



# BMJ Open Cohort analysis of child abuse and neglect cases treated during the initial 2 years of a programme to support hospital-based child protection work in Austria

Eva Anna Mora-Theuer <sup>1</sup>, Sophie Klomfar,<sup>1</sup> Dariga Ramazanova,<sup>2</sup> Chryssa Grylli,<sup>1</sup> Maria Kletecka-Pulker,<sup>3</sup> Sabine Völkl-Kernstock,<sup>4</sup> Gabriel Otterman <sup>5,6</sup>, Judit Simon,<sup>7</sup> Susanne Greber-Platzer<sup>1</sup>

**To cite:** Mora-Theuer EA, Klomfar S, Ramazanova D, *et al*. Cohort analysis of child abuse and neglect cases treated during the initial 2 years of a programme to support hospital-based child protection work in Austria. *BMJ Open* 2023;**13**:e071536. doi:10.1136/bmjopen-2022-071536

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2022-071536>).

Received 09 January 2023

Accepted 09 June 2023



© Author(s) (or their employer(s)) 2023. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

For numbered affiliations see end of article.

## Correspondence to

Professor Dr Susanne Greber-Platzer; [susanne.greber-platzer@meduniwien.ac.at](mailto:susanne.greber-platzer@meduniwien.ac.at)

## ABSTRACT

**Objective** To describe characteristics of suspected child abuse and neglect (CAN) cases associated with the decision of paediatric departments (PDs) in Vienna, Austria, to involve services of a regional tertiary child protection service programme (Forensische Kinder- und JugendUntersuchungsStelle, FOKUS).

**Design** Retrospective cohort analysis of a regional data collection of CAN cases over the first 2 years of FOKUS's operational period (1 July 2015–30 June 2017).

**Setting** All CAN cases reported to the PDs of six public hospitals in Vienna. Five of these public hospitals were secondary health care centres and one was a tertiary healthcare centre.

**Results** Overall, 231 cases (59.1%) were treated without and 160 (40.9%) with additional involvement of the FOKUS service programme. The odds of a case to be treated without FOKUS involvement were higher if neglect was suspected (OR 3.233, 95% CI 2.024 to 5.279). In contrast, when sexual abuse was suspected, the odds for involvement with FOKUS were significantly higher (OR 7.577, 95% CI 4.580 to 12.879). The odds of being managed with FOKUS services nearly doubled when multiple forms of abuse were suspected (OR 1.926, 95% CI 1.136 to 3.285). The odds for additional FOKUS involvement were significantly lower for patients treated as inpatients (OR 0.239, 95% CI 0.151 to 0.373). CAN patients managed with FOKUS involvement were significantly more often reported to law enforcement (LE) (OR 3.234, 95% CI 2.078 to 5.002). Concurrently, suspected sexual abuse cases and cases reported to LE were more frequently treated in the PD of the tertiary centre than in other PDs ( $\chi^2$  p<0.001).

**Conclusion** CAN case characteristics significantly influenced if PDs involved a tertiary child protection programme. Suspected sexual abuse, if more than one form of CAN was suspected and cases reported to LE required additional specialist expertise. For suspected neglect involvement of tertiary services seemed less important.

## INTRODUCTION

Child abuse and neglect (CAN) includes the emotional, physical, and/or sexual abuse

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The created uniform database facilitated retrospective data analysis of all regional public paediatric departments (PDs) in Vienna, Austria, by structuring relevant child abuse and neglect (CAN) research data from multiple sources, such as general administrative data, child protection documentation, patient records and documentation of the Forensische Kinder- und JugendUntersuchungsStelle (FOKUS).
- ⇒ The FOKUS documentation was used for cross validation to ensure the accuracy of FOKUS-involved case numbers.
- ⇒ A considerable limitation of the study was that the vast majority of CAN cases in which FOKUS was involved (n=140, 87.5%) came from the PD of the only tertiary university teaching hospital.
- ⇒ In the context of retrospective data entry, we were confronted with a great heterogeneity of data documentation, as the documentation practices in the PDs were not uniform.

and/or neglect of children under 18 years of age. It represents a major public health problem across all countries and within all cultures.<sup>1</sup> In the European region, CAN affects over 55 million children annually. Furthermore, as many as 852 avoidable deaths in children under 15 years of age per year can be attributed to CAN in Europe.<sup>2</sup> These figures are most likely underestimated due to unreported cases which health professionals fail to recognise or are reluctant to report.<sup>3</sup>

Traumatic experiences in childhood are associated with adverse health, social and economic consequences across the lifespan, including acute injuries and reactions and long-term impaired physical, emotional and social developments. The outcomes for victims include an increased risk of mental



health disorders, alcohol and drug abuse, chronic disease, delinquency, adult criminality and violent behaviour as well as early death.<sup>4 5</sup>

The economic burden in high-income countries is enormous.<sup>6</sup> In Germany, annual childhood trauma follow-up costs calculated for 2008 ranged from EUR11.1 billion to EUR29.8 billion. These costs included direct care costs (different types of educational family/parent support and foster care) and indirect costs (treatment of trauma-related disorders, educational services and productivity losses) for healthcare services, social services, educational services and losses in productivity due to low professional qualification, unemployment and occupational disability.<sup>7</sup>

Standardised procedures and specialised hospital-based multidisciplinary teams seem to be essential for the optimal detection and medical management of CAN cases.<sup>2 8–11</sup> The importance of multidisciplinary team work in targeting CAN can be demonstrated also in the context of prevention and early intervention.<sup>1 12</sup> It was shown that programmes with multidisciplinary services provided by professionally trained staff and offering additional services to home visits (eg, telephone contacts, referrals and assistance with clinical visits, social work interventions, housing assistance) were the most cost-effective.<sup>12</sup>

Hospital-based multidisciplinary child protection services (hbCPSs) have been established broadly in North America and some countries in Europe over the past several decades.<sup>13–22</sup> Multiple efforts have been made to evaluate the work of these hbCPSs.<sup>13–15 17–20 23 24</sup> International literature described multidisciplinary team approaches favourably in terms of diagnostic procedures and decision-making, leading to better patient outcomes (less unnecessary reporting to federal CPSs (fCPSs) and law enforcement (LE), and avoidance of ‘out-of-hospital investigations’ and ‘out-of-home placements’). Further benefits of multidisciplinary team approaches described are an improvement in cost efficiency and availability of better training opportunities for team members.<sup>24</sup>

Between 2005 and 2013, four publications describing the hbCPSs work in Austria reported it to be useful overall. Nevertheless, several areas in need of improvement were identified. These included the development of suitable quality monitoring tools, better diagnostic sensitivity and specificity, long-term follow-up of cases, child protection outpatient clinics at every children’s hospital and the establishment of an overarching national network. It was also recommended that a national register with uniform documentation of cases should be set up.<sup>13 23 25 26</sup>

In Austria, provisions require multidisciplinary assessment of child protection patients and reporting of suspected CAN by healthcare professionals to statutory agencies (fCPSs and LE) is mandatory. According to the law, a report to LE can only be refrained from if it is in the best interest of the child, the suspect is a close relative and a notification to fCPSs and, if necessary, the involvement of hbCPSs has taken place.<sup>27 28</sup>

