

The “neglected” relationship between child maltreatment and oral health? an international scoping review of research

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Abstract

Globally, the oral health needs of children who have, or are suspected of having, experienced abuse or neglect has become a focus of concern. It is thus valuable and timely to map the contemporary nature of the research landscape in this expanding field. This review reports the findings of a scoping review of the international empirical literature. The aim was to explore the relationship between child maltreatment and oral health and how this complex issue is addressed in contemporary dental, health and social care practice. The review identified 68 papers, analysis of which identified three themes: 1) There is a relationship between poor oral health and child maltreatment that is well-evidenced but conceptually under-developed 2) There are discrepancies between the knowledge of members of the dental team about child maltreatment and their confidence and aptitude to identify and report child protection concerns 3) There are areas of local-level policy and practice development that seek to improve working relationships between dentists and health and social care practitioners; however, there is widespread evidence that this group of vulnerable children continue to ‘slip through’ the gaps of different professional communication systems and policy areas. To orientate critical discussion and planning for future research and practice, we present the Patterns, Advances, Gaps, Evidence for practice and Research Recommendations framework (PAGER). The review’s findings are likely to be of interest and relevance to researchers, practitioners and policy makers working across dentistry, health and social work.

Key words: child, dental, maltreatment, neglect, oral, protection

1 **Introduction**

2 Over the past two decades, the dental profession has increasingly embraced its role
3 identifying and addressing oral health dimensions of child maltreatment (Harris &
4 Whittington, 2016). This shift in focus is international in nature and underpinned by a
5 growing evidence base about the relationship between child abuse and neglect - collectively
6 characterized as child maltreatment - and child oral health (Ramazani, 2014). In many
7 national contexts, dentistry's increased engagement with child welfare and child protection is
8 shaped by new legal and professional duties incumbent on the dental team in respect to
9 protecting children from maltreatment and significant harm (Jameson, 2016).

10

11 This paper reports on a scoping review of empirical literature about the oral health needs of
12 abused and neglected children and how they are being recognized and addressed in a range of
13 practice fora. The review is timely because the literature on if, how and why dental, health
14 and social care practitioners are meeting the oral health needs of maltreated children spans
15 different disciplinary perspectives. This can make it difficult to navigate for conceptual and
16 practical reasons. Moreover, due to significant research output in the field of dentistry, the
17 volume of literature has increased greatly in the last five to ten years. The review's findings
18 are likely to be of interest and relevance to researchers and practitioners working across
19 dentistry, health and social care in addition to policy makers and professional leaders and
20 regulators. Because the included articles span multiple countries, the findings are likely to be
21 of interest to an international audience.

22

23 **Background**

24 Children's rights and professionals' responsibilities

25 The UN Convention on the Rights of the Child (UNCRC) (UNICEF 1989) is regarded widely
26 as the foundation for children’s relationships with the adult, institutional and governmental
27 contexts in which they live (Lund, 2007). Internationally, the Convention enshrines the rights
28 of children, defined as any person under 18 years old, across a range of areas. They include
29 children’s rights to education, play, health, and privacy, as well as their right to be protected
30 from all forms of abuse, neglect, and violence. Furthermore, the 189 signatories of the United
31 Nation’s Millennium Development goals have pledged to eradicate all forms of child
32 maltreatment by 2030 (Council of Europe, 2017) and health services are identified as major
33 stakeholders in realizing this ambition (Richter et al, 2017). It is in this context that the global
34 professional agenda about the role and responsibilities of dentistry and child protection has
35 become an organizing focus of research and practice.

36

37 Making child maltreatment a priority in dentistry

38 Untreated dental disease may cause a host of negative symptoms for an affected child,
39 including persistent pain and discomfort; acute and chronic infection; loss of appetite and,
40 subsequently, loss of body weight; and loss of sleep, resulting in disrupted attention for play
41 and learning (Harris, Balmer & Sidebotham, 2009). Signs of dental neglect (e.g. untreated
42 dental disease such as dental caries and poor oral hygiene) can also be precursors to or
43 symptoms of global child neglect. Child dental neglect is therefore a subset of child neglect
44 rather than a separate condition.

45

46 Definitions of child maltreatment (encompassing child abuse and neglect) vary. In this paper,
47 we adopt the United States Centers for Disease Control and Prevention definition which
48 characterizes child abuse and neglect as any act, or series of acts, by a parent or other
49 caregiver that results in harm, potential for harm, or threat of harm to a child; these acts, or

50 series of acts, can be caused by commission or omission (Arias, Leeb, Melanson, Paulozzi, &
51 Simon, 2008). Definitions of child dental neglect also vary. In this paper we adopt the
52 American Academy of Pediatric Dentistry's (AAPD) definition that characterizes child dental
53 neglect as the willful failure of parent or guardian to seek and follow through with treatment
54 necessary to ensure a level of oral health essential for a child to have adequate function and
55 freedom from pain and infection (AAPD, 2016).

