

# Paediatric dentistry provision in the North East of England: workforce confidence and attitudes

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## Key points

Provides insight into primary care and early-career dentist confidence in providing dental treatment for children.

Provides an overview of attitudes of primary care dentists towards current provision of paediatric dental services in North East England and North Cumbria.

Provides insight into primary care workforce self-reported capacity and willingness to provide Level 2 commissioned paediatric dental services.

## Abstract

**Background** Exploration of workforce confidence and attitudes towards the provision of paediatric dental care has the potential to inform targeted workforce development to address the oral health needs of children.

**Aims** To explore: workforce confidence in providing paediatric dentistry; attitudes towards existing paediatric dental service provision; and perceived capacity and willingness to deliver Level 2 paediatric dental services.

**Methods** An anonymous online survey was distributed to regional primary care and early-career dentists. It was distributed via Local Dental Committee Chairs, Community Dental Service Clinical Directors, a regional research collaborative and social media for a six-week period.

**Results** Eighty-eight respondents self-reported confidence in 28 paediatric dental skills/competencies. Overall, 64% of respondents rated themselves as confident or very confident, with the least confidence reported in endodontic treatment of immature teeth and prescribing removable orthodontic appliances. In addition, 66% of respondents felt that the current provision of paediatric dental services was inadequate and 44% expressed willingness to provide Level 2 paediatric dental services.

**Conclusion** High levels of confidence were reported in most paediatric dental skills/competencies. Current regional provision of paediatric dental services was described as inadequate. There is willingness and capacity within the existing workforce to provide Level 2 paediatric dental services.

## Introduction

For the first time in ten years, the oral health trends in five-year-olds of England have shown no improvement.<sup>1</sup> The decay experience of children in the North East of England and Cumbria is equal to that of the national average; however, the proportion of extracted decayed teeth in five-year-olds within the North East is higher (16.9%) than the national average (10.7%).<sup>1</sup> Furthermore, between 2019–2020, 3,415 children were admitted to hospital

for dental extractions within the North East, of which 75.3% had a primary diagnosis of dental decay.<sup>2</sup>

A recent Healthwatch report highlighted concerns about access to NHS dentistry, with 73% of respondents describing difficulty in accessing help and support.<sup>3</sup> Only 55% of children in the North East of England were seen by a dentist between June 2019–2020, with this figure likely to worsen in light of the impact of COVID-19.<sup>4</sup> Currently, there are limited private paediatric dentistry providers in the region for those families who can afford them. Given the financial challenges facing the profession in the post-COVID-19 recovery period, there may be an influx of dental practices leaving NHS dentistry, further restricting access to dentistry for children.

NHS England commissions all NHS dental services and aims to commission in such a way to ‘reduce inequalities, improve care

for patients to ensure they are receiving the highest quality dental care in the most appropriate setting, delivered by professionals with the required skill set.<sup>5</sup> National guidance has been released describing three levels of complexity for commissioned speciality dental services.<sup>6</sup> Level 1 describes services that all dentists should be able to provide on completion of foundation training. Level 2 is described as services provided by practitioners with enhanced skills who may or may not be on a GDC specialist list in paediatric dentistry. Finally, Level 3 services are described as suitable to be provided by specialists and consultants.

Level 1 and 3 dental workforces are well established, although the chronic shortage of paediatric dental specialists has been highlighted on multiple occasions.<sup>7,8</sup> Today, the registered number of paediatric dental specialists remains largely unchanged with

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large areas of England without Level 3 services.<sup>8</sup> These issues can lead to long waiting lists and inequalities in access which impacts patient outcomes. The capacity for specialist-led training and support is also constrained.

There is a paucity in the literature reporting primary care dental practitioner confidence providing Level 1 routine and urgent dental care for children. Self-reported confidence of general dental practitioners (GDPs) has been explored in limited areas of clinical practice and is reduced when managing anxious and autistic patients.<sup>9,10</sup> Undergraduates report high levels of confidence, feeling generally well prepared to provide routine care for children, aside from management of trauma.<sup>11</sup> It is unclear, however, how confident the primary care workforce is at providing a comprehensive range of Level 1 and 2 dental care for children.