National legislation introduced in 2004 requires hospitals to establish and maintain hbCPSs in accordance

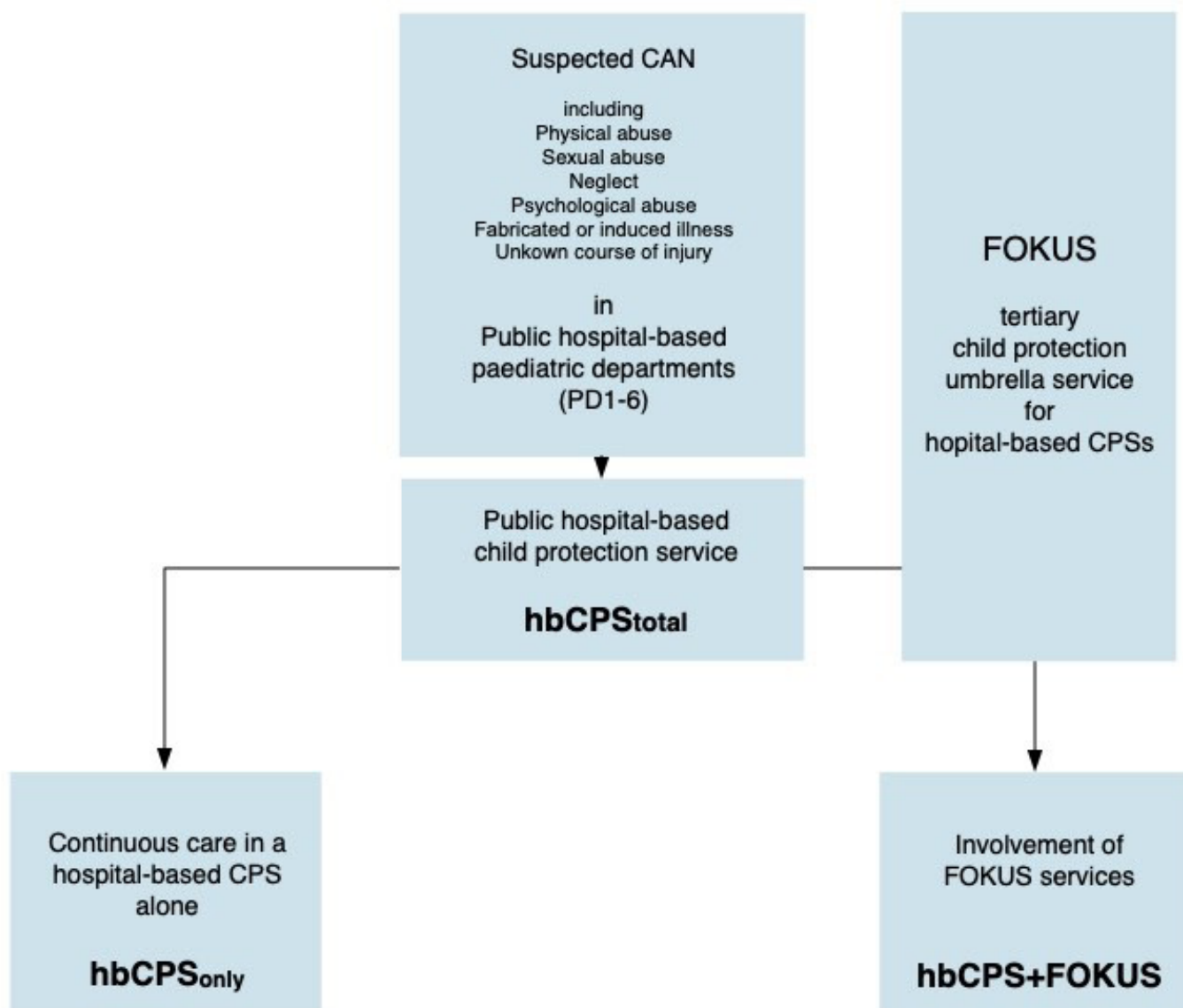
with their state of purpose and range of services. These hbCPSs are responsible for the diagnostic workup and medical management of suspected CAN cases (inpatient or outpatient) in the hospitals.<sup>27 28</sup> However, these child protection tasks have so far been delegated to the staff of general paediatric departments (PDs) in addition to the existing clinical tasks, without additional personnel and time resources being created for this work. This has resulted in rather limited time resources and insufficient training of the healthcare professionals assigned to the child protection work and subsequently led to a lack of standardised guidelines and procedures, leading to misdiagnosis, inadequate forensic evidence gathering, and inaccurate or incomplete documentation and reporting.<sup>1 19</sup> Training and capacity building for healthcare professionals as well as for professionals with specific assigned child protection responsibilities in general PDs are necessary for the continuous improvement of inter-agency management of maltreatment cases.<sup>1 11</sup>

In the city of Vienna (total population in 2017=1 877 719; children population aged 0–17 years in 2017=320 579) nine hbCPSs are established, of which six are based in PDs.<sup>29 30</sup> To date, we are not aware of any publications that provide reliable information on the numbers and characteristics of CAN cases treated in Viennese hbCPSs. Available published data in Vienna is limited to those collected by the fCPS agencies. During 2015–2017, suspected CAN cases registered with the fCPSs ranged between 13 532 (2015) and 14 621 (2017).<sup>31–33</sup>

However, knowledge of how well hbCPSs in general PDs work is of general interest. Knowing whether CAN cases are appropriately recognised and managed enables policymakers to make decisions about resource allocation in terms of professional training and change of practice. This would require continuous data-driven monitoring of the performed child protection work.<sup>34</sup> Still, relatively new established child protection programmes in Europe are working with anonymous data, which makes follow-up of cases and hence continuous data-driven monitoring impossible.<sup>35 36</sup>

In 2015, the Forensic Examination Centre for Children and Adolescents (Forensische Kinder- und JugendUntersuchungsStelle, FOKUS) was established within the framework of a bottom-up action plan with the main goal to support the work of hbCPSs. It is a service arrangement in Austria’s capital Vienna funded by the Austrian Federal Ministry for Social Affairs, Health, Care and Consumer Protection, the Vienna Health Council and the Medical University of Vienna (MUV). FOKUS is located at the Department of Paediatrics and Adolescent Medicine of the MUV. It functions as umbrella service for all regional and university hbCPSs of Vienna (figure 1).<sup>37</sup>

FOKUS represents the first highly specialised tertiary child protection programme for the forensic evaluation and documentation as well as the clinical management of suspected CAN cases in Austria. The multidisciplinary team of FOKUS consists of paediatricians, a forensic



**Figure 1** Assessment flow chart of CAN cases reported to hbCPSs of public PDs in Vienna. CAN, child abuse and neglect; FOKUS, Forensische Kinder- und JugendUntersuchungsStelle; hbCPSs, hospital-based multidisciplinary child protection services; PDs, paediatric departments.

physician, clinical psychologists and research assistants. FOKUS offers multiple services:

- ▶ FOKUS services can be requested by the hbCPSs of all Vienna-based hospitals regarding suspected CAN cases treated both as inpatients and outpatients. FOKUS services are not anonymous and therefore medical records of the CAN cases are archived at the FOKUS service facility. Depending on the individual needs of each case, the circumstances under which the CAN case has to be managed and the level of support required by the referring hbCPS, FOKUS provides:
  - Consultations on the medical and psychological evaluation and management of CAN cases: providing physical and forensic examinations, psychological examinations and support as well as the possibility of telephone consultations for professionals of all hospitals in Vienna to guide diagnostic

procedures, forensic documentation and reporting of suspected CAN.