56

57 In addition to the role of dental teams in spotting the signs of child dental neglect, because the
58 mouth and head are common sites of physical injury in children, they are also well-placed to
59 identify signs of physical (Vadiakas, Roberts & Dilley, 1991) and sexual abuse; in the latter
60 case by recognizing signs of unexplained oral infection or forced oral sex (Kellogg, 2005).
61 Dental teams can thus play a number of important roles identifying and responding to child
62 maltreatment, challenging the once-accepted view that child protection issues are outside or
63 beyond the scope of dentistry (Welbury, 2014).

64

65 There are many factors for dentists to consider when diagnosing potential neglect and abuse.
66 For example, they need to be alert to differences between accidental and non-accidental
67 injury, particularly in young children (Kellogg, 2005). Furthermore, it is important to
68 differentiate between children who have unmet dental needs, in contrast to children subject to
69 willful negligence (Heads, 2013). Children with developmental disabilities, for example, are
70 more likely to experience poor dental health as are children who live in areas where
71 sanitation and public health measures are sub-standard or whose parents do not have the
72 economic means to access regular dental care. These factors may predispose a child to poor
73 dental health and may or may not co-occur with maltreatment. Similarly, oral injuries and
74 signs of physical trauma cannot be taken as axiomatic of physical or sexual abuse (Malhorta,

75 Gupta & Alam, 2013; Weeranta, 2014; Welbury, 2007). It is therefore incumbent on dentists
76 to make careful, considered assessments about the causes and context of dental neglect and to
77 draw on inter-professional support and evidence in so doing. Exploring the views and
78 priorities of parents and children is also a valuable exercise in making realistic and sensitive
79 treatment plans (Park, Welbury, Herbison & Cairns, 2015).

80

81 Against the backdrop of legislative and practice change, we considered it timely to review the
82 empirical landscape and to explore the nature of evidence about the oral-dental health needs
83 of maltreated children and practice efforts to address them. The following three questions
84 foregrounded our review:

85

- 86 1. What is known about children who experience, or are at risk of experiencing,
87 maltreatment (abuse, neglect, exploitation, etc.) and their oral health needs?
- 88 2. How are these children's needs met in contemporary dental and multi-agency
89 practice?
- 90 3. What is the nature of interdisciplinary knowledge and practice about this issue?

91

92 **Methods**

93 Scoping reviews

94 Over the past 20 years, scoping studies have become a well-established and popular review
95 methodology across a range of health and social science disciplines. Scoping reviews are
96 frequently used to explore a wide-ranging body of literature with the purpose of addressing a
97 specific, often practice-orientated research question (Levac, Colquhoun & O'Brien, 2010). In
98 the context of child protection research, examples of scoping reviews include: an evaluation
99 of educational interventions to improve the attainment of children placed in out-of-home care

100 (Forsman & Vinnerljung, 2012); mapping evidence about the needs and views of disabled
101 children who have experienced (or are at risk of experiencing) maltreatment (Stalker &
102 McArthur, 2012); and, identifying the nature and scope of sexual abuse in children's
103 residential care (Timmerman & Schrueder, 2014). For this review, we anticipated drawing on
104 an interdisciplinary literature that would likely encompass a range of methodological
105 approaches in terms of study design. Thus, a scoping review was an appropriate way of
106 beginning to map the diverse research landscape.

107

108 Establishing the parameters of the scoping review

109 In March 2018, we carried out an initial 'scoping' exercise to develop our review question
110 and the inclusion/ exclusion criteria for prospective studies. It became evident that there was
111 an expansive literature relating to the oral health needs and experiences of abused and
112 neglected children. This literature was located predominately within the field of dentistry and
113 initial searches for potentially relevant literature returned over 40,000 sources. Following
114 these exploratory searches, we refined the inclusion criteria to papers that reported on
115 empirical studies and literature reviews. Please see Table 1 for the full inclusion criteria.

116

117 *Insert Table 1*

118

119 Identification of articles

120 To retrieve included studies, we used a range of paired search terms in conjunction with
121 Boolean operators (please see Table 2 for details). We systematically searched for relevant
122 papers in March and April 2018 in four electronic databases: Web of Science, ProQuest
123 Nursing and Allied Health, Medline and Cinahl Plus. We did not set a time-period for
124 publication. Furthermore, we only included papers published in the English language as we

125 did not have the resources (or linguistic skills) to review papers in other languages and we did
126 not quality appraise the studies. We discuss the potential limitations engendered by these two
127 criteria in the Limitations section. Figure 1 documents the decision-making process
128 underpinning the systematic retrieval, searching and inclusion of the final papers.

