Factors Associated with Extended Length of Stay for Paediatric Mental Health Presentations to Emergency Departments in South Western Sydney, Australia

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Article

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Abstract: Background: Evidence suggests that children and young people (CYP) who present to the emergency department (ED) for mental health (MH) difficulties may have extended lengths of stay (LOS); however, there is a paucity of research in Australia regarding the factors associated with extended LOS. This study aimed to determine the factors associated with extended LOS for paediatric MH-related presentations to the EDs in South Western Sydney (SWS), a multicultural community in Australia. Methods: We analysed electronic medical records (eMR) of 7,409 MH-related ED encounters of CYP aged 0 up to 18 years from all six public hospitals in SWS from January 2016 to April 2022. Extended LOS was defined as encounters of more than 4 hours. We assessed factors associated with extended LOS using a multilevel logistic regression model, accounting for hospital-level clustering. Results: Approximately 57.6% of all ED presentations for paediatric MH involved extended LOS. ED presentations by adolescents (adjusted odds ratio (AOR) 2.23, 95% CI 1.20-4.17 for 12-14 years and AOR 2.69, 95% CI 1.44-5.00 for 15-17 years), and patients with a preferred language other than English (AOR 1.47, 95% CI 1.15-1.89) had increased odds of extended LOS compared to their counterparts. Deliberate self-harm related presentations, the most commonly presented MH condition, had higher odds of extended LOS than other MH-related presentations (AOR 1.77, 95% CI 1.59-1.98). Patients with MH presentations that required urgent evaluation (triage levels 1-2) had higher odds of extended LOS (AOR 1.38, 95% CI 1.15-1.65) compared to triage level 3, whereas those with triage levels 4-5 had lower odds (AOR 0.66, 95% CI 0.58-0.74). Further, patients with MH-related presentations that came by ambulance (compared to other mode of presentations) and presentations that happened at night and late at night (compared to early morning and daytime presentations). The odds of extended LOS were considerably lower during the COVID-19 period compared to the pre-COVID-19 period (AOR 0.74, 95% CI 0.67-0.82). Additionally, extended paediatric LOS for MH issues in the ED showed notable hospital-level heterogeneity. Conclusion: A large proportion of extended LOS in ED and sociodemographic disparities reflect inequality in access to paediatric MH care. Our findings highlight the need for equitable distribution of resources directed towards at-risk CYP to improve MH outcomes and reduce health system burden.

Keywords: extended length of stay; emergency department; mental health

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1. Introduction

Overcrowding in emergency department (ED) is a global issue reaching crisis proportions particularly since the COVID-19 pandemic; it is a growing concern, resulting in both health and economic burden to patients and the health care system, respectively [1,2]. International evidence suggests that overcrowding in ED results in extended length of stay (LOS) at the ED, which in turn leads to adverse health outcomes, increased morbidity and mortality, and poor satisfaction among patients [3–6]. At the health system level, ED overcrowding is also associated with poor quality of care [7], dissatisfaction and burnout among health care staff [2], and overall higher treatment costs [8]. Therefore, decreasing ED crowding by decreasing the ED LOS has a significant potential to not only improve health outcomes at the patient-level but also decrease the economic and resource burden at the health system level.

The Emergency Target Performance (formerly known as National Emergency Access Target (NEAT)) in Australia classifies a LOS of more than 4 hours in the ED as extended [9,10]. Several studies have reported that CYP who present to the ED with MH-related needs are likely to have an extended LOS [11–13]. For example, a study of CYP aged 7 to 17 years who presented to the Royal Children's Hospital (RCH) in Melbourne, Australia, between January and December 2018, found that about 38.6% of MH-related presentations had extended LOS [14]. Further, the recent COVID-19 pandemic has significantly challenged the health systems in terms of increased demand for ED services [15], where our study showed a 16% increase in mental health (MH)-related ED presentations among children and young people (CYP) during the COVID-19 period (March 2020 onwards) [16]. However, there is a scarcity of evidence on paediatric ED LOS for MH presentations following the recent COVID-19 pandemic.