The Level 2 workforce is in its infancy and unquantified. While Level 2 curriculum and accreditation guidance is published, there is significant national variation in the establishment of accreditation panels and managed clinical networks (MCNs). There is also regional variation in Level 2 education and training, with only one established level 2 paediatric dental training programme in existence in England launched in January 2021. However, there may be practitioners within the existing workforce with skills and experience to provide Level 2 complexity care, but this is currently unknown.

There continues to be a high dental need in the paediatric population of England. There is also evidence of existing oral health inequalities and access challenges. There continues to be a national appetite from policymakers to redistribute the flow of patients from secondary to primary care. Developing the Level 2 workforce has the potential to reduce oral health inequalities by increasing access to NHS care and enabling patients to access care closer to home. It has additional benefits such as promoting continuity of care with the same dentist.

Without an understanding of baseline skills and confidence of the primary care workforce in treating the child patient, it is difficult to appreciate workforce training needs and how this affects service access across all complexity levels. This paper therefore aims to report current levels of confidence in paediatric dentistry among primary care and early-career dentists in the North East of England. It also explores attitudes towards

current regional provision of paediatric dental services and the perceived capacity and willingness to deliver Level 2 paediatric dental services.

## Method

This was a cross-sectional, anonymous, online survey-based study.

### Survey development

The structured questionnaire survey consisted of 35 items and was developed in accordance with best practice guidelines.<sup>12</sup> It was conducted on an online survey software (Google Forms). Questionnaire design was based on concepts of interest identified in previous work and engagement from regional dental workforce stakeholders.

Section 1 of the survey collected data on respondent demographics including job role, year of graduation, additional qualifications and workplace postcode. Section 2 explored self-rated confidence in 28 questions relating to Level 1 and Level 2 skills and competencies for the provision of paediatric dental care as per paediatric dental commissioning standards using a five-point Likert scale.<sup>13</sup> A single Likert scale was used throughout where respondents rated themselves as either very confident, confident, neutral, unconfident or very unconfident. Level 1 and 2 skills and competencies involved the provision of emergency care, restorative care, oral medicine, orthodontic management, and management of children with additional medical, social or learning needs. Respondents were also asked about access to equipment required to provide Level 1 and 2 paediatric dental services; for example, rubber dam and trauma splints. The final section explored attitudes towards the current provision of paediatric dentistry in the region with free-text responses. The survey was piloted with primary care and early-career dentists (four individuals) from outwith the region for content and face validity. It was adapted in response to feedback until fit for purpose.

### Sample

The target population was all dentists working in primary care in the North East and North Cumbria region. An open sampling frame was used to maximise potential responses. The survey was distributed to primary care (general dental service and community dental service) and early-career dentists (dental foundation

trainees, general professional trainees and dental core trainees) within North East and North Cumbria. Ethical approval was obtained by Newcastle University Research Ethics Committee (Reference number: 617/2020). Consent was obtained from respondents within the survey to use anonymised data within the research.

### Data collection

Potential respondents were approached by e-mail or social media post with a standard e-mail invite. Distribution was via e-mail mailing lists of Local Dental Committee, regional community dental service (via clinical directors) and the Northern Dental Practice Based Research Network regional primary care research collaborative. In addition, the survey was shared via social media (Facebook and Twitter). The survey was open for six weeks between 23 November 2020 to 28 December 2020. A reminder e-mail and social media post was released at four weeks.

### Analysis

Microsoft Excel was used for statistical analysis. Descriptive analysis was undertaken for each variable. When reporting self-assessed confidence in Level 1 and 2 skills and competencies, respondents were grouped as 'confident and very confident' and 'unconfident and very unconfident' for analysis. Data were analysed for all respondents and separately for GDPs who were the largest respondent group. Cross tabulation was carried out for year of respondent graduation, age of child being treated and nature of the skill/competency being carried out.

Inductive thematic content analysis was undertaken on free-text responses.<sup>14</sup> Two investigators (SS and CW) independently established 'themes' based on content of free-text responses. Investigators then collaborated to finalise 'themes', discussing any discrepancies until agreement was reached. A third investigator (CV) intervened when agreement could not be reached.