129

130 *Insert Table 2*

131 *Insert Figure 1*

132

133 Data abstraction and analysis

134 We abstracted and analyzed data from the papers following Ritchie and Spencer's (2002)
135 Framework Analysis approach. Framework Analysis provides a clear, systematic process of
136 organizing, analyzing and synthesizing data. It is characterized by five central stages, as
137 described in Table 3. Because framework analysis provides a clear set of guidelines for
138 carrying out and illustrating the analytic process, it has become a popular approach within
139 scoping reviews (Levac et al, 2010). During the process of extraction, we identified thematic
140 patterns within the synthesized literature relating to the study's aims and objectives, its
141 technical and analytical methods and the disciplinary background of contributing authors. We
142 also captured information relating to each study's principal findings and recommendations.

143

144 The study team

145 The study team was made up of four researcher-academics with a professional background in,
146 respectively: clinical nursing, public health nursing and midwifery, dentistry and child
147 protection social work (anonymized for review purposes). (Anonymized) led the project and
148 contributed to the review process through to submission. (Anonymized) coordinated the
149 searches, data retrieval and analysis and produced the first full draft of the manuscript.

150 (Anonymized) and (Anonymized) verified the analysis and contributed to writing the
151 manuscript. All authors read and approved the final version.

152

153 *Insert Table 3*

154

155 **Findings**

156 Overview

157 Sixty-eight papers were identified as meeting the inclusion criteria and were subject to data
158 extraction and analysis. In terms of chronological scope, the paper publication dates ranged
159 from 1986 to 2018 although a significant majority (n=53) were published in the last decade.
160 Included papers came from 23 countries, spanning Western Asia, the Indian Subcontinent,
161 South America, Europe, Africa, North America and Australasia. In terms of discipline, 60 of
162 the 68 papers were identified as dentistry-orientated. Four studies were multi-disciplinary and
163 the remaining four papers were from nursing (n=2), psychology (n=1) and counselling (n=1).
164 Finally, in terms of methodological design, most papers were observational (n=57). Within
165 this category studies included case-control, retrospective cohort, clinical audits and, most
166 commonly, cross-sectional surveys. Amongst the remaining papers, there were eight reviews,
167 two qualitative and one mixed-methods paper. Analysis of the papers identified three themes:
168 1) Establishing and exploring the relationship between child abuse and neglect (CAN) and
169 oral health. 2) Identifying and bridging the gaps in professional knowledge, attitudes and
170 responses to CAN and oral health. 3) Future directions and noteworthy findings.

171

172 **1. Establishing and exploring the relationship between CAN and oral health**

173 *Exploring relationships between poor oral health and child maltreatment*

174 Exploring the relationship between dental neglect and other forms of maltreatment was a
175 central theme of included papers. By comparing children already affected by maltreatment
176 with a general population sample, several papers found evidence that maltreated children had
177 significantly poorer dental health than children in the general population (da Silva-Júnior et
178 al, 2018; Duda et al, 2017; Keene, Skelton, Day, Munyombwe, & Balmer, 2015; Kvist,
179 Malmberg, Boovist, Larheden & Dahllof, 2012; Valencia-Rojas, Lawrence & Goodman,
180 2008; Baptista, et al, 2017; Lourenco, de Lima Saintrain, & Gomes Fernandes Vieira, 2013).
181 Although one study did not identify this association (Badger, 1986), Duda et al. (2017), for
182 example, found that maltreated children had a higher incidence of dental caries, missing
183 primary teeth and untreated permanent decay. Drawing on social service data, Kvist et al
184 (2012) identified that children in contact with social services (because of maltreatment
185 concerns) had higher rates of dental caries, fillings in permanent teeth and missed dental
186 appointments. Keene et al. (2015) also found that children on a child protection plan had poor
187 levels of dental health and dental health care. These papers collectively highlighted that the
188 relationship between child maltreatment and poor oral health is consistently found.
189 Nevertheless, these papers were retrospective in focus in that they were examining the oral
190 health of children who had already been abused or neglected. Thus, it is questionable whether
191 dental neglect was a signifier or outcome of maltreatment. To this end, several papers
192 highlighted the need for further theoretical and empirical inquiry to better understand the
193 intersection between child maltreatment and poor dental health and to provide a more robust
194 basis for clinical diagnosis (for example, Bhatia et al, 2014).

