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The Physical and Mental Health of Mothers of Aboriginal Children in Out-of-Home Care in Western Australia

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ABSTRACT

There is a need to better understand the physical and mental health of mothers of Aboriginal children who enter out-of-home care to prevent removals. Evidence suggests that families involved in child protection systems often experience significant needs that may culminate in child removals. For Aboriginal families, these are compounded by the inter-generational trauma from colonisation which has resulted in health issues, poverty and family violence. This is a retrospective cohort study, using linked administrative data, involving all (17,060) mothers of Aboriginal children born in Western Australia between 2000 and 2013. The health outcomes of mothers whose child was placed in care (8%) were compared to those of mothers whose child was notified to child protection authorities (30%) or had no child protection involvement (62%). A higher proportion of mothers of children in care had mental health diagnoses, hospitalisations related to alcohol/drug issues and assault prior to child removal, compared to mothers of children never in care. Mothers of children in care experienced multiple health issues, including 27% experiencing three or more conditions within 5 years prior to child removal. There is an urgent need to provide appropriate support to these mothers, and for coordination and integration of service provision to address their needs.

1 | Introduction

There is strong national and international evidence that families involved in child protection systems often experience a myriad of devastating impacts that culminate in the apprehension of children, including mental health, substance issues, family violence, homelessness and poverty. The Family is Culture report by Davis (2019) has also described how for Aboriginal and Torres Strait Islander (hereafter Aboriginal) families the impact of inter-generational trauma from colonisation has disrupted traditional child rearing practices and has had ongoing impacts which can result in health and mental health issues, substance issues, poverty and family violence. Similarly, a report from the Australian Institute of Health and Welfare highlighted the significant impacts on socio-economic stress, homelessness, long-term health conditions, and particularly mental health related issues, experienced by Aboriginal families who were survivors from

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the Stolen Generation (Australian Institute of Health and Welfare 2021). As stated by Davis 'this trauma manifests itself in behaviours that are regularly viewed as a reason to remove children, and not restore these children once they have been removed' (Davis 2019, 21). Davis' report made a specific recommendation that child protection agencies should work with relevant agencies and service providers, including Aboriginal Community Controlled Organisations, 'to develop a plan to co-ordinate integrated service provision in early intervention support efforts for Aboriginal children and families' (Davis 2019, 44).

Australia has commenced implementation of *Safe and Supported: the National Framework for Protecting Australia's Children 2021–2031*, which is Australia's framework for preventing and reducing the number of children who experience child abuse and neglect (Commonwealth of Australia 2021). Both the Safe and Supported Framework and Australia's Closing the Gap agreement have prioritised reducing the over-representation of Aboriginal children in the child protection system and (OOHC) (Commonwealth of Australia 2020). The National Framework has identified that families with multiple and complex needs require targeted supports. The challenge of providing for the needs of these families is that different areas of government deliver health and social support services, which are typically not integrated, co-ordinated or culturally responsive (Bromfield et al. 2012; Lefebvre et al. 2024). For families with complex needs, navigating a fragmented service system results in families falling through gaps.

The child protection system is more likely to be involved with families facing challenges, including maternal health issues. The most recent Australian Institute of Health and Welfare report states that the leading causes of non-fatal burden of disease for Indigenous women are anxiety disorders, alcohol use disorders and depressive disorders (Australian Insitute of Health and Welfare 2022b). Orr, Preen, et al. (2019) have also identified that there is a high prevalence of Aboriginal mothers hospitalised for interpersonal violence during pregnancy and following birth. It has been widely reported, both in the national and international literature, that the perinatal period is associated with an increased risk of adverse health outcomes for mothers, including mental health disorders (Adane et al. 2023; Davies et al. 2016; Hafekost et al. 2017). These risks are more common in Indigenous populations as they are also impacted by many other factors such as systemic racism, trauma, poverty and domestic violence (Adane et al. 2023; Lima et al. 2019; Orr, Preen, et al. 2019; Owais et al. 2020). Other research has also suggested that children born to mothers hospitalised with an alcohol-use, mental health and/or assault diagnosis were more likely to experience child maltreatment or be placed in OOHC (Hafekost et al. 2017; O'Donnell et al. 2015; Orr, Fisher, et al. 2019; Pearson et al. 2022). These studies reported that these risks were highest if the diagnosis was during pregnancy, around birth, and if the mother was Aboriginal. The mental health of Aboriginal mothers exposed to racism has also been linked with negative impacts on parental skills (Macedo et al. 2020).

The existing literature is fragmented, investigating only individual health outcomes and not addressing the multiple, complex and interconnected health needs experienced by mothers of children placed in OOHC. To our knowledge, there is no other study investigating the physical and mental health of mothers of Aboriginal children prior to child removal. Therefore, there is a need to examine the physical and mental health of these mothers as a whole, identifying the characteristics of families needing additional supports, to inform a supportive plan for early service provision (Ayers et al. 2019; Bowen et al. 2014). Early intervention and support may reduce the number of Aboriginal children entering care and increase the number of children restored to their families. The aim of this study is therefore to identify, quantify and describe the physical and mental health of mothers of Aboriginal children who enter care, the types of health and mental health conditions, and the level of comorbidities that these mothers experience.

2 | Methods

2.1 | Study Design and Data Sources

This is a population-level retrospective cohort study including all mothers ($N=17{,}060$) of all Aboriginal children born in Western Australia (WA) between 2000 and 2013 ($N=34{,}127$). This study used WA linked longitudinal administrative data, available overall from July 1969 to June 2020, to investigate the physical and mental health of mothers of Aboriginal children who enter OOHC at least once between birth and 30 June 2020.