## Results

### Demographics

There were 93 responses of which five were excluded due to duplicated entries, resulting in 88 responses suitable for analysis. Ninety-three percent (n = 82) of respondents were UK graduates. Respondents were largely GDPs (75%, n = 66) with the remainder

being community dental service staff ( $n = 15$ ), core and foundation trainees ( $n = 7$ ). Geographic spread of respondent workplace is illustrated by heat mapping in Figure 1. Table 1 describes respondent work setting and service contribution. Participant year of graduation ranged from 1983–2020. Dentists were divided into four groups in terms of when they qualified as dentists:

1. 1983–1993 ( $n = 21$ )
2. 1994–2003 ( $n = 24$ )
3. 2004–2013 ( $n = 24$ )
4. 2014–2020 ( $n = 19$ ).

Most respondents (95%,  $n = 84$ ) were not on a specialist list; however, 5% ( $n = 4$ ) were on the oral surgery or special care specialist list. Thirty-nine percent ( $n = 34$ ) of participants had no additional qualifications, 36% ( $n = 32$ ) had one and 25% ( $n = 22$ ) had more than one additional qualification. The primary qualification of all respondents was Bachelor of Dental Surgery. There were a wide range of additional qualifications (dental- and science-based). The most common additional qualifications were Membership of Faculty of Dental Surgery (MFDS) ( $n = 28$ ), Membership of the Joint Dental Faculties (MJDF) ( $n = 7$ ), Diploma in Conscious Sedation ( $n = 7$ ) and Postgraduate Certificate in Medical Education ( $n = 5$ ). Most respondents ( $n = 55$ ) had no experience of working within a specialist paediatric or community dental setting; however, a small proportion ( $n = 13$ ) had more than five years of experience. Table 2 describes respondents' duration of experience within a specialist paediatric dentistry or community dental setting.

### Survey results

Overall confidence was high, with respondents reporting high levels of confidence in 24 of the 28 skills/competencies questions rating themselves as very confident or confident as opposed to neutral, unconfident or very unconfident. Out of a total of 2,464 responses, 64% ( $n = 1,575$ ) were self-rated as very confident or confident.

Most respondents reported being very confident or confident in managing anxious children (76%,  $n = 67$ ) and giving local anaesthetic to children (82%,  $n = 72$ ). There were high levels of confidence managing children with stable complex medical conditions (72%,  $n = 63$ ) and complex learning disability (55%,  $n = 46$ ).

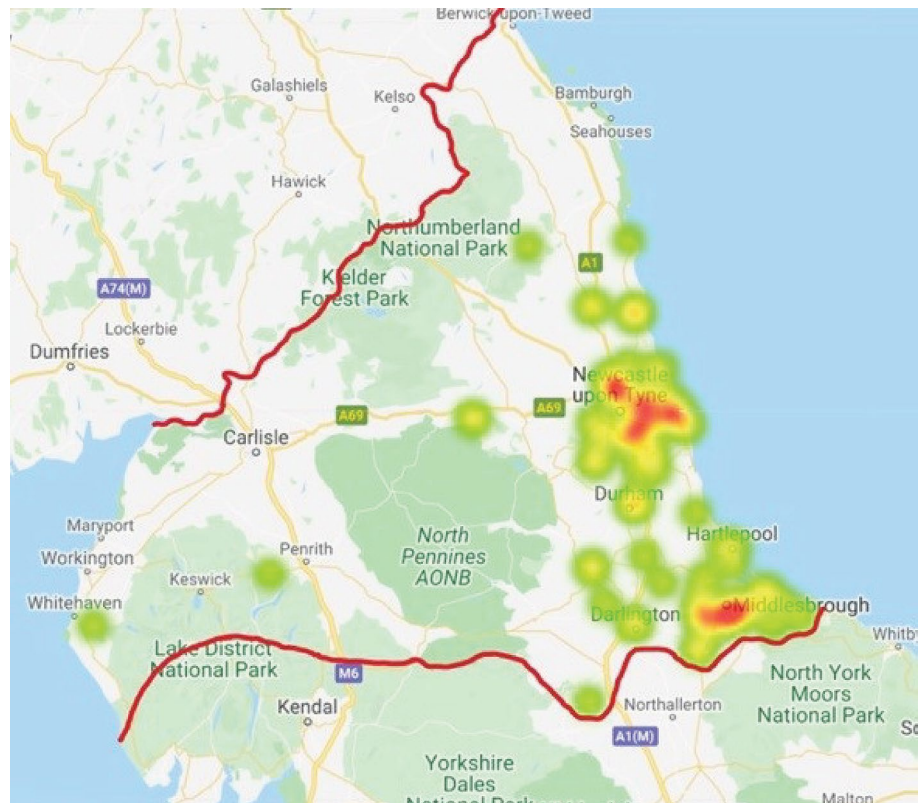


Fig. 1 Heat map of respondent workplace postcode plotted using Geolytics (<https://geo.sg>), map data ©2021 Google