195

196 *Head and neck trauma: indicators of potential physical and sexual abuse*

197 Several papers explored rates and characteristics of head and neck trauma among maltreated
198 children (da Fonseca, Feigal, & ten Bensel, 1992; da Silva, Freire, Júnior, Goettems, &

199 Azevedo, 2016; Greene, Chisick & Aaron, 1994; Maguire et al, 2007; Phillips & van der
200 Heyde, 2006). Auditing hospital child protection files, DeFonseca et al (1992) found that
201 37.5% of children had experienced head or neck trauma, whilst DeSilva et al (2016) found
202 that maltreated children had more frequent oral and facial injuries than children in the general
203 population. Maguire et al. (2007) also found evidence of higher rates of intra-oral injuries
204 amongst maltreated children, including lip, gum, tongue and palate wounds, fractures,
205 intrusions and bites. In an audit of autopsies performed on children who had died because of
206 abuse or neglect, Philips and van der Hyde (2006) found that several children had suffered
207 head and neck injuries, including bruised lips, lacerations to the mouth, torn frenum and
208 avulsed teeth. This small body of papers highlights the connections between signs of oral,
209 facial and neck injuries and children's experiences of (often serious) physical and sexual
210 abuse. This is an important finding for professionals working outside of dentistry who may
211 not recognize the vulnerability of the head and neck region and the prevalence of childhood
212 injuries in this area.

213

214 *The oral health impact of childhood abuse and adversity across the life-course*

215 A small group of studies explored the views and experiences of children and adults affected
216 by childhood abuse. This marked a shift in focus from that of the immediate safety and
217 welfare of children to that of trauma and its oral and dental implications over time. Bright,
218 Alford, Hinojosa, Knapp and Fernandez-Baca (2015), Matsuyama et al (2016) and Nicolau,
219 Marcenes and Sheiham (2003), for example, found that adverse and traumatic childhood
220 experiences were associated with poorer adult dental health. Exploring the impact of early
221 life adversity on oral health, Mattheus (2010) found that adopting a socially-informed,
222 ecological approach to oral health assessment could lead to interventions in infancy that
223 would seriously reduce dental health needs in later childhood and adulthood.

224

225 Three studies investigated the dental treatment experiences of women affected by childhood
226 sexual abuse (Hays & Stanley, 1996; Leeners et al, 2007; Willumsen, 2004). Hays and
227 Stanley (1996) found that adult survivors had difficulty keeping dental appointments and
228 experienced a higher level of stress-related symptoms, particularly during intrusive
229 examinations. Leeners et al. (2007) similarly found that if women experienced discomfort
230 and feelings of loss of control within the dental consultation, this could lead to recall of past
231 traumas, including childhood abuse. These papers highlight that survivors of childhood abuse
232 and adversity may have additional and complex needs in regard to their oral health and ability
233 to engage in oral health care.

234

235 2. Professional knowledge, attitudes and responses to CAN

236 *Improving knowledge and confidence amongst dentists*

237 Exploring dental practitioners' knowledge and attitudes about child maltreatment was the
238 most common investigative focus in the reviewed literature. Despite the geographic and
239 cultural diversity of the studies, their findings were strikingly similar. That is, a majority of
240 studies identified worrying disparities between dentists' self-reported knowledge and their
241 clinical abilities diagnosing signs of abuse and neglect. Cukovic-Bagic et al (2015) found
242 dental practitioners' knowledge of CAN to be limited and that, concomitantly, there were
243 high levels of uncertainty and hesitation amongst practitioners when diagnosing and reporting
244 suspected cases. Several studies found, like Cukovic-Bagic et al (2015) that this could lead to
245 misattribution errors in diagnosis and / or result in inconsistent documentation of potential
246 signs of abuse and neglect (DeFonseca et al, 1992; Kvist, Annerback, & Dahllof, 2018;
247 Preethi, Einstein, & Sivapathasundharam, 2011; Hazar Bodrumlu, Avsar & Arslan, 2018).
248 Similar findings were made by Deshpande et al (2015), Hussein, Ahmad, Ibrahim, Yusoff

249 and Ahmad (2016), Kaur et al (2016), Malpani et al (2017), Mogaddam, Kamal, Merdad and
250 Alamoudi (2016), Al-Jundi, Zawaideh and Al-Rawi (2010), Sonbol et al (2012), Thomas,
251 Straffon and Inglehart (2006), Tilvawala, Murray, Farah and Broadbent (2014) and Uldum,
252 Christensen, Welbury and Poulsen (2010).

253

254 There was also evidence of intra-professional differences in how practitioners used and
255 shared their knowledge about CAN. For example, Jahanimoghadam, Kalantari, Horri,
256 Ahmadipour and Pourmorteza (2017) found that pediatric dentists had more detailed
257 knowledge and greater confidence engaging with CAN issues than a comparison group of
258 general dentists. O’Callaghan (2012) also found that although dentists had considerable
259 expertise in relation to oral health, they had poor knowledge of broad CAN issues in
260 comparison to doctors and nurses. Lastly, Thomas, Straffon, and Inglehart (2006) found that
261 dental students’ knowledge and skills about CAN was better than those of dental hygiene
262 students. These intra-professional studies suggest that training, coupled with familiarization
263 and frequency of exposure to CAN cases shapes practitioners’ confidence aptitude to
264 diagnose and follow up concerns.

