ABSTRACT

Aims

The aims of this study were to examine: (1) medications prescribed by Australian general and community paediatricians; (2) predictors of prescribing (child age, gender); and (3) changes in medication prescription between 2008 and 2013.

Method

Two patient-level practice national audits were conducted by the Australian Paediatric Research Network, in 2008 and 2013. General and community paediatricians in outpatient clinics and private practices recorded demographic data, diagnoses and medications prescribed for all patients seen over a two-week period.

Results

In 2008 199 paediatricians submitted data on 8,345 consultations, and in 2013 180 paediatricians submitted data on 7,102 consultations. The most frequently prescribed drug class was the psychotropics, prescribed for 46.8% of patients with developmental-behavioural/mental health (DB/MH) diagnoses in 2008 and 49.8% in 2013 ($p=0.015$). Within this class in 2013 the stimulants were prescribed in 35.3% of DB/MH consultations, antidepressants in 7.8% and antipsychotics in 5.6%. The next most frequently prescribed drug classes were laxatives (4.6% of all consultations in 2013), asthma preventers (4.1%), melatonin (3.7%), asthma relievers (2.6%) and proton-pump inhibitors (2.2%), topical corticosteroids (1.8%) and antihistamines (1.4%). Medication

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prescription was predicted by patient age ($p < 0.001$, both audits) and male gender ($p < 0.01$, both audits), but not by measured prescriber variables. The rates of prescribing of psychotropics, melatonin, laxatives, and enuresis medications increased between 2008 and 2013

Conclusions

Australian paediatricians prescribe mostly psychotropic medications, and the amount prescribed appears to be increasing. Paediatricians need good training and professional development in mental health diagnosis and management, and rational prescribing of psychotropic medications.

INTRODUCTION

Prescribing represents one of the greatest risks in the medical care of children. In Australia, paediatricians can only see patients on referral from a general practitioner (GP), and so the casemix is generally complex with a large proportion of chronic problems such as developmental disabilities, mental health disorders and multisystem diseases.^{1, 2} Therefore, although most simple medications such as antibiotics are prescribed for children by GPs, Australian paediatricians prescribe a range of medications with relatively higher risk.³ Understanding the pattern of prescribing by paediatricians may have implications in relation to quality of care, financial costs, and training needs. However there is little information about prescribing for Australian children in secondary care settings, as most paediatric research emanates from either primary care or tertiary settings.

The Australian Paediatric Research Network (APRN) is a network of Australian general and community paediatricians across all states and territories, which facilitates multi-site research in secondary care settings. The APRN has conducted two nationwide audits of paediatric practice, in 2008 and 2013. These audits have demonstrated that the most frequent diagnoses seen by Australian paediatricians are developmental and behavioural disorders such as attention deficit hyperactivity disorder (ADHD), autism spectrum

disorders (ASD), and learning disabilities.² This paper reports on the medication data from these two audits.

The aims of this study were to examine: (1) medications currently prescribed by Australian general and community paediatricians; (2) predictors of prescribing (child age, gender); and (3) changes in medication prescription between 2008 and 2013. We hypothesised that 1) psychotropic medications would be the largest drug class prescribed; and 2) medication prescribing would be predicted by child age. We had no specific hypothesis regarding changes in prescribing rates between the two audits.

METHODS

Design and participants

All eligible APRN members were invited to participate via email in both audits (2008: n=300; 2013: n=376). Audit booklets were mailed to interested paediatricians.

Procedures

In October-November 2008 and November 2013, paediatricians were asked to complete a de-identified data form for all patients seen over a two-week period, or for 100 patients, whichever came first. Completed booklets were returned by reply-paid post.

Measures

Data forms

The data forms, modelled on forms used in audits of Australian general practice,⁴ included demographic data, diagnoses, investigations ordered, medications prescribed in the consultation and referrals made. Up to four medications could be recorded.

