

Molar-incisor hypomineralisation combat: exploratory qualitative interviews with general dental practitioners in England regarding the management of children with molar-incisor hypomineralisation

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Key points

Highlights barriers to providing care for children with MIH within the general dental service.

Shows that remuneration for behaviour management and prevention is perceived to be insufficient.

Shows that a lack of specialists in paediatric dentistry and long waiting lists for treatment in secondary care has a knock-on systemic effect on the dental care of children generally.

Abstract

Introduction Molar-incisor hypomineralisation (MIH) presents as a spectrum, with severe cases becoming increasingly complex to manage. This study aimed to investigate the perceptions and experience of general dental practitioners (GDPs) in England when managing children with MIH.

Method Semi-structured telephone interviews with GDPs who regularly treat children took place in May 2020. A sample of four male and six female GDPs with 1–15 years of experience was achieved through purposively sampling interested parties following advertisement via professional groups. Thematic analysis using a realist and inductive approach was used in analysis.

Results The overarching theme was of managing uncertainty, with four subthemes: setting the scene; fighting the tooth; working within the system; and self and interpersonal insight. Despite being knowledgeable, participants expressed varying levels of confidence in many aspects while managing children with MIH. There was a great deal of uncertainty surrounding 'doing the right thing' across the themes. Systemic barriers to managing children with MIH within the general dental service were identified.

Conclusion The challenges of managing children with MIH was experienced as 'uncertainty'. Barriers within the general dental service made managing children with MIH difficult and participants relied on colleagues in secondary care to manage severe cases.

Introduction

Molar-incisor hypomineralisation (MIH) is a common developmental defect of enamel, which causes demarcated areas of hypomineralisation on first permanent molars (FPM), sometimes the incisors and less often, the second permanent molars and canines in the adult dentition. It affects 14.2% of children worldwide¹ and in the UK, a study in the North East of England found a prevalence of 15.9%.² It has a uniquely

varied presentation,³ with mild cases often asymptomatic, apart from minor aesthetic concerns and the most severe cases having painfully sensitive molars with post-eruptive breakdown and caries,⁴ or incisors with an appearance that negatively affects the child's quality of life.⁵ Mild cases can normally be managed by general dental practitioners (GDPs), whereas more severe cases may be managed in secondary care under the guidance of specialists in paediatric dentistry and/or orthodontics.⁶

Much guidance exists regarding possible options for preventive care and management.^{4,7,8,9,10} Where teeth are mildly affected, non-invasive management is recommended, including professional interventions, such as fluoride varnish, calcium phosphopeptide, amorphous calcium phosphate and resin-based fissure sealants of FPM. As the severity of MIH increases, management options become more complex. In

general, restoration of any caries or post-eruptive breakdown using resin-modified glass ionomer cements, composite resin or preformed metal crowns (PMCs) is recommended initially for FPM, before making a decision regarding the long-term prognosis and possible elective loss of the tooth between the ages of 8–10 years.^{11,12} In some cases, it may be appropriate to plan for endodontic treatment¹³ or durable cast restorations, such as onlays, to restore FPM once the child reaches adolescence instead.¹⁴

Difficulty in completing these treatments have been reported in the literature. Children with severe MIH are known to have increased anxiety and present more behaviour management issues.^{15,16} Difficulty gaining effective anaesthesia due to low-level pulpal inflammation has also been described.¹⁷ Hypomineralised enamel means bonding is less effective.¹⁸ Decision-making regarding whether to keep a FPM or

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Refereed Paper.

Accepted 10 September 2021

<https://doi.org/10.1038/s41415-022-4254-2>

remove it is disputed among dentists from the UK and the rest of the world and between specialists and GDPs within the UK – the latter preferring to restore rather than remove compromised FPM.¹⁹

In many countries, including the UK, children are only seen by specialists in paediatric dentistry on referral, the majority of which come from GDPs.²⁰ This means GDPs have an important role in the early identification and immediate management for children with MIH.^{20,21} Previous qualitative work has been carried out in the UK investigating the experience of providing dental care for children, including use of PMCs, restoration of carious primary teeth and preventive care.^{22,23,24,25} Common themes identified were: time pressures in relation to giving adequate preventive advice; stress related to provision of local anaesthetic (LA) in young children; and a feeling that regulations for primary care dentistry restricted care in a way that authors of ‘idealistic’ guidelines did not fully appreciate. The aim of this study was to explore the experience of GDPs when managing children with MIH in English primary care, in terms of their understanding of the condition and their perception of their own management and challenges encountered.