265

266 *Barriers to accurate diagnosis and consistent reporting practice*

267 Across the studies, common themes were identified relating to the barriers and challenges
268 experienced by dental practitioners diagnosing and reporting concerns about CAN. Problems
269 included: fear of parental reprisal towards the concerned child; violence or litigation against
270 the dental practitioner; professional uncertainty about accuracy of diagnosis; and, poor
271 knowledge of reporting procedures (Al-Dabaan, Newton, & Asimakopoulou, 2014; Al-habsi,
272 Roberts, Attari & Parekh, 2009; Bankole, Denloye & Adeyemi, 2008; Cukovic-Bagic et al.
273 2015; Mogaddam et al. 2016; Sonbol et al, 2012; Tilvawala, Murray, Farah, & Broadbent,

274 2014; Uldum, Christensen, Welbury, & Poulsen, 2010). Kvist, Wickstrom, Miglis and
275 Dahllof, (2014) identified that practitioners regularly experienced dilemmas and felt
276 uncertain when engaging with child protection issues. Practitioners considered there to be
277 difficult, if not irreconcilable tensions, between supporting families or reporting child
278 protection concerns and differentiating between child welfare and child maltreatment issues
279 (Kvist, et al 2014a).

280

281 Several papers called for child protection training to become a mandatory and continuous
282 feature of undergraduate and postgraduate dental education (for example: Flander, Tarabic &
283 Cukovic-Bagic, 2015; Gutmann & Solomon, 2002; Jessee & Martin, 1998; Malpani et al.
284 2017) and four papers reported on evaluations of CAN-focused training programs. Al-Daban
285 et al (2016) and Shapiro, Anderson and Lal (2014) piloted online training modules and
286 reported an improvement in practitioners' knowledge post-completion. Evaluations were also
287 conducted on a classroom-focused child protection module (Harmer-Beem, 2005) and an
288 interactive training program (Soldani, Robertson & Foley, 2008): both reported improved
289 levels of practitioner knowledge and confidence post-intervention.

290

291 In terms of assessing current levels of dentists' knowledge, Brattabo, Bjorknes and Astrom
292 (2018) found high levels of awareness that persistent non-attendance and severe dental caries
293 could be indicators of maltreatment. Similarly, Harris, Welbury, and Cairns (2013) found
294 improved rates of knowledge about, and reporting of, CAN amongst a cohort of dentists over
295 a seven-year period. DeMattei and Sherry (2011) noted an improvement in practitioners'
296 knowledge of CAN between 1994 and 2009; however, the authors cited concerns that this did
297 not consistently result in accurate diagnosis or timely reporting (DeMattei & Sherry, 2011).
298 Soldani et al. (2008) reported similar concerns that training needed to be continuous and

299 bespoke if dentists' attitudes and approaches to CAN were to change in the long-term. These
300 studies indicate that dentists' knowledge and attitudes towards child protection and child
301 welfare has changed significantly over the last twenty years. Nevertheless, the sample sizes
302 were small and many relied on self-report measures. Thus, it is credible to suggest that
303 education and training are likely to be necessary but not sufficient factors in bringing about
304 large-scale professional reform.

305

306 3. Future directions and noteworthy findings

307 *Inter-disciplinary practice*

308 Several papers explored the quality and consistency of working relationships between
309 dentists and professions such as public health nursing, social work and paediatric medicine.
310 These studies were predicated on the view that an integrated approach was necessary to meet
311 the complex oral health and social needs of children affected by CAN (Al-Dabaan,
312 Asimakopoulou & Newton, 2016; da Silva-Junior et al; Duda et al. 2017; Lourenco, 2013;
313 Ramazani, 2014). Studies highlighted concerns about contemporary multi-agency practice.
314 For example, Brattabo et al. (2018) found that although dental practitioners were making
315 increased numbers of referrals to children's social care, they were only infrequently given
316 feedback about what action had been taken and the rationale for these decisions. The authors
317 suggest that this may damage nascent relationships with children's social services (Brattabo
318 et al. 2018). Similarly, Kvist, Malmberg, Boovist, Larheden, and Dahllof (2012) found that a
319 lack of trust was a major inhibiting factor to dentists making referrals to social care, as did
320 Harris, Firth and Chadwick (2017). Similarly, Bradbury-Jones et al (2013) found that public
321 health nurses used proxy measures, alongside opportunistic investigation, to investigate
322 concerns about children's oral health. This spoke to gaps in their knowledge about the link
323 between untreated dental caries and child neglect and the lack of opportunities to work with,

324 or even communicate regularly with, dentists (Bradbury-Jones et al, 2013). When combined
325 with a relative paucity of established reporting systems, these limitations in inter-professional
326 communication and trust could result in children “slipping through the net” between dental
327 and child protection services (Harris et al, 2017).