Several factors, including sociodemographic, clinical, and hospital-related characteristics, are linked to extended LOS in ED. Previous studies in Australia have shown that factors such as patient age, mode of arrival, triage category, and reason for ED presentations were significantly associated with extended ED LOS [17,18]. However, these studies include all age groups including the elderly population, hence may have missed specific factors associated with extended LOS in ED among the paediatric population – a key focus of this study. Consequently, children and adolescent patients with MH problems may be vulnerable to negative consequences resulting from extended LOS in ED. These may include disruptive behaviours such as aggression towards self or others, requiring intervention by clinical or security staff [19], greater rates of re-presentations to ED as well as adverse health outcomes [20]. Therefore, it is necessary to empirically identify factors associated with extended LOS in ED to mitigate such consequences.

Research into MH-related ED use and LOS among Australia's culturally and linguistically diverse (CALD) populations, is limited in general. South Western Sydney (SWS) is a Local Health District (LHD) in NSW, which is home to a substantial number of CALD residents compared to the rest of NSW (43% of the SWS residents are born overseas compared to the NSW state average of 34%). Social disadvantage (e.g., lower levels of educational attainment and income) is also notably high in this region compared to other parts of NSW [21], with a recent report featuring three suburbs in SWS in the list of top 10 communities severely impacted by COVID-19 for children experiencing family employment stress [22]. However, there is a dearth of research that attempts to ascertain the interplay between ED LOS and the sociocultural factors among CYP particularly in multicultural communities.

To address the above knowledge gaps, this study aimed to determine the impact of sociodemographic, sociocultural, treatment, hospital factors and the COVID-19 on extended LOS for paediatric MH presentations to ED.

2. Materials and Methods

2.1. Data source

We used the electronic medical records (eMR) to conduct a retrospective analysis of de-deidentified records of paediatric MH-related ED presentations (ED arrival time) between 1st January 2016 and 31st March 2022 among six public hospitals located in South Western Sydney Local Health

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District (SWSLHD). The eMR data was securely accessed from the novel CEDRIC platform (Comprehensive Emergency Dataset for Research, Innovation, and Collaboration) which draws data (including demographic information, ED and inpatient wards clinical and operational records for patient flow tracking, pathology, and radiology reports) from the Cerner PowerChart EMR system, and links all datapoints together to give a prospective, continually growing database of detailed patient journeys [23]. CEDRIC is built from 'Big Data' tools, using open-source software in a lightweight microservices-based architecture, and is planned to ingest data every 15 minutes. Currently CEDRIC comprises data on 14 million ED patient presentations, and is housed in a high-performance server in the LHD Data Centre, with plans to move to a hybrid infrastructure leveraging a Self-Managed Cloud.

2.2. Cohort selection

ED encounters of CYP aged 0 to 18 years (at arrival) who presented for a MH problem in the six SWSLHD Public hospitals during the 6-year period were included in this study. The presence of a principal diagnosis (ED discharge diagnosis) of a mental health condition using International Classification of Diseases, 10th Division, Australian Modification (ICD-10-AM) codes was used to categorise presentations as MH-related presentations. In the ED database, presenting problems were defined based on the Systematized Nomenclature of Medicine-Clinical Terms Australian Extension codes (SNOMED CT-AU), and we converted these codes into ICD-10-AM codes using the snoMAP-Starter AU [24]. A list of the ICD-10-AM codes used to categorise patients with mental health disorders is shown in Table 1.

Table 1. ICD-10 codes to define mental health conditions among children and adolescent.

All mental health conditions	F code and all other codes specified here: E24.4, G31.2, G40.5, G62.1, G72.0, G72.1, I42.6 K29.2, K70, K85.2, K85.3, K86.0, O35.4, Y47, Y49, Z50.2, Z50.3, Z71.4, Z71.5, Z86.4, F55 G24.0, Z72.2, R78.1-R78.5, Y87.0, Z91.5, X60-X84, Y87.2, Y10-Y34, Z86.5, Z09.3, Z50.4, Z91.4, R45.81.

