and postcode). All statistically significant univariable predictors at a 5% level were included in the adjusted model. All analyses were performed using Stata version 14.0 (StataCorp, College Station, Tex).[17]

RESULTS

In 2013, of the 451 APRN members invited to take part, 75 (17%) were ineligible (ie, were subspecialists or retired, only consulted on inpatients, only worked in nonclinical settings, or were on leave or could not be contacted). Of the remaining 376 pediatricians, 180 (48%) participated in 2013 compared with 199 of 300 (66%) in 2008; 113 pediatricians completed both audits (Table 1). In 2013, 7102 consultations were recorded compared with 8345 in 2008. Participating pediatricians in 2013 compared with 2008 were more likely to be female ($P = .02$), and there were no significant differences in age, practice setting, or geographic area. There were no discernable differences in gender, age, practice setting, or geographic area between all pediatricians and those who completed both audits. Compared with general pediatricians across Australia, APRN pediatricians participating in 2013 were more likely to be female, younger, working part time, and working in the state of Victoria, as described in the main CAPS publication.[12] Australia has a population of 24 million people, and, after New South Wales, Victoria has the second highest population with 5.9 million people.

Across both study periods, the majority of children with a diagnosis of anxiety were male with similar age distribution, parent-reported overall health, and an Australian Socio-Economic Indexes for Areas index score for socioeconomic disadvantage by postcode (Table 1). Significantly more children had a health care card in 2013 (43.4% vs 34.4% in 2008), an alternative marker of low income. Health care card holders are eligible for access to less expensive medicines and certain other discounts.

ANXIETY DIAGNOSES

The overall proportion of children who had a diagnosis of anxiety increased from 4.4% (95% confidence interval [CI], 4.0−4.8) to 7.6% (95% CI, 7.0−8.2; $P < .001$) in 2013, with a doubling of anxiety diagnoses in review consultations from 2.2% (95% CI, 1.9−2.6) to 4.8% (95% CI, 4.3−5.3; $P < .001$) (Table 1). When restricted to only pediatricians who completed both audits (n = 113), similar increases were observed for all anxiety diagnoses, which increased from 4.3% (95% CI, 3.8−4.9) to 7.3% (95% CI, 6.5−8.0; $P < .001$), and review consultations, which increased from 2.2% (95% CI, 1.9−2.6) to 4.5% (95% CI, 3.9−5.1; $P < .001$).

There was a significant increase in comorbid ASD (from 18.4% to 29.5%; $P < .001$) and sleep disturbance (from 5.1% to 9.5%; $P = .02$) and a nonsignificant increase in the proportion of children with anxiety who had 2 or more comorbidities (from 30.6% to 37.7%; $P = .08$) (Table 1). When the analysis was restricted to only pediatricians who completed both audits, an increase in comorbid ASD persisted, and additionally the proportion of children with comorbid ADHD increased from 30.7% to 38.8% ($P = .052$; analysis not shown). Similarly, the overall proportion of 2 or more comorbidities also increased, from 28.9% to 40.0% ($P = .01$).

MANAGEMENT OF ANXIETY

No differences were seen between 2008 and 2013 in referrals made for anxiety diagnoses, with the exception of multidisciplinary team referrals for new consultations (9.3% in 2013 vs 1.9% in 2008; $P = .02$) (Table 2). There was an increase in rates of prescribing SSRIs in consultations where there was a diagnosis of anxiety, which appeared to be driven by review consultations (31.2% vs 22.3%; $P = .03$) rather than new consults (decrease to 10.2% in 2013 vs 13.1% in 2008); however, this was not found when the analysis was restricted to only pediatricians who completed both audits. A similar pattern was observed for the prescription of melatonin (9.0% in 2013 vs 2.4% in 2008; $P < .001$), which was also significant for pediatricians who completed both audits.

ANXIETY CONSULTATIONS IN METROPOLITAN AND REGIONAL/REMOTE AREAS

From 2008 to 2013, by family region, the proportion of all children seen that were diagnosed with anxiety increased for both metropolitan and regional/remote areas; however, in 2008 there was a significantly greater difference between the two settings ($P < .001$). There were no significant differences in the proportion of children prescribed medications at either time point, and a similar proportion of children were referred to psychologists (Table 3).