Each child was assigned a census-derived Socio-Economic Indexes For Areas Index of Relative Disadvantage score (SEIFA) based on the postal code of their home address (mean = 1000, SD = 100, lower scores indicate greater disadvantage).⁵ Ethics approval was obtained from Melbourne's Royal Children's Hospital Ethics in Human Research Committee (HREC #33197).

Analyses

Sample characteristics were described using proportions (categorical data), and means and standard deviations (normally distributed data). We compared characteristics of APRN members who completed the audit with APRN members who did not using Chi-squared tests.

The medication data were subjected to a series of steps of post-hoc cleaning. First non-medication items entered were removed. This included A2 milk, bleach baths, dietary supplements (eg. multivitamins, fish oil) and other miscellaneous non-pharmacological preparations. Next, generic and multiple trade names were collapsed for individual drugs. Individual drugs were then grouped by drug class (eg. topical corticosteroids), and high volume prescribed classes (eg. psychotropics) were broken down into groups. Identical processes were undertaken for the 2008 and 2013 datasets.

We then conducted a series of logistic regressions to examine predictors of medication prescription, including patient (age, gender, socioeconomic status) and paediatrician (age, metropolitan vs regional/rural, private vs public) level variables. Given that patient encounters were not independent but potentially repeated by participating paediatricians, regressions were additionally adjusted for clustering at the level of the paediatrician. To compare data from 2008 and 2013, we used multi-level logistic models (generalised estimating equation [GEE])⁶ to cluster consultations within paediatrician, as well as account for the effect of paediatrician participation in both audits. Finally, to ensure relevance in post-hoc analysis of prescribing of psychotropic medications, consultations were filtered to include only those in which one of more developmental-behavioural or mental health (DB/MH) diagnosis was recorded (DB/MH consultations: Asperger's syndrome, ASD, ADHD, Behaviour, Conduct Disorder, Oppositional defiant disorder, Anxiety, Depression, Obsessive compulsive disorder, Learning difficulty/disability, Mental Health, Sleep disturbance, Tics, Tourette's syndrome). All analyses were performed using Stata version 14.1.⁷

RESULTS

Participants

The characteristics of participating paediatricians and patients are provided in Table 1. Responders were more likely to be female, younger and working part time than average

Australian general paediatricians (2013 Australian Health Practitioner Regulation Agency (AHPRA) workforce survey). The 2008 audit included 199/300 (66%) paediatricians who provided data on 8,345 consultations, and the 2013 audit included 180/376 (48%) paediatricians participated who provided data on 7,102 consultations. There were no differences in work setting or geographical area between participants in the two audits, however the proportion of male paediatricians decreased between 2008 and 2013 (53.6% vs. 45.8%, $p=0.014$). The patients seen had a mean age of approximately 7 years across the two audits. The most common diagnoses recorded were ADHD, ASD, learning difficulty/disability, and asthma.

Prescribing

The proportion of consultations in which one or more medications was prescribed was 46.6% in 2008, and 54.1% in 2013 ($p<0.001$). Two or more medications were prescribed at 15.6% of consultations in 2008 and 21.8% in 2013 ($p<0.001$). There was some variation by paediatrician, with distribution of rate of prescribing one or more medications having a median of 42.3% and interquartile range (IQR) 29.8%-56.0% in 2008, and a median of 54.5% and IQR 37.6%-66.7% in 2013.

Predictors of prescription of medications

Medication prescription was predicted by patient age. Mean age of patients with medication prescribed was 2.7 and 3.2 years higher than those with no medication prescribed in 2008 and 2013, respectively (both $p < 0.001$). Medication prescription was also predicted by patient gender in both 2008 (male 48.4%, female 44.5%, $p = 0.001$) and 2013 (male 55.8%, female 52.4%, $p = 0.007$).

Prescription rates were also explored in relation to prescriber factors. No statistically significant differences were found by paediatrician age ($p = 0.175$), metropolitan vs rural/regional ($p = 0.575$), or private vs public/community health centre settings ($p = 0.354$).

