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Mental health–related service and medicine use among a cohort of urban Aboriginal children and young people: Data linkage study

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Abstract

Objective: The objective was to describe mental health service and psychotropic medicine use among a cohort of Aboriginal young people and quantify their relation to sociodemographic, family and health factors.

Methods: In a prospective cohort study with data linkage, 892 Aboriginal children aged 0–17 years living in urban and regional areas of New South Wales, Australia, were included. We assessed mental health–related service use, paediatric service use and psychotropic medicine dispensing claims covered by the Australian Government Medicare Benefits Schedule and the Pharmaceutical Benefits Scheme from July 2012 to June 2017.

Results: Most children (71%) did not have a record of mental health service or psychotropic medication use. 18.7% had ⩾1 mental health–related service claim; 26.7% had ⩾1 paediatric service claim; and 20.3% had ⩾1 psychotropic medicine dispensing claim. General practitioner services were the most accessed mental health–related service (17.4%) and 12.7% had been dispensed attention-deficit hyperactivity disorder medicines. Child characteristics associated with treatment included emotional and behavioural problems (prevalence ratio: 1.97, 95% confidence interval = [1.46, 2.64] for mental health services; prevalence ratio: 2.87, 95% confidence interval = [2.07, 3.96] for medicines) and risky behaviour (prevalence ratio: 1.56, 95% confidence interval = [1.12, 2.16] for mental health services; prevalence ratio: 2.28, 95% confidence interval = [1.54, 3.37] for medicines). Parent-related factors included chronic illness (prevalence ratio: 1.42, 95% confidence interval = [1.03, 1.95] for mental health services; prevalence ratio: 2.00, 95% confidence interval = [1.49, 2.69] for medicines) and functional limitations (prevalence ratio: 1.61, 95% confidence interval = [1.16, 2.24] for mental health services; prevalence ratio: 1.86, 95% confidence interval = [1.34, 2.59] for medicines).

Conclusions: Most Aboriginal children and young people did not have claims for mental health services or medicines. Aboriginal children with emotional and behavioural problems, or parents with health problems were more likely to have mental health service or medicine claims.

Keywords

Aboriginal, young people, mental health, Medicare Benefits Schedule, Pharmaceutical Benefits Scheme

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Introduction

Nearly one in four people will experience a significant mental illness in their lifetime, the first occurrence of which is most likely to be during childhood and adolescence (Kessler et al., 2005; Sayers, 2001). In Australia, Aboriginal people are known to experience inequities in the social determinants of health, resulting from the legacy of systemic racism and discrimination (Larson et al., 2007; Marmot, 2011; Purdie et al., 2010). Despite these challenges, most Aboriginal children are resilient and have good mental health (Williamson et al., 2016). However, the proportion of Aboriginal children at high risk of emotional or behavioural problems is approximately twice that of non-Aboriginal children (Australian Institute of Health and Welfare [AIHW], 2018; Kneebone et al., 2012; Zubrick et al., 2005), and suicide rates among Aboriginal young people are over 3 times higher than among non-Aboriginal young people (Australian Bureau of Statistics [ABS], 2019). Poor mental health in childhood and adolescence is a known risk factor for a number of later health and social outcomes, including lower educational attainment, substance use, criminal behaviour and adult mental health problems (Fergusson et al., 1993, 2005, 2007; Loe and Feldman, 2007). Given the challenges to Aboriginal children and young peoples' (hereafter 'young people') mental health, the timely diagnosis and treatment of mental health challenges is critical to promoting the health and safety of Aboriginal young people.

Australia's mental health system includes a diverse network of services subsidised in-part or in-full by government, non-government and private sectors, and non-subsidised services (Australian Government, n.d. -b). Some mental health services and medicines are subsidised by the government under the Medicare Benefits Schedule (MBS) and the Pharmaceutical Benefits Scheme (PBS) (Australian Government, n.d. -a, n.d. -b, n.d. -c). MBS funded or subsidised mental health services for young people are provided by general practitioners (GPs), paediatricians, psychologists, psychiatrists and other allied health professionals. Government initiatives that provide referral pathways to primary mental health services include Access to Allied Psychological Services (ATAPS) (Bassilios et al., 2017) and Better Access to Psychiatrists, Psychologists and General Practitioners (Better Access) (Pirkis et al., 2011). For young people, mental health medicines subsidised through the PBS include psychostimulants (primarily for attention-deficit hyperactivity disorder [ADHD]), antidepressants (primarily for anxiety and depression) and antipsychotics (primarily for autism, psychosis and conduct disorder).

Providing access to services for Aboriginal people is a priority of several major government mental health programmes, including ATAPS and nationwide mental health service providers such as headspace (Rickwood et al., 2019). Suicide rates and epidemiological studies, however, suggest that there remains an urgent need to better support Aboriginal young people's mental health (AIHW, 2018; Kneebone et al., 2012; Zubrick et al., 2005). Efforts to improve the mental health services and supports available to Aboriginal young people are currently hampered by a lack of evidence regarding the care currently received. For example, research suggests that in urban and regional parts of New South Wales (NSW), Aboriginal young people present at hospital emergency departments (EDs) with mental health problems more frequently than non-Aboriginal young people (Williamson et al., 2018), yet little is currently known about primary mental health care access or psychotropic medication use.

This study uses data from the Study of Environment on Aboriginal Resilience and Child Health (SEARCH) (2010) cohort and public health insurance claim data to describe mental health service and psychotropic medicine use among a cohort of urban Aboriginal young people and explore their relation to sociodemographic and health characteristics of Aboriginal young people.

Methods

Data sources

We used data from the SEARCH, which was linked to MBS and the PBS data up to 30 November 2017 for the Medicare card numbers we supplied, made available from Services Australia.

SEARCH is a large cohort study that investigates the health and wellbeing of 1669 urban Aboriginal children and their caregivers who attended four Aboriginal Community Controlled Health Services (ACCHSs) located in urban and regional NSW (Campbelltown, Mt Druitt, Newcastle and Wagga Wagga). SEARCH collects survey data on a range of demographic, social, health and environmental domains as has been described in detail elsewhere (SEARCH, 2010).