Materials and methods

Participants

UK-based GDPs were recruited by sharing information regarding the study on UK-based dental networks. This included the webpage ‘For Dentists, By Dentists’ on Facebook and via National Institute for Health Research Clinical Research Networks for the North West Coast and North East and North Cumbria. Interested parties were invited to contact the author for further information. Of the 21 clinicians who contacted the lead author to participate, 12 were women and 9 were men. Interested parties were asked to confirm how long they had been practising dentistry before selection. Selection of interested parties was purposive and guided by the need for varied years of experience and sex, with roughly half of respondents contacted to gain consent before interview. Ethical approval for this study was granted by University of Liverpool Ethics Board (project 5997). Demonstration of data saturation was reached with ten interviews when the authors found that themes were not significantly changed when further interview data were added.²⁶

Approach

Semi-structured telephone interviews were planned to take place during the COVID-19 pandemic. A semi-structured interview schedule was designed, piloted and refined several times after feedback from experienced qualitative researchers. Participants selected a suitable time (and place) for the interviews to take place. One author (JH) conducted all interviews, which were recorded using an M-Audio Microtrack 24/96 audio recording device. Field notes were taken during each interview. The interviews were anonymised and transcribed by one author (JH) and the original recordings deleted after resolving any unclear parts of text in the transcript, confirmed with the participants directly. This allowed increased familiarity with the data before actual analysis. Initial data analysis was completed concurrently with data collection and transcription of the interviews.

Analysis

Thematic analysis using a systematic inductive approach was used to analyse the data within the transcripts.²⁶ Coding of text with important, interesting or poignant significance were created across all data. Nvivo 12 software (QSR International, Melbourne, Australia) was used to create a record of coding and themes, which were re-analysed and interpreted several times. A coding framework was produced from the initial six transcripts and this was then developed and adjusted from the analysis

of the additional four transcripts. A second researcher (EM) also reviewed the transcripts and coding to increase robustness of the analysis. Participants were invited to feedback comments regarding this manuscript to the first author (JH).

The analysis was semantic in nature and follows realist paradigms. This was appropriate to explore individual experience and participant reflection on the situations described by participants.²⁷ Beyond purely describing the findings, analysis involved interpretation to contextualise the broader meanings and implications of the findings within management of MIH and the general dental service for children. Results have been reported in accordance with Consolidated Criteria for Reporting Qualitative Research and Standards for Reporting Qualitative Research principals.^{28,29}

Results

Telephone interviews were conducted during May 2020. Most participants were at home during the interview which took place during the first lockdown of the COVID-19 pandemic. Ten participants were initially recruited and no further participants were contacted following initial data analysis. Interviews lasted between 18–37 minutes (mean 29 minutes). The final sample included four men and six women. Participant demographics are demonstrated in Table 1. The overarching theme was developed as a uniting concept underpinning

Table 1 Interview participant demographics

Participant number	Sex	Qualified since	Location	Additional information
1	F	2014	London	NHS practice associate. Dental core trainee (DCT) experience
2	F	2014	London	NHS practice associate. DCT experience
3	M	2015	London	NHS practice associate. DCT experience
4	F	2016	South East	NHS practice associate. DCT experience in paediatric dentistry
5	M	2004	London	NHS practice principal. DCT experience
6	F	2016	London	NHS practice associate. No postgraduate experience
7	F	2016	London	NHS practice associate. No postgraduate experience
8	F	2003	Yorkshire	Associate in private practice with NHS contract for children. No postgraduate experience
9	M	2005	London	NHS practice principal. Hospital-based experience clinical tutor
10	M	2019	North West	NHS practice foundation dentist. No postgraduate experience

all the themes and a central idea found in all interviews (Fig. 1).

Overarching theme – managing uncertainty

Participants experienced managing children with MIH as a highly variable experience which was dependent on the severity of MIH, the child and the clinician themselves. There was a great deal of uncertainty surrounding ‘doing the right thing’ across the themes and an attempt to try to control these uncertainties, with solutions frequently suggested. Situations where participants felt a lack of control were particularly stressful.