Linked data from the WA Department of Health and Department of Communities, Child Protection and Family Support (CPFS) were utilised. Datasets were linked by the Data Linkage Services (DLS) at the Department of Health using probabilistic matching and internationally accepted privacy preserving protocol (Holman et al. 1999). Only de-identified data was provided to researchers. The Midwives Notification System (MNS) and Birth Registry (BR) were used to link mothers with their children, as well as identify mothers' and children's demographic characteristics at birth. Aboriginal status was identified by a Derived Aboriginal and Torres Strait Islander Status Flag algorithm generated by DLS, a verified approach to identifying Aboriginal people in administrative datasets (Christensen et al. 2014). Mothers' physical and mental health conditions were identified from mothers' hospitalisations in WA public and private hospitals, retrieved from Hospital Morbidity Data Collection (HMDC, available July 1969–June 2019); and mental health inpatient (public and private) and outpatient (public only) contacts to WA hospitals and mental health clinics, captured by the Mental Health Information System (MHIS, available July 1989–June 2019). Data on children's deaths were identified using the Death Register. Children's involvement with the child protection system (maltreatment notifications, substantiations and OOHC placements) were obtained from the CPFS data (available January 2000–June 2020). In Australia, maltreatment notifications are all reports of concerns about a child's safety and wellbeing received by CPFS. As a result of an investigation, a notification might become a substantiated maltreatment notification (hereafter a 'substantiation'), if there is evidence to believe that the child has been, is being, or is likely to be

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harmed. Finally, if there are significant concerns about the safety of the child, they may be placed in OOHC (Australian Institute of Health and Welfare 2023).

Ethical approval for this project was obtained from the WA Aboriginal Human Ethics Committee (943) and the WA Department of Health Human Research Ethics Committee (RGS0000003496).

2.2 | Study Cohort

This study included 17,060 mothers of the 34,127 Aboriginal children born in WA between 2000 and 2013. Only the first live born child in the study period was chosen to enable the analysis of mother's health during the period prior to that child's child protection involvement, resulting in a study cohort of 17,060 mothers and 17,060 Aboriginal children. In cases of plural births, one child was randomly selected. It is important to note that since our earliest available child protection data was 1 January 2000, children of mothers in the study who were born before 2000 were not included.

Of the 17,060 mothers in this study, three groups were identified in relation to their child's highest level of child protection involvement. The 'no involvement' group included 10,652 (62%) mothers of children who had no contact with child protection services from childbirth to 30 June 2020; the 'involvement' group included 5035 (30%) mothers of children who had a contact (at least one child maltreatment notification and/or substantiation) but were not placed in care in the study period; and the 'care' group included 1373 (8%) mothers of children who had at least one OOHC placement by 30 June 2020. Child protection services in WA are generally provided to children until the age of 18 years; however, not all children in the study reached 18 years of age by the end of follow-up.

Almost three quarters (73%, $N=12,432$) of mothers of Aboriginal children born between 2000 and 2013 were Aboriginal mothers, and the remaining 27% were non-Aboriginal mothers. However, the 'care' and 'involvement' groups had a higher proportion of Aboriginal mothers, at 86% and 84%, respectively, compared to the 'no involvement' group, at 66% (Table 1). Note that maternal health outcomes were investigated with the aim of informing and promoting policies to provide targeted support to mothers of Aboriginal children placed in out of home care, focussing on reducing Aboriginal child removals, and addressing the over-representation of Aboriginal children in the child protection system. For this reason, all mothers of Aboriginal children were included, the vast majority of whom were Aboriginal themselves.

2.3 | Maternal Health Outcomes

Maternal health outcomes, including hospitalisations and mental health outpatient contacts, were identified if the mother had a diagnosis in the HMDC and MHIS data during the follow-up period. From the HMDS, principal and secondary diagnoses were investigated, and from MHIS only the principal diagnosis was available. Diagnoses were classified using the International Classification of Disease—Australian Modification 10th edition (ICD-AM-10). Given that only mental health conditions were identified using contacts in both MHIS and HMDC, the term hospitalisations will be used to refer to mental health hospitalisation/contacts across the study.

Several maternal health outcomes were investigated. First, 16 diagnostic groups were constructed based on the Major Diagnostic Categories defined by the AIHW (Australian Institute of Health and Welfare 2005), using hospitalisations' principal diagnosis only (Table S1). These are mutually exclusive categories identified to broadly understand mothers' health issues prior to childbirth and prior to child removal.

Additionally, 10 health outcomes were identified using principal and secondary diagnoses, grouping more specific areas of support needs (Table S2), including: alcohol and drugs; injuries and poisoning (accidents, self-harm, undetermined intent); assault; mental health conditions (organic disorder, substance-related disorder, schizophrenia, mood disorder, anxiety, intellectual disability, personality disorder, disorders of psychological development, self-harm, other) and potentially preventable hospitalisations (vaccine-preventable conditions, chronic conditions, acute conditions). These health conditions were chosen as they are associated with children's child protection involvement (Hafekost et al. 2017; O'Donnell et al. 2015; Orr, Fisher, et al. 2019; Pearson et al. 2022) and potentially preventable hospitalisations which are indicators of the effectiveness of preventative health interventions and disease management in the community (Australian Insitute of Health and Welfare 2022a).

2.4 | Time Periods

Maternal health outcomes were described during three periods including:

- 1-year prior to childbirth: one calendar year before the child's date of birth.
- 5 years prior to child removal: five calendar years before the child's date of first OOHC placement.
- 1-year prior to child removal: one calendar year before the child's date of first OOHC placement.