Due to the Cerner EMR system's limitation in terms of possible ambiguous encounter information (e.g., different clinical staff would triage the same patient during the same presentation (unique encounter identity number) but may not give enough information in the system for the data manager to identify which is the correct status of the patient), we excluded any duplicated presentations when extracting data from CEDRIC.

We excluded ED encounters with missing data on sex, postcode, preferred language, country of birth, ED LOS, and any presentations by patients who left at their own risk to ensure completeness of data using a conservative approach. Since ED presentations, and not individuals, were analysed, multiple encounters by the same individual may have been included. After applying exclusion criteria, the total number of ED encounters for MH conditions was reduced from 8,135 to 7,409.

2.3. Outcome variable

The primary outcome variable of interest was extended ED LOS (i.e., difference between time of arrival and time of departure) that was greater than four hours as per the Australia's National Emergency Access Target (NEAT) [9].

2.4. Predictors

Age at ED presentation (in years), gender (male, female), preferred language (English, non-English), country of birth (Australian-born, Overseas-born), Australasian triage level (1 - immediate, 2 – emergency, within 10 minutes, 3 – urgent, within 30 minutes, 4 - semi-urgent, within 60 minutes, 5 - non-urgent, within 120 minutes) [25], indigenous status (yes, no), deliberate self-harm (DSH) (yes, no), day of arrival (weekday, weekend), time of arrival (00.00 - 07.59, 08.00 - 17.59, and 18.00 - 23.59),

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ambulance arrival (yes, no), residential area (i.e., postcode), socioeconomic status (SES), expressed using the Australian Bureau of Statistics Census 2016 Index of Relative Socioeconomic Disadvantage (IRSD)) operationalised as quartile-based categorical variables (least advantaged, second least advantaged, second most advantaged, most advantaged), and COVID-19 period (pre-COVID-19 i.e., January 2016 to February 2020, COVID-19 i.e., March 2020 to March 2022). In this study, triage categories 1 and 2 were grouped into one class, while categories 4 and 5 were grouped into one class (due to the low number of records in these categories) to indicate the severity of the condition, resulting in three triage classes (1-2, 3, 4-5). The SES index summarises a variety of socioeconomic factors (such as education, employment status, and income) of individuals and households within defined spatial units [26].

2.5. Statistical analysis

We utilised descriptive statistics to make comparisons between the various groups of predictors and their respective rates of extended ED LOS. Following this, we utilised a multilevel logistic regression model to investigate the association between extended LOS and predictors, adjusting for hospital level clustering. As presentations were clustered within hospitals, hospital-level clustering was explored to evaluate hospital level variability. All models were investigated at the ED presentation level, and R version 3.6.3 was utilised to perform statistical analyses.

3. Results

3.1. Descriptive findings

We analysed data from 7,409 mental health-related ED encounters to six public hospitals during the study period. The median LOS for mental health ED presentation was 4.65 hours (IQR 5.41), which exceeded the suggested recommended threshold of 4 hours. Among these presentations, 57.6% had extended LOS (>4 hours) (**Table 2**). The median LOS for MH-related ED presentations with an extended LOS was about 2.6 times that of presentations without an extended LOS (7.48 hours vs. 2.83 hours). The highest share of all MH presentations was made up of females (62.9%) and adolescents (aged 12 to 17 years, 58.5%). The proportion of CYP from minority populations were non-Australian births (9.5%) and non-English speaking backgrounds (4.9%), as well as being indigenous (Aboriginal and/or Torres Strait Islander; 13.8%). Additionally, one in two (51.6%) presentations were made by CYP from socioeconomically deprived regions (i.e., Q1 least advantaged).