Medications groups prescribed

The psychotropics were the most frequently prescribed medication class (Table 2). One or more psychotropic medications were prescribed in 19.6% and 26.8% of all consultations in 2008 and 2013, respectively. Asthma medications, laxatives, topical corticosteroids, and proton-pump inhibitors were each prescribed in over 1% of consultations in both audits.

After filtering to include only DB/MH consultations, there were 3,186 consultations from 185 paediatricians in 2008, and 3,455 consultations from 169 paediatricians in 2013. Psychotropic medications were prescribed in 46.8% of DB/MH consultations in 2008 and 49.8% in 2013.

Psychotropics

Stimulants were the highest prescribed medications in the psychotropic class, making up 62.9% of psychotropics prescribed in 2008 and 60.7% in 2013. The next most commonly prescribed psychotropics were antiepileptic drugs (AEDs), selective serotonin reuptake inhibitors (SSRIs) / serotonin and noradrenaline reuptake inhibitors (SNRIs), second generation antipsychotics (SGA), and clonidine (Table 3).

More than one psychotropic medication was prescribed in 8.2% of consultations in 2008, and 14.1% in 2013. In 2013 the most common psychotropic combinations prescribed were stimulant and clonidine (n=104; 5.5% of consultations in which one or more psychotropic medication was prescribed), stimulant and SGA (79; 4.2%), stimulant and SSRI/SNRI (72; 3.8%), and SSRI/SNRI and SGA (43; 2.3%). Of the children prescribed one or more psychotropic medication, 11.2% and 15.3 % were referred to psychology in 2008 in 2013, respectively.

Changes in prescribing frequency between 2008 and 2013

Psychotropics

GEE models were used to explore differences in prescription rates from 2008 to 2013. Between the two audits there were significant increases in the rates of prescribing of stimulants (33% increase, $p<0.001$), SSRIs / SNRIs (87% $p=0.001$), AEDs (51%, $p=0.001$), SGAs (40%, $p<0.001$), tricyclic antidepressants (29%, $p=0.042$) and clonidine (23%, $p=0.005$).

Other medications

The most commonly prescribed non-psychotropic medication was melatonin. The rate of prescribing of melatonin increased by 463% between the two audits ($p<0.001$), and melatonin was co-prescribed with a stimulant in 4.4% of consultations in 2013. There was a 9% increase in the prescribing of proton-pump inhibitors ($p=0.633$) and a converse 31% decrease in H2-receptor antagonists ($p=0.027$). Other medication groups for which the rate of prescribing increased between the two audits were laxatives (increased by 49%, $p<0.001$), and medications to treat enuresis, both desmopressin (83% increase, $p=0.02$) and anti-cholinergic (86% increase, $p=0.035$). The rate of prescribing of asthma preventers was stable.

DISCUSSION

This study shows that the outpatient prescribing practice of Australian general/community paediatricians is dominated by psychotropic medications. This reflects the casemix of patients seen, with the most frequent diagnoses being developmental and behavioural. All of these problems represented a higher proportion of consultations in 2013 compared to 2008.²

The proportion of consultations in which one or more psychotropic medications was prescribed increased between the two audits. In 2008 one in five children attending a

paediatrician was prescribed a psychotropic medication, and in 2013 this had increased to over one in four. Within this category the psychostimulants represented the largest drug group, and increased between the two audits to over one in 6 consultations in 2013. Given that ADHD was present in over 20% of consultations in 2013, and that stimulant medication is recommended treatment in school-aged children with ADHD,⁸ this level of prescribing of this drug group appears to be appropriate. However the stimulants can cause significant adverse effects⁹ and need to be prescribed judiciously. Whereas in 2008, the majority of patients treated with stimulants were prescribed short-acting preparations, in 2013 the majority were prescribed long-acting preparations, preferred by many patients and families for convenience.