Table 1 Respondent service contribution and workplace setting (note: responses were not mutually exclusive and therefore proportions equate to greater than 100%)

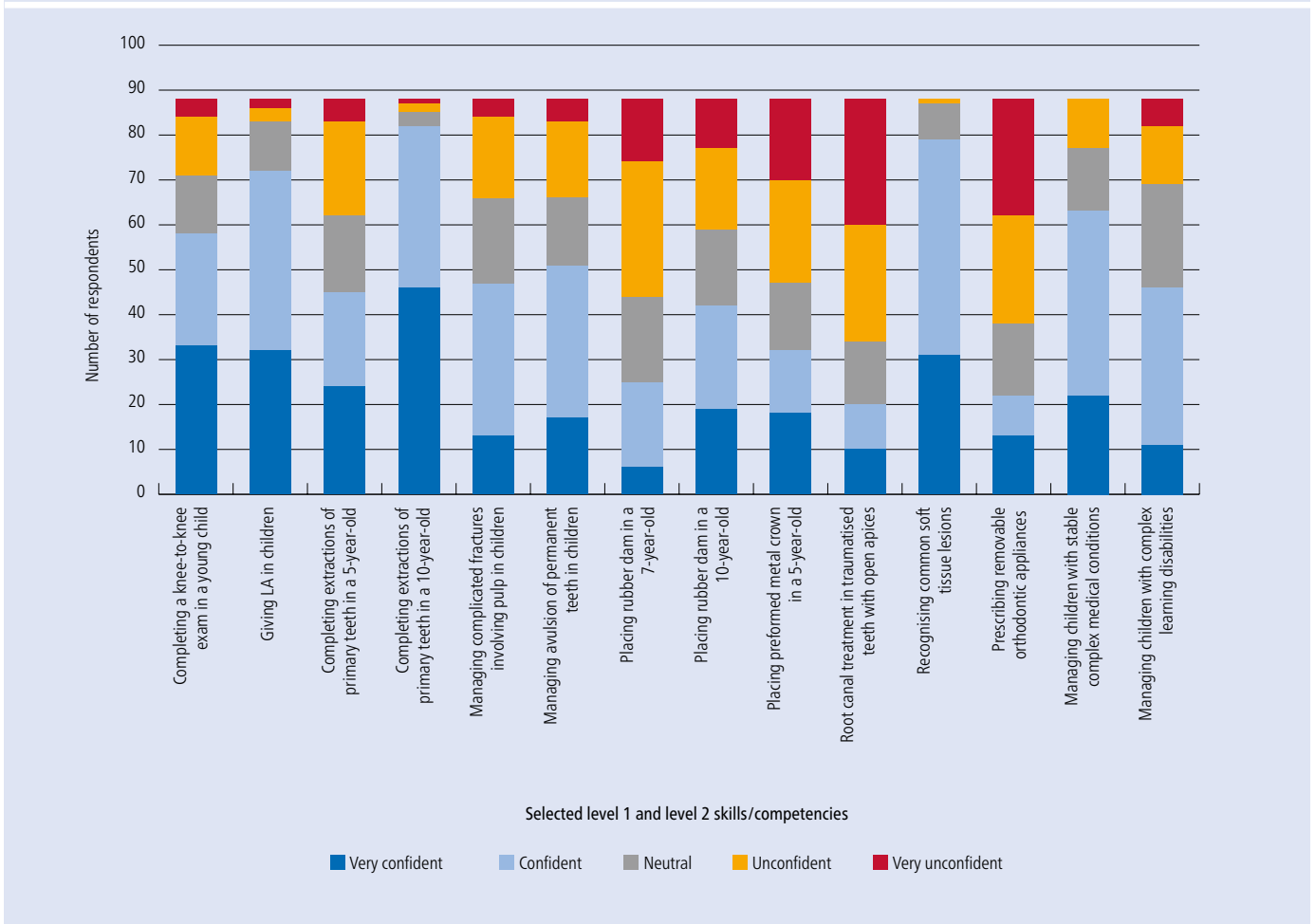
Respondent service contribution and setting	Proportion of respondents (%) ( $n = 88$ )
Provide NHS treatment	91
Provide private treatment	51
Provide emergency and urgent care services	27
Work within community dental service providing paediatric dental care	19
Work within community dental service but do not provide paediatric dental care	8
Work within hospital dental service	17

