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Pediatric Self-Harm Injuries and Child Protection Histories

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Abstract

We assessed the child protective services (CPS) histories of children with medical encounters for self-harm (SH) using linked medical and CPS data. Most children with SH had prior CPS reports (61.0%), but few had foster care placements (5.9%). CPS histories may be important to understand, treat, and prevent pediatric SH.

Keywords

self-harm; child protection; child maltreatment; COVID-19; pandemic; injury

Children investigated by child protective services (CPS) may have increased risk for self-harm (SH), including attempted suicides and suicidal ideation.^{1,2} During the COVID-19 pandemic, pediatric medical encounters for SH injuries increased, particularly for girls.³ It is yet to be determined whether these observed pandemic-related SH injury trends were primarily driven by children already at risk for SH injuries, including those previously reported to CPS, or by children without such risks.

Previous research on the relationship between SH and prior CPS contact has primarily relied on surveys within CPS populations.^{1,2} Survey data regarding SH have noted limitations, including inconsistent measures, social desirability bias, and small samples.⁴ There is a need

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Declaration of interests

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for more reliable data regarding CPS histories among children treated for SH injuries to better understand this relationship and inform practice. The linkage of administrative data across multiple systems, particularly CPS and medical records, provides an effective means of integrating population-based information from relevant systems, generating insights that are not possible with siloed, single data sources.⁵ Recent examples using linked CPS record and medical system data include CPS reports among children testing positive for illicit drugs⁶ and those hospitalized for maltreatment-related injuries.⁷

Studies to date, however, have not estimated the population prevalence of past CPS histories among children treated for SH injuries. In this study we use a population-based source of linked CPS and medical records to: (1) assess monthly counts of pediatric SH injury encounters before and after the pandemic onset by sex and a prior CPS report; and (2) characterize children with SH injury encounters based on the nature of their prior interactions with CPS.

Methods

We used emergency department and inpatient discharge records from January 2016 to November 2021 from a large children's hospital and regional pediatric trauma center (Rady Children's Hospital-San Diego). The sample was limited to children (< 18 years) with a medical encounter associated with a ICD-10-CM diagnosis specifying SH injury (codes in eTable 1).⁸ At the child-level, we linked the medical records to statewide CPS records using personally identifiable information and probabilistic methods detailed and demonstrated to be accurate elsewhere.^{9,10}

We aggregated SH injury medical encounters by month and stratified these counts by sex and a CPS report prior to the encounter. We assessed SH count changes after the onset of COVID-19 (March 17, 2019) using quasi-Poisson interrupted time series (ITS) models reported as relative risks (RR) with 95% confidence intervals (CI). SH injury encounters were included regardless of whether it involved a child with multiple SH encounters as we were interested in encounter trends.

In addition, among children with a CPS history, we examined the nature of those CPS interactions prior to their first SH injury encounter. Specifically, we coded the following non-mutually exclusive indicators: (1) ever reported to CPS regardless of screening decision for investigation; (2) the age at first CPS report; (3) ever reported for each specific maltreatment type (sexual abuse, physical abuse, neglect, emotional abuse); (4) ever investigated by CPS; (5) ever had a maltreatment allegation substantiated (also known as a confirmed maltreatment allegation); (6) ever had a CPS case opened for services beyond an investigation; and (7) ever placed in a foster care placement (including with relatives). We tallied the count of CPS reports prior to their first SH injury encounter. We stratified these indicators by child sex and assessed for differences in the distributions with chi-square tests. We calculated the means of the prior CPS report counts and assessed for sex differences using t-tests. Analyses were performed in R version 4.4.1. A two-sided $p < .05$ was considered significant. This study was approved by university and state IRB committees.

Results

During the study window, there were 2,584 SH injury encounters involving 2,093 unique children. Overall, 81.3% of SH injuries were caused by drugs (both medicinal and illicit), slightly less than half (44%) of all SH injuries resulted in inpatient hospitalizations, and half (51.3%) were covered by public insurance. Patients of these encounters were largely female (78.7%), had an average age of 14.5 years, and notably, 64.0% had received a CPS report of alleged maltreatment prior to the SH injury encounter. There was no significant difference in prior CPS report distribution by encounter type (emergency department vs. inpatient hospitalization).

Figure 1 presents the monthly counts over time. ITS models indicated that SH injury encounter trends increased significantly post-COVID-19 onset for females overall (RR: 1.04, CI: 1.02-1.06, $p < 0.001$), and those with a maltreatment history (RR: 1.03, CI: 1.01-1.05, $p < 0.01$) as well as without (RR: 1.05, CI: 1.03-1.08, $p < 0.001$). On average, the number of monthly female SH injury encounters increased from 23.8 to 39.6. No statistically significant changes were observed for males whose average number of monthly SH injury encounters was 7.6.