The next biggest class of psychotropic medications prescribed was the SSRI/SNRIs, which were prescribed in 3.8% of consultations, almost double the rate compared with 2008, consistent with the increase in anxiety disorders in patients seen by Australian paediatricians across this interval.² This is again consistent with best practice for the pharmacological management of childhood anxiety disorders.¹⁰ The rate of prescribing of second-generation antipsychotics also increased, from 2% to 2.9% of consultations. This likely reflects the increased rate of ASD being seen by paediatricians as these medications are often used to treat irritability, aggression and self-injury in children with ASD.¹¹

In this study psychotropic polypharmacy (the prescribing of more than one psychotropic medication concurrently) almost doubled between the two audits. This is consistent with US data, with concurrent use of SGAs with either stimulants or mood stabilisers having been identified as prevalent among Medicaid-enrolled children, particularly those with disabilities and in foster care.¹² However, there have been few studies of the efficacy and safety of using two psychotropic medications concurrently in children. The American Academy of Child and Adolescent Psychiatry (AACAP) states that the “The use of multiple psychotropic medications in refractory patients may, at times, be necessary but has not been studied rigorously and clinicians should proceed with caution”.¹³

Among the non-psychotropic medications, the most frequently prescribed drug classes were laxatives, asthma medications, melatonin, acid-suppressing agents and topical corticosteroids. These medications are all used to treat common paediatrician problems, much of which is managed in general practice.

Within the laxative class osmotic laxatives appear to be replacing stool softeners and bowel stimulants. This is consistent with expert consensus recommendations for the treatment of chronic constipation in children.¹⁴ This shift likely explains the increase in overall recorded prescribing of laxatives, as prescription is required for osmotic laxatives, in contrast to other types of laxatives. While there has been some concern regarding possible over-prescribing of combination preventers (inhaled corticosteroids and long-active beta-2 agonists),¹⁵ patients with asthma referred to paediatricians are likely to have

severe and/or persistent disease, for which preventer medication may be indicated.¹⁶ Melatonin prescribing increased substantially between the two audits, likely reflecting increased availability of pharmaceutical grade melatonin. With regard to acid-suppressing agents, there was an increase in the prescribing of proton-pump inhibitors and a corresponding decrease in the prescribing of H₂ receptor antagonists. This is of concern as proton-pump inhibitors are not effective in reducing crying and irritability in infants, even those with proven gastroesophageal reflux.¹⁷

This study profiles Australian paediatric prescribing for the first time. It has a number of strengths, including a large sample size, with demographic, diagnostic and referral data in serial audits. Our study also had some limitations. Although we can relate our data to the recently published diagnosis casemix of Australian paediatricians,² we were unable to determine the indication for individual prescriptions directly from the data. Furthermore, although paediatricians reported on medications prescribed, we could not confirm that medications were dispensed, nor could we report on medications that parents may have bought over the counter. This includes some laxatives, asthma relievers, low-potency topical corticosteroids and antihistamines. Therefore, in some consultations these medications may have been recommended but not prescribed by paediatricians or recorded on the data forms. Another limitation is that these “snapshot” data reflect only activity recorded as occurring during that consultation. As we were unable to record a history of referrals to psychologists or other behavioural interventions our data on this

point will represent an underestimate. Finally, given that we identified some demographic differences between participating paediatricians and AHPRA paediatric workforce data, there may have been some self-selection bias and so our sample may not be representative of the population of Australian paediatricians.

This study has important clinical, training and policy implications. Modern ambulatory paediatric therapeutics is largely comprised of psychotropic medications. The literature on the use of psychotropic medications for children and adolescents is expanding rapidly, and so it is important that clinicians have access to current evidence-based guidelines to support safe and effective prescribing and monitoring. In 2009, AACAP published a practice parameter on the use of psychotropic medication.¹⁸ This document articulated best practice principles including comprehensive assessment, education for the patient and family about the disorder and treatment, consent/assent, conducting an adequate trial, evaluating response, managing non-response, use of medication combinations and discontinuation. More specific guidelines have been published for individual drug groups including the stimulants¹⁹ and SSRIs²⁰.