MBS and PBS datasets comprise records of the number and type of claims for government-subsidised health services and medicines. MBS data are obtained from medical and diagnostic services and include the date of service, amount paid by the consumer, the benefit paid and an MBS item number item. PBS data are collected on all medicines included in the PBS schedule and include date of purchase, a PBS item number and payment information. All PBS-subsidised medicines attract a consumer co-payment (a proportion of the cost the consumer is required to pay). For 'general beneficiaries', this amount is US$42.50; concession card holders are required to pay the smaller amount of US$6.80 (DHAC, 2019). Before July 2012, PBS dispensing data for medicines that cost less than the consumer co-payment level were not collected (no medicines cost less than the concessional co-payment). For this reason, only data from the 5-year period from 1 July 2012 to 30 June

2017 (the study period) are presented in the results. In Australia, psychostimulant medicines can only be administered by approved prescribers such as paediatricians and psychiatrists.

Study population

Participants were Aboriginal children aged 0–17 years at the time of entry into the SEARCH study (November 2007–2012). Caregivers of Aboriginal children were recruited in the ACCHS waiting rooms by Aboriginal research officers. Eligible caregivers were 18 years or older, full-time caregivers of an Aboriginal child or children and those who agreed to take part in follow-up research.

Caregivers were asked to provide written consent to linkage of health data, including Medicare and Pharmaceutical data. Only children who were listed on the same Medicare card as the caregiver who provided consent were eligible for data linkage. Preliminary analysis showed that SEARCH children whose caregivers were not their parents were considerably less likely to meet criteria for data linkage (8% vs 64%) and were excluded from further analysis. Of those SEARCH children who were living with a parent, differences between those who were successfully linked to MBS/PBS data, compared to those who were not, were assessed using chi-square statistics.

Outcomes

Mental health services. We identified MBS codes for mental health services from the MBS website (DHAC, 2019). Codes were grouped into the following mental health service provider categories: Psychiatrist, Psychologist, General Practitioner (mental health–related) and Other Allied Health (mental health–related) services. Given the important role paediatricians play in the diagnosis and treatment of childhood mental health disorders, paediatrician service codes were also identified. However, there is no information recorded on the diagnosis or reason for the consultation in the MBS dataset, which means it is not possible to discriminate between paediatrician services for mental health reasons, compared with other health or developmental needs. Therefore, throughout this paper, MBS mental health–related services *do not include paediatrician services*, and paediatrician claims for all reasons are reported separately.

Psychotropic medicines. We identified Anatomical Therapeutic Chemical (ATC) Classification System codes for psychotropic medicines from the World Health Organisation (WHO) Collaborating Centre for Drug Statistics Methodology website (WHO, 2021). Codes were grouped into the following categories: antipsychotics (ATC code N05A); anxiolytics, hypnotics and sedatives (ATC codes N05B, N05C); antidepressants (ATC code N06A); and psychostimulants, agents used for ADHD, nootropics and clonidine (ATC codes N06B, C02AC01). Clonidine was included with ‘agents to treat ADHD’, given that the prescription of this medicine to paediatric patients would most commonly be for the treatment of ADHD (Efron et al., 2013). A full list of all included MBS and PBS codes is available in Supplemental File A.

Social and health characteristics

All characteristics of the children and parent were measured at the time of recruitment to the SEARCH study (November 2007–2012). For this analysis, we used the child’s date of birth to calculate their age at the beginning of the study period (i.e. 1 July 2012). Parents answered survey items relating to their health and living circumstances, and that of each of their children, and measures of body mass index (BMI) were also taken. Survey items are described below.

Risk of emotional and behavioural difficulties was measured by the parent-reported Strengths and Difficulties Questionnaire (SDQ) ‘total difficulties’ score. The SDQ has previously been shown to be a reliable and valid measure of Aboriginal children’s (ages 4–17 years) risk of emotional or behavioural problems (Williamson et al., 2014). SDQ scores of <17 indicate low risk of emotional and behavioural problems (Mellor, 2005). Children’s risky behaviour was parent reported and included children running away from home, self-harming, talking about death or suicide or attempting suicide in the last 6 months. Raw BMI scores were converted to age- and sex-specific z scores using SAS macros provided by the WHO (WHO, 2019a, 2019b). We used the WHO guidelines to classify children as underweight, healthy weight, overweight and obese. Parent chronic illness was assessed by asking parents if they had ‘any medical conditions which have/or will last or 6 months or more?’. Parent functional limitations were assessed by asking parents if they were ‘limited in any way in doing normal daily activities because of a medical or health problem?’. Parent psychological distress was assessed by asking parents to complete the Kessler Psychological Distress Scale (K10) (Kessler et al., 2002). K10 scores $\geqslant 22$ were considered to be indicative of high psychological distress. The K10 has been shown to be a valid measure of psychological distress in Aboriginal adults in NSW (McNamara et al., 2014).

Analysis

The number of participants with one or more claims for a mental health–related service, paediatrician service or mental health–related medicine between 1 July 2012 and 30 June 2017 was identified. The number and proportion of young people with each outcome during the 12-month period from July 2012 to June 2017 are summarised, stratified by the young person's age group in each year of the study period (0–14 years old; 15–24 years old).

The association of young person and parent factors with outcomes was examined using log-binomial regression models within the generalised estimating equations framework to account for young people within families, with an exchangeable correlation structure. For all sociodemographic and health characteristics, unadjusted prevalence ratios (PRs) and PRs adjusted for ACCHSs, sex and age on 1 July 2012 in years were calculated for each of the three outcomes. The functional form of age was checked using fractional polynomials.