- Specific checklists and evidence-based clinical guidelines to further support the evidence-based evaluation and appropriated management of the suspected CAN cases.
- Enhancement of collaboration with fCPSs, social services, LE and state prosecution.
- ▶ FOKUS provides lectures and training courses on medical assessment, the psychological evaluation, securing of forensic evidence and corresponding documentation, mandatory reporting laws and procedures as well as available evidence and guidelines regarding the medical and psychological evaluation and management of CAN cases for all types of professionals involved with CAN.





- FOKUS further provides a systematised data collection which is managed by the FOKUS service facility.

The aim of the current study was to assess the relevance and use of the FOKUS services by examining which characteristics of CAN cases are associated with the decision of PDs in Vienna to involve a regional tertiary CPS programme (FOKUS). In addition, we thought to identify trends of requested FOKUS services during the study period.

## METHODS

### Study design

We performed a retrospective cohort study of all suspected CAN cases reported to the six public hbCPSs of PDs in Vienna (hbCPS<sub>total</sub>) during the period July 2015 to June 2017 (first 2 years of FOKUS services). We analysed recorded administrative data, the available forensic documentation, reporting behaviour to fCPSs and LE, and whether patients were treated as inpatients or outpatients.

Two groups were compared: CAN cases managed by the hbCPSs alone (hbCPS<sub>only</sub>) versus CAN cases managed with additional involvement of the FOKUS umbrella service (hbCPS+FOKUS) (figure 1).

CAN cases were registered within the hbCPS<sub>only</sub> group if a PD referred them to the associated hbCPS and the hbCPS evaluated and managed the case without additional involvement of FOKUS services. On the other hand, CAN cases were registered within the hbCPS+FOKUS group if the associated hbCPS sought involvement of FOKUS services.

Characteristics of the suspected CAN cases such as age and gender of the child, type of suspected abuse, number of different types of alleged abuse, suspected perpetrators, involvement of fCPSs and reporting to LE as well as inpatient versus outpatient treatment were assessed.

### Data collection and management

A Research, Documentation and Analysis database (RDA) was used to create a uniform register for structured storage of relevant CAN research data. The RDA met the requirements of the Data Protection Act (DSchG 2000).<sup>38</sup>

The data of CAN cases that were referred to the PDs from July 2015 to June 2017 were retrospectively entered into the register. The relevant data were collected from the general administrative data, the available child protection documentation and patient records of the PDs as well as the documentation of FOKUS.

Multiple data cleaning and data screening steps were carried out including logical checks prior to the descriptive analysis of each variable. The study included data from CAN patients under 18 years of age reported to a hbCPS of a PD in Vienna (index patient) between 1 July 2015 and 30 June 2017. By study definition an index patient was a patient via whom a CAN case was primarily reported to a hbCPS. Data from patients who were only treated due to being siblings and/or children living in the same household of/as an index patient were excluded

from the study. The data clearing process for included CAN cases is illustrated in figure 2.

### Patient and public involvement statement

Since this was a retrospective cohort data analysis study, there was no specific patient or public involvement.

### Analysis of CAN case characteristics

We conducted a descriptive statistical analysis to describe the cohort population in total as well as to compare the two groups. Age was reported by median and IQR due to the asymmetrical distribution. Binary variables were reported by absolute and relative frequencies in the whole study population (hbCPS<sub>total</sub>) as well as in both study groups (hbCPS<sub>only</sub> and hbCPS+FOKUS). We performed a Poisson regression analysis with total number of suspected CAN cases per quarter to identify a trend over time on the probability of FOKUS involvements. Univariate logistic regression analyses for the probability of FOKUS involvement as outcome variables were performed for the metric variable age and binary variables gender, type of suspected abuse, number of different types of alleged abuse (dichotomised into one vs multiple types), involvement of fCPSs and reporting to LE as well as inpatient treatment. For the binary variables, absence of the characteristic (eg, absence of suspected type of abuse) was used as the reference group. Six patients were observed more than once as index patient of a CAN case. These cases were excluded from the logistic regression analysis to avoid bias. The  $\chi^2$  test was used to determine differences in the proportions of the different CAN case characteristics among PDs. There were no missing data, except that in two CAN cases it was unclear whether they were reported to LE.

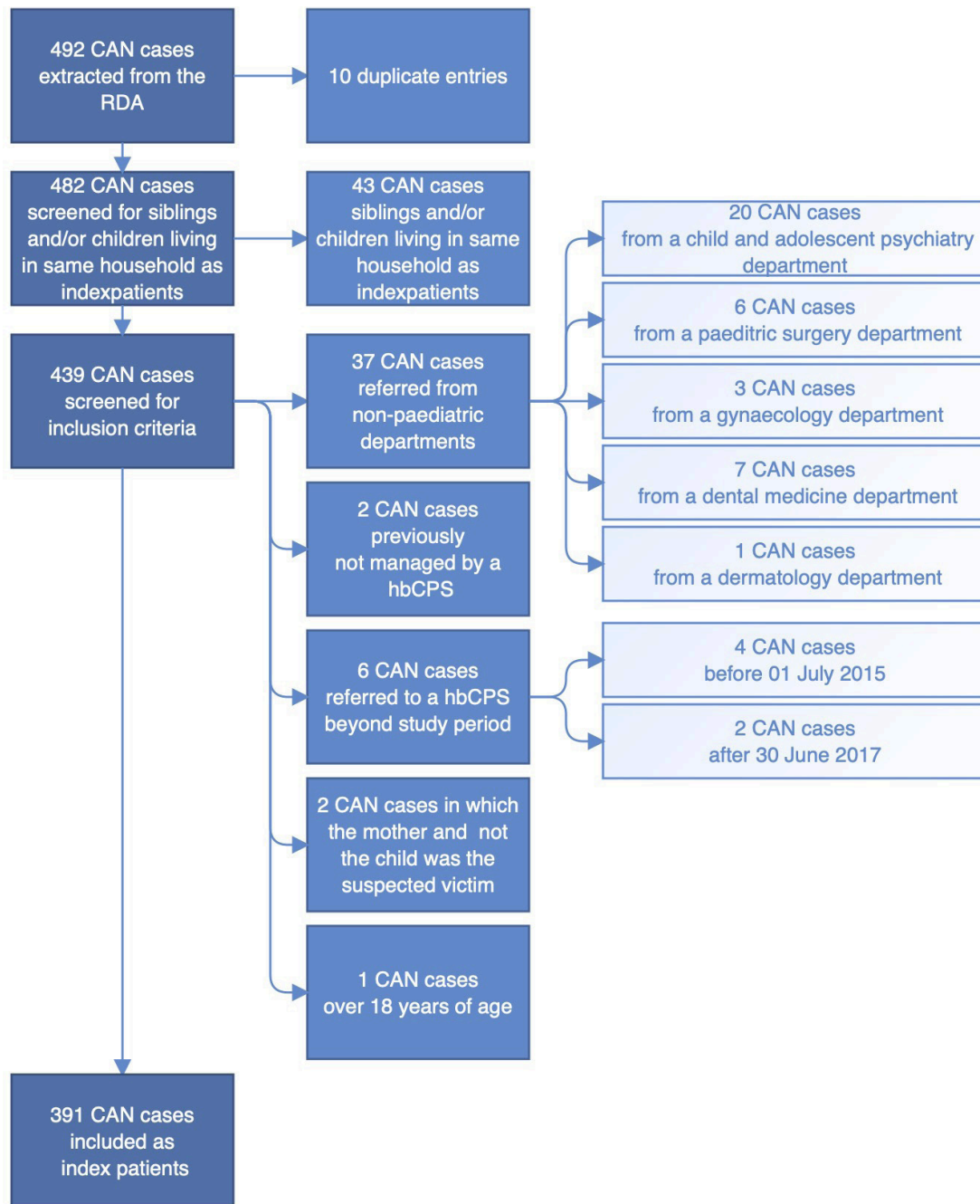
Statistical analysis was performed using IBM SPSS Statistics V.27 and R 4.1.3.