A worldwide rise in the rate of prescribing of SGAs has been documented with concerns raised regarding potential harms to cognitive (sedation), physical (weight gain, metabolic syndrome) and social (peer relations) functioning and development.²¹ Hypothesised reasons for this trend in the US paediatric primary care context include an increase in evidence for their use in some patient groups, limited access to non-pharmacological

treatments, demand for quick and affordable treatments, and inadequate provider time and reimbursement behavioural problems.²² These factors are likely to be operating to some extent in most health care systems, however practice drivers may vary and future research should determine whether these hypotheses are valid in different countries. A number of clinical guidelines and practice parameters have been published on the use of SGAs in children and adolescents, with variation in recommendations in relation to monitoring for metabolic side effects.^{13, 23} The use of psychotropic medications for children and adolescents is a domain where practice has shifted ahead of evidence. Key research gaps include optimisation of effectiveness (eg. by close monitoring and dose adjustment), studies of concurrent use of two medications, and outcomes in children treated long-term.

In summary, in addition to medications prescribed by GPs, Australian children are increasingly being exposed to medications with higher risk, particularly the psychotropics. It is important that children treated with medications are closely monitored, and that appropriate non-pharmacological therapies are also in place. The modern paediatrician needs to be particularly well trained in the quality use of psychotropic medicines, which has become a major aspect of paediatric practice, and to maintain professional standards as new evidence emerges.

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"What is already known on this topic" –

1. The prescription of medications represents one of the highest-risk activities performed by paediatricians
2. Modern ambulatory paediatric casemix includes many patients with developmental-behavioural and mental health diagnoses, often treated with medications.
3. There is widespread community concern regarding the quality and safety of the prescribing of psychotropic medication for children and adolescents.

"What this study adds"

1. The largest medication group prescribed by Australian paediatricians was the psychotropics, prescribed in 20% of consultations in 2008 and 27% in 2013.
2. More than one psychotropic medication was prescribed in 8% of consultations in 2008 and 14% in 2013.
3. The rates of prescribing of melatonin, laxatives, and enuresis medications also increased between 2008 and 2013.

REFERENCES

1. Hiscock H, Roberts G, Efron D, Sewell JR, Bryson HE, Price AM, et al. Children Attending Pediatricians Study: a national prospective audit of outpatient practice from the Australian Paediatric Research Network. *Med J Aust*. 2011;194:392-7.
2. Hiscock H, Danchin M, Efron D, Gulenc A, Hearps S, Freed G, et al. Trends in paediatric practice in Australia: 2008 and 2013 national audits from the Australian Paediatric Research Network. Early View September 4 2016. *J Paediatr Child Health*.
3. Efron D, Hiscock H, Sewell JR, Cranswick NE, Vance AL, Tyl Y, et al. Prescribing of psychotropic medications for children by Australian pediatricians and child psychiatrists. *Pediatrics*. 2003;111(2):372-5.
4. Britt HC, GC. M. The BEACH study of general practice [editorial]. *Med J Aust*. 2000;173:63-4.
5. Australian Bureau of Statistics: Census of Population and Housing. Socio-Economic Indexes for Areas (SEIFA), Australia.
<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/2033.0.55.0012011?OpenDocument>. 2013.
6. Hedeker D GR. Application of random-effects pattern-mixture models for missing data in longitudinal studies. *Psychol Methods*. 1997;2(1):64-78.
7. StataCorp. College Station TSL. Stata Statistical Software: Release 14. 2013.
8. American Academy of Pediatrics Subcommittee on Attention-Deficit/Hyperactivity Disorder Steering Committee on Quality Improvement and Management. ADHD: Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents. *Pediatrics* 2011;128(5):1007-22.
9. Graham J, Coghill D. Adverse effects of pharmacotherapies for attention-deficit hyperactivity disorder: epidemiology, prevention and management. *CNS Drugs*. 2008;22(3):213-37.
10. Birmaher B, Axelson DA, Monk K, Kalas C, Clark DB, Ehmann M, et al. Fluoxetine for the treatment of childhood anxiety disorders. *J Am Acad Child Adolesc Psychiatry*. 2003;42(4):415-23.
11. Posey DJ, Stigler KA, Erickson CA, McDougall CJ. Antipsychotics in the treatment of autism. *J Clin Invest*. 2008;118(1):6-14.
12. Kreider AR, Matone M, Bellonci C, dosReis S, Feudtner C, Huang YS, et al. Growth in the concurrent use of antipsychotics with other psychotropic medications in Medicaid-enrolled children. *J Am Acad Child Adolesc Psychiatry*. 2014;53(9):960-70.e2.
13. American Academy of Child and Adolescent Psychiatry. Practice Parameter For The Use Of Atypical Antipsychotic Medications In Children And Adolescents. Washington, D.C.: American Academy of Child and Adolescent Psychiatry, 2011.
14. Tabbers MM, DiLorenzo C, Berger MY, Faure C, Langendam MW, Nurko S, et al. Evaluation and treatment of functional constipation in infants and children: evidence-based