Stratifying our analysis by pediatrician practice region, rather than by family region, had no effect on our findings for the proportion of children with a diagnosis of anxiety nor on the proportion of children prescribed medication. However, a significantly smaller proportion of children seeing pediatricians in regional/remote areas were referred to a psychologist in 2013 (25.7% vs 38.8% in metropolitan areas; $P = .002$), and this was also significant when analysis was restricted to pediatricians who completed both audits.

Table 1. Characteristics of All and CAPS Pediatricians Who Completed Both Audits and Patients With Anxiety

Characteristic	All Pediatricians			Pediatricians Who Completed Both Audits[¶]		
	2008	2013	*P*	2008	2013	*P*
No. of consultations overall	8345	7102		5057	4691	
Consultations with anxiety diagnosis, n (%)[*]						
Any (new, review, or unspecified)[†]	370 (4.4)	546 (7.6)	<.001	218 (4.3)	340 (7.3)	<.001
New	107 (1.3)	108 (1.5)	.21	72 (1.4)	73 (1.6)	.59
Review	188 (2.2)	346 (4.8)	<.001	113 (2.2)	211 (4.5)	<.001
Pediatrician Characteristics						
No. of participating pediatricians	199	180		113		
Pediatricians seeing child with anxiety, n (%)	101 (5.8)	124 (68.9)		62 (54.9)	80 (70.8)	
Male, n (%)	107 (53.8)	81 (45.0)	.02	59 (52.7)		
Age, n (%)			.15			
<45 y	71 (35.7)	71 (39.5)		46 (41.1)		
45–54 y	59 (29.7)	59 (32.8)		37 (33.0)		
55–64 y	38 (19.1)	31 (17.2)		20 (17.9)		
≥65 y	9 (4.5)	12 (6.7)		9 (8.0)		
Setting, n (%)[‡]						
Private practice	101 (50.8)	97 (55.4)	.15	66 (58.9)		
Public hospital outpatients	159 (79.9)	145 (83.4)	.14	93 (83.0)		
Community health center	14 (7.0)	14 (8.0)	.56	8 (7.1)		
Academic post, n (%)	34 (17.1)	36 (20.6)	.11	24 (21.4)		
Geographic area, n (%)			.39			
Metropolitan	132 (67.0)	126 (71.6)		79 (70.5)		
Regional/remote	65 (33.0)	50 (28.4)		33 (29.5)		
Patient Characteristics[§]						
Male, n (%)	211 (59.9)	311 (63.3)	.32	125 (59.2)	201 (64.8)	.20
Age at visit, mean (SD)	10.6 (4.2)	11.2 (4.1)	.02	10.5 (4.2)	10.8 (3.8)	.49
Setting			<.001			.05
Private practice	256 (69.2)	318 (58.2)		160 (73.4)	215 (63.2)	
Public hospital outpatients	69 (18.7)	180 (33.0)		44 (20.2)	98 (28.8)	
Community health center	33 (8.9)	19 (3.5)		7 (3.21)	13 (3.8)	
SEIFA, mean (SD)	993.0 (66.4)	1006.6 (66.5)	.003	1002.6 (64.8)	1002.8 (66.7)	.97
Comorbidities, n (%)						
ADHD/ADD	117 (31.6)	187 (34.3)	.41	67 (30.7)	132 (38.8)	.052
ASD (including Asperger syndrome)	68 (18.4)	161 (29.5)	<.001	38 (17.4)	98 (28.8)	.002
Learning difficulty/disability	44 (11.9)	82 (15.0)	.18	24 (11.0)	56 (16.5)	.07
Sleep disturbance	19 (5.1)	52 (9.5)	.02	14 (6.4)	31 (9.1)	.25
Behavior	42 (11.4)	48 (8.8)	.20	24 (11.0)	38 (11.2)	.95
Depression	23 (7.6)	38 (7.0)	.73	14 (6.4)	15 (4.4)	.30
Intellectual disability	17 (4.6)	30 (5.5)	.55	11 (5.1)	14 (4.1)	.61
Oppositional defiant disorder	23 (6.2)	29 (5.3)	.56	12 (5.5)	18 (5.3)	.91
Language delay	17 (4.6)	11 (2.0)	.03	7 (3.2)	9 (2.7)	.70
Tics/Tourette syndrome	10 (2.7)	11 (2.0)	.49	7 (3.2)	8 (2.4)	.54
Developmental delay	9 (2.4)	9 (1.7)	.40	4 (1.8)	7 (2.1)	.85
Conduct disorder	5 (1.4)	7 (1.3)	.93	2 (0.9)	6 (1.8)	.41
No. of comorbidities, n (%)			.08			.01
0	110 (29.7)	139 (25.5)		70 (32.1)	79 (23.2)	
1	147 (39.7)	202 (37.0)		85 (39.0)	125 (36.8)	
≥2	113 (30.5)	205 (37.6)		63 (28.9)	136 (40.0)	
Child's overall health status, n (%)[‖]			.52			.26
Poor/fair	75 (24.0)	115 (25.1)		39 (21.0)	66 (23.5)	
Good	113 (36.0)	177 (38.7)		62 (33.3)	108 (38.4)	
Very good/excellent	126 (4.1)	165 (36.1)		85 (45.7)	107 (38.1)	
Sociodemographic Characteristics						
Main language spoken at home, n (%)						
English	340 (96.6)	512 (98.8)	.02	203 (97.1)	320 (99.7)	.01
Health care card, n (%)	126 (34.1)	238 (43.6)	.004	68 (31.2)	147 (43.2)	.004