Most covariates had 9–22% missing data; ACCHSs, sex and age covariates were all complete. To assess potential bias due to missing data, we conducted a sensitivity analysis in which all analyses were repeated in a dataset with multiply imputed data for the covariates. Under the assumption that the missing data were missing at random, multilevel multiple imputation was performed using REALCOM-IMPUTE software (Carpenter et al., 2011) with the outcomes and all risk factors in the imputation models. We created 50 imputed datasets, which incorporated variability due to uncertainty in the exact values, with a burn-in period of 2500 iterations and 500 iterations between imputations. Estimates of coefficients obtained for each dataset were combined using Rubin's rules (Rubin, 2004).

Because we could not ascertain whether, or when, a child switched to a different Medicare card due to changing carers or obtaining their own Medicare card, we conducted a second sensitivity analysis to address potential biases that may arise from excluding children who switched to another Medicare card during the study period. This analysis was restricted to participants who had one or more MBS service or PBS medicine claims in both the first and last years of the study period.

All analyses were conducted in Stata version 16 (StataCorp, College Station, TX, USA).

Ethical approval was granted for this study by the Aboriginal Health and Medical Research Council (AHMRC) of NSW and the University of Sydney (Ethics ID: 729/10 and 8506, respectively).

Results

Of the 1669 children recruited to Phase I of the SEARCH programme, 892 children met the study criteria and were included in the analysis, see Figure 1. The median age of children on 1 July 2012 was 8.3 years (interquartile range: 5.5–12.3 years). Cohort characteristics are presented in Table 1.

We observed differences between SEARCH young people who were successfully linked to MBS/PBS data, compared to those who were not. Differences were observed in ACCHS location, parent employment status (parents who reported their employment status as being 'Home duties' were more likely to have children linked) and parent-reported mental health service use (parents who had not previously used a mental health service were more likely to have their children linked), see Supplemental File B.

Tables 2 and 3 present the number of children who had any MBS mental health–related claim, paediatrician claim and PBS psychotropic medicine claim by age range and individual year. Because some children moved from the younger age range (0–14 years old) to the older (15–24 years old) within the same 12-month period, the total number of children in each 12-month period will sum to greater than 892.

Mental health–related service use claims

The proportion of young people who had at least one claim for a mental health service increased from 4.6% in the first year of the 5-year study period to 8.9% in the final year (Table 2). Over the study period, GP services were accessed by the largest proportion of young people (17.4%), followed by psychologists (8.1%), then psychiatrists (1.9%). During the study period, 26.7% of young people had at least one paediatrician claim (including for non-mental health reasons). Allied mental health–related services were rarely accessed compared to the other mental health service providers, with fewer than five young people having a claim within the 5-year study period (results not shown).

Mental health–related medicine claims

The number of young people who had any PBS mental health–related medicine claim increased from 8.5% in the first year of the 5-year study period to 13.2% in the final year (Table 3). Psychostimulants were the group of mental health–related medicines accessed by the largest proportion of young people at least once during the study period (12.7%), followed by antidepressants (8.0%). The proportion of young people making at least one claim for a psychostimulant medicine was higher among the younger ages (0- to 14-year-olds: 13.5%; 15- to 24-year-olds: 5.0%). The proportion of young people making at least one claim for any antidepressant medicine was higher among the older ages (0- to 14-year-olds: 3.4%; 15- to 24-year-olds: 14.2%).

Figure 2 presents forest plots showing the associations between child and parent characteristics and access to any mental health–related service or medicine at least once over the study period. Associations between child and parent characteristics and access to any paediatrician service at least once over the study period are available in Supplemental File C. Variables with overall (omnibus) p values less than 0.05 are discussed below, and the full list of adjusted and unadjusted PRs are available in Supplemental File D.

Figure 1. Inclusion and exclusion of participants.