recommendations from ESPGHAN and NASPGHAN. *J Pediatr Gastroenterol Nutr.* 2014;58(2):258-74.

15. van Asperen P. Deaths from childhood asthma, 2004–2013: what lessons can we learn? *Med J Aust.* 2015;202(3):125-6.

16. British Thoracic Society SIGN. British guideline on the management of asthma. *Thorax.* 2014;63:iv1.

17. van der Pol RJ, Smits MJ, van Wijk MP, Omari TI, Tabbers MM, Benninga MA. Efficacy of proton-pump inhibitors in children with gastroesophageal reflux disease: a systematic review. *Pediatrics.* 2011;127(5):925-35.

18. Walkup J. Practice Parameter on the Use of Psychotropic Medication in Children and Adolescents. *J Am Acad Child Adolesc Psychiatry.* 48(9):961-73.

19. Greenhill LL, Pliszka S, Dulcan MK. Practice Parameter for the Use of Stimulant Medications in the Treatment of Children, Adolescents, and Adults. *J Am Acad Child Adolesc Psychiatry.* 41(2):26S-49S.

20. Oberlander TF, AR. M. Antidepressant use in children and adolescents: Practice touch points to guide paediatricians. *Paediatr Child Health.* 2011 16(9):549-53.

21. McKinney C, Renk K. Atypical antipsychotic medications in the management of disruptive behaviors in children: safety guidelines and recommendations. *Clin Psychol Rev.* 2011;31(3):465-71.

22. Harrison JN, Cluxton-Keller F, Gross D. Antipsychotic medication prescribing trends in children and adolescents. *J Pediatr Health Care.* 2012;26(2):139-45.

23. Correll CU. Monitoring and management of antipsychotic-related metabolic and endocrine adverse events in pediatric patients. *Int Rev Psychiatry.* 2008;20(2):195-201.

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Table 1. Characteristics of participating paediatricians and patients