A higher proportion of respondents reported to be confident completing extractions (32%,  $n = 28$ ) compared to completing restorative procedures (17%,  $n = 15$ ). Cross-tabulation analysis demonstrated that confidence was consistently higher treating older children (>10 years old) compared to younger children. A small proportion of respondents (3%) reported to be confident across all skills/competencies. Generally, self-reported confidence varied depending on the particular skill/competency; that is, while an individual was highly confident in some areas, they would be less confident in other areas, indicating respondents were not consistently confident throughout the survey

or within each discipline assessed within the survey. Figure 2 illustrates participant confidence levels completing a selection of Level 1 and 2 skills/competencies surveyed.

Respondents graduating in the middle year groups (1994–2003 and 2004–2013) appeared slightly more confident than the longest qualified (1983–1993) and most recently qualified (2014–2020). Exceptions to this trend were in carrying out knee-to-knee examinations, in which confidence was highest (71%,  $n = 15$ ) in the longest qualified and lowest (53%,  $n = 10$ ) in the most recently qualified, and placing preformed metal crown (Hall technique) in a five-year-old was

Fig. 2 Respondent confidence in selected Level 1 and 2 paediatric dental skills/competencies



Duration of experience	Proportion of respondents (%) (n = 88)
None/never	63
<6 months	9
6–12 months	4
1–2 years	6
3–5 years	3
5+ years	15

highest in most recently and longest qualified. Confidence in selected procedures by year of graduation is shown in Table 3.

GDPs were less confident in some skills/competences than their community dental service and early-career dentist colleagues. Table 4 illustrates confidence of GDPs in comparison to other respondent groups.

Capacity for urgent care within the primary care workforce was favourable, with 90% (n = 80) of respondents reporting

they would create space for paediatric urgent dental care within their workplace. Respondents most commonly (83%, n = 73) referred paediatric patients to the regional dental hospital. Just over half of respondents (52%, n = 46) referred patients to their local community dental service and 59% (n = 52) referred to primary care practices that hold sedation contracts.

Eleven percent (n = 10) of respondents had equipment within their place of work

required to carry out Level 2 endodontic services for paediatric patients (rubber dam, calcium hydroxide, thermoplastic obturation, MTA). Furthermore, 63% (n = 55) of respondents had access to equipment required for splinting of an avulsed tooth. Only 9% (n = 8) of respondents, however, had access to the required equipment to provide both a trauma splint and any subsequent endodontic treatment (rubber dam, calcium hydroxide, thermoplastic obturation, MTA).

Two-thirds (66%, n = 58) of respondents felt that the current provision of paediatric dental services was inadequate. Over one-quarter (26%, n = 23) felt that patients were not seen in a geographically appropriate location, while 40% (n = 35) felt that patients were not seen in a timely manner. Forty-four percent (n = 39) of respondents expressed interest in providing Level 2 paediatric dental services. Just under a quarter of respondents (23%, n = 20) agreed or strongly agreed that they already had the skills, knowledge and experience to fulfil Level 2 paediatric dental services.