ADD indicates attention-deficit disorder; ADHD, attention-deficit/hyperactivity disorder; ASD, autism spectrum disorder; CAPS, Children Attending Paediatricians Study; SD, standard deviation; and SEIFA, Socio-Economic Index for Areas.

*Anxiety diagnoses percentage of all consultations.

†Includes where pediatrician did not specify new or review.

‡Settings are not mutually exclusive; pediatricians can work across multiple settings.

§Children with a diagnosis of anxiety recorded for that visit.

‖Child's overall health status was parent reported.

¶Pediatrician characteristics of only those completing both audits (n = 113).

Table 2. Management of Anxiety: Comparing Proportions in 2008 and 2013 Outcomes

	Proportion of All New Diagnoses (%)			Proportion of All Review Diagnoses (%)			Proportion of All Consults (%)†		
	2008 n = 107	2013 n = 108	*P*	2008 n = 188	2013 n = 346	*P*	2008 n = 370	2013 n = 546	*P*
Referrals made at visit, n (%)									
Any	73 (68.2)	82 (75.9)	.21	70 (37.2)	140 (40.5)	.47	176 (47.6)	247 (45.2)	.49
Psychology	59 (55.1)	69 (63.9)	.19	47 (25.0)	93 (26.9)	.64	133 (36.0)	183 (33.5)	.45
Subspecialist	10 (9.4)	7 (6.5)	.44	12 (6.4)	29 (8.4)	.41	28 (7.6)	41 (7.5)	.97
Multidisciplinary team	2 (1.9)	10 (9.3)	.02	6 (3.2)	17 (4.9)	.35	10 (2.7)	27 (5.0)	.09
Other allied health	7 (6.5)	11 (10.2)	.34	10 (5.3)	22 (6.4)	.63	22 (6.0)	36 (6.6)	.69
Other	3 (3.7)	3 (2.8)	.99	1 (1.1)	3(0.9)	.67	5 (1.9)	6 (1.1)	.73
Medications, n (%)									
Core anxiety medications	16 (15.0)	11 (10.2)	.29	47 (25.0)	111 (32.1)	.09	83 (22.4)	151 (27.6)	.08
SSRIs	14 (13.1)	11 (10.2)	.51	42 (22.3)	108 (31.2)	.03	74 (2.0)	151 (27.7)	0.01
Other antidepressants	1 (0.9)	1 (0.9)	1.00	7 (3.7)	8 (2.3)	.35	11 (3.0)	11 (2.0)	.35
Benzodiazepines	1 (0.9)	0 (0.0)	.31	3 (1.6)	5 (1.5)	.89	6 (1.6)	7 (1.3)	.67
Melatonin	2 (1.9)	6 (5.6)	.15	6 (3.2)	35 (10.1)	.004	9 (2.4)	49 (9.0)	<.001
Other*	17 (15.9)	17 (15.7)	.98	82 (43.6)	141 (40.8)	.52	121 (32.7)	186 (34.1)	.67

SSRIs indicates selective serotonin reuptake inhibitors.