Characteristic, n (%)	2008	2013	p*
No. consultations	8345	7102	
<i>Paediatricians</i>			
Number	199	180	
Male, n (%)	90 (53.3)	81 (45.6)	0.01
Age [years], n (%)			0.34
<45	68 (40.7)	71 (41.0)	
45-54	55 (32.9)	59 (34.1)	
55-64	35 (21.0)	31 (17.9)	
65+	9 (5.4)	12 (6.9)	
Setting, n (%)			0.20
Private practice	91 (45.5)	76 (42.2)	
Public hospital outpatients	85 (42.5)	91 (50.6)	
Community health centre	15 (7.5)	10 (5.6)	
Geographic area, n (%)			0.71
Metropolitan	118 (59.0)	127 (70.6)	
Regional / rural	47 (23.5)	48 (26.7)	
<i>Patients</i>			
Male, %	57.5	56.6	0.50
Age, mean (SD)	6.6 (5.5)	7.6 (5.6)	<0.001
SEIFA code, mean (SD)	996.6 (75.8)	1004.3 (69.6)	0.95
Top 10 diagnoses (% consultations in which diagnosis was recorded)			
1.	ADHD (18.3)	ADHD (22.6)	
2.	ASD (9.4)	ASD (14.8)	
3.	Baby check (9.1)	Learning difficulty / disability (8.8)	
4.	Learning difficulty / disability (7.5)	Anxiety (7.3)	
5.	Asthma (6.6)	Baby check (6.9)	
6.	Behaviour (6.0)	Behaviour (6.8)	
7.	Developmental delay (5.9)	Sleep disturbance (6.8)	
8.	Eczema (5.0)	Asthma (6.0)	
9.	Language delay (4.6)	Intellectual disability (5.8)	
10.	Intellectual disability	Language delay	

ADHD = attention deficit hyperactivity disorder; ASD = autism spectrum disorder

*All analyses clustered at paediatrician level

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Table 2. Medications prescribed by drug group

Medication group	Proportion of all consultations in which medication prescribed (%)		p
	2008	2013	
Psychotropic	19.6	26.8	<0.001
Laxatives	3.1	4.6	<0.001
Osmotic agents	1.6	3.4	<0.001
Stool softeners	1.5	1.3	0.23
Bowel stimulants	0.3	0.3	0.34
Asthma medications			
Preventers	4.1	4.1	0.10
Relievers	3.0	2.6	0.59
Melatonin	0.7	3.7	<0.001
Acid-suppressing agents			
Proton-pump inhibitors	2.0	2.2	0.63
H2 receptor antagonists	0.9	0.6	0.03
Eczema medications			
Topical corticosteroids	2.2	1.8	0.77
Pimecrolimus	0.4	0.1	0.12
Emollients	0.2	0.2	0.75
Antihistamine	0.8	1.4	0.16
Enuresis medications			
Desmopressin	0.4	0.7	0.02
Anticholinergic	0.4	0.7	0.04
Specialised infant formula			
Extensively hydrolysed	0.2	0.3	0.31
Amino acid based	0.6	0.4	0.27
Other	13.1	12.3	0.13

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Table 3. Psychotropic medications prescribed

Medication group	Proportion of ALL consultations in which medication prescribed (%)		p	Proportion of DB/MH* consultations in which medication prescribed (%)		p
	2008	2013		2008	2013	
Psychotropic (any)	19.6	26.8	<0.001	46.8	49.8	<0.001
Stimulants	13.1	17.4	<0.001	33.9	35.3	<0.001
Long-acting	5.2	9.6	<0.001	13.5	19.7	<0.001
Other (short-acting, unspecified)	8.3	8.9	<0.01	21.5	18.0	0.52
SSRIs /SNRIs	2.0	3.8	<0.001	5.0	7.2	<0.01
Clonidine	1.9	2.3	<0.01	4.9	4.6	0.46
Atomoxetine	1.2	1.2	0.91	3.1	2.4	0.18
Tricyclics	0.4	0.5	0.04	0.9	0.6	0.92
Anti-psychotics						
First generation	0.02	0.04	0.54	0.1	0.1	0.72
Second generation	2.0	2.9	<0.001	5.2	5.5	0.12
AED	2.8	4.2	<0.01	3.7	5.0	0.07

* DB/MH = consultations in which patient had one or more developmental-behavioural or mental health diagnosis recorded

SSRIs /SNRIs = selective serotonin reuptake inhibitors / serotonin and noradrenaline reuptake inhibitors; AED = antiepileptic drugs

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