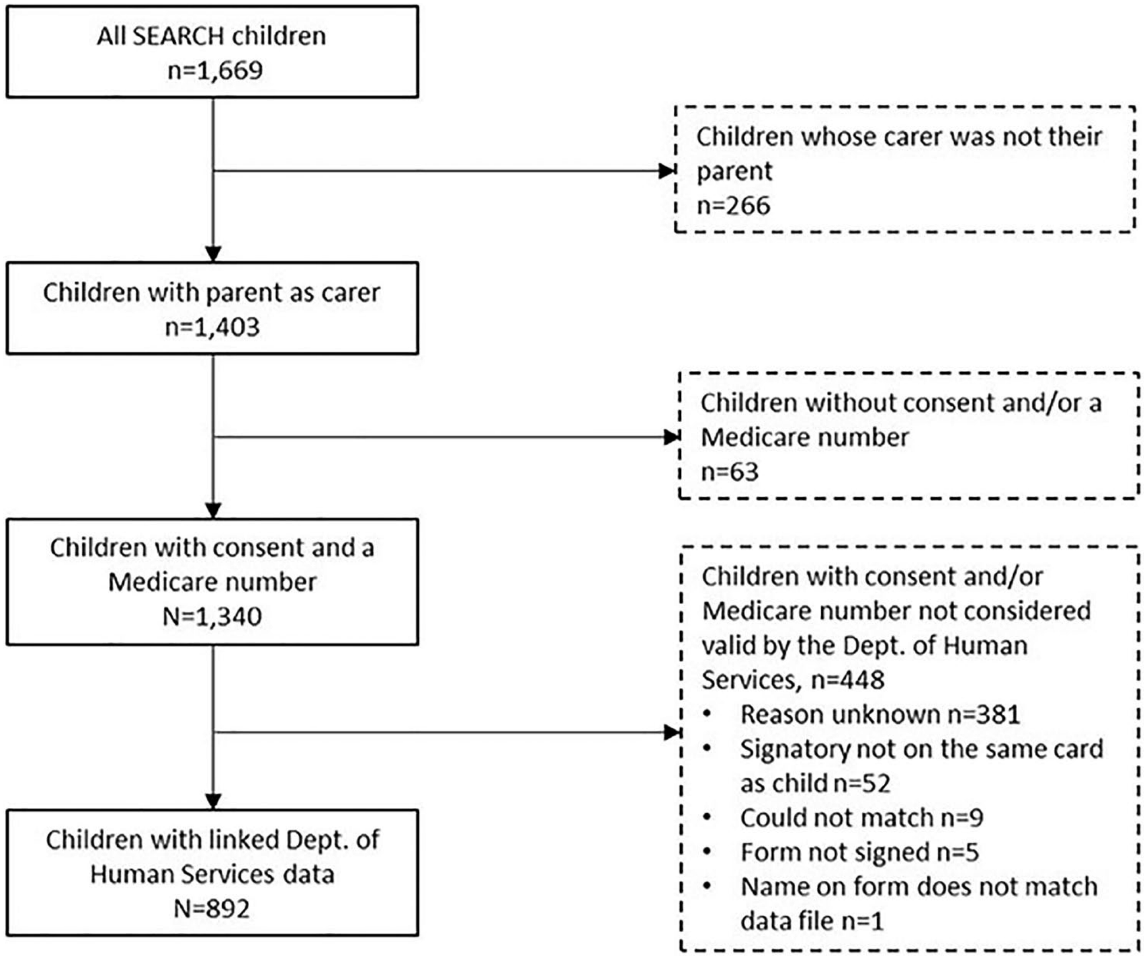


Table 1. Mental health–related service and medication use in relation to cohort characteristics at baseline.

	Any MBS or PBS mental health-related claims		
	None	One or more	Total
Child characteristics	*n* (%)	*n* (%)	*n* (%)
Gender			
Male	342 (70.2)	145 (29.8)	487
Female	294 (72.6)	111 (27.4)	405
Age (years, measured at 1st July 2012)			
0 to < 5	137 (77.0)	41 (23.0)	178
5 to < 10	281 (74.5)	96 (25.5)	377
10 to < 15	150 (65.8)	78 (34.2)	228
15 +	68 (62.4)	41 (37.6)	109

(Continued)

Table 1. (Continued)

	Any MBS or PBS mental health-related claims		
	None	One or more	Total
Child characteristics	*n* (%)	*n* (%)	*n* (%)
Risk of social or emotional difficulties[a]			
Low	278 (74.3)	96 (25.7)	374
High	56 (45.5)	67 (54.5)	123
BMI			
Underweight/normal weight	353 (72.9)	131 (27.1)	484
Overweight	79 (69.9)	34 (30.1)	113
Obese	63 (61.2)	40 (38.8)	103
Days of physical activity per week			
0-3	84 (63.6)	48 (36.4)	132
4-7	246 (69.3)	109 (30.7)	355
Parent characteristics			
Employment status			
Employed/studying	171 (75.7)	55 (24.3)	226
Unemployed/retired/unable to work	45 (54.2)	38 (45.8)	83
Home duties	357 (70.7)	148 (29.3)	505
Qualifications			
None	281 (70.3)	119 (29.8)	400
Trade/certificate/diploma	219 (69.3)	97 (30.7)	316
Bachelor or postgraduate degree	26 (72.2)	10 (27.8)	36
Fortnightly household income			
\$0-\$799	223 (68.8)	101 (31.2)	324
\$800-\$1999	237 (70.3)	100 (29.7)	337
\$2000 +	53 (81.5)	12 (18.5)	65
Chronic illness			
No	408 (75.7)	131 (24.3)	539
Yes	145 (58.5)	103 (41.5)	248
Functional limitations			
No	467 (73.9)	165 (26.1)	632
Yes	66 (51.6)	62 (48.4)	128
Mental health service use			
No	366 (74.1)	128 (25.9)	494
Yes	183 (62.2)	111 (37.8)	294
Psychological distress			
Low (K10 score < 22)	434 (72.8)	162 (27.2)	596
High (K10 score 22 +)	92 (59.4)	63 (40.6)	155

BMI: Body Mass Index; K10: Kessler Psychological Distress Scale; SDQ: Strengths and Difficulties Questionnaire.

[a] Based on SDQ scores.

Table 2. Number of SEARCH participants with one or more claims for mental health–related services by age and year from July 2012 to June 2017 ($N = 892$).

	Total (all years)	1st July 2012 - 30th June 2013	1st July 2013 - 30th June 2014	1st July 2014 - 30th June 2015	1st July 2015 - 30th June 2016	1st July 2016 - 30th June 2017
MBS service provider and age range (years)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Participants aged 0-14 years	783	783	737	695	656	603
Participants aged 15-24 years	337	155	197	236	289	337
Psychiatrist						
0 to 14	7/783 (0.9)	<5	<5	<5	<5	<5
15 to 24	10/337 (3.0)	<5	<5	<5	<5	<5
All participants (0 to 24)	17/892 (1.9)	<5	<5	<5	6/892 (0.7)	5/892 (0.6)
Psychologist						
0 to 14	45/783 (5.7)	14/783 (1.8)	8/737 (1.1)	12/695 (1.7)	15/656 (2.3)	15/603 (2.5)
15 to 24	28/337 (8.3)	<5	7/197 (3.6)	5/236 (2.1)	<5	14/337 (4.2)
All participants (0 to 24)	72/892 (8.1)	18/892 (2.0)	15/892 (1.7)	17/892 (1.9)	19/892 (2.1)	28/892 (3.1)
General Practitioner						
0 to 14	91/783 (11.6)	18/783 (2.3)	19/737 (2.6)	20/695 (2.9)	38/656 (5.8)	33/603 (5.5)
15 to 24	71/337 (21.1)	13/155 (8.4)	18/197 (9.1)	17/236 (7.2)	31/289 (10.7)	37/337 (11.0)
All participants (0 to 24)	155/892 (17.4)	31/892 (3.5)	37/892 (4.1)	37/892 (4.1)	69/892 (7.7)	70/892 (7.8)
Any mental health service						
0 to 14	103/783 (13.2)	27/783 (3.4)	23/737 (3.1)	26/695 (3.7)	41/656 (6.3)	39/603 (6.5)
15 to 24	74/337 (22.0)	14/155 (9.0)	19/197 (9.6)	20/236 (8.5)	33/289 (11.4)	41/337 (12.2)
All participants (0 to 24)	167/892 (18.7)	41/892 (4.6)	42/892 (4.7)	46/892 (5.2)	74/892 (8.3)	79/892 (8.9)
Paediatrician[a]						
0 to 14	212/783 (27.1)	84/783 (10.7)	81/737 (11.0)	89/695 (12.8)	93/656 (14.2)	91/603 (15.1)
15 to 24	37/337 (11.0)	6/155 (3.9)	10/197 (5.1)	11/236 (4.7)	10/289 (3.5)	19/337 (5.6)
All participants (0 to 24)	238/892 (26.7)	88/892 (9.9)	90/892 (10.1)	99/892 (11.1)	102/892 (11.4)	107/892 (12.0)

MBS: Medicare Benefits Schedule. %'s calculated using the number of children in each age range per year.
[a] Includes claims for non-mental health reasons.