**Table 3 Respondent confidence by year of graduation – selected skills/competencies**

Item from skills/competencies survey section	Year of graduation	Proportion of respondents that were very confident and confident (%)	Proportion of respondents that were neutral (%)	Proportion of respondents that were very unconfident and unconfident (%)
Completing a knee-to-knee exam in a young child	All (n = 88)	66	15	19
	1983–1993 (n = 21)	71	10	19
	1994–2003 (n = 24)	79	13	8
	2004–2013 (n = 24)	58	22	20
	2014–2020 (n = 19)	53	15	32
Completing extractions of primary teeth in a five-year-old child	All (n = 88)	51	19	30
	1983–1993 (n = 21)	38	19	43
	1994–2003 (n = 24)	67	16	17
	2004–2013 (n = 24)	67	16	17
	2014–2020 (n = 19)	26	26	48
Splinting traumatised teeth	All (n = 88)	67	10	23
	1983–1993 (n = 21)	67	4	29
	1994–2003 (n = 24)	83	9	8
	2004–2013 (n = 24)	71	4	25
	2014–2020 (n = 19)	42	26	32
Managing complicated fractures involving pulp in children	All (n = 88)	53	22	25
	1983–1993 (n = 21)	52	10	38
	1994–2003 (n = 24)	58	21	21
	2004–2013 (n = 24)	58	25	17
	2014–2020 (n = 19)	42	32	26
Placement of a preformed crown (Hall technique) on a five-year-old	All (n = 88)	36	17	47
	1983–1993 (n = 21)	43	5	52
	1994–2003 (n = 24)	29	33	38
	2004–2013 (n = 24)	29	21	50
	2014–2020 (n = 19)	47	6	47
Prescribing removable orthodontic appliances for simple tooth movements (eg correcting cross bites)	All (n = 88)	25	18	57
	1983–1993 (n = 21)	24	14	62
	1994–2003 (n = 24)	33	21	46
	2004–2013 (n = 24)	33	21	46
	2014–2020 (n = 19)	5	32	63

**Table 4 Comparison of confidence of general dental practitioner and other respondents**

Item from skills/competencies survey section	Proportion of general dental practitioners reporting confidence (%) (n = 66)	Proportion of other respondents reporting confidence (%) (n = 22)
Completing a knee-to-knee exam in a young child	60	82
Completing extractions of primary teeth in a five-year-old child	47	64
Splinting traumatised teeth	67	68
Managing complicated fractures involving pulp in children	55	50
Placement of a preformed crown (Hall technique) on a five-year-old	26	68
Prescribing removable orthodontic appliances for simple tooth movements (eg correcting cross bites)	30	9



## Content analysis

Multiple themes were identified in content analysis of respondent dissatisfaction with the current provision of paediatric dental services. Respondents specifically felt that waiting lists were too long. They acknowledged that 'services were overwhelmed', leading to waiting lists exceeding six months' duration. Respondents also acknowledged the impact COVID-19 had on the pre-existing waiting list pressures:

- 'In [the] current [COVID-19] situation all referrals returned and waits over 1 year.'

Respondents noted that there was a lack of specialist/consultant-led services in the region, which resulted in patients travelling long distances to access specialist/consultant-led care and excessive waiting times. Some respondents expressed preferences for local specialist/consultant appointments, noting the positive effect this would have on tertiary care pressures. The benefits of shared learning, support mechanisms, and workforce education and training were also highlighted:

- 'A Specialist or Consultant post in Paediatric Dentistry should be in every team in Salaried/Community Dental services to provide care and relieve pressures on [hospital dental services]. Dentists in these services would then become more confident/competent in their roles.'

There was strong acknowledgement that patients are required to travel too far to access paediatric dental services. Some respondents highlighted implications this could have in contributing to oral health inequalities:

- 'From [my area] to [the hospital dental service] is too far for those from disadvantaged backgrounds.'

Insufficient provision of sedation services for paediatric patients was also noted to be a problem in the region. Respondents suggested that there has been an increase in demand for sedation services throughout the region, with a shortage of sedation providers and resultant long waiting lists. GDPs wanted an increase in regional sedation providers to increase referral options.

There was also a desire for increased access to other paediatric dental services and referral options; for example, trauma management and treatment under general anaesthetic. Respondents want more sites and services available to refer children to in addition to existing secondary and tertiary care services.

There was a desire for 'more local' practice-based services. Similarly, there was a demand for private provider referral options:

- 'I recently put a social media post out enquiring about [private] options for a paediatric patient and the options were sparse.'

Respondents expressed a desire for paediatric dental education and training. There was an appetite for specific elements of education and training related to paediatric dentistry and even for clinical attachments in the speciality:

- 'Would certainly do appropriate course/CPD if the opportunity for work was there'
- 'Advice or a tool book on caring for children with additional needs.'

## Discussion

The sampled sub-section of workforce in this region reports high confidence in carrying out dental treatment for the paediatric population and reports regularly facilitating access for urgent treatment within primary care. A proportion of respondents expressed dissatisfaction with the current paediatric dental service provision in the region. Main reasons for dissatisfaction were related to a perceived lack of timely treatment, lack of local specialist services and limited referral service options. There is an existing proportion of the regional primary care workforce who feel they currently have the required skills, knowledge and experience to provide Level 2 services. Additionally, there is an appetite for further education and training within this speciality.