328

329 Several papers highlighted how inconsistent policy and guidance had a negative effect on
330 inter-professional practice and the ‘translation’ of research into practice (Adair et al, 1997;
331 Laud, Gizani, Maragkou, Welbury & Papagiannoulis, 2013; Mogaddam et al. 2016). For
332 example, Kvist et al. (2018) investigated how different Swedish localities implemented
333 national law and policy guidance and found high levels of variation. They found that dental
334 surgeries or departments that had developed their own policies consistently made more child
335 protection referrals to social services; those who had not developed local protocols had
336 persistently low rates of referral. Similarly, Kaur (2016) found that despite mandatory
337 guidance to report child protection issues, dental practitioners had limited knowledge about
338 how to do so and this in turn was likely to inhibit reporting rates. These papers suggest that
339 there is a fragmented and ad hoc nature to current service provision, despite the growing body
340 of empirical evidence that links child maltreatment and poor oral health.

341

342 *New directions and issues*

343 There were many cross-cutting themes in the included papers; however, there were also
344 papers that broke new ground, studying populations or issues that had hitherto received
345 limited research focus. For example, Al-Habsi et al. (2009) and Kvist, Zedren-Sunemo, Graca
346 and Dahllof (2014b) identified an association between children requiring anesthesia in dental
347 care – often as the result of more complex dental treatment needs and poor dental health - and
348 children who had experienced abuse or neglect. Alongside dental caries and repeat

349 extractions (Sillevis Smitt, de Leeuw & de Vries, 2017) anesthesia may therefore be another
350 way of identifying children at risk of abuse or neglect. Kivisto, Alapulli, Tupola, Alaluusua
351 and Kivitie-Kallio (2014) found that children whose parents used Buprenorphine had
352 significantly higher levels of dental caries, decayed, missing and filled teeth as well as lower
353 levels of dental care and support from their parents and carers. Finally, Melbye, Huebner,
354 Chi, Hinderberger and Milgrom (2013) found that although children in foster care often had
355 significant dental health needs they received sporadic and inadequate dental care because of
356 concerns about payment of their treatment costs, their relative transience (moving between
357 homes and therefore dental practices) and the low priority given to their oral health by foster
358 parents and social workers. Taken together with the wider literature, these studies enhance
359 understanding about some children's oral health needs. They also raise questions about if it is
360 appropriate to develop targeted interventions to better recognize and prevent poor oral health
361 for some, particularly vulnerable, groups of children and young people.

362

363 **Discussion**

364 One of the central findings of this scoping review was the concerted effort by the
365 international dental community to recognize and prioritize child protection and to chart once
366 unfamiliar, perhaps daunting, territory. Child protection appears to have become a priority
367 both in dentistry research *and* practice. However, the review also finds that children's dental
368 health is not well-recognized or discussed within disciplines such as health or social care. In
369 the following section, we discuss advances and gaps in the literature alongside the
370 implications they present for future research and practice. The discussion is orientated around
371 four themes: 1. Developing understanding about CAN and poor child oral health 2.
372 Supporting dentists to identify and respond to CAN 3. Supporting non-dentists to identify and
373 respond to oral neglect and injury 4. Developing knowledge about affected children's

374 treatment needs and experiences. We provide an overview of these recommendations in
375 Table 4 and we call this the Patterns, Advances, Gaps, Evidence for practice and Research
376 Recommendations framework (PAGER). It is intended as a tool to orientate critical
377 discussion and planning for future research and practice.

378

379 *Insert Table 4*

380

381 1. Developing understanding about CAN and poor child oral health

382 There is a body of empirical evidence that establishes an associative relationship between
383 child abuse and neglect and poor oral health outcomes. The reviewed literature also finds an
384 associative relationship between child dental neglect and broader child neglect. However, the
385 relationship between CAN and oral health is not causal and there remains limited theoretical
386 and conceptual work that captures the complex relationship between the two issues (e.g. its
387 social, economic, structural and inter-personal dimensions). Research and evaluation
388 therefore need to focus on how to operationalize multi-disciplinary practice so that dentistry
389 is a more involved partner and so that oral neglect and trauma is more widely recognized as a
390 potential signifier of maltreatment. Without wishing to de-value the considerable inroads that
391 have been made, the current research landscape reflects a lack of ‘joined-up’ thinking and
392 communication between different professional communities. This finding may reflect historic
393 differences between dentistry, health and social work practitioners’ education and training. In
394 terms of future directions, we suggest that there is limited value investigating further whether
395 child abuse and neglect are associated with poorer oral-dental health outcomes. However,
396 there is a need to further explore the complex, often multi-causal nature of oral neglect and
397 trauma in children. Conceptual and theoretical work is likely to be valuable, as is directed
398 empirical study.