## RESULTS

For the initial analysis, 492 CAN cases were extracted from the RDA. Ten of these CAN cases were duplicate entries and therefore removed. The remaining 482 CAN cases were examined to identify siblings and/or children living in the same household as an index patient with 43 cases eventually removed. Of the remaining 439 CAN cases, 391 CAN cases met the remaining inclusion criteria and were included in the analysis (figure 2).

Two hundred and thirty-one cases (59.1%) were treated by a hbCPS alone (hbCPS<sub>only</sub>) and 160 cases (40.9%) were managed with additional involvement of FOKUS services (hbCPS+FOKUS). The proportion of cases treated by hbCPS+FOKUS increased during the study period from 31.8% to 58.7% (table 1, figure 3). Although, regression analysis could not identify a significant trend for FOKUS involvement. The total number of CAN cases remained stable throughout the study period, as did the numbers for each type of abuse (online supplemental figure 1).

Overall cohort characteristics and separate group characteristics are listed in table 2.



**Figure 2** Cohort data diagram. CAN, child abuse and neglect; hbCPS, hospital-based multidisciplinary child protection service; RDA, Research, Documentation and Analysis.

Notably, almost all cases ( $n=140$ ; 87.5%) in the hbCPS+FOKUS group came from the hbCPS of PD1 which represents the PD of the only tertiary care university teaching hospital in Vienna and functions as the hosting site of FOKUS.

Age of the index patients ranged from 0 to 17 years (median age=6.0 years, IQR 2–12) with 68 index patients (17.4%) aged under 1 year. Age distribution showed similar patterns in all study groups. FOKUS involvement was not related to age (OR 1.029, 95% CI 0.993 to 1.068). The odds for FOKUS involvement were significantly lower for patients managed as inpatients (OR 0.239, 95% CI 0.151 to 0.373).

All univariate logistic regression results are listed in table 2.

Overall, the most common forms of child abuse, neglect ( $n=99$ , 76.2%) and physical abuse ( $n=90$ , 58.4%), were predominantly treated by hbCPS<sub>only</sub>. Whereas, nearly three-quarters of sexual abuse cases were referred for hbCPS+FOKUS ( $n=79$ , 73.8%). Three hundred and ten CAN cases (79.2%) were reported to at least one statutory agency. fCPSs were involved in 295 cases (75.4%) and LE in 139 cases (35.5%). One hundred and twenty-two cases (31.2%) were reported to both agencies.

In suspected neglect, the odds to be treated by hbCPS<sub>only</sub> were significantly higher (OR 3.233, 95% CI 2.024 to

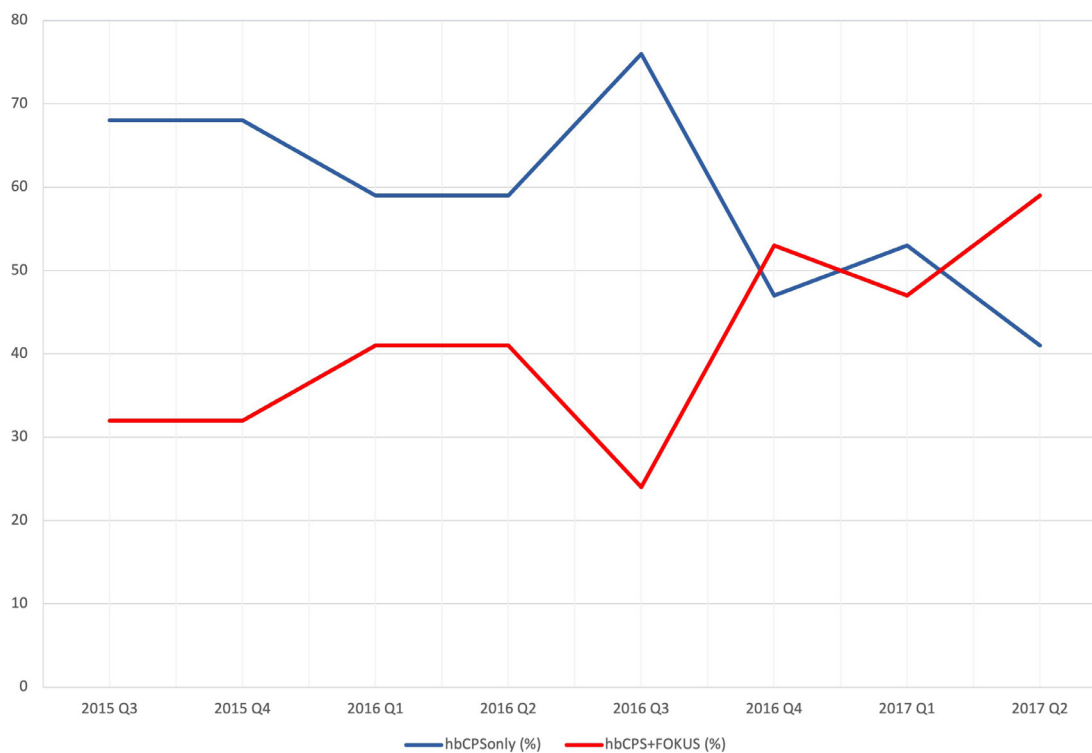
**Table 1** Absolute and percentage frequencies of suspected CAN cases treated by hbCPSs in total (hbCPS<sub>total</sub>) as well as in the two study groups (hbCPS<sub>only</sub> and hbCPS+FOKUS) over the study period (Q1: January–March, Q2: April–June, Q3: July–September, Q4: October–December)

Time period	hbCPS <sub>only</sub>		hbCPS+FOKUS		hbCPS <sub>total</sub>	
	n	%	n	%	n	%
2015						
Q3	30	68.2	14	31.8	44	100
Q4	39	68.4	18	31.6	57	100
2016						
Q1	26	59.1	18	40.9	44	100
Q2	41	59.4	28	40.6	69	100
Q3	31	75.6	10	24.4	41	100
Q4	21	46.7	24	53.3	45	100
2017						
Q1	24	53.3	21	46.7	45	100
Q2	19	41.3	27	58.7	46	100

CAN, child abuse and neglect; FOKUS, Forensische Kinder- und JugendUntersuchungsStelle; hbCPSs, hospital-based multidisciplinary child protection services.