Approximately 50.2% of these MH-related presentations were by ambulance, 76.8% were on weekdays, and 51.9% occurred between the hours of 08:00 and 17:59 (Table 1). The majority of presentations (66.4%) classified as triage level 3, were for potentially life-threatening conditions (i.e., need to have treatment within 30 minutes). Approximately a third (30.8%) of the MH-related presentations were for DSH and 37.6% of all presentations were within the COVID-19 period. Campbelltown and Liverpool hospitals accounted for over three fourths of all presentations due to their larger capacity. Similar patterns in the distribution of the variables were seen among the extended and non- extended LOS MH-related ED presentations (Table 2).

Table 2. Baseline characteristics of paediatric mental health presentations by extended ED LOS

Characteristics	All presentations	Presentations without extended LOS (≤4 hours)	Presentations with extended LOS (>4 hours)
	n=7,409	n=3,142	n=4,267
LOS (hours, median (IQR))	4.65 (5.4)	2.83 (1.36)	7.48 (8.02)
Age at ED presentation (years)	n (%)	n (%)	n (%)
0-4	57 (0.77%)	42 (1.34%)	15 (0.35%)

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5-8	165 (2.23%)	103 (3.28%)	62 (1.45%)
9-11	509 (6.87%)	280 (8.91%)	229 (5.37%)
12-14	2341 (31.6%)	1019 (32.4%)	1322 (31.0%)
15-17	4337 (58.5%)	1698 (54.0%)	2639 (61.8%)
Gender			
Male	2747 (37.1%)	1200 (38.2%)	1547 (36.3%)
Female	4662 (62.9%)	1942 (61.8%)	2720 (63.7%)
Country of birth			
Australian-born	6707 (90.5%)	2844 (90.5%)	3863 (90.5%)
Overseas born	702 (9.47%)	298 (9.48%)	404 (9.47%)
Preferred language			
English	7048 (95.1%)	3004 (95.6%)	4044 (94.8%)
Others	361 (4.87%)	138 (4.39%)	223 (5.23%)
Indigenous status			
No	6390 (86.2%)	2754 (87.7%)	3636 (85.2%)
Yes	1019 (13.8%)	388 (12.3%)	631 (14.8%)
Ambulance arrival			
Yes	3722 (50.2%)	1381 (44.0%)	2341 (54.9%)
No	3687 (49.8%)	1761 (56.0%)	1926 (45.1%)
Day of arrival			
Weekday	5690 (76.8%)	2378 (75.7%)	3312 (77.6%)
Weekend	1719 (23.2%)	764 (24.3%)	955 (22.4%)
Time of arrival			
0-7.59	930 (12.6%)	254 (8.08%)	676 (15.8%)
8-17.59	3847 (51.9%)	1799 (57.3%)	2048 (48.0%)
18-23.59	2632 (35.5%)	1089 (34.7%)	1543 (36.2%)
Triage category			
Levels 1-2	640 (8.64%)	223 (7.10%)	417 (9.77%)
Level 3	4920 (66.4%)	1952 (62.1%)	2968 (69.6%)
Levels 4-5	1849 (25.0%)	967 (30.8%)	882 (20.7%)
Deliberate self-harm			
No	5126 (69.2%)	2438 (77.6%)	2687 (63.0%)
Yes	2283 (30.8%)	703 (22.4%)	1580 (37.0%)
Area socio-economic status			

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Q1: Least advantaged (1-25)	3823 (51.6%)	1575 (50.1%)	2248 (52.7%)
Q2: 2nd least advantaged (26-50)	925 (12.5%)	351 (11.2%)	574 (13.5%)
Q3: 2nd most advantaged (51-75)	1162 (15.7%)	574 (18.3%)	588 (13.8%)
Q4: most advantaged (76-100)	1499 (20.2%)	642 (20.4%)	857 (20.1%)
Covid period			
Pre-COVID	4621 (62.4%)	1877 (59.7%)	2744 (64.3%)
COVID	2788 (37.6%)	1265 (40.3%)	1523 (35.7%)
Hospitals			
Bankstown	885 (11.9%)	378 (12.0%)	507 (11.9%)
Bowral	588 (7.94%)	445 (14.2%)	143 (3.35%)
Camden	66 (0.89%)	50 (1.59%)	16 (0.37%)
Campbelltown	3408 (46.0%)	1202 (38.3%)	2206 (51.7%)
Fairfield	200 (2.70%)	148 (4.71%)	52 (1.22%)
Liverpool	2262 (30.5%)	919 (29.2%)	1343 (31.5%)