Females were more likely than males to access mental health–related services at least once during the 5-year study period (PR: 1.36, 95% confidence interval [CI] = [1.06, 1.76]), but were less likely to access paediatrician services (PR: 0.72, 95% CI = [0.58, 0.89]). Both mental health–related service and medicine use were more likely to be accessed with each increase in age group (PRs: 1.28–2.97 for mental health services; PRs: 1.09–1.71 for medicines), while access to paediatrician services was seen to decrease with age (PRs: 0.81–0.43). Tests for age-related trends were significant in each case (mental health–related services: $p < 0.001$, mental health–related medicines: $p = 0.022$, paediatrician services: $p < 0.001$). Children who scored in the high-risk range of the SDQ were more likely to access any mental health–related service/medicine (PR: 1.97, 95% CI = [1.46, 2.64] for mental health services; PR: 2.87, 95% CI = [2.07, 3.96] for medicines) or paediatrician service (PR: 2.01, 95% CI = [1.49, 2.71]). Children who had displayed risky behaviour were more likely to access any mental health–related service/medicine (PR: 1.56, 95% CI = [1.12, 2.16] for mental health services; PR: 2.28, 95% CI = [1.54, 3.37] for medicines) or paediatrician service (PR: 1.98, 95% CI = [1.37, 2.86]) at least once over the study period.

Parents who were unemployed/retired/unable to work were more likely to have children who accessed a mental health–related medicine than those who were employed or studying (PR: 2.02, 95% CI = [1.24, 3.27]). Children whose parents reported a chronic illness were more likely to have accessed any mental health–related service/medicine

Table 3. Number of SEARCH participants with one or more claims for psychotropic medicines by age and year from July 2012 to June 2017 ($N=892$).

Medicine category and age range (years)	Total (all years)	1st July 2012 - 30th June 2013	1st July 2013 - 30th June 2014	1st July 2014 - 30th June 2015	1st July 2015 - 30th June 2016	1st July 2016 - 30th June 2017
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Participants aged 0-14 years	783	783	737	695	656	603
Participants aged 15-24 years	337	155	197	236	289	337
Antipsychotics						
0 to 14	11/783 (1.4)	< 5	< 5	< 5	< 5	5/603 (0.8)
15 to 24	17/337 (5.0)	6/155 (3.9)	< 5	5/236 (2.1)	11/289 (3.8)	11/337 (3.3)
All participants (0 to 24)	25/892 (2.8)	8/892 (0.9)	7/892 (0.8)	7/892 (0.8)	15/892 (1.7)	16/892 (1.8)
Anxiolytics, Hypnotics and Sedatives						
0 to 14	5/783 (0.6)	< 5	< 5	< 5	< 5	< 5
15 to 24	8/337 (2.4)	< 5	< 5	< 5	< 5	< 5
All participants (0 to 24)	13/892 (1.5)	< 5	< 5	< 5	< 5	< 5
Antidepressants						
0 to 14	27/783 (3.4)	7/783 (0.9)	10/737 (1.4)	7/695 (1.0)	12/656 (1.8)	13/603 (2.2)
15 to 24	48/337 (14.2)	12/155 (7.7)	13/197 (6.6)	14/236 (5.9)	26/289 (9.0)	27/337 (8.0)
All participants (0 to 24)	71/892 (8.0)	18/892 (2.0)	22/892 (2.5)	21/892 (2.4)	38/892 (4.3)	40/892 (4.5)
Psychostimulants, agents used for ADHD, Nootropics and Clonidine						
0 to 14	106/783 (13.5)	56/783 (7.2)	59/737 (8.0)	58/695 (8.3)	71/656 (10.8)	71/603 (11.8)
15 to 24	17/337 (5.0)	< 5	< 5	< 5	7/289 (2.4)	11/337 (3.3)
All participants (0 to 24)	113/892 (12.7)	56/892 (6.3)	61/892 (6.8)	61/892 (6.8)	76/892 (8.5)	80/892 (9.0)
Any psychotropic medicine use						
0 to 14	129/783 (16.5)	65/783 (8.3)	68/737 (9.2)	63/695 (9.1)	77/656 (11.7)	80/603 (13.3)
15 to 24	69/337 (20.5)	16/155 (10.3)	18/197 (9.1)	19/236 (8.1)	37/289 (12.8)	40/337 (11.9)
All participants (0 to 24)	181/892 (20.3)	76/892 (8.5)	85/892 (9.5)	81/892 (9.1)	112/892 (12.6)	118/892 (13.2)