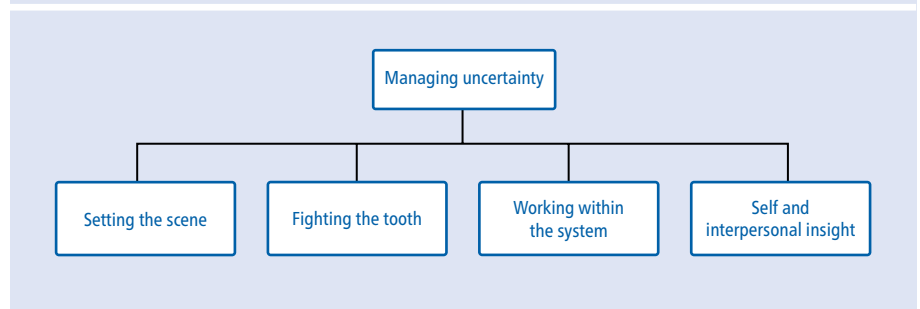
Setting the scene

This theme encompassed the initial stages of diagnosis, treatment planning and education of the family regarding MIH. Participants spoke about the diagnostic process, including feeling more confident when both molars and incisors were involved and many also described the presentation as a spectrum from mild to severe. Some participants also touched on the perception of diagnosing MIH more frequently as they actively looked for it during examinations. Participants were generally sympathetic to children and families with MIH, more so for children with caries who they perceived had disease which could be prevented. Education about MIH involved reassurance that parents hadn't caused the condition and an outline of the long-term care that the affected teeth might require. To manage the uncertainty of prognosis, most participants gave a worse-case scenario to the patient:

- ‘And I think, you just, it's important with this to...even if there has started to be some breakdown, so you know, there's starting to be caries in the tooth, it's quite important to reassure them [the parent] that this isn't something that they've done wrong’ (Interview 8, qualified 2003).

In terms of treatment planning, mild cases were seen as straightforward to handle. This relates not only to the low technical demands of preventive care but also to the fact that those children who are asymptomatic will likely have expectations that are easily met by the GDP. Severe cases were more difficult to plan for, particularly considering FPM of poor prognosis. Participants expressed high uncertainty in their decision-making regarding whether teeth should be extracted or restored,

Fig. 1 Overarching and major themes



although many dealt with this by referring into secondary care for planning:

- ‘Um, but if there are any, um, cases of, especially severe MIH, involving the 6's I would consider doing a referral then as well, especially if it looks as if they might have a poor prognosis, making sure that they're referred, at, um, the appropriate time to, to consider having them extracted. In secondary care [...] I feel that its better, probably better in that [borderline] case, when it can go either way, to get a specialist opinion. To get an opinion in secondary care, so that I know that I've got an opinion from someone more knowledgeable, someone who's an expert in that field’ (Interview 2, qualified 2014).

Fighting the tooth

This theme covered aspects of treatment which participants experienced as important or challenging when caring for children with MIH. This included restoration of FPM, aesthetic treatments, use of LA and suggested solutions for some of the challenges discussed. Participants discussed the struggle of restoring the severely affected FPM tooth. Achieving adequate moisture control was difficult, in addition to restorations that needed frequent replacement due to suboptimal bonding to hypomineralised enamel. Unusually shaped cavities and partially erupted teeth meant dental dam placement wasn't always possible. Participants discussed the frustration of producing what they perceived to be a lower quality of restoration than they could achieve in an adult's carious tooth:

- ‘But I feel with MIH, it's, like, really difficult because you're battling with, like, the condition of the teeth and the enamel. So, um, it's always quite hard...like much harder than with a child who just has a small carious lesion on the 6...so, um, I feel like when you do restore the teeth, it's like, never a definitive restoration. It will fail at some point’ (Interview 7, qualified 2016).

LA was another source of anxiety for participants, with most admitting they did not enjoy administering for young children generally. However, for a child with MIH, the stakes were even higher as it wasn't always guaranteed to be successful first time. This left lots of opportunity for self-doubt for the GDP, in addition to potential loss of trust and cooperation for the child:

- ‘I've had a couple of cases [of MIH] where I've given local anaesthetic and it's still felt “oh, this is still very sensitive”, etcetera. Um, so again, that perceived fear, that, eh actually, if this child's going to need an intervention, um and then I'm starting to give local anaesthetic and I'm getting everything ready and then I try to drill and the child's in pain and then they're no longer happy with the idea of having dental treatment, um and then I do the referral, I feel like then the child is you know, a bit more compromised in that way’ (Interview 3, qualified 2015).