5.279), while the odds to be treated by hbCPS+FOKUS were significantly higher in suspected sexual abuse (OR 7.577, 95% CI 4.580 to 12.879). The odds for FOKUS involvements were almost twice as high in cases with multiple forms of maltreatment suspected (OR 1.926, 95% CI 1.136 to 3.285).

No significant difference for reporting to fCPSs between the two groups was found (OR 0.717, 95% CI 0.447 to 1.150). But in a higher percentage of cases FOKUS involvement took place if the cases were reported to LE (OR 3.234, 95% CI 2.075 to 5.002).



**Figure 3** Percentage frequencies of CAN cases treated by hbCPS+FOKUS (red) versus treatment by hbCPS<sub>only</sub> (blue) over the study period per quarter (Q1: January–March, Q2: April–June, Q3: July–September, Q4: October–December). CAN, child abuse and neglect; FOKUS, Forensische Kinder- und JugendUntersuchungsStelle; hbCPS, hospital-based multidisciplinary child protection services.

**Table 2** Cohort characteristics with between group comparisons

	hbCPS <sub>total</sub>		hbCPS <sub>only</sub>		hbCPS+FOKUS		Univariate logistic regression†	
	Median	IQR	Median	IQR	Median	IQR	OR (95% CI)	p-value
Age (years)	6.00	2–12	5	1–12	8	3–12	1.029 (0.993 to 1.068)	0.119
	hbCPS <sub>total</sub>		hbCPS <sub>only</sub>		hbCPS+FOKUS		Univariate logistic regression†	
	n	%	n	%	n	%	OR (95% CI)	p-value
Sex								
Male	174	44.5	112	48.5	62	38.8	0.666 (0.438 to 1.007)	0.055
Female	217	55.5	119	51.5	98	61.3		
Inpatient treatment								
Yes	172	44.0	132	57.1	40	25.0	0.239 (0.151 to 0.373)	<0.001
Suspected CAN cases by PD								
PD 1	146	37.3	6	2.6	140	87.5		
PD 2	85	21.7	83	35.9	2	1.2		
PD 3	76	19.4	71	31.7	5	3.1		
PD 4	38	9.7	34	14.7	4	2.5		
PD 5	25	6.4	17	7.4	8	5.0		
PD 6	21	5.4	20	8.7	1	0.6		
Suspected form of maltreatment								
Physical abuse	154	39.4	90	39.0	64	40.0	1.051 (0.690 to 1.597)	0.817
Neglect	130	33.2	99	42.9	31	19.4	0.309 (0.189 to 0.494)	<0.001
Sexual abuse	107	27.4	28	12.1	79	49.4	7.577 (4.580 to 12.879)	<0.001
Unknown course of injury	59	15.1	34	14.7	25	15.6	1.061 (0.600 to 1.856)	0.837
Psychological abuse	20	5.1	13	5.6	7	4.4	0.646 (0.223 to 1.675)	0.387
Fabricated or induced illness	7	1.8	1	0.4	6	3.8	n.p.	n.p.
No. of suspected maltreatment forms								
1	320	81.8	199	86.1	121	75.6	0.5190 (0.304 to 0.880)	
> 1	71	18.2	32	13.9	39	24.4	1.926 (1.136 to 3.285)	0.015
Involvement of fCPSs								
Yes	295	75.4	180	77.9	115	71.9	0.717 (0.447 to 1.15)	0.166
No	96	24.6	51	22.1	45	28.1		
Reporting to LE								
Yes	139	35.5	57	24.7	82	51.2	3.234 (2.078 to 5.002)	<0.001
No	250	63.9	173	74.9	77	48.1		
Unknown	2	0.5	1	0.4	1	0.6		
Suspected perpetrator								
Mother	175	44.8	126	54.5	49	30.6		
Father	156	39.9	104	45.0	52	32.5		
Unclear suspicion*	66*	16.9*	32*	13.9*	34*	21.2*		
Other known person	39	10.0	12	5.2	27	16.9		
Close relative	30	7.7	14	6.1	16	10.0		
Not close relative	17	4.3	6	2.6	11	6.9		
Teacher, kindergarten or social pedagogue	16	4.1	1	0.4	15	9.4		
Unknown person	15	3.8	10	4.3	5	3.1		
Sibling	14	3.6	3	1.3	11	6.9		
Online acquaintance	5	1.3	0	0.0	5	3.1		

Continued





Table 2 Continued

	hbCPS <sub>total</sub>		hbCPS <sub>only</sub>		hbCPS+FOKUS		Univariate logistic regression†	
	n	%	n	%	n	%	OR (95% CI)	p-value
Police officer	3	0.8	0	0.0	3	1.9		
Physician	1	0.3	0	0.0	1	0.6		
One suspected perpetrator	194	49.6	122	52.8	72	45.0		
Known multiple no. of suspected perpetrators	122	31.2	75	32.5	47	29.4		
Multiple no. of suspected perpetrator, exact no. unknown	9	2.3	1	0.4	8	5.0		
No. of suspected perpetrators unknown*	66*	16.9*	33*	14.3*	33*	20.6*		

\*in 66 cases the suspicion of CAN was unclear both in regards to the suspected perpetrator and the no. of suspected perpetrators.

†the reference group is hbCPS<sub>only</sub>

CAN, child abuse and neglect; fCPSs, federal CPSs; FOKUS, Forensische Kinder- und JugendUntersuchungsStelle; hbCPS, hospital-based multidisciplinary child protection services; LE, law enforcement; n.p., not performed; PD, paediatric department.

CAN cases with suspected sexual abuse and CAN cases reported to LE were significantly more often treated by PD1 ( $\chi^2$  test for both  $p < 0.001$ ), whereas CAN cases treated as inpatients were significantly less often treated by PD1 ( $\chi^2$  test  $p < 0.001$ ) than by other PDs. In cases with suspected neglect, it could not be shown that they were less often treated by PD1 than by other PDs (online supplemental figure 2).

## DISCUSSION

The study aimed to explore the child protection work of public PDs in Vienna (PD1 to PD6) in conjunction with required involvement of FOKUS (Forensic Examination Center for Children and Adolescents), a subspecialised forensic service facility established in 2015. We, therefore, assessed characteristics of CAN cases that were associated with FOKUS involvements as well as trends in use of FOKUS services.