I1 presents the CPS histories of the 2,093 children with SH injury encounters by sex. More than half of the children with SH encounters had prior CPS reports (61.0%) and investigations (53.9%), but no differences by sex were identified. They averaged 4.16 prior CPS reports (SD: 6.84) and more than a quarter (28.5%) had 5 or more prior CPS reports. Nearly a quarter (24.1%) of these children were first reported before age 5 years and 20.3% had a maltreatment allegation substantiated, but few ever had a CPS service case opened (8.5%) or were placed in foster care (5.9%). Neglect (45.1%) was the most common allegation type, followed by emotional abuse (37.6%), physical abuse (35.2%), and sexual abuse (27.3%). Females were more likely to ever had prior reports with allegations for emotional abuse (39.3%, $p < .05$) and sexual abuse (29.7%, $p < .001$) than males (31.6%, 18.9%, respectively). No other differences by sex were identified. Of children with SH injuries, 51.0% had a SH encounter paid for with public health insurance, and of the children who had used public insurance, 74.3% of children had a prior CPS report while 47.2% of those who had not used public insurance had a prior CPS report (not in Table).

Discussion

We used a unique linked dataset to generate estimates of the prevalence of CPS histories among children with a medical encounter for SH injury. Importantly, our findings suggest that among children presenting for a SH injury requiring medical attention, it is more likely than not that the child has been previously reported and investigated for alleged abuse or neglect.

The prevalence of CPS investigations for our sample of pediatric SH injury patients is much higher than estimated for U.S. children overall at 37.4%.¹¹ In California, specifically, estimates suggest that approximately 26.3% of children are investigated by CPS by age 18.¹² For our sample of SH patients, the number was twice that (53.9%). Our findings, however,

are consistent with other research examining the prevalence of past maltreatment allegations among children who have received a mental health diagnosis.¹³ Similarly, 20.3% of children with SH injury encounters had a prior maltreatment allegation substantiated, nearly double the cumulative percentage found in the California 1999 birth cohort (10.5%).¹² The share of children with SH injuries for whom sexual (27.3%) or physical abuse (35.2%) emerged as a past allegation (versus neglect) was high relative to what is observed among children investigated for maltreatment generally. In comparison, sexual abuse accounted for 8.6%-11.8% and physical abuse accounted for 15.7-19.3% of maltreatment allegations in California in years 2015-2021.¹⁴ These results indicate that maltreatment histories may be an important component to understand, treat, and prevent pediatric SH. Future research should explore these relationships, including the timing and allegations of prior CPS reports – and the services that follow. Furthermore, medical providers caring for pediatric patients with SH should consider questions about maltreatment during their assessments to inform treatment strategies. The high rates of prior CPS contact for children with SH injuries may be indicative of unresolved issues related with prior maltreatment and/or CPS contact.

We also found that SH injury encounters increased precipitously for girls after the COVID-19 pandemic onset, regardless of prior CPS contact. No such changes were observed for boys. Our findings are consistent with prior research regarding SH increases for girls¹ but underscore that the increased SH among girls was not isolated to girls with particular risk profiles. The COVID-19 pandemic likely exacerbated mental health symptoms broadly for girls,¹⁵ including SH injuries that required medical attention. Similar findings for adolescents (overall) regarding hospitalizations for eating disorders during the pandemic have been found, emphasizing the pandemic's impacts on pediatric mental health.¹⁶

In addition, in our study, the previously alleged maltreatment types differed by sex, with higher rates of sexual abuse (29.7%) and emotional abuse (39.3%) for females than males (18.9%, 31.6%, respectively), indicating that service and mental health needs may also vary by sex. These needs include services tailored to victims of emotional and sexual abuse presenting with SH, specifically. Given that most adolescents with SH injury encounters did not receive CPS services beyond an investigation (just 8.5%), these findings suggest, in particular, that children may still require mental health interventions even if no further CPS involvement is indicated.

Limitations of our study relate to administrative data use, including reliance on diagnostic codes and dependence on quantitative measures. It is also unknown how or if these study findings may be generalizable to other locations. Future research should examine these relationships in different communities and populations. Importantly, our understanding of what services may have been offered by other systems is limited.