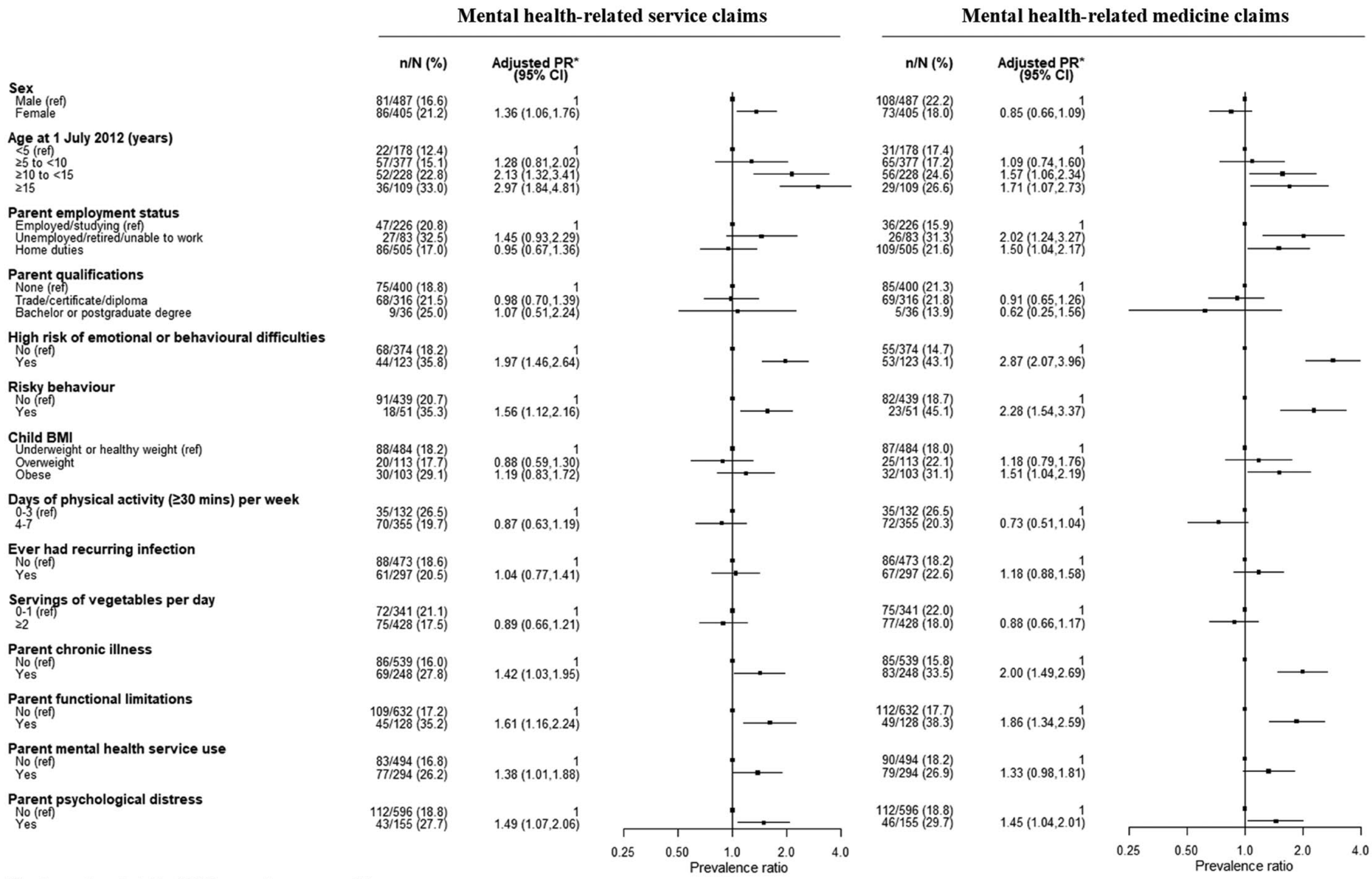
PBS: Pharmaceutical Benefits Scheme; ADHD: attention-deficit/hyperactivity disorder. %'s calculated using the number of children in each age range per year.

(PR: 1.42, 95% CI = [1.03, 1.95] for mental health services; PR: 2.00, 95% CI = [1.49, 2.69] for medicines) or paediatrician service (PR: 1.49, 95% CI = [1.15,1.93]). Children whose parents reported a functional limitation were more likely to access a mental health–related service/medicine (PR: 1.61, 95% CI = [1.16, 2.24] for mental health services; PR: 1.86, 95% CI = [1.34, 2.59] for medicines) or paediatrician service (PR: 1.52, 95% CI = [1.11, 2.09]). Children whose parents reported any mental health service use were more likely to access a mental health–related service (PR: 1.38, 95% CI = [1.01, 1.88]) or paediatrician service (PR: 1.37, 95% CI = [1.06, 1.75]). Children whose parent's K10 scores indicated high levels of psychological distress were more likely to have accessed any mental health–related service/medicine (PR: 1.49, 95% CI = [1.07, 2.06] for mental health services; PR: 1.45, 95% CI = [1.04, 2.01] for medicines) or paediatrician service (PR: 1.42, 95% CI = [1.07, 1.88]).

Sensitivity analysis

The results from analyses using the imputed data were mostly consistent with the results from our primary analyses. The amount of missing data for the covariates ranged from 9% for parent employment status to 20% for both risky behaviour and days of physical activity per week. The adjusted PRs for parent psychological distress for all three outcomes decreased slightly and no longer achieved significance (mental health services: from PR: 1.49, 95% CI = [1.07, 2.06] to PR: 1.41, 95% CI = [0.99, 2.01]; mental

Figure 2. Relation of cohort characteristics to receiving one or more claims for mental health–related services or psychotropic medicines from July 2012 to June 2017.