The 1-year period prior to childbirth was selected as pregnancy/childbirth is a period where mothers have near universal contact with the health system and understanding their needs provides a unique opportunity for early support during pregnancy and childbirth and the prevention of child removals. Five years prior to child removal into OOHC was selected as the majority of children were removed between the ages of 0–5 years and also allows an examination of prior health issues and potential co-occurring conditions over an extended period. The period 1-year prior to child removal provides more specific insights on the type and burden of maternal health outcomes prior to children's removal. To explore the timing of health contacts and potential points of early intervention, we included analysis of the 1-year period prior to childbirth and the 5-year period prior to

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TABLE 1 | Demographic characteristics of mothers of Aboriginal children between 2000 and 2013 in WA, according to their highest level of child protection involvement by 30 June 2020.

	Care group		Involvement group		No involvement group	
	N	%	*N*	%	*N*	%
N	1373		5035		10,652	
Mother's Indigenous status						
Aboriginal	1185	86.3	4209	83.6	7038	66.1
Non-Aboriginal	188	13.7	826	16.4	3614	33.9
Maternal age at childbirth						
< 20 years	527	38.4	2010	39.9	3034	28.5
20–29 years	606	44.1	2263	44.9	5327	50.0
30–39 years	222	16.2	712	14.1	2119	19.9
> 39 years	18	1.3	50	1.0	172	1.6
Marital status						
Never married	699	50.9	2105	41.8	3410	32.0
Divorced/widowed	9	0.7	26	0.5	30	0.3
Separated	22	1.6	80	1.6	111	1.0
Married/de facto	618	45.0	2741	54.4	6979	65.5
Unknown	25	1.8	83	1.6	122	1.1
Socio-economic status (2016)						
1 (high disadvantage)	739	53.8	2817	55.9	5072	47.6
2	323	23.5	1165	23.1	2598	24.4
3	140	10.2	521	10.3	1474	13.8
4	100	7.3	293	5.8	928	8.7
5 (low disadvantage)	32	2.3	81	1.6	410	3.8
Missing	39	2.8	158	3.1	170	1.6
Remoteness (2016)						
Major cities	702	51.1	2016	40.0	4642	43.6
Inner regional	69	5.0	282	5.6	710	6.7
Outer regional	181	13.2	731	14.5	1604	15.1
Remote	152	11.1	604	12.0	1553	14.6
Very remote	230	16.8	1244	24.7	1973	18.5
Missing	39	2.8	158	3.1	170	1.6

child removal in the main body of the study, and the analysis restricted to 1 year prior to removal was included in Appendix S1 (Table S4).

For the care group mothers, the 1- and 5-year periods prior to child removal were determined by the date of first child removal. To compare maternal health outcomes with children in the involvement and no involvement groups, we constructed a comparison period by assigning a dummy 'removal date' to those children who were not placed in care in the study period. The date at first OOHC placement of children in the care group was used as the dummy 'removal date'. For this, a stratified random selection matching without replacement was performed between the 1373 children in the care group and the 15,687 in the two comparison groups (involvement and no involvement groups). Children were matched by child year of birth, with the intention of keeping all children in the birth cohort in the study. Other matching factors were evaluated but would have resulted in exclusions. Matching ratios were determined by strata as the ratio of children in the comparison versus care groups, which

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enabled all children in the comparison to have a match in the care group with a ratio for each strata between 10:1 and 20:1 (average 11:1).

2.5 | Mother and Child Characteristics

Demographic characteristics including child year of birth, maternal age at childbirth and marital status of the mother were retrieved from the Midwives Notification System and Birth Registry. Mother and child Indigenous status was identified using the WA DLS Derived Indigenous Status Flag (Christensen et al. 2014). The index of socio-economic advantage/disadvantage 2016 from the Australian Bureau of Statistics (ABS) (Australian Bureau of Statistics 2023) was used to determine mothers' socio-economic status at childbirth (SES, in quintiles). ABS Remoteness Structures 2016, an indication of relative access to services, were used to define remoteness areas at childbirth (Australian Bureau of Statistics 2021). Both SES and RA indicators were constructed using Statistical Areas 1, which are the smallest geographical areas for data collection in the Australian Census. Children's child protection characteristics including number of notifications and substantiations for child abuse and neglect, type of maltreatment at first substantiation, number of OOHC placements, maternal age at child's first placement in OOHC, child age at first placement, and other placement characteristics were obtained from the CPFS datasets.

2.6 | Analysis

Maternal health outcomes were described and compared between mothers of Aboriginal children in the care, involvement, and no involvement groups. The number and proportion of mothers with any hospitalisations in the study periods, as well as the rate of mothers' hospitalisations (Table S5), were calculated for each follow-up period. Multinomial logistic regression analysis was used to test differences between groups in the likelihood of mothers being hospitalised for selected health outcomes within the periods under study, accounting for maternal age at childbirth. Relative risk ratios and *p*-values are displayed in Appendix S1 (Table S6); percentages were used to make comparisons as differences in proportions were stark. The number of mothers with at least one of these outcomes, as well as mothers with multiple health issues, were quantified. The interaction (extent of overlap) and combination (number of co-occurring issues) of health outcomes were investigated for mothers who had one or more of the four health outcomes: alcohol and drugs, assault, mental health diagnosis and potentially preventable hospitalisations. Differences in the proportion of mothers with comorbid outcomes between groups were tested using the prtest command, and analyses were performed in Stata software version 17.0 (StataCorp 2021).