In conclusion, this study found that among children with SH injury medical encounters, more than half had been reported to and investigated by CPS, but few received CPS services beyond an investigation. These histories may be important considerations for medical providers in the development of treatment plans for children with SH and an important line of inquiry for future research.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Abbreviations:

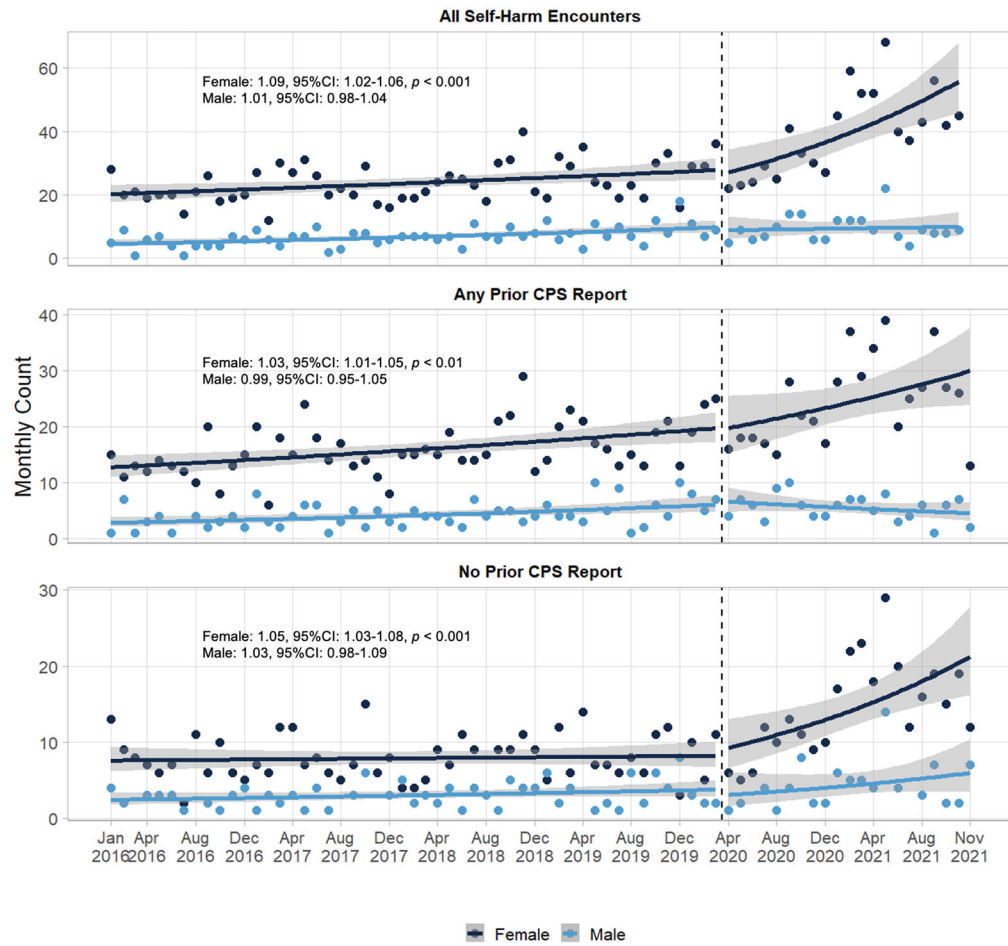
SH	self-harm
CPS	child protective services
ITS	interrupted time series
RR	relative risks
CI	confidence intervals
SD	standard deviation