Involvement of FOKUS was requested in almost all CAN patients ( $n=140$ , 87.5%) treated by PD1, which represented the PD of the only tertiary care university teaching hospital in Vienna and functions as hosting institution of FOKUS. This might suggest a closer relationship between healthcare professionals from PD1 and FOKUS enhanced the involvement process for patients with suspected CAN. Previous studies showed effective information sharing between different healthcare professionals, the responsible agencies, and involvement of physicians and other healthcare professionals with expertise in child protection medicine were crucial for the ideal management of CAN patients.<sup>9–11 24 39 40</sup>

As described above, FOKUS provided the same range of services for all PDs included in this study (PD1–PD6). Still, CAN patient referred from PD2–PD6 only counted for 12.4% (percentage per PD are presented in table 2) of all CAN cases in which FOKUS services were requested. This discrepancy highlights the urge of raising awareness

for optimal management of suspected CAN patients in routine paediatric work settings. Intensification and improvement of training possibilities for healthcare professionals in child protection medicine should be promoted.<sup>41–44</sup> Stronger support through telephone counselling services is an additional option to provide more security and awareness for healthcare professionals managing suspected CAN patients.<sup>11 45</sup> This was confirmed after the implementation of the child protection hotline, ‘Kinderschutzhotline’, a 24/7 national telephone hotline supporting healthcare professionals with issues concerning child protection in Germany.<sup>45 46</sup> Evaluation of the hotline highlighted the need for continuous support of healthcare professionals in child protection work. Users rated the hotline as helpful to very helpful in 98.8%.<sup>45</sup>

Still, the German child protection hotline is still one of the forensic programmes in Europe working with anonymous data.<sup>35 36</sup> Policy-makers and stakeholders need reliable longitudinal case-based data to assess the functioning of institutional child protection work. Assembling of longitudinal data requires follow-up of cases, which can only be compiled at the institutions where patients’ data are recorded. Concerns about anonymous service facilities have been raised in relevant international literature, as absence of data-driven monitoring precludes continuous quality assessment.<sup>35 36</sup> However, quality monitoring and analysis of medical child protection work is crucial for improving services like in any other medical field.<sup>34</sup> This need is underscored by previous Austrian studies, which identified and listed several areas where hospital-based child protection work in Austria needs to be developed. Leading the areas listed was the need for an appropriate systematic quality improvement tool. Other areas included were improvement in diagnostic sensitivity and specificity, long-term case tracking, implementation of child protection outpatient clinics in every children’s hospital and



the establishment of an overarching national learning network, as well as uniform documentation and a unified register.<sup>23 25 26 47</sup> FOKUS covers most of the areas issued. As FOKUS represents a referral-based service, medical records of all CAN cases are archived and recorded in a register. This way, long-term follow-up and thus health economic evaluations on the performed procedures and on the CAN patients' well-being is made possible.

Requests for FOKUS involvement showed slight fluctuations throughout the year, with highest numbers of requests between April and June and lowest between July and September. In general, requests for involvement of FOKUS increased throughout the study period, while the total number of CAN cases remained fairly stable similarly to the distribution of the different types of abuses over the whole study period. Nevertheless, no significant trend could be shown. A follow-up study is needed that assesses the trend of FOKUS involvements over a longer period of time to determine whether FOKUS involvements are more frequent. After all, such a finding could potentially indicate that FOKUS has become better known and more accepted in the course of its operating period and consequently has received more referrals. This could further underline the need for service facilities to support medical staff of general PDs in CAN cases.

Involvement of FOKUS was more often requested for CAN cases covering sexual abuse, if multiple forms of CAN were suspected, and if suspected cases were reported to LE.

For suspected sexual abuse, accurate workup is most critical.<sup>48–50</sup> FOKUS seems to fulfil its role as tertiary service facility assisting hbCPSs in addressing sexual abuse. The number of suspected forms of maltreatment might enhance complexity of treating CAN patients. This could indicate that FOKUS is more likely to be involved in CAN cases of greater complexity or in situations that are unfamiliar to the general PD's hbCPSs. Further research and follow-up on the complexity of these CAN cases would be needed.<sup>20</sup>

Analysing reporting behaviour to statutory agencies, no difference between study groups was found for reporting to fCPSs. However, in CAN cases reported to LE, FOKUS was significantly more often involved. This result seems to be an effect of Austrian legislation described above.<sup>27</sup> CAN patients must be reported to LE as soon as the well-being of the child is in question, even if both a hbCPS and a fCPS were involved. This appears to be the case more often when FOKUS gets involved and might reflect as well the severity and complexity of CAN cases.

Notably, inpatient admission was significantly higher when CAN cases were treated by hbCPS<sub>only</sub>. This might reflect on the opportunity that inpatient treatment enables safe CAN assessment at general PDs. Another study could show that the implementation of a specialised child protection programme at a hospital led to a significant decrease in length of hospital stays for CAN patients.<sup>22</sup> If FOKUS involvement led to less and/or decreased length of inpatient hospital stays, this would

further represent a positive impact of FOKUS in health economic terms. Further analysis and a more detailed evaluation, including CAN characteristics of inpatient cases, would be needed.

There are clear differences of CAN cases characteristics among the PDs. Suspected sexual abuse cases and cases reported to LE were more frequently treated in PD1, while CAN cases treated as inpatients were less frequently treated in PD1 than in other PDs. These findings further suggest that the increased rate of FOKUS involvement in sexual abuse cases, cases reported to LE and cases that were not treated as inpatients may also be due to the fact that these cases are more often treated in the PD of the tertiary teaching hospital. However, the fact that neglect cases were not less frequently treated in PD1, does not support this assumption. More research is needed to clarify whether more complex CAN cases and cases that general PDs are not familiar with handling should ideally be transferred to a tertiary hospital for involvement of a tertiary service programme such as FOKUS.

As discussed above, the high rate of FOKUS involvement from PD1 is a limitation to consider when looking at characteristics of CAN cases in which FOKUS was involved. Another limitation of this study is the heterogeneity of data documentation based on different procedures performed by the hbCPSs of PD1 to PD6. Inthorn also mentioned that missing uniform documentation practice is a major challenge Austrian hbCPSs are facing.<sup>23</sup> Therefore, extensive data cleaning was necessary to guarantee a stable statistical analysis. In addition, we have no comparative information on long-term outcomes of the included CAN patients which could be key information for future optimised planning and funding of FOKUS services. Systematic follow-up of children who have been referred for CAN could also help to reveal the true longer-term medical and forensic complexities of these cases.

## Conclusion

It can be concluded that in suspected cases of sexual abuse, in cases in which more than one form of CAN was suspected, and in cases which were reported to LE, medical forensic evaluation and management may require additional specialist expertise. More research on the topic is needed to elaborate whether involvement of a highly specialised forensic service appears helpful to general PDs to enhance the care and management of children who may have experienced CAN. For patients for which there are concerns of neglect, involvement of forensic services seems to be regarded as less important.