3 | Results

Of the 17,060 mothers of Aboriginal children included in the study, 62% had no contact with the child protection system in the study period ('no involvement group'), 30% had at least one contact but their child was not placed in care ('involvement group') and 8% had a child placed at least once in OOHC ('care group') (Table 1). Mothers of the care and involvement groups were more likely to have their child before the age of 20 (39%), compared to 28% in the no involvement group. The proportion mothers in the most socio-economically disadvantaged groups at childbirth (quintile 1 and 2) was higher in the care (77%) and involvement (79%) groups, compared to the no involvement group (72%). Mothers of the care group were more likely to live in major cities at childbirth (51%) and less likely to be from remote and very remote areas (28%) compared to the other two groups.

3.1 | Child Protection Contact

Mothers of children in the care group were younger at children's first child protection notification compared to the involvement group, with 21% under the age of 20 years old. Their children had, on average, a higher number of notifications and were also more likely to have their first notification at a younger age compared to the involvement group children (Table S3). Almost 62% of the care group mothers had their child removed before the child was 6 years old, and 25% had their child removed before the child was 1 year old.

3.2 | Maternal Health Outcomes

In the 5 years prior to child removal, 97% of the care group mothers had at least one hospitalisation, which compares to 93% of the involvement group and 88% of the no involvement group. These percentages were lower when investigating the 1-year period prior to childbirth, at 75%, 70% and 65%, respectively (hospitalisation for child delivery were excluded. See Table S1). For both study periods and all major diagnostic categories, the proportion of mothers with hospitalisations in the care and involvement groups were higher compared to the no involvement group (Figure 1). These differences were more pronounced for hospitalisations related to 'Injury and poisoning' and 'Mental and behavioural disorders'.

3.3 | Overview of Maternal Health Outcomes—Principal Diagnosis

In the 5 years prior to removal, around 40% of the care group mothers had at least one 'Injury and poisoning' hospitalisation, which was almost double the proportion for the involvement group (23%) and over four times the no involvement group (9%). One in three (31%) mothers of the care group had at least one 'Mental and behavioural disorders' hospitalisation, compared to 14% of mothers of the involvement group and 6% of the no involvement group (Figure 1).

3.4 | Select Maternal Health Conditions—Principal and Secondary Diagnosis

In the 5 years prior to child removal, more than half of the mothers of the care group had at least one alcohol and drug-related hospitalisation (Table 2). This compares to 23% of mothers of

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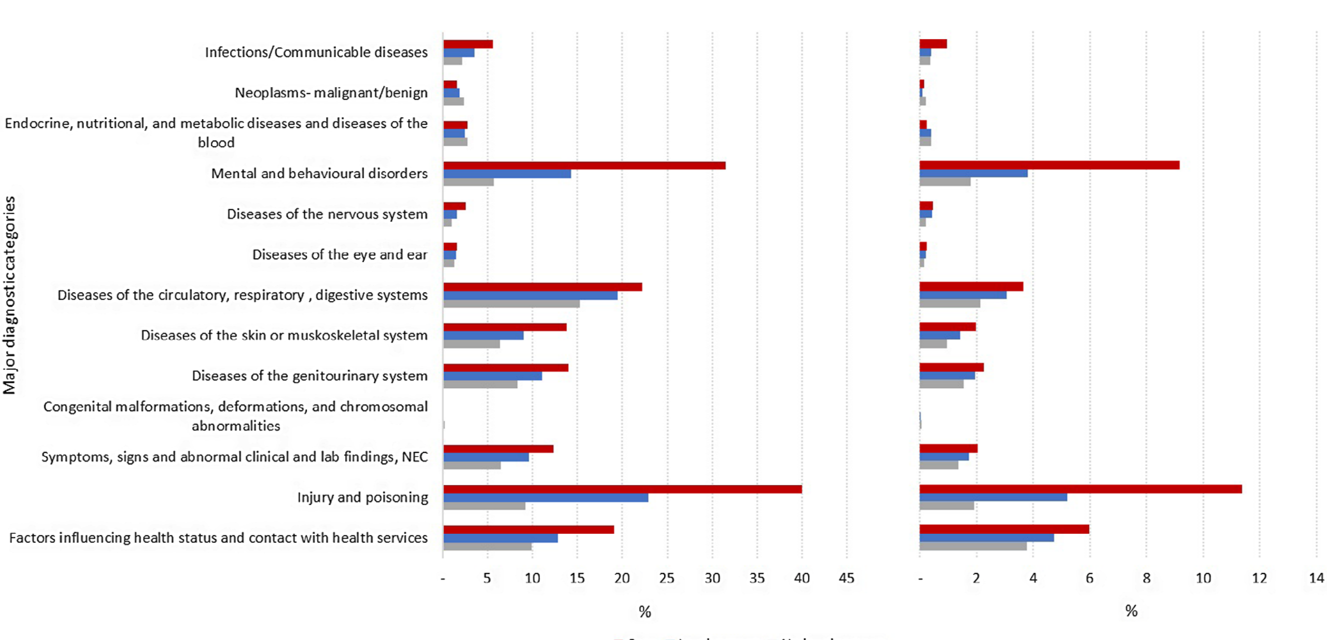

FIGURE 1 | Proportion of mothers with hospitalisations (HMDC principal diagnosis and MHIS) by major diagnostic categories within the 5 years prior to child removal and 1 year prior to childbirth. [a]X axis scales are different for the two different follow-up periods to visually show similarities in groups distribution. [b]'Pregnancy, childbirth and the puerperium' category was not displayed for visual purposes given the relative differences in the scale of pregnancy related hospitalisations.

the involvement group and 7% of mothers of the no involvement group. Similarly, 1 year prior to childbirth, the percentage of mothers with alcohol and drug hospitalisations in the care group (21%) more than double that of the involvement group (8%) and was almost 10 times that of the no involvement group (2%).