*Other medication includes stimulants, antipsychotics, alpha-2 adrenergic agonists, antiepileptics, and atypical antipsychotics.

†Includes where pediatrician did not specify new or review.

PREDICTORS OF ANXIETY TREATMENT

There were no significant unadjusted predictors for prescribing core anxiety medications in 2013 (Table 4); however, in 2008 a diagnosis of ASD was associated with higher rates of prescribing core anxiety medications (odds ratio [OR] = 2.7; 95% CI, 1.3−5.6; $P = .01$). Unadjusted predictors for a psychology referral in 2013 were poorer overall health, diagnosis of a learning difficulty, and seeing a pediatrician in a metropolitan location (all $P < .05$). In 2008, male sex and pediatricians under the age of 55 years old were predictive of a psychology referral (both $P < .05$). All significant unadjusted predictors were also significant when the analysis was restricted to pediatricians who completed both audits.

In the multivariable adjusted model for prescription of anxiety medication in 2013, children with better overall health were less likely to receive a prescription for anxiety medication (OR = 0.6; 95% CI, 0.3−1.0; $P = .05$), although this was not apparent in 2008. Children with comorbid ASD had fourfold higher odds of being prescribed core anxiety medications compared with children without ASD in 2008 (OR = 4.2; 95% CI, 1.7−10.5; $P = .002$), although this was not seen in 2013 (Table 5).

In the adjusted model in 2013, children with learning difficulties (OR = 2.1; 95% CI, 1.1−3.9; $P = .03$) and those seeing a pediatrician in a metropolitan location (OR = 2.0; 95% CI, 1.1−3.9; $P = .03$) were more likely to be referred to a psychologist, although neither was a predictor of referral in 2008. The finding that children in metropolitan regions were twice as likely to receive a psychological referral as children in rural and regional areas was also significant when restricted to pediatricians who completed both audits. In 2008, only male sex was predictive of referral (OR = 2.5; 95% CI, 1.3−4.9; $P = .01$). There was a trend toward lower referral rates for children with higher overall health at both time points.

DISCUSSION

In children attending Australian pediatricians, the proportion diagnosed with anxiety disorders appears to have nearly doubled over a 5-year period. In the same interval there has been a nearly 9% increase in the prescription of SSRIs for children during review consultations, and children with better overall health were less likely to receive core anxiety medications in 2013. Children attending pediatricians in regional/remote areas were less likely to be referred to a psychologist in 2013 than their metropolitan counterparts, suggesting inequity in access to first-line psychological services.

Our results suggest an increase in the reported prevalence of anxiety disorders in children and adolescents attending pediatricians, which remained significant when analyzed by pediatricians who completed both audits; however, we did not collect data on the severity of anxiety. Other possibilities for this increase include a shift in management from primary to secondary care or a diagnostic shift. With increasing awareness and detection of anxiety by parents and teachers, recognition of the role of the pediatrician, and earlier and more frequent referral, more children may now be diagnosed with an anxiety disorder than 5 years ago.[18] Alternatively, a true increase in the prevalence of anxiety disorders presenting to pediatricians may be associated with changes in lifestyle and the subsequent impact on children, such as insufficient sleep,[19] excessive screen time,[20] bullying,[21] and overscheduling due to school and extracurricular activities,[22]

Table 3. Diagnoses Made and Management (Medication Prescribed and Psychology Referral) by Family and Pediatrician Location