3.2. Findings of the multilevel logistic regression model

Table 3 summarises significant factors associated with extended LOS for paediatric MH ED presentations. Adolescents aged 12-17 years had significantly higher odds of having an extended LOS than children aged 0-4 years (adjusted odds ratio (AOR) 2.23, 95% CI 1.20-4.17 for 12-14 years and AOR 2.69, 95% CI 1.44-5.00 for 15-17 years). ED presentations by CYP whose preferred language was other than English had higher odds of extended LOS than those whose preferred language was English (AOR 1.47, 95% CI 1.15-1.89).

Table 3. Factors associated with extended LOS in ED for mental health related conditions

Factors	**AOR**	**95% CI**		**p-value**
Age at admission (years) (reference: 0-4 years)				
5-8	1.42	0.71	2.85	
9-11	1.58	0.83	3.00	
12-14	2.23	1.2	4.17	*
15-17	2.69	1.44	5.00	**
Gender (reference: Female)				
Male	0.98	0.88	1.08	
Country of birth (reference: Australian-born)				
Overseas born	0.95	0.79	1.13	

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Preferred language (reference: English)				
Others	1.47	1.15	1.89	**
Indigenous status (reference: No)				
Yes	1.04	0.90	1.20	
Ambulance arrival (reference: No)				
Yes	1.22	1.10	1.35	***
Day of arrival (reference: Weekday)				
Weekend	0.83	0.74	0.94	**
Time of arrival (reference: 8-17.59)				
00.00 - 07.59	2.38	2.01	2.82	***
18.00 - 23.59	1.25	1.12	1.39	***
Triage (reference: Level 3)				
Levels 1-2	1.38	1.15	1.65	***
Levels 4-5	0.66	0.58	0.74	***
Deliberate self-harm (reference: No)				
Yes	1.77	1.59	1.98	***
Area SES (reference: Q4-most advantaged)				
Least advantaged (1-25)	0.97	0.85	1.12	
2nd least advantaged (26-50)	1.06	0.89	1.27	
2nd most advantaged (51-75)	1.08	0.91	1.29	
COVID-19 period (reference: pre-COVID)				
COVID	0.74	0.67	0.82	***
$ICC_{hospital}$		0.1243		

***<0.001; **<0.01, and *<0.05; AOR: adjusted odds ratio; CI: confidence interval; ICC: intraclass correlation coefficient

Patients with MH-related presentations that came by ambulance had higher odds of having extended LOS than those that came by other means (AOR 1.22, 95% CI 1.10-1.35). The odds of an extended LOS were lower for presentations that occurred on weekends than during the weekdays (AOR 0.83, 95% CI 0.74-0.94), but the odds were higher for presentations that happened at night or late at night to early morning compared to those during the daytime (AOR 2.38, 95% CI 2.01-2.82 for 0-7.59; AOR 1.25, 95% CI 1.12-1.39 for 8-17.59). MH-related presentations needing more urgent levels of care (triage levels 1 and 2) had higher odds of extended LOS than those with triage level 3 (AOR 1.38, 95% CI 1.15-1.65), whereas those with less urgent levels of care (triage levels 4 and 5) showed lower odds (AOR 0.66, 95% CI 0.58-0.74). When compared to presentations for other MH problems,

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presentations for DSH had significantly higher odds of having an extended LOS (AOR 1.77, 95% CI 1.59-1.98). The odds of extended LOS were considerably lower during the COVID-19 period compared to the pre-COVID-19 period (AOR 0.74, 95% CI 0.67-0.82). There was significant unexplained hospital-level variation in the MH-related extended LOS for children and adolescents (intra-class correlation coefficient=12.43%).