Accidents were the most prevalent injury and poisoning-related hospitalisations for mothers in all groups. In the 5 years prior to removal, 19% of mothers of the care group had at least one accident-related hospitalisation, which was higher than both comparison groups. One third of mothers of the care group had at least one assault hospitalisation 5 years prior to child removal, more than double the proportion found for mothers of the involvement group (14%) and almost eight times the no involvement group (4%).

Two-thirds of mothers of the care group had a hospitalisation/contact with mental health services at least once in the 5 years prior to child removal, with 53% having a diagnosed mental health condition. In the involvement group, 36% of mothers had hospitalisations related to mental health services, with 26% having a diagnosis. For those with no child protection involvement, 16% of mothers had mental health-related hospitalisations and 10% had a diagnosis.

A substance-related disorder was the most common mental health diagnosis for all groups within both study periods, but with significant differences in prevalence (Figure 2). Two in five (41%) mothers of the care group had at least one substance-related diagnosis in the 5 years prior to child removal, compared to one in six (17%) mothers of the involvement group and 6% of the no involvement group. Anxiety and schizophrenia were diagnosed in 20% and 18% of mothers of the care group within the 5 years prior to child removal, respectively (compared to 8% with schizophrenia and 8% with anxiety for mothers of the involvement group) (Figure 2).

One in four mothers of the care group had at least one potentially preventable hospitalisation in the last 5 years prior to child removal (26%), compared to 17% and 10% of mothers in the involvement and no involvement groups, respectively. The most common potentially preventable hospitalisations for all three groups were acute conditions which included cellulitis, urinary tract infections, convulsions and epilepsy and ear, nose and throat infections.

3.5 | Mothers With Multiple Health Conditions

Alcohol and drugs, mental health, assault and potentially preventable hospitalisations were analysed to determine their co-occurrence. In the 5 years prior to child removal, three-quarters (74%) of the care group's mothers had at least one of these outcomes, compared to 43% of mothers of the involvement group and 21% of the no involvement group (Table 3). One year prior to birth, these proportions were much lower, at 35%, 17% and < 8% of mothers of the care, involvement and no involvement groups, respectively.

In the 5 years prior to child removal, one in five mothers of both the care and involvement groups had only one of these health outcomes; however, for mothers of the care group, the highest

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TABLE 2 | Number and percentage of mothers who had selected maternal health hospitalisations (HMDC and MHIS) by child protection group (care, involvement and no involvement groups) and analysis period (5 years prior to child removal and 1 year prior to childbirth).

	5 years prior to child removal						1 year prior to childbirth					
	Care		Involvement		No involvement		Care		Involvement		No involvement	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%
Alcohol and drugs related	724	52.7*	1162	23.1*	783	7.4	295	21.5*	417	8.3*	257	2.4
Alcohol related	441	32.1	667	13.2	438	4.1	135	9.8	173	3.4	105	1.0
Drug related	495	36.1	697	13.8	471	4.4	215	15.7	281	5.6	180	1.7
Injury and poisoning	363	26.4*	788	15.7*	762	7.2	86	6.3*	162	3.2*	166	1.6
Accident	266	19.4	620	12.3	640	6.0	61	4.4	123	2.4	140	1.3
Self-harm	120	8.7	199	4.0	137	1.3	23	1.7	37	0.7	22	0.2
Undetermined intent	26	1.9	41	0.8	28	0.3	< 5	0.4	8	0.2	7	0.1
Assault	423	30.8*	722	14.3*	418	3.9	144	10.5*	201	4.0*	124	1.2
Mental health service contact with diagnosis	727	52.9*	1300	25.8*	1088	10.2	309	22.5*	484	9.6*	415	3.9
Organic disorder	9	0.7	14	0.3	10	0.1	< 5	0.4	< 5	0.1	< 5	0.0
Substance-related disorder	565	41.2	833	16.5	528	5.0	203	14.8	257	5.1	157	1.5
Schizophrenia	247	18.0	425	8.4	353	3.3	93	6.8	158	3.1	148	1.4
Mood disorder	151	11.0	259	5.1	220	2.1	48	3.5	93	1.8	95	0.9
Anxiety	272	19.8	417	8.3	380	3.6	78	5.7	132	2.6	154	1.4
Intellectual disability (ID)	7	0.5	6	0.1	< 5	0.0	7	0.5	< 5	0.1	< 5	0.0
Personality disorder	76	5.5	75	1.5	49	0.5	29	2.1	17	0.3	13	0.1
Disorders of psychological development	18	1.3	17	0.3	12	0.1	6	0.4	7	0.1	< 5	0.1
Self-harm	120	8.7	199	4.0	137	1.3	23	1.7	37	0.7	22	0.2
Other	35	2.5	61	1.2	67	0.6	6	0.4	19	0.4	17	0.2
Mental health services contact with no diagnosis[a]	196	14.3*	490	9.7*	643	6.0	86	6.3*	181	3.6*	263	2.5
Any mental health service contact	923	67.2*	1790	35.6*	1731	16.3	395	28.8*	665	13.2*	678	6.4
Potentially preventable hospitalisations	358	26.1*	854	17.0*	1060	10.0	69	5.1*	172	3.4*	206	1.9
Vaccine-preventable conditions	25	1.8	63	1.3	81	0.8	8	0.6	19	0.4	20	0.2

(Continues)

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TABLE 2 | (Continued)

	5 years prior to child removal						1 year prior to childbirth					
	Care		Involvement		No involvement		Care		Involvement		No involvement	
	N	**%**	***N***	**%**	***N***	**%**	***N***	**%**	***N***	**%**	***N***	**%**
Chronic conditions	54	3.9	158	3.1	219	2.1	11	0.8	27	0.5	58	0.5
Acute conditions	313	22.8	702	13.9	835	7.8	52	3.8	127	2.5	132	1.2

Note: Mothers can have more than one health outcome, so they may be counted in more than one category.
[a]Mothers with mental health contact with no diagnosis had contact with mental health services but did not have a mental health diagnosis during the study period.
*$p < 0.05$ on the comparison between care versus involvement/no involvement and involvement versus no involvement. Results of multinomial logistic regression analysis are displayed in Table S6.

proportion was for those with two health outcomes (26%). The discrepancy is most pronounced for the care group mothers, with one in two mothers (54%) having two or more conditions, compared to the involvement group at 23% and the no involvement group at 7%.