## Author affiliations

<sup>1</sup>Department of Pediatrics and Adolescent Medicine, Medical University of Vienna, Vienna, Austria

<sup>2</sup>Center for Medical Data Science, Medical University of Vienna, Vienna, Austria

<sup>3</sup>Ludwig Boltzmann Institute for Digital Health and Patient Safety, Medical University of Vienna, Vienna, Austria

<sup>4</sup>Department of Child and Adolescent Psychiatry, Medical University of Vienna, Vienna, Austria



<sup>5</sup>Department of Biomedical and Clinical Sciences, Linköping University, Linköping, Sweden

<sup>6</sup>Department of Women's and Children's Health, Uppsala University, Uppsala, Sweden

<sup>7</sup>Department of Health Economics, Center for Public Health, Medical University of Vienna, Vienna, Austria

**Acknowledgements** We want to thank Georg Heinze (GH) and Christoph Krall (CK) from the Centre for Medical Data Science of the MUV for their support in preparing the statistical analysis plan. We also thank Christoph Krall for his support in revising the statistical analysis. We further would like to thank Martin Grassberger, Astrid Grundner and Daniela Thurn-Valsassina for their involvement with the realization of FOKUS and their contribution in creating the database. In addition, we would like to thank the Euro-CAN network (COST-Action-19106) for promoting international cooperation. The authors further want to acknowledge the cooperating paediatric departments, heads of departments and health care professionals for providing the CAN case data: St. Anna Children's Hospital, Centre for Paediatrics and Adolescent Medicine, Vienna, Austria: Wolfgang Holter, Andreas Havranek, Reinhard Topf, Renate Höfing. Vienna Healthcare Group, Clinic Donaustadt, Department for Pediatrics and Adolescent Medicine, Vienna, Austria: Herbert Kurz, Wolfgang Novak. Vienna Healthcare Group, Clinic Favoriten, Department for Pediatrics and Adolescent Medicine, Vienna, Austria: Günther Bernert, Katharina Kruppa. Vienna Healthcare Group, Clinic Floridsdorf, Department for Pediatrics and Adolescent Medicine, Vienna, Austria: Milen Minkov, Beatrix Sadler, Amalia Brown, Ingrid Teufel, Miriam Janauschek. Vienna Healthcare Group, Clinic Ottakring, Department for Pediatrics and Adolescent Medicine, Vienna, Austria: Thomas Frischer, Regina GraBl-Jurek.

**Contributors** EAM-T was involved with the realization of FOKUS, developed the study protocol and statistical analysis plan (SAP), was involved in the design of the data collection instrument, collected data, performed data cleaning and data analysis in cooperation with DR, drafted the initial manuscript and revised the statistical data analysis and the manuscript. SK was involved in the design of the data collection instrument, collected data, extracted data from RDA and reviewed the manuscript. DR revised and reviewed the SAP, performed statistical data analysis and reviewed the manuscript. CG reviewed and revised the manuscript. MK-P was involved with the planning and realization of FOKUS and reviewed the manuscript. SV-K was involved with the planning and realization of FOKUS and reviewed the manuscript. GO was involved with the development of study protocol and reviewed the manuscript. JS was involved in the development of the study protocol, supervised the study, revised the original manuscript and reviewed further versions. SG-P was involved with the planning and realization of FOKUS, development of study protocol and statistical analysis plan (SAP), in the design of the data collection instrument, data on case numbers of the paediatric emergency units, supervised the study, revised the original draft of the manuscript, reviewed further versions, and acts as guarantor. All authors approved the final version for submission.

**Funding** This study was funded by the Austrian Federal Ministry for Social Affairs, Health, Care and Consumer Protection (GZ: BMASK-40030/0002-IV/A/7/2017), the Vienna Health Council and the Medical University Vienna. Furthermore, a grant from the Medical-Scientific Fund of the Mayor of Vienna, City of Vienna financially supported this research (project number 15131 2016).

**Competing interests** GO: Payment for expert testimony: Uppsala University Children's Hospital; Uppsala, Sweden, bills for certain cases of expert child abuse consultation and testimony in court.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Not applicable.

**Ethics approval** The study received ethics (1253/2016) and data protection committee approvals by the MUV.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data are available on reasonable request. Data are available on reasonable request from SG-P.

**Supplemental material** This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines,

terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

#### ORCID iDs

Eva Anna Mora-Theuer <http://orcid.org/0000-0002-2620-6010>

Gabriel Otterman <http://orcid.org/0000-0003-4837-9614>

#### REFERENCES

- Dinesh Sethi YY, Parekh N, Anderson T, *et al*. *European status report on preventing child maltreatment*. Publication of the WHO Regional Office for Europe. World Health Organization Regional Office for Europe, 2018.
- Sethi DBM, Hughes K, Gilbert R, *et al*. *European report on preventing child maltreatment*. Copenhagen: WHO Regional Office for Europe, 2013.
- Lynne EG, Gifford EJ, Evans KE, *et al*. Joel B Rosch barriers to reporting child Maltreatment: do emergency medical services professionals fully understand their role as mandatory reporters *N C Med J* 2015;76:13–8.
- Felitti VJ, Anda RF, Nordenberg D, *et al*. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. *Am J Prev Med* 1998;14:245–58.
- Hughes K, Bellis MA, Hardcastle KA, *et al*. The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *Lancet Public Health* 2017;2:e356–66.
- Fang X, Brown DS, Florence CS, *et al*. The economic burden of child Maltreatment in the United States and implications for prevention. *Child Abuse Negl* 2012;36:156–65.
- Habetha S, Bleich S, Weidenhammer J, *et al*. A prevalence-based approach to societal costs occurring in consequence of child abuse and neglect. *Child Adolesc Psychiatry Ment Health* 2012;6:35.
- Tiyyagura G, Emerson B, Gaither JR, *et al*. Child protection team consultation for injuries potentially due to child abuse in community emergency departments. *Acad Emerg Med* 2021;28:70–81. 10.1111/acem.14132 Available: <https://onlinelibrary.wiley.com/doi/10.1111/acem.14132>
- Powers E, Tiyyagura G, Asnes AG, *et al*. Early involvement of the child protection team in the care of injured infants in a pediatric emergency Department. *J Emerg Med* 2019;56:592–600.
- Tiyyagura G, Leventhal JM, Auerbach M, *et al*. Improving the care of abused children presenting to community emergency departments: the evolving landscape. *Acad Pediatr* 2021;21:221–2.
- Tiyyagura G, Schaeffer P, Gawel M, *et al*. A qualitative study examining Stakeholder perspectives of a local child abuse program in community emergency departments. *Acad Pediatr* 2019;19:438–45.
- Dalziel K, Segal L. Home visiting programmes for the prevention of child Maltreatment: cost-effectiveness of 33 programmes. *Arch Dis Child* 2012;97:787–98.
- Thun-Hohenstein L. The work of child protection groups in Austria. *Wien Med Wochenschr* 2005;155:365–70.
- Kinderschutzeleitlinienbüro. *AWMF S3(+) Leitlinie Kindesmisshandlung, -missbrauch, -vernachlässigung unter Einbindung der Jugendhilfe und Pädagogik (Kinderschutzeleitlinie)*. Langfassung. 2019.
- Hochstadt NJ, Harwicke NJ. How effective is the Multidisciplinary approach? A follow-up study. *Child Abuse Negl* 1985;9:365–72.
- Teeuw AH, Sieswerda-Hoogendoorn T, Aaftink D, *et al*. Assessments carried out by a child abuse and neglect team in an Amsterdam teaching hospital led to interventions in most of the reported cases. *Acta Paediatr* 2017;106:1118–27.
- Tien I, Bauchner H, Reece RM. What is the system of care for abused and neglected children in children's institutions *Pediatrics* 2002;110:1226–31.
- Kempe CH. The last word. *Child Abuse Negl* 1985;9:155–7.
- Giardino AP, Montoya LA, Richardson AC, *et al*. Funding realities: child abuse diagnostic evaluations in the health care setting. *Child Abuse Negl* 1999;23:531–8.
- Jud A, Lips U, Landolt MA. Characteristics associated with Maltreatment types in children referred to a hospital protection team. *Eur J Pediatr* 2010;169:173–80.