	Mental health-related service claims n/N (%)	Mental health-related service claims Adjusted PR* (95% CI)	Mental health-related medicine claims n/N (%)	Mental health-related medicine claims Adjusted PR* (95% CI)
Sex				
Male (ref)	81/487 (16.6)	1	108/487 (22.2)	1
Female	86/405 (21.2)	1.36 (1.06,1.76)	73/405 (18.0)	0.85 (0.66,1.09)
Age at 1 July 2012 (years)				
<5 (ref)	22/178 (12.4)	1	31/178 (17.4)	1
≥5 to <10	57/377 (15.1)	1.28 (0.81,2.02)	65/377 (17.2)	1.09 (0.74,1.60)
≥10 to <15	52/228 (22.8)	2.13 (1.32,3.41)	56/228 (24.6)	1.57 (1.06,2.34)
≥15	36/109 (33.0)	2.97 (1.84,4.81)	29/109 (26.6)	1.71 (1.07,2.73)
Parent employment status				
Employed/studying (ref)	47/226 (20.8)	1	36/226 (15.9)	1
Unemployed/retired/unable to work	27/83 (32.5)	1.45 (0.93,2.29)	26/83 (31.3)	2.02 (1.24,3.27)
Home duties	86/505 (17.0)	0.95 (0.67,1.36)	109/505 (21.6)	1.50 (1.04,2.17)
Parent qualifications				
None (ref)	75/400 (18.8)	1	85/400 (21.3)	1
Trade/certificate/diploma	68/316 (21.5)	0.98 (0.70,1.39)	69/316 (21.8)	0.91 (0.65,1.26)
Bachelor or postgraduate degree	9/36 (25.0)	1.07 (0.51,2.24)	5/36 (13.9)	0.62 (0.25,1.56)
High risk of emotional or behavioural difficulties				
No (ref)	68/374 (18.2)	1	55/374 (14.7)	1
Yes	44/123 (35.8)	1.97 (1.46,2.64)	53/123 (43.1)	2.87 (2.07,3.96)
Risky behaviour				
No (ref)	91/439 (20.7)	1	82/439 (18.7)	1
Yes	18/51 (35.3)	1.56 (1.12,2.16)	23/51 (45.1)	2.28 (1.54,3.37)
Child BMI				
Underweight or healthy weight (ref)	88/484 (18.2)	1	87/484 (18.0)	1
Overweight	20/113 (17.7)	0.88 (0.59,1.30)	25/113 (22.1)	1.18 (0.79,1.76)
Obese	30/103 (29.1)	1.19 (0.83,1.72)	32/103 (31.1)	1.51 (1.04,2.19)
Days of physical activity (≥30 mins) per week				
0-3 (ref)	35/132 (26.5)	1	35/132 (26.5)	1
4-7	70/355 (19.7)	0.87 (0.63,1.19)	72/355 (20.3)	0.73 (0.51,1.04)
Ever had recurring infection				
No (ref)	88/473 (18.6)	1	86/473 (18.2)	1
Yes	61/297 (20.5)	1.04 (0.77,1.41)	67/297 (22.6)	1.18 (0.88,1.58)
Servings of vegetables per day				
0-1 (ref)	72/341 (21.1)	1	75/341 (22.0)	1
≥2	75/428 (17.5)	0.89 (0.66,1.21)	77/428 (18.0)	0.88 (0.66,1.17)
Parent chronic illness				
No (ref)	86/539 (16.0)	1	85/539 (15.8)	1
Yes	69/248 (27.8)	1.42 (1.03,1.95)	83/248 (33.5)	2.00 (1.49,2.69)
Parent functional limitations				
No (ref)	109/632 (17.2)	1	112/632 (17.7)	1
Yes	45/128 (35.2)	1.61 (1.16,2.24)	49/128 (38.3)	1.86 (1.34,2.59)
Parent mental health service use				
No (ref)	83/494 (16.8)	1	90/494 (18.2)	1
Yes	77/294 (26.2)	1.38 (1.01,1.88)	79/294 (26.9)	1.33 (0.98,1.81)
Parent psychological distress				
No (ref)	112/596 (18.8)	1	112/596 (18.8)	1
Yes	43/155 (27.7)	1.49 (1.07,2.06)	46/155 (29.7)	1.45 (1.04,2.01)

*Prevalence ratios adjusted for ACCHS, sex and age, as appropriate health–related medicines: PR: 1.36, 95% CI = [0.97, 1.90] to PR: 1.37, 95% CI = [0.98, 1.92]; paediatrician services: PR: 1.42, 95% CI = [1.07, 1.88] to PR: 1.32, 95% CI = [0.99, 1.77]). For the mental health service outcome, the adjusted PRs for parent chronic illness and parent mental health service use no longer achieved statistical significance when using the imputed data (PR: 1.42, 95% CI = [1.03, 1.95] to PR: 1.37, 95% CI = [0.99, 1.90]; PR: 1.38, 95% CI = [1.01, 1.88] to PR: 1.36, 95% CI = [0.996, 1.87], respectively). See Supplemental File E for the full table of PRs.

When the participants were restricted to those who had at least one service or claim in both the first and last years of the study period ($n = 707$), the results were also mostly consistent with our primary analyses. The adjusted PRs for parent chronic illness for the mental health–related service claims outcome, and for parent psychological distress for the mental health–related medicine claims outcome, no longer achieved statistical significance (PR: 1.42, 95% CI = [1.03, 1.95] to PR: 1.37, 95% CI = [0.99, 1.90]; PR: 1.45, 95% CI = [1.04, 2.01] to PR: 1.37, 95% CI = [0.98, 1.92], respectively). See Supplemental File F for the full table of PRs.

Discussion

In this cohort of urban Aboriginal young people, the majority of participants did not access mental health services or medications over a 5-year period. Almost one in five claimed a government-subsidised mental health–related service, a similar proportion claimed a government-subsidised mental health–related medicine and around one quarter accessed a paediatrician service at least once between July 2012 and June 2017. Mental health–related GP consults were the most common type of claim for mental health–related services, followed by psychologist and psychiatrist services. Mental health–related allied health services were rarely claimed. Psychostimulant agents for ADHD (and clonidine) were the most common type of mental health–related medicine claimed during the study period, followed by antidepressants, antipsychotics and anxiolytics, hypnotics and sedatives. The child and parent characteristics associated with mental health–related service and medicine use, and paediatrician service use, were similar for all three outcomes, with children more likely to have mental health service/paediatrician/medicine use if they had high risk of emotional or behavioural difficulties, parent-reported risky behaviour or parents with poorer physical and mental health. Children's BMI, physical activity, recurring infections, vegetable intake and parent's qualifications were not associated with mental health–related service, medicine or paediatrician service use in this cohort.