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y-axis varied by plot



y-axis fixed for each plot

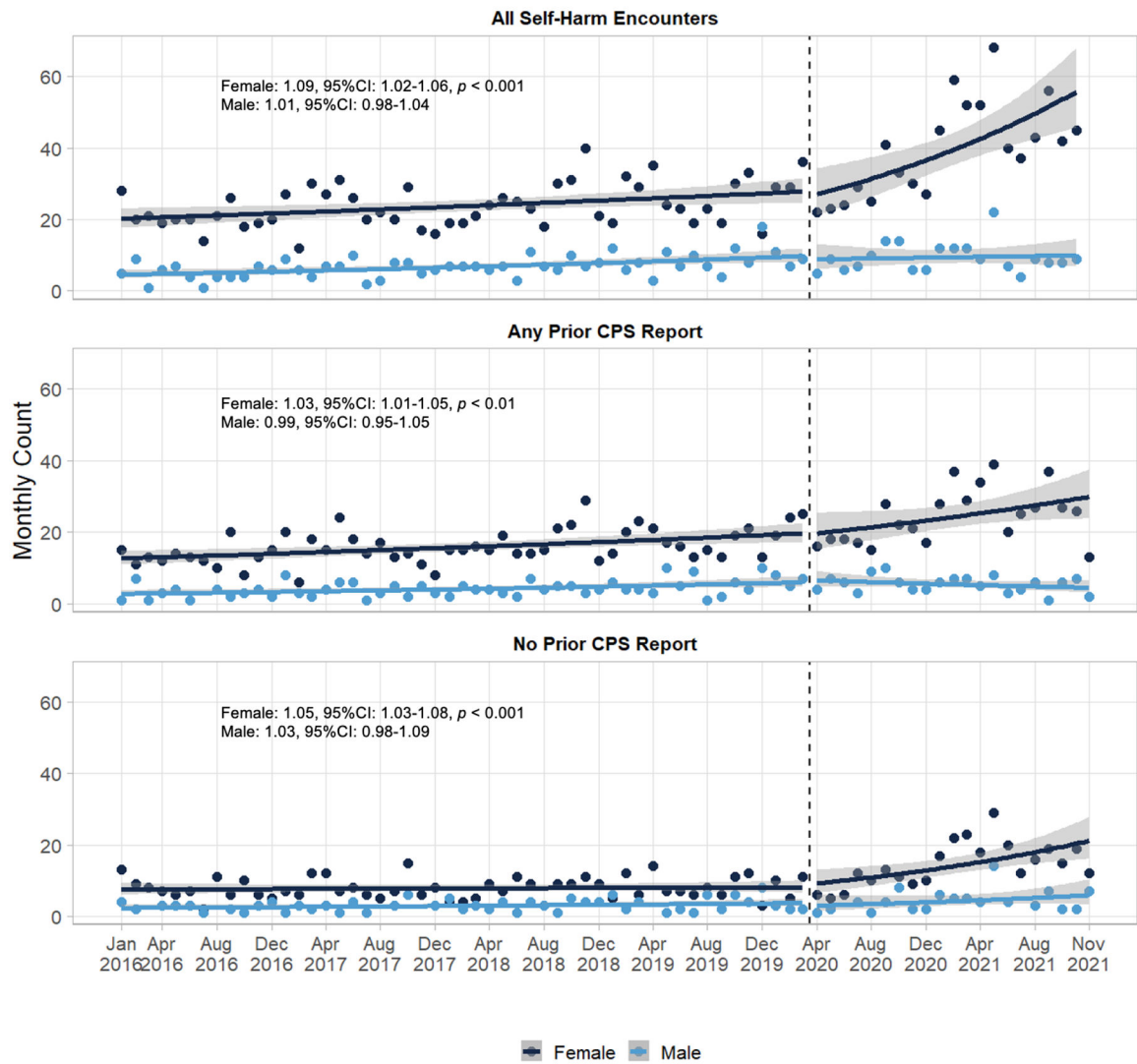


Figure 1.
 Monthly Counts of Self-Harm Injury Encounters by Sex and Child Protection Report History

Table 1.
Child Protection Histories Prior to First Self-Harm Injury Encounter by Child Sex

	Children with Self-Harm Encounters (N = 2093, [100%])	Females (n = 1615, [77.2%])	Males (n = 487, [23.3%])	P value
Ever Reported to CPS	1277 (61.0)	997 (61.7)	280 (57.5)	0.234
Ever Prior CPS Interactions ^b				
Investigation	1128 (53.9)	882 (54.6)	246 (50.5)	0.923
Substantiation	424 (20.3)	328 (20.3)	96 (19.7)	0.966
Case Open	178 (8.5)	134 (8.3)	44 (9)	0.621
Placement	123 (5.9)	89 (5.5)	34 (7)	0.241
Mean count of CPS Reports (SD) ^c	4.16 (6.84)	4.26 (6.88)	3.83 (6.72)	0.225
Count of Prior CPS Reports				
0	816 (39)	618 (38.3)	198 (40.7)	
1-2	466 (22.3)	358 (22.2)	108 (22.2)	
3-4	215 (10.3)	169 (10.5)	46 (9.4)	0.662
5-9	306 (14.6)	239 (14.8)	67 (13.8)	
10+	290 (13.9)	231 (14.3)	59 (12.1)	
Age 1st CPS Report				
Under 5 Years	505 (24.1)	396 (24.5)	109 (22.4)	
5-12 Years	527 (25.2)	411 (25.4)	116 (23.8)	0.655
13+ Years	245 (11.7)	190 (11.8)	55 (11.3)	
Ever Alleged ^a				
Sexual Abuse	571 (27.3)	479 (29.7)	92 (18.9)	<.001
Physical Abuse	736 (35.2)	566 (35.0)	170 (34.9)	0.189
Neglect	943 (45.1)	745 (46.1)	198 (40.7)	0.334
Emotional Abuse	788 (37.6)	634 (39.3)	154 (31.6)	<.05

Abbreviations: CPS, child protective services; SD, standard deviation;

^a Allegations are not mutually exclusive

^b CPS interactions are not mutually exclusive

^c T-test was used to test for differences for the mean counts of CPS reports, chi-square tests were used for all other variables.