4. Discussion

We report on factors associated with extended LOS among CYP presenting to the ED with a primary MH diagnosis in a multicultural community in Sydney, Australia. During the 6-year study period (January 2016 to April 2022), more than one in two MH-related ED encounters (57.6%) among CYP had extended LOS. Additionally, the findings of this study also suggest that the likelihood of extended LOS for MH ED presentations were higher for CYP, those from a minority population (e.g., non-English-speakers), those arriving by ambulance, those arriving during the night or late night to early morning period, needing urgent levels of care (triage levels 1 and 2), and DSH-related presentations. Additionally, we found that the odds of extended LOS were lower during the COVID-19 period compared to the pre-COVID-19 period. In addition, we found that extended ED LOS varied significantly across hospitals.

We found that about 58% of paediatric MH-related ED presentations had extended LOS (>4 hours). This proportion is substantially higher than the nationwide increase in extended LOS for all ED presentations from 29% in 2017-18 to 39% in 2021-22 [27]. However, in line with other Australian studies [28,29], children and adolescents presenting to ED with MH problems were more likely to breach the NEAT timeframe than those with physical health problems. A study by Hiscock et al [28] showed that fewer MH presentations met the NEAT target than physical health presentations (65.4% vs 82.4%). Such increase may be compounded in SWSLHD due to the insufficient systems-level resources available to meet the disproportionate increase in demand, given the large population growth in this area, particularly CYP (5.47% increase from 2016 to 2022 in 0-19-year-olds) as more young families are moving to this area due to affordability [30].

We found several sociodemographic and sociocultural factors that were important predictors of extended LOS. Age was significantly associated with extended LOS where adolescents aged 15-17 years had the longest LOS compared to their younger counterparts (0-14 years). Consistent with other studies [14,31], this may suggest that adolescents, compared to younger children, are more likely to have severe MH problems or complex psychosocial situations requiring more time for MH assessment including ascertaining further information, stabilisation, and management. In terms of minority populations, we found that CYP whose preferred language was not English, had extended LOS. This is consistent with the findings from other studies which might be explained by delays due to potential reasons of language barrier and the need for an interpreter, and in some cases, could be compounded by cultural barriers, for example, women from Middle Eastern cultures prefer to see female doctors [32,33].

Patients who were brought to the ED by ambulance appeared to have a higher risk of having an extended LOS. This trend may suggest that patients who arrived at the ED via ambulance were more severely ill, necessitating longer treatment times [12,14]. We also found that patients who arrived by ambulance were also more likely to be triaged into a higher acuity category compared to patients who arrived by any other method, which supports the severity of illness [12,14]. Patients who arrived at the ED at night or late at night were more likely to have an extended LOS. One possible explanation is that there are fewer services ((e.g., imaging, laboratory tests for diagnosis) and staff available, resulting in longer wait times. Therefore, patients who arrived late at night may have had to wait for a longer time to be assessed and admitted or discharged [34,35]. This study also found that weekend LOS were less likely to be extended. This may be due to the nature of MH conditions such that due to reduced access to primary care physicians on the weekend, CYP with less severe issues may be accessing the ED [36].

Many studies have reported that patients with less severe triage codes (triage categories 4 and 5) experienced longer waiting times compared to more severe cases that are usually prioritised

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[12,37]. Contrary to this, our study found that encounters that were triaged to urgent evaluation (Triage 1 and 2) had extended LOS, perhaps needing more assessment and treatment time. Further, we found that 31% of all MH-related ED encounters were DSH-related, of which 37% had extended LOS. Such a high proportion of DSH-related ED presentations has been reported in several other studies [12,14,28,38]. It is possible that most of the DSH-related presentations would require an urgent triage code (as noted in Table S1, around 81% of DSH-related ED presentations had triage levels 1-3) (Table S1), but it may take longer to organise MH specialist assessments in the ED resulting in extended LOS. In addition, such assessments and immediate ED management may take more time due to reasons of needing both physical stabilisation based on the type of DSH (e.g., overdose needing treatment with antidotes and gastric lavage) as well as involvement of social care or child protective services, or delays related to involvement of parents or carers etc. [39,40].