399

400 2. Supporting dentists to identify and respond to CAN

401 The review identifies that there is both awareness and willingness within the dental
402 practitioner community to respond to CAN. However, we found that unless dental teams
403 have specialist knowledge or regular exposure to child protection issues, dentists may
404 experience anxiety responding to the ethical and social challenges that CAN presents. They
405 also face difficulties establishing meaningful and timely communication with other
406 professionals involved in child protection. This is in part due to organizational boundaries
407 and inconsistent support for inter-disciplinary working at policy and statute level. These are
408 important structural issues that need to be addressed. Without clear leadership and co-
409 development of local mechanisms for collaborative working, there is a limit to what
410 individual practitioners – however well-informed or skilled – can do to broker shared
411 decision-making and joint working. On a related point, there is a need for consistency and
412 continuity in dental education and training. The review found some evidence that education is
413 found to make a positive difference to raising awareness and confidence levels amongst
414 dental practitioners. However, practitioners need to be better equipped to develop the
415 communication and reflective skills that their role increasingly necessitates. In terms of future
416 research, it may be valuable to explore the structural and inter-personal factors that inhibit
417 timely information-sharing and effective collaborative work. This requires a shift away from
418 only using observational research methods. Qualitative techniques may, for example, be
419 useful in exploring further the feelings of confusion, anxiety and hesitancy that dental
420 practitioners were found to experience when ‘putting into practice’ their training and
421 knowledge about child protection. Individual interviews and/ or focus group methods may
422 also afford greater time and space to explore these issues and the extent to which training and
423 policy guidance address them.

424

425 3. Supporting non-dentists to identify and respond to oral neglect and injury

426 There were few examples of empirical research about the oral health needs of abused and
427 neglected children by nursing, social work or medical researchers/ practitioners. This
428 underlines the need for a more concerted effort to raise awareness of the dental-oral health
429 needs of abused and neglected children in nursing, social work and medicine. It appears that
430 oral health continues to fall, albeit unintentionally, ‘beyond’ their assumed professional remit.
431 This is troubling given the critical role of nurses and social workers, in particular. The
432 review’s findings also raise questions about how children’s oral health could develop parity
433 of esteem with their physical and emotional development. Until this happens, children may
434 suffer the pain, discomfort and secondary social and emotional effects of oral ill health and
435 opportunities for early identification of abuse and neglect may be missed.

436

437 4. *. Developing knowledge about affected children's treatment needs and experiences*

438 Lastly, there is some evidence to suggest that abused children and adults affected by
439 childhood abuse may have complex treatment needs and that they place considerable value
440 on their oral-dental health. Yet there is a paucity of evidence about abused or neglected
441 children’s perspectives on their oral-dental health and their experiences, views and concerns
442 accessing treatment. Practitioners need to be cognizant that many symptoms of poor oral
443 health may be masked or non-visible and children and adults may be reluctant to disclose
444 their additional needs as a result of anticipatory shame and stigma. Asking children and
445 adults about their views and priorities is therefore vital. Research could play an important
446 role developing knowledge in this area. Working in partnership with children and adults, as
447 participants or co-researchers for example, may provide valuable insights about their needs

448 and experiences. These methods have led to new and valuable insights in the wider field of
449 child neglect and trauma-informed care.

450

451 **Limitations**

452 This review has several methodological limitations. Firstly, we did not quality appraise the
453 included studies, as is a common feature of scoping reviews (Grant & Booth, 2009). Thus,
454 we are not able to comment on the robustness of rigor of the appraised studies (Pham et al,
455 2014; Davis, 2009). Rather, our aim was to map the thematic contours of the empirical
456 landscape in order to direct future research and practice directions. Secondly, the decisions
457 we made about how to organize and analyze the papers is likely to reflect the research team's
458 collective interpretation of what is useful, relevant and important in the reviewed literature.
459 We recognize the limitations that this may engender and thus we have sought to make
460 transparent the basis for our methodological decisions. In addition, we convened an
461 interdisciplinary reviewing team and an expert discussion panel at the end of the review
462 process to foster inter-professional dialogue and to ensure that the review findings were
463 informed by practice needs (Arksey & O'Malley, 2005).