	Family Region						Pediatrician Practice region					
	2008			2013			2008			2013		
	Metro n = 173	Regional/ Remote n = 190	*P*	Metro n = 280	Regional/ Remote n = 244	*P*	Metro n = 203	Regional/ Remote n = 161	*P*	Metro n = 338	Regional/ Remote n = 191	*P*
Diagnoses made, n (%)												
New	51 (1.1)	53 (1.5)	.08	52 (1.4)	53 (1.8)	.16	59 (1.1)	48 (1.7)	.03	65 (1.4)	42 (1.8)	.27
Review	85 (1.8)	100 (2.9)	.001	177 (4.6)	155 (5.2)	.27	106 (2.0)	79 (2.8)	.02	216 (4.8)	120 (5.1)	.56
All anxiety diagnosis*	173 (3.7)	190 (5.5)	<.001	280 (7.3)	244 (8.2)	.18	203 (3.8)	161 (5.7)	<.001	338 (7.4)	191 (8.1)	.35
Core anxiety medications, n (%)												
New	8 (15.7)	7 (13.2)	.72	4 (7.7)	6 (11.3)	.53	9 (15.3)	7 (14.6)	.92	7 (10.8)	4 (9.5)	.84
Review	17 (20.0)	29 (29.0)	.16	57 (32.2)	52 (33.6)	.80	26 (24.5)	21 (26.6)	.75	66 (30.6)	43 (35.8)	.32
All anxiety diagnosis*	34 (19.7)	46 (24.2)	.30	75 (26.8)	70 (28.7)	.63	43 (21.2)	40 (24.8)	.41	89 (26.3)	57 (29.8)	.39
Psychology referral, n (%)												
New	26 (51.0)	32 (60.4)	.34	34 (65.4)	33 (62.3)	.74	29 (49.2)	30 (62.5)	.17	44 (67.7)	24 (57.1)	.27
Review	28 (32.9)	18 (18.0)	.02	50 (28.3)	38 (24.5)	.44	29 (27.4)	16 (20.3)	.27	71 (32.9)	20 (16.7)	.001
All anxiety diagnosis*	69 (40.0)	62 (32.6)	.15	98 (35.0)	77 (31.6)	.41	71 (35.0)	59 (36.7)	.74	131 (38.8)	49 (25.7)	.002

Metro indicates metropolitan.
*All anxiety diagnoses include new, review, and those not specified by the pediatrician.

or, more broadly, with social and financial disadvantage.[1] Consistent with the high caseload of developmental behavioral problems seen by Australian pediatricians, anxiety diagnoses in children with ASD (29.5%) and ADHD (34.3%) were high in 2013 and significantly higher over the 5-year period for ASD.[23] Future prospective research studies are needed to further describe pediatric practice in Australia and elsewhere to identify causal associations.

First-line treatment of anxiety includes referral for evidence-based psychological interventions.[8–11] Early cognitive behavioral therapy for childhood anxiety[24] has been shown to reduce anxiety, depression, and substance abuse in young adulthood.[9–11] Consistent with National Institute for Health and Care Excellence and other best-practice guidelines,[8,25,26] there was a small nonsignificant increase in psychology referrals over the 5-year period (63.9% in 2013 vs 55.1% in 2008; $P = .19$). In Australia, where 54% of anxiety disorders in children and adolescents are mild, referral for psychological interventions such as cognitive behavioral therapy would be expected as initial treatment for these children. The high rate of initial referral to multidisciplinary teams most likely reflects the high comorbid diagnosis of ASDs and other developmental behavioral problems necessitating allied health input.[4,24]

As a second-line treatment, medication has been shown to be effective in treating anxiety compared with placebo[8,14,25,26,27] or in combination with cognitive behavioral therapy.[27] In Australia, general practitioners refer children to pediatricians who are the specialists responsible for the bulk of psychotropic medication prescriptions. In our study, the increase in prescriptions of SSRIs was observed during review consultations (31.2% in 2013 vs 22.3% in 2008; $P = .03$), suggesting that the prescription of medication is appropriately delayed. In the adjusted analysis, children with parent-reported good or excellent health were less likely to get core anxiety medications that may be a proxy for the impact of the anxiety on the child, suggesting that children with more severe anxiety and poorer health may be prescribed medication more frequently. Prescription rates of other antidepressants and benzodiazepines fell, indicating a clear preference for the use of SSRIs, the pharmacological treatment of choice for pediatric anxiety disorders due to their effectiveness and safety profile.[14,15] There was also a nearly fourfold increase in the prescription of melatonin overall, consistent with the increased awareness and diagnosis of sleep problems in children with anxiety and developmental behavioral problems.[28,29]