Despite the significant increase in MH presentations to ED during COVID-19, we found that COVID-19 period (March 2020 – April 2022) was associated with lower odds of extended LOS. This is consistent with an US study which reported that ED LOS was shorter during the COVID-19 pandemic for both patients admitted for MH conditions (16.6 minutes shorter) and patients with MH conditions discharged from the ED (10.3 minutes shorter) compared to the pre-COVID period [41]. It could be speculated that the EDs were less busy on the whole with allocation of ED capacity prioritised for the treatment of COVID-19 cases, and patients presenting to ED with severe forms of MH problems were more likely to be transferred to MH units for assessment and/or admission rather than be managed in the ED itself, thereby these patients did not have extended LOS in the ED [41].

This study has several strengths and limitations. This study utilised a large and up-to-date administrative data from six public hospitals and identified significant sociodemographic and sociocultural risk factors associated with extended LOS in one of the most diverse and socially disadvantaged communities in Australia. This highlights the importance of enhancing the quality of paediatric mental health care by ensuring equitable and timely access. We also note several study limitations. Whilst it is anticipated that administrative data are recorded with high accuracy within the eMR, the data is dependent on the accuracy and completeness of clinician documentation. Secondly, our study demonstrates an association rather than a causative relationship between predictors and outcomes. Finally, this study did not include any hospital-level characteristics (e.g., staff numbers, paediatric beds), individual-level sociodemographic variables (e.g., education, income), or spatial accessibility (e.g., distance to hospital) [42] that may be associated with extended LOS. Future studies will need to take these into account when evaluating factors linked with extended LOS.

Implications for policy and practice

Findings of this study show a disproportionate number of CYP with extended LOS which could be one of the reasons for significant overcrowding of EDs in SWSLHD. Future interventions including community-based MH services, specialised psychiatric support for ED presentations, and re-designing the physical ED environment to assess MH patients may reduce LOS. In line with this, NSW has implemented alternate models of care for ED avoidance such as Towards Zero Suicide (TZS) [43] and the 'Safeguards' Child and Adolescent Mental Health Rapid Response Teams [44], which are currently being implemented which may help redirect the patient load from EDs. Such programs are expected to provide targeted supports and thereby EDs to be less burdened with patient volume. Additionally, increasing capacity among general practitioners (GPs) to manage social, emotional, and behavioural problems at primary care level is also critical.

5. Conclusions

More than one in two CYP presenting to EDs in SWSLHD for MH difficulties have extended LOS. This is more pronounced among older adolescents, those from a non-English speaking background, those presenting with DSH-related issues, and encounters requiring urgent evaluation. Findings of this study show that these vulnerable subgroups who are at the highest risk for extended ED encounter need to be better managed. Since poor service use experience especially during acute

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presentations such as to the ED can significantly impact the future trajectory of their engagement and service use, it is critical that such service contacts are leveraged to optimise care and outcomes. This reiterates the need to redirect resources to target improvements to not only the ED system but the entire child and adolescent mental health care system. In this regard, an Integrated Continuum of Connect and Care (I-CCC) model has been proposed that would integrate all relevant services using a tiered care pathway proportionate to the needs of the CYP and their families/carers [45]. Directions for future research include ascertaining subjective experiences via qualitative interviews of children and adolescents and their families about the ED presentations, as well their subsequent service use including provision of appropriate care pathways. This might yield relevant information about the barriers and facilitators of service use and after care that will help shape equitable services for better management of acute paediatric mental health presentations.

Supplementary Materials: The following supporting information can be downloaded at the website of this paper posted on Preprints.org. Table S1. Distribution of deliberate self-harm (DSH) related ED presentation by Triage class.

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