For both study periods and for any number of co-occurring health outcomes, the percentage of mothers in the care and involvement groups was higher than in the no involvement group. These relative differences increased as the number of co-occurring health outcomes increased, particularly when comparing the care and no involvement groups.

Figure 3 details, for mothers of the care group only, the co-occurrence between the four health outcomes for the two periods under study. Across both study periods, the most prevalent co-occurrence was mental health together with alcohol and drug hospitalisations. In the 5 years prior to child removal, 18% of mothers of the care group had at least one mental health diagnosis and one alcohol and drug-related hospitalisation, and 11% had a mental health diagnosis, an alcohol and drug-related hospitalisation, and an assault-related hospitalisation. Of all mothers of the care group, 8% had all four health outcomes in the 5 years prior to child removal.

4 | Discussion

This research describes the physical and mental health conditions of mothers of Aboriginal children born between 2000 and 2013 in WA. Eight percent were mothers of children who were placed in OOHC between birth and 30 June 2020, of which a quarter of these children were placed in care for the first time as infants, and this is consistent with O'Donnell et al. (2019) highlighting that infants are the age group being removed at the highest rate. Mothers who have an Aboriginal child removed were found to have a high level of health service contact: 97% of mothers had health service contact in the 5 years prior to removal and 75% the year prior to childbirth. Findings from systematic reviews in England, Canada and Australia indicate that mothers, and particularly Indigenous mothers, are at increased risk of mental health and substance use issues in the perinatal period (Adane et al. 2023; Howard and Khalifeh 2020; Owais et al. 2020). In line with this, our study found that a high proportion of mothers had mental health diagnoses or hospitalisations related to alcohol and drug issues, as well as injury or poisoning, assault and potentially preventable hospitalisations, in the periods of 1-year prior to childbirth and 5 years prior to child removal. In addition, our study identified that mothers experienced high levels of multiple health conditions, with over half of mothers experiencing two or more conditions within 5 years prior to child removal, as well as close to one in five in the year prior to childbirth.

4.1 | High Level of Contact With Health Services and Hospitalisation

The majority of mothers of children who were removed had a mental health diagnosis (53%) and/or alcohol and drug issues (53%), and 31% had an assault-related hospitalisation in the 5 years prior to child removal. These diagnoses were up to 2 times more common in mothers of the care group compared to the involvement group and between 5 and 8 times more common than the no involvement group. These findings are similar to those in Orr, Fisher, et al. (2019) who also found maternal mental health, substance use and assault hospitalisations were strongly associated with a higher risk of subsequent maltreatment notifications for Aboriginal children.

Given that a quarter of the mothers had their child removed before the child's first birthday, the findings of maternal hospitalisations during the perinatal period (1 year before childbirth) are important as this is a potentially critical time for targeted support and intervention with most women having health contact during pregnancy. Other studies have investigated maternal health outcomes in the perinatal period (Hafekost et al. 2017; Lima et al. 2019; Owais et al. 2020); however, their research did not include the entire population or did not focus on children's level of child protection involvement. Our study found that during this period mothers whose children were placed in care had more than double the proportion of alcohol and drug, assault and mental health diagnoses compared to mothers of children with involvement only, and this was over five to ten times the proportion of those with no involvement with child protection. Overall, one in five mothers of children removed into OOHC had alcohol and drug or mental health hospitalisation.

4.2 | High Proportion of Mothers With Multiple and Complex Needs

This study highlighted the complexity of health conditions experienced by mothers, where 74% of mothers who had their

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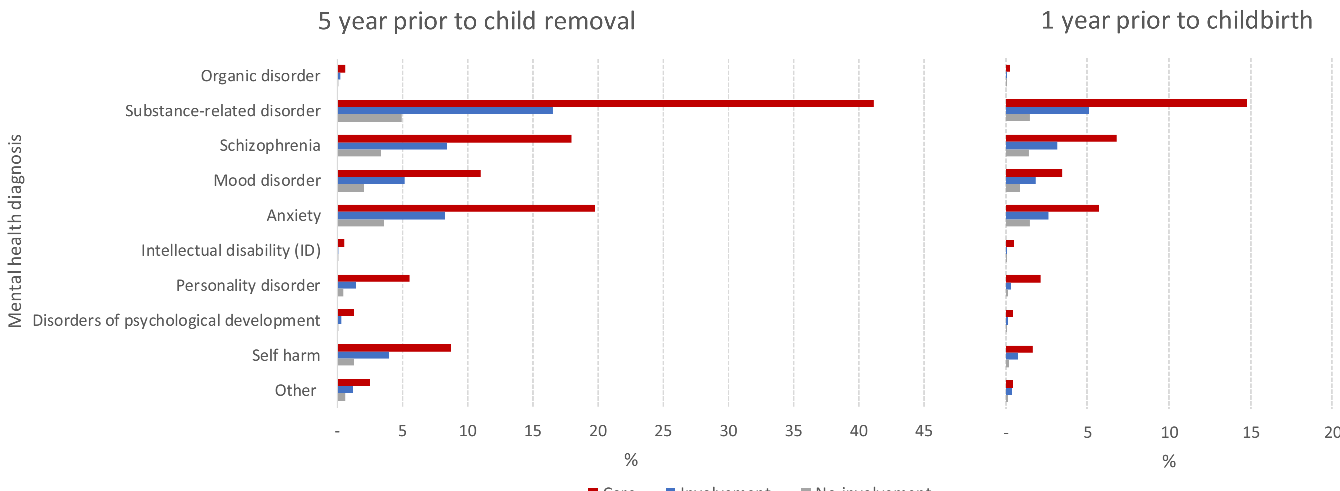

FIGURE 2 | Proportion of mothers who had mental health-related diagnosis within the 5 years prior to child removal and 1 year prior to childbirth. [a]X axis scales are different for the two different follow-up periods to visually show similarities in groups distribution. [b]All percentages of mothers with a mental health diagnosis are displayed in Table 2.