Our study suggests that children who see a pediatrician in a regional or remote location are less likely to receive psychological services, a finding that remained significant when only pediatricians who completed both audits were included. As the majority of childhood anxiety is mild, these children may be missing out on psychology and other allied services compared with children living in cities due to health care system factors such as the supply of psychological services and wait times. We did not collect

Table 4. Unadjusted Logistic Regression of the Predictors of Core Anxiety Medication Prescribing and Psychology Referral by Audit Year

	2008‡				2013§			
	Core Anxiety Medication		Psychology Referral		Core Anxiety Medication		Psychology Referral	
	OR (95% CI)	*P*	OR (95% CI)	*P*	OR (95% CI)	*P*	OR (95% CI)	*P*
Child/Family Variables								
Male	0.7 (0.4–1.4)	.37	2.4 (1.4–4.3)	.002	1.5 (0.9–2.5)	.10	1.1 (0.7–1.8)	.58
SEIFA	1.0 (0.6–1.5)	.96	0.9 (0.6–1.2)	.34	0.9 (0.7–1.2)	.40	1.1 (0.9–1.5)	.33
Metropolitan	0.6 (0.3–1.4)	.23	1.4 (0.8–2.4)	.23	0.9 (0.5–1.5)	.66	1.1 (0.7–1.8)	.73
Overall health*	0.8 (0.3–1.9)	.63	0.7 (0.4–1.3)	.27	0.7 (0.4–1.2)	.18	0.6 (0.3–0.9)	.03
Comorbidities (any)	1.6 (0.8–3.3)	.22	1.3 (0.8–2.3)	.32	1.5 (0.9–2.7)	.12	1.3 (0.7–2.1)	.40
ADHD	1.3 (0.6–2.6)	.52	0.8 (0.4–1.3)	.33	1.0 (0.6–1.7)	.89	1.1 (0.7–1.8)	.74
ASD	2.7 (1.3–5.6)	.01	1.5 (0.8–2.7)	.23	1.3 (0.8–2.1)	.26	0.7 (0.4–1.1)	.13
Learning difficulties	0.4 (0.1–1.3)	.13	1.0 (0.5–2.3)	.93	0.6 (0.3–1.2)	.19	2.0 (1.1–3.5)	.03
Sleep	1.1 (0.2–5.2)	.87	0.8 (0.2–2.4)	.67	0.9 (0.4–1.9)	.80	0.7 (0.3–1.6)	.44
Behavior	2.6 (1.0–7.2)	.06	1.7 (0.8–3.6)	.20	0.7 (0.3–1.6)	.44	0.9 (0.4–1.8)	.72
Pediatrician Variables								
Private practice	0.9 (0.3–3.0)	.93	0.8 (0.4–1.7)	.62	1.4 (0.8–2.4)	.26	1.3 (0.7–2.3)	.37
Community health center	1.2 (0.1–10.9)	.90	2.0 (0.5–7.9)	.31	1.5 (0.4–5.7)	.55	1.4 (0.4–5.0)	.61
Metropolitan region	0.6 (0.2–1.6)	.31	0.9 (0.5–1.7)	.74	0.8 (0.5–1.6)	.58	1.8 (1.0–3.3)	.04
Sex	1.6 (0.5–5.0)	.44	0.6 (0.3–1.3)	.19	1.4 (0.8–2.6)	.24	1.3 (0.7–2.4)	.34
45–54 y†	1.0 (0.3–3.5)	.94	0.6 (0.2–1.3)	.19	0.6 (0.3–1.4)	.27	1.4 (0.7–2.8)	.39
≥55 y†	2.0 (0.6–6.5)	.27	0.4 (0.2–1.0)	.05	0.8 (0.4–1.8)	.67	1.4 (0.7–2.8)	.40

OR indicates odds ratio; 95% CI, 95% confidence interval; ADHD, attention-deficit/hyperactivity disorder; ASD, autism spectrum disorder; and SEIFA, Socio-Economic Index for Areas.