- 21 Benbenishty R, Chen W. Decision making by the child protection team of a medical center. *Health Soc Work* 2003;28:284–92.
- 22 Lee ACW, Li CH, So KT. The impact of a management protocol on the outcomes of child abuse in hospitalized children in Hong Kong. *Child Abuse Negl* 2006;30:909–17.
- 23 Inthorn J, Kletecka-Pulker M. *Kinderschutzgruppen in Österreich: Verlag Österreich*. 2012.
- 24 Wallace GH, Makoroff KL, Malott HA, et al. Hospital-based Multidisciplinary teams can prevent unnecessary child abuse reports and out-of-home placements. *Child Abuse Negl* 2007;31:623–9.
- 25 Kitzelmann IA, Feurstein A, Schiemer A, et al. Vernetzungsarbeit der Kinderschutzgruppe Feldkirch in Vorarlberg, Österreich. *Monatsschr Kinderheilkd* 2007;155:40–4.
- 26 Verocai E, Kitzelmann I, Juen F, et al. Evaluation of a child protecting team by an independent cooperation partner - suggestions for an Optimized procedure. *Klin Padiatr* 2013;225:234–8.
- 27 Ärztegesetz 1998 Bgbl. I NR. 169/1998 Zuletzt Geändert Durch Bgbl. I NR. 122/2006 § 54. Verschwiegenheits-, Anzeige- und Meldepflicht.
- 28 Krankenanstalten- und Kuranstaltengesetz, Bgbl. NR. 1/1957 Zuletzt Geändert Durch Bgbl I NR. 69/2011, § 8E. Kinder- und Opferschutzgruppen.
- 29 ÖGKiM. Bundesländerstellen: Österreichische Gesellschaft Für Kinderschutz-Medizin. 2022. Available: <https://www.oegkim.at/angebot-der-gesellschaft/bundeslaenderstellen>
- 30 Statistik Austria. Bevölkerungsstand. n.d. Available: <https://www.statistik.at/statistiken/bevoelkerung-und-soziales/bevoelkerung/bevoelkerungsstand/bevoelkerung-nach-alter/geschlecht>
- 31 Wiener Kinder- und Jugendhilfe. *MAG ELF Jahresbericht 2015*. 2016.
- 32 Wiener Kinder- und Jugendhilfe. *MAG ELF Jahresbericht 2016*. 2016.
- 33 Wiener Kinder- und Jugendhilfe. *MAG ELF Jahresbericht 2017*. 2018.
- 34 Jud A, Fegert JM, Finkelhor D. On the incidence and prevalence of child Maltreatment: a research agenda. *Child Adolesc Psychiatry Ment Health* 2016;10:17.
- 35 van Rijn RR, Affourtit MJ, Karst WA, et al. Implementation of the Dutch expertise centre for child abuse: descriptive data from the first 4 years. *BMJ Open* 2019;9:e031008.
- 36 Medizinische Kinderschutzhotline. n.d. Available: <https://kinderschutzhotline.de/course/view.php?id=9>
- 37 FOKUS - Forensische Kinder- und Jugenduntersuchungsstelle. n.d. Available: <https://kinderklinik.meduniwien.ac.at/forschung/fokus>
- 38 Bundesgesetz Zum Schutz Natürlicher Personen BEI der Verarbeitung Personenbezogener Daten (Datenschutzgesetz – DSGVO) Zuletzt Geändert Durch Bgbl. I NR. 148/2021.
- 39 Lorenz DJ, Pierce MC, Kaczor K, et al. Classifying injuries in young children as abusive or accidental. Reliability and accuracy of an expert panel approach. *J Pediatr* 2018;198:144–50.
- 40 Tiyyagura G, Asnes AG, Leventhal JM. Improving child abuse recognition and management: moving forward with clinical decision support. *J Pediatr* 2023;252:11–3.
- 41 Carter YH, Bannon MJ, Limbert C, et al. Improving child protection: a systematic review of training and procedural interventions. *Arch Dis Child* 2006;91:740–3.
- 42 Flaherty EG, Sege RD, Griffith J, et al. From suspicion of physical child abuse to reporting: primary care clinician decision-making. *Pediatrics* 2008;122:611–9.
- 43 Jones R, Flaherty EG, Binns HJ, et al. Clinicians' description of factors influencing their reporting of suspected child abuse: report of the child abuse reporting experience study research group. *Pediatrics* 2008;122:259–66.
- 44 Asanuma K, Kim K, Oh J, et al. Synaptopodin regulates the actin-bundling activity of alpha-Actinin in an Isoform-specific manner. *J Clin Invest* 2005;115:1188–98.
- 45 Kinder- und Jugendschutz. Medizinische Kinderschutzhotline Wird Ausgeweitet und Verlängert Berlin, Germany: Bundesministerium Für Familie, Senioren, Frauen und Jugend. 2021. Available: <https://www.bmfsfj.de/bmfsfj/aktuelles/alle-meldungen/medizinische-kinderschutzhotline-wird-ausgeweitet-und-verlaengert-164860>
- 46 Berthold O, Frericks B, John T, et al. Abuse as a cause of childhood fractures. *Dtsch Arztebl Int* 2018;115:769–75.
- 47 Thun-Hohenstein L. Interdisciplinary child protection team work in a hospital setting. *Eur J Pediatr* 2006;165:402–7.
- 48 Finkel MA, Alexander RA. Conducting the medical history. *J Child Sex Abus* 2011;20:486–504.
- 49 Crawford-Jakubiak JE, Alderman EM, Leventhal JM, et al. Care of the adolescent after an acute sexual assault. *Pediatrics* 2017;139.
- 50 Adams JA, Kellogg ND, Farst KJ, et al. Updated guidelines for the medical assessment and care of children who may have been sexually abused. *J Pediatr Adolesc Gynecol* 2016;29:81–7.