TABLE 3 | Number of co-occurring health conditions—alcohol and drugs, mental health, assault and potentially preventable hospitalisations.

Number of health outcomes	Care		Involvement		No involvement	
	N	%	*N*	%	*N*	%
5 years prior to child removal						
At least 1	1010	73.6**	2188	43.5*	2231	20.9
0	363	26.4**	2847	56.5*	8421	79.1
1	274	20.0*	1027	20.4*	1445	13.6
2	360	26.2**	599	11.9*	505	4.7
3	266	19.4**	435	8.6*	230	2.2
4	110	8.0**	127	2.5*	51	0.5
1 year prior to childbirth						
At least 1	481	35.0**	859	17.1*	< 800	< 8.0
0	892	65.0**	4176	82.9*	9882	92.8
1	228	16.6**	534	10.6*	577	5.4
2	181	13.2**	243	4.8*	155	1.5
3	61	4.4**	74	1.5*	37	0.3
4	11	0.8**	8	0.2*	< 5	0.0

*$p < 0.05$ on test of proportions against no involvement groups only.
**$p < 0.05$ on test of proportions against no involvement and involvement groups.

child removed had one or more health conditions recorded in hospitalisations or mental health contacts. Over one quarter of mothers of children in the care group had two health outcomes, almost one fifth had three, and 8% experienced four conditions in the 5 years prior to child removal. Mothers of children in the care group had double the proportion of co-occurring conditions relative to the mothers of children with and without involvement, across both the 5 years prior to child removal and 1 year prior to childbirth. Within the 5 years prior to child removal, 18% of mothers of the care group experienced hospitalisation for alcohol and drug use, and a mental health diagnosis, followed by 11% of mothers in the care group who experienced hospitalisation for alcohol and drugs, assault and mental health diagnoses. This demonstrates that mothers of children removed experience multiple and complex health conditions which require a more comprehensive response by service providers to address needs and support mothers. Our findings provide further evidence of the complex and multidimensional adversities these families are facing, which is in line with national and international studies highlighting the varied and multifaceted needs families involved with Child Protection Systems are experiencing (Bromfield et al. 2012; Hood et al. 2021; Lefebvre et al. 2024). Addressing these needs becomes even more urgent when taking into consideration the profound impacts of child removals on these mothers' health, mental health, employment and social life in general (Broadhurst and Mason 2020; Wall-Wieler et al. 2017; Newton 2020). The immediate psychological crisis following child removals, as described by Broadhurst and Mason (2020), compounds with the multiple and complex issues these mothers were already facing prior to removal. For Aboriginal families, these effects should also be understood in the context of past colonisation policies of discrimination, systemic racism and forced child removals (Davis 2019). Lefebvre et al. (2024) suggested that these families require more targeted and/or differential response models, other than a child protection approach, which assist them to overcome adversities.

4.3 | Policy and Practice Implications—Importance of Coordination and Integration of Service Provision to Support Mothers

This study provides evidence of the high level of health needs of mothers whose children are subsequently removed into care. There is an urgent need to provide appropriate supports for mothers of Aboriginal children with physical and mental health conditions if the government is to achieve its Closing

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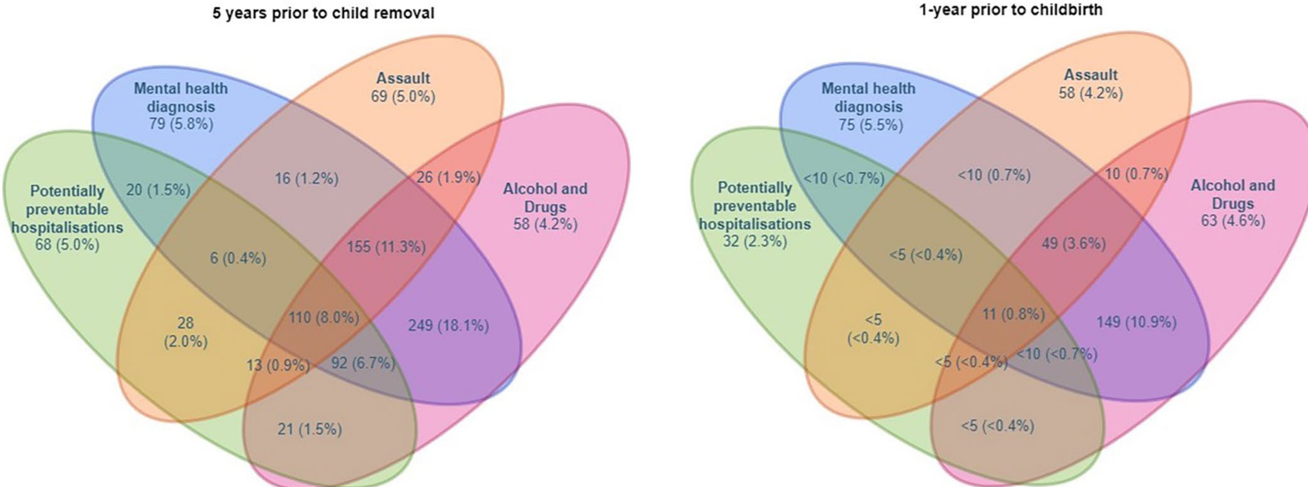