*Reference group: poor/fair health.

†Reference group: <45 years of age.

‡N ranged from 314 to 370.

§N ranged from 457 to 546.

data on the severity of anxiety to ascertain if fewer referrals for psychology services in regional and remote areas may have been due to increasing severity of anxiety and higher reliance on medication. Our data indicate more anxiety diagnoses in regional/remote areas and a disparity in access and equity of care. We know that early and accurate diagnosis and timely access to services for anxiety disorders—including psychological services—ensure the best outcome for children and adolescents, and rural and regional children should not be disadvantaged with regard to accessing services.[30]

The strength of this study is that we obtained the first Australian data on pediatricians' diagnostic, management, and referral practices for child and adolescent anxiety, and they are derived from a large national sample. There were several limitations to this study. The diagnosis of anxiety by pediatricians at new and review appointments did not include information on the severity of anxiety or

Table 5. Adjusted Logistic Regression of Predictors of Core Anxiety Medication and Psychology Referral by Audit Year

	2008‡				2013§			
	Core Anxiety Medication		Psychology Referral		Core Anxiety Medication		Psychology Referral	
	OR (95% CI)	*P*	OR (95% CI)	*P*	OR (95% CI)	*P*	OR (95% CI)	*P*
Child/Family Variables								
Male	0.7 (0.3–1.5)	.32	2.5 (1.3–4.9)	.01	1.6 (0.9–2.7)	.12	1.5 (0.9–2.5)	.15
Overall health*	0.7 (0.3–1.7)	.43	0.6 (0.3–1.3)	.19	0.6 (0.3–1.0)	.05	0.6 (0.3–1.0)	.07
ASD	4.2 (1.7–10.5)	.002	0.9 (0.4–2.0)	.80	1.4 (0.8–2.4)	.27	0.8 (0.5–1.4)	.43
Learning difficulties	0.5 (0.1–1.9)	.33	0.8 (0.3–2.1)	.72	0.6 (0.3–1.3)	.17	2.1 (1.1–3.9)	.03
Pediatrician Variables								
Metropolitan region	0.6 (0.2–1.6)	.28	0.8 (0.4–1.9)	.65	0.8 (0.4–1.5)	.42	2.0 (1.1–3.9)	.03
45–54 y†	1.1 (0.3–4.5)	.92	0.8 (0.3–2.2)	.66	0.9 (0.4–2.0)	.70	1.2 (0.6–2.7)	.58
≥55 y†	2.9 (0.8–10.9)	.11	0.6 (0.2–1.6)	.28	1.0 (0.5–2.2)	.96	1.2 (0.5–2.5)	.71

OR indicates odds ratio; 95% CI, 95% confidence interval; and ASD, autism spectrum disorder.

Multivariable models each were adjusted for sex, overall health, comorbid ASD, comorbid learning difficulties, region by pediatrician, and age of pediatrician.

*Reference group: poor/fair health.

†Reference group: <45 years of age.

‡N = 272.

§N = 402.

whether the child was already receiving medication or psychological support, only whether this was initiated at the appointment. Thus, some children may have already been receiving these treatments. Although our sample had a high representation of pediatricians in regional and remote settings, only a third of the children in the study were from regional or remote areas, and a larger sample from such areas may have increased the power to detect a greater difference in inequity of care between regional and metropolitan children. Finally, fewer pediatricians participated in 2013, and there was incomplete overlap between the pediatricians completing audits at both time points; however, we restricted the analyses to pediatricians who completed both audits for comparisons.

CONCLUSIONS

Prevalence of anxiety among children and adolescents attending pediatricians nearly doubled over the 5-year period of our study. For all children diagnosed with anxiety, prescription of core anxiety medications during review consultations increased overall, but the prescription of anxiety medication remained less common than psychological referral. Children in regional and remote locations were less likely to be referred to psychological services, prompting concern about an inequity in access to care for Australian children.

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