Using MBS data, the AIHW reports that the proportion of all Australian 0- to 14-year-olds who used any publicly funded mental health–related service in 2016–2017 was 5.1% and the proportion of 15- to 24-year-olds was 12.6% (Australian Institute of Health and Welfare (AIHW), 2019a). During the same timeframe, the proportion of Aboriginal young people in our study was similar, with 6.5% of 0- to 14-year-olds and 12.2% of 15- to 24-year-olds claiming any mental health–related service use. AIHW PBS data from 2016 to 2017 (subsidised or co-payment prescriptions) show that while the proportion of 15- to 24-year-olds in this study who made at least one claim for a mental health–related medicine was similar to national averages from the same age range (11.9% and 10.3%, respectively), the proportion of younger children (0–14 years old) accessing mental health–related medicines in this Aboriginal cohort (13.3%) was higher than national-level data from the same age range (2.4%) (Australian Institute of Health and Welfare (AIHW), 2019b). This difference may reflect a lack of psychological supports or access to specialist treatment for Aboriginal children in our cohort and warrants further investigation. Aligning with previous research involving a national audit of 379 paediatricians in Australia in 2008 and 2013, agents used to treat ADHD were the class of medicines dispensed most frequently to Aboriginal young people in this study for their mental health (Efron et al., 2017).

The relationships between children's emotional and behavioural problems and poorer parent mental health and mental health service use found in this study are also consistent with previous research with Aboriginal children. The Western Australian Aboriginal Child Health Survey (WAACHS) reported that children who were at high risk of emotional or behavioural difficulties or who had a parent who had used a mental health service were significantly more likely to use a mental health service (Zubrick et al., 2005). Similar child- and parent-level risk factors were also associated with mental health–related ED presentations and hospitalisations from 1476 young people enrolled in SEARCH over a median 6-year follow-up (Williamson et al., 2018). Our study shows that in our cohort of Aboriginal young people, not only are these child and parent characteristics associated with mental health service use but also that they are associated with both mental health–related medicine and paediatrician use.

It is estimated that around half of all adult mental health issues emerge before early adolescence (Kessler et al., 2007). In Australia, the need to improve mental health through more early intervention and prevention supports has been recognised at the national level (National Mental Health Commission [NMHC], 2021). Given the association between child social and emotional difficulties and parent chronic illness and/or mental health problems noted in the current cohort, prioritising Aboriginal children experiencing these challenges for screening for early identification of mental health problems and, if indicated, holistic services for their families may be useful. Timely provision of required social and emotional wellbeing and other supports is particularly important for Aboriginal families who face known disparities in the social determinants of health (Marmot, 2011) and ongoing intergenerational trauma due to the history of child removal in this country (Menzies, 2019).

Nationally, there is a recognised shortage of mental health care for children, prompting a call for greater provision of easily accessible specialised mental health care for this age group (NMHC, 2021). The resultant difficulty in accessing services is likely to be particularly pronounced for Aboriginal families, who face known barriers when accessing mental health services (Kilian and Williamson, 2018; Nolan-Isles et al., 2021). Most young people in our study who used a mental health–related service accessed a mental health–related GP service, and relatively few claimed for sessions with publicly funded psychologist or psychiatrist services. Previous research with GPs who work primarily with Aboriginal communities indicates that they generally see themselves as the ‘coordinators’ of young people’s mental health treatment, rather than providers of such treatment (Kalucy et al., 2019). Moreover, there are few, if any, pathways developed specifically for Aboriginal young people to aid their access to culturally appropriate mental health care (Kilian and Williamson, 2018). The National Children’s Mental Health and Wellbeing Strategy has highlighted the importance of this, citing the need for mental health and wellbeing supports for Aboriginal families to be delivered by Aboriginal Community Controlled Organisations wherever possible (NMHC, 2021). ACCHSs are known to play a crucial role in circumventing known barriers to health service access for Aboriginal people by providing convenient, trusted and culturally appropriate healthcare within Aboriginal communities (Adams, 2009; Panaretto et al., 2014).

To our knowledge, this is the first study using linked data to assess mental health–related service and medicine use within a young urban Aboriginal cohort. The primary data collected as part of the SEARCH study provide a unique insight into child and parent characteristics that are associated with publicly funded mental health services and medicine use within an urban Aboriginal setting. A further strength of this study is that all SEARCH research is carried out in partnership with the ACCHSs that participate in SEARCH, and that Aboriginal people are key contributors to all stages of the research. There are, however, several limitations to acknowledge. Our sample included children recruited from four participating ACCHSs in urban areas and may not represent urban Aboriginal young people at the population level. Similarly, we note that the large number of children who were excluded from the analysis may constrain the ability to generalise results. In particular, the health needs of our sample may differ from those of Aboriginal children in general, and therefore, the absolute rates of service use should be regarded with caution. However, the associations between cohort characteristics and health service/medicine use are based on internal comparisons and are less affected by selection into the cohort (Mealing et al., 2010). MBS data do not record a reason for paediatrician services; thus, we were unable to discriminate between mental health–related and non-mental health–related paediatrician services. This impacted our ability to know how many of the paediatrician visits included assessment and management of mental health–related diagnoses. This study included mental health service use recorded in the MBS claim data; however, this is likely an underestimate of the true number of services/medicines used because some mental health services are not captured in the study data, including outpatient services provided by publicly funded mainstream and Aboriginal community-controlled sectors and some privately funded services such as more specialist mental health services.

Mental health accounts for the highest proportion of the disease burden experienced by young Aboriginal Australians (AIHW, 2018) and thus constitutes a priority area for health policy if the gap in health outcomes between Aboriginal and non-Aboriginal people is to be closed. In our cohort of urban Aboriginal young people, the majority did not access mental health services or medications during the 5 years from 2012 to 2017. However, Aboriginal children with emotional and behavioural problems and poorer parent mental and physical health were more likely to use mental health services or medications, and paediatrician services. Ensuring Aboriginal children who meet this client profile are identified early and have access to timely, culturally appropriate mental health care is likely to promote better mental health outcomes for Aboriginal children.

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Supplemental material

Supplemental material for this article is available online.

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