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

Introduction

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

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

Background

Children's rights and professionals' responsibilities

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

Making child maltreatment a priority in dentistry

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

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

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

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

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

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

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

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

Methods

Scoping reviews

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

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

Establishing the parameters of the scoping review

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

Insert Table 1

Identification of articles

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

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

Insert Table 2

Insert Figure 1

Data abstraction and analysis

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

The study team

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

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

Insert Table 3

Findings

Overview

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

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

Exploring relationships between poor oral health and child maltreatment

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

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

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

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

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

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

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

2. Professional knowledge, attitudes and responses to CAN

Improving knowledge and confidence amongst dentists

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

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

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

Barriers to accurate diagnosis and consistent reporting practice

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

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

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

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

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

3. Future directions and noteworthy findings

Inter-disciplinary practice

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

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

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

New directions and issues

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

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

Discussion

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

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

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

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

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

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

Limitations

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

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

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

Conclusions

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

Abbreviations

Child Abuse and Neglect (CAN)

United Nations International Children's Emergency Fund (UNICEF)

Patterns, Advances, Gaps, Evidence for practice and Research recommendations (PAGER)

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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 *and* 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