464

465 Thirdly, we are aware of the large number of important papers relating to the oral health
466 needs of children affected by abuse and neglect that were not included in this review because
467 they were discussion papers, editorials or policy documents. These papers have played a vital
468 role making visible a once 'neglected' area of child neglect in dentistry. We did not include
469 them because we assessed that there was a sufficient and growing body of empirical work
470 and that reviewing its findings would be of contemporary value to a wide range of
471 professional beyond dentistry. In addition, our search terms may have filtered out potentially
472 valuable papers because they did not explicitly identify child oral health in their title or

473 abstract. For example, Lazenbatt and Freeman’s (2006) survey of identification and reporting
474 of child physical abuse amongst primary healthcare professionals was not retrieved during
475 our initial search and screening phase; however, dentists were amongst the survey
476 participants. The review only included English-language studies. As a result, the geographical
477 and cultural diversity of our sample is likely to be limited. Finally, we were made aware of a
478 single new UK study (Schlabe, Kabban, Chapireau and Fan, 2018) which was published after
479 we had completed our review.

480

481 **Conclusions**

482 This study provides a summative and scoping review of the contemporary literature. To our
483 knowledge, this is the first review that explores the oral and dental health needs of children
484 affected, or potentially affected by maltreatment, that considers evidence about the
485 phenomenon alongside practice responses to it. Developing a review that spoke to, and in
486 some cases across different disciplines was one of the central objectives of this study. This is
487 because there remain significant, often troubling disparities in intra-professional knowledge
488 and action when it comes to recognizing, responding to, and reflecting on the intersection
489 between child maltreatment and dental-oral health. Reflecting on the wider child protection
490 field, we recognize that building consensus takes time, commitment and sometimes a re-
491 orientation of professional priorities. This means that research and education alone cannot
492 build all the bridges: developing the agenda requires practical, systemic and cultural support
493 and this review’s findings can help to orientate and inform this work.

494

495 **Abbreviations**

496 Child Abuse and Neglect (CAN)

497 United Nations International Children's Emergency Fund (UNICEF)

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Table 1: Inclusion criteria

1.	Peer-reviewed publications, including: empirical studies (all research designs) and theoretical or conceptual papers based on empirical work.
2.	Focus on children (defined as any person aged 18 years old and younger. Appropriate synonyms used e.g. adolescent, teen, pediatric, infant).
3.	Publications focusing primarily on the dental/oral health of children who have, are, or are likely to experience abuse or neglect or to a specific issue (such as experience of dental trauma, dental caries, dental fear etc.).
4.	English-language papers.

Table 2: Search terms (combined with AND)

1.	'child/ren', 'youth' or 'teen/ager', 'adolescen/t/ce' and 'young people' and 'pediatric'
2.	oral health', 'dental health', 'dental care', 'dental hygiene' and 'dental neglect'
3.	'abuse', 'neglect', 'maltreatment' and 'safeguarding'

Table 3: Summary description of the central stages of framework analysis (Ritchie & Spencer, 1994)

	Stage	Brief description
1	Familiarization	Immersion and close consideration of the data.
2	Identifying a thematic framework	The initial development of a matrix to analyze subsequent data, usually integrating both descriptive and analytical codes.
3	Indexing	The analysis of all data in reference to the thematic framework, often resulting in 'single' and 'multiple' coding of words, sentences, and segments of text.
4	Charting	The developing and diversification of multiple frameworks that focus around central areas of meaning and analysis <i>and</i> the process of placing reflective summaries of the data within these charts.
5	Mapping and interpretation	The development of conceptual frameworks, explanatory categories, or typological schemas that interpret and explain the data whilst staying 'close' to its original meaning and context.

Table 4: Practice and research implications

	Pattern	Advances	Gaps	Evidence for practice	Research recommendations
1	Developing understanding about CAN and poor child oral health	Associative relationship between CAN and oral health established	Need more robust empirical base to underpin clinical guidance Limited conceptual or theoretical work	Skilling practitioners to explore caregiver and social factors contributing to injury and maltreatment	Making better use of theoretical and conceptual models Developing clearer diagnostic criteria
2	Supporting dentists to identify and respond to CAN	Growing evidence base about practitioners' knowledge and education needs	Limited evidence about how they manage ethical dilemmas and conflict and/ or their views about CAN-focused work	Support to develop reflective and critical skills Improving policies and systems for inter-professional working	Qualitative research on dentists' roles and experiences
3	Supporting non-dentists to identify and respond to oral neglect and injury	Evidence of some valuable insights from non-dentistry professions	Paucity of research about non-dentists' knowledge and training needs re CAN-oral health	Raising awareness of CAN-oral health amongst non-dentistry practitioners Improving skills to identify and respond to oral neglect and injury	Exploring non-dentists knowledge and training needs
4	Developing knowledge about affected children's treatment needs and experiences	Evidence that may have complex or additional treatment needs	Paucity of qualitative or participatory research about needs and experiences accessing and engaging with dental treatment	Identifying patients who may need enhanced support Developing collaborative treatment plans	Developing participatory and qualitative research on children and affected adults treatment experiences