FIGURE 3 | Co-occurrence between alcohol and drugs, mental health, assault and potentially preventable hospitalisations for mothers of the care group within 5 years prior to child removal and 1 year prior to childbirth. Low count under 5 (< 5) was suppressed for confidentiality issues.

the Gap target of reducing the rate of over-representation of Aboriginal children in OOHC by 45% by 2030 (Australian Government 2020). This study also highlights that many children will be removed prior to their first birthday with our study finding that one in five of these mothers will have had a mental health and/or alcohol or drug hospitalisation during the perinatal period. The removal in the first year of life is considered a major contributor to the rising numbers of Aboriginal children in care (Chamberlain et al. 2022). As outlined in Chamberlain et al.'s (2022) paper on 'Supporting Aboriginal and Torres Strait Islander Families to Stay Together from the Start' principles and practices can be implemented from the Family Matters Building Blocks and Aboriginal and Torres Strait Islander Child Placement Principle to re-focus on prevention, participation and partnership. The perinatal period provides a unique opportunity where culturally safe multidisciplinary support services can be offered to support mothers and prevent removals of children into care. The 'western' model of maternity services can be culturally inappropriate and contribute to poorer outcomes for Aboriginal families (Kildea et al. 2019). Gatwiri et al. (2021) have also concluded that increasing cultural safety, racial dignity, and respect for and inclusion of Indigenous knowledge systems within mainstream health will have a positive outcome as well as greater equality of access across regional and remote areas.

The high prevalence of multiple health conditions identified highlights the need for coordination and integration of service provision to support mothers to address their needs (Bromfield et al. 2012). The development of a plan to co-ordinate and integrate service provision for Aboriginal children and families with a focus on targeted support at an early stage of health care services should be prioritised. However, navigating the healthcare system can be challenging and supporting mothers to access culturally safe services and supports matched to their needs is essential. Ensuring the appropriate resourcing of Aboriginal Community Controlled Organisations for early intervention programmes and support of mothers' wholistic needs is essential.

Another potential opportunity is the utilisation of Indigenous Patient Navigators for mothers of Aboriginal children to access services and supports to address the complexity of needs (Rankin et al. 2022). Indigenous Patient Navigators have been utilised in a range of healthcare settings internationally and in Australia (Bernardes et al. 2017; Rankin et al. 2022). While further evaluation evidence of Indigenous Patient Navigators is still required, the child protection and health system are also piloting Navigators for children in care.

4.4 | Strengths and Limitations

This is one of the first studies to quantify the level of multiple and complex needs that mothers of Aboriginal children are experiencing, according to their level of child protection contact. Linked deidentified health and child protection data allow for population-level longitudinal understanding of maternal health outcomes for Aboriginal children who have been placed in care with comparison to those who had child protection involvement, but never placed in care, and no involvement. This study, however, is limited by the data only capturing formal OOHC placements; however, children in this study may have had informal care arrangements prior to their formal involvement with the child protection system. The data utilised in this study represents only the higher end of service involvement, such as hospitalisation; therefore, it does not capture health conditions which have not resulted in diagnoses or were identified in community health practices only. The utilisation of data from other health services, such as general practice and Aboriginal community-controlled services, will provide a more comprehensive picture of health and mental health needs. Additionally, this study was focused on a broad range of health outcomes and their co-occurrence. It is recommended that future studies investigate each of these issues and their interrelationship in greater detail utilising mixed methods. A further limitation was that the child protection data used in the study included the data available at the time of data extraction. However, as we focused on the first

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time a child was removed and a large proportion of removals occur early in a child's life, the data likely contains most first removals.

5 | Conclusion

This study provides evidence of the high burden of health and mental health needs of mothers whose children are subsequently removed into care compared to those mothers with other child protection involvement and no involvement. It also highlights that mothers experience high levels of multiple health conditions, including 26% of these mothers experiencing two conditions, and 27% experiencing three or more conditions, within 5 years prior to child removal. If the government is to achieve its Closing the Gap target of reducing the rate of overrepresentation of Aboriginal and Torres Strait Islander children in OOHC by 45% by 2030, then there is an urgent need to provide and resource culturally safe appropriate support to mothers of Aboriginal children so that mothers' health and mental health needs can be addressed.

Author Contributions

Fernando Lima: conceptualization, investigation, writing – original draft, methodology, visualization, writing – review and editing, software, formal analysis, data curation, validation, project administration. **Melissa O'Donnell:** conceptualization, investigation, writing – original draft, methodology, writing – review and editing, supervision, visualization, project administration. **Alison J. Gibberd:** conceptualization, writing – review and editing. **Kathleen Falster:** conceptualization, methodology, writing – review and editing. **Emily Banks:** conceptualization, methodology, writing – review and editing. **Jocelyn Jones:** conceptualization, writing – review and editing. **Robyn Williams:** conceptualization, writing – review and editing. **Francine Eades:** conceptualization, writing – review and editing. **Benjamin Harrap:** conceptualization, writing – review and editing. **Richard Chenhall:** conceptualization, writing – review and editing. **Olivia Octoman:** conceptualization, investigation, writing – original draft, writing – review and editing. **Sandra Eades:** conceptualization, writing – review and editing, supervision.

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Conflicts of Interest

The authors declare no conflicts of interest.

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