The Office of the Chief Dental Officer released commissioning standards for paediatric dental services in 2016.<sup>2</sup> Uptake has been variable across the country with different regions at different stages of implementation. There have, however, been limited attempts to explore the existing capacity within the workforce to provide Level 2 services. To the best of our knowledge, this is the first publication assessing primary care workforce self-reported capacity and willingness to provide Level 2 paediatric dental services.

A national cross-sectional survey currently in press, related to restorative dentistry, identified that 33% of respondents felt that they were in a position to apply for a Level 2 role within a restorative MCN.<sup>15</sup> This is greater than the proportion of respondents in this study (23%) that felt they were in a position to provide Level 2 services in paediatric dentistry.

This may be related to differences in access to Level 2 training opportunities in the different specialities, different samples obtained, the national versus regional approach and the exclusive sampling of GDPs in the restorative survey.

Furthermore, this appears to be the first publication assessing confidence of the primary care and early-career dental workforce in providing a range of Level 1 and Level 2 paediatric dental skills/competencies. Confidence in management of uncomplicated and complicated crown fractures is lower than previously published studies while confidence in management of permanent avulsion injuries was higher.<sup>16</sup> This may again be related to sample size and characteristics; however, it may also be a reflection of undergraduate and postgraduate trauma education, training and experience.

Inconsistent confidence levels in trauma management, a respondent desire for more trauma management referral sites, and a lack of access to required equipment to manage traumatic dental injuries and complications could highlight a lack of workforce preparedness in acute and long-term management of dental trauma. This indicates a workforce training priority in the region.

A major limitation of this study is the sample. While an open sampling frame was used and so it is not possible to determine a response rate, it is helpful to consider that the estimated number of dentists in the region (based on NHS Business Services Authority and Health Education England North East Workforce figures) is 2,161, meaning that only a small number responded (4%).<sup>17</sup> However, of more concern, due to the opt-in nature and distribution routes of the survey, it is likely that an element of selection bias occurred, with well-motivated respondents with an interest in paediatric dentistry and Level 2 services being self-selected from the population. While there is the potential that results may not be representative of the entire workforce, attempts were made to reach a diverse selection of the workforce by also disseminating across general dental services, community dental services and regional research collaborative networks.

The survey was only available in a digital format; therefore, it was only accessible to IT-literate respondents. Social media was used as a major distribution route, so sections of the population active on social media may have been more likely to access the survey. This may have affected the representativeness of the results.

Surveys of this kind are susceptible to response bias where respondents may provide perceived ideal or desirable responses. Participant anonymity was used to reduce the risk of this bias. Question design of the survey and Likert scale used may also have contributed to response bias.

The survey asked respondents to self-assess their confidence which, although helpful, is subjective and may not translate to the same level of competence. Respondents that felt they were able to provide Level 2 services in reality may not have the necessary competencies to be suitable for Level 2 accreditation.

This survey was carried out during the COVID-19 pandemic at a time point when services in the region were recovering. During this time, acceptance criteria and service capacity for paediatric dental services were restricted and this may have influenced respondent satisfaction.

Given current levels of unmet dental need and backlog of dental care resulting from the COVID-19 pandemic, there is an urgent need to identify ways to increase access to dental care for paediatric patients. Commissioning Level 2 paediatric dental services is one way in which access could be improved, and this survey will provide valuable information for those planning such services and the related necessary training. Further explorations of motivators and barriers to becoming a Level 2 performer in paediatric dentistry would add value.

## Conclusion

There were high levels of confidence relating to completion of paediatric dental treatment in the surveyed sub-section of early-career and primary care (general dental service and community dental service) dentists

working in North East England and North Cumbria. Generally, respondents felt that the current provision of paediatric dental services is inadequate, and concerns centred around extensive waiting lists, lack of local specialist services, limited referral services and insufficient provision of sedation services. Respondents identified a desire for further education and training, and providing Level 2 paediatric dental services, of which some felt that they had the required skills, knowledge and experience.

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### Ethics declaration

*The authors declare no conflicts of interests.*

### Author contributions

*C.R. Vernazza contributed to overall project supervision and manuscript review. C.K. Wallace contributed to project conception, survey design, data analysis and manuscript review. S. Simpson contributed to survey design and distribution, data analysis and manuscript creation.*

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