Working within the system

This theme explored the influence of practice demographics, the current system of remuneration within the English general dental services and the referral process. Local working environments and professional expectations were dictated by the ethos of the individual practice participants worked at and the wider socioeconomic status of the area they worked in. Most participants felt that the current remuneration system didn't adequately encourage behaviour management and prevention. Behaviour management and prevention come under a Band 1 charge; however, this band also includes examination, treatment planning, radiographs and scaling. The dentist is paid a flat rate for this work which therefore does not encourage additional time to be spent on these areas beyond the first visit of the treatment plan:

- ‘I have had my principal tell me a few times, being like, oh you know, “why have you

booked so and so back in?” And I’m like, you know, “just so I can make sure she’s acclimatised”. Eh, but obviously, the way the national health service remunerates dentists, that is not part of it’ (Interview 3, qualified 2015).

Referral was discussed at length by all participants. Often it was seen as a last resort when the GDP reached a barrier which they were unable to resolve locally. This included clinical issues, such as planning long-term for severely affected FPM, but also the emotional barrier of feeling ‘stuck’. The actual system of referral was described as tedious and complex to navigate for some participants, with many dealing with rejections for clerical errors which delayed the child getting the specialist care they required. In addition, long waiting lists for both initial assessments and treatment under general anaesthetic (GA) created worry regarding children missing the best opportunity to extract FPM with good space closure post-operatively. While the child awaits their first visit with a specialist, the GDP remains responsible for management which they may feel unable to provide. Participants expressed feeling isolated from support from specialist colleagues during these times:

- *‘Being able to get them a GA at the time that they need it, I suppose! You know, because you sort of need to be thinking quite a long time ahead. [...] um, because otherwise it’s like, when I think it’s time, I might miss the window or I might refer and there’s a really long waiting list for a GA, you know. They might be in pain before they have it, do you see what I mean? I tend to try to refer quite early because of the problems with the NHS’ (Interview 8, qualified 2003).*

Participants discussed the grey area of aesthetic dentistry within the publicly funded NHS general dental service. Participants described the paradox of being skilled in many aesthetic procedures that they provide privately to adult patients but felt unable to offer to children or adolescents. In addition, the law surrounding bleaching, upheld by the General Dental Council (GDC), states that bleaching should not be performed in children under the age of 18 unless for a medical reason. Participants felt unable to perform bleaching and other procedures due to fear of litigation and lack of support from their indemnity providers:

- *‘But I know that there are like, regulations, with regards to bleaching in children under 18 and whether I would feel happy doing that in general practice myself? I would probably say no. Not because I feel that it’s unsafe but because I don’t feel that the regulations would back you for doing it, unless you’re in a paediatric [dentistry] department’ (Interview 4, qualified 2016)*
- *‘It’s a case of whitening, infiltrating and then restoring the tooth, in the absolute severe cases. And that’s probably where we slightly cross the GDC boundary of what’s restorative dentistry and what’s aesthetic dentistry. And, um, you know, that’s on a case-by-case basis’ (Interview 5, qualified 2004).*

Self and interpersonal insight

The final theme encompassed the different relationships that affected the provision of care for children with MIH. This included the relationship with the family and child, previous dentists and the participants’ own reflection on their current practice. Participants placed high importance on cultivating a good relationship for children with MIH, bearing in mind the likely need for restorative intervention in the future. Fear of the unknown, LA and the patient’s age were commonly encountered hurdles to cooperation. Participants talked at length regarding the different behaviour management techniques used and discussed bringing children back for reviews after difficult appointments to rebuild trust. This was not a technique used with adults, so it seems that the participants placed more importance in ensuring positive experiences for children in their formative years. Related to this, there was a lot of fear expressed regarding doing too much and causing dental anxiety:

- *‘My worry is that I’ll traumatise the child and then they’ll refuse any kind of treatment, lose any kind of cooperation in the future’ (Interview 1, qualified 2014).*

The relationship between dentist and child is complex and often influenced by the parent. Participants discussed having to manage the behaviour and expectations of the parent, in addition to the child. This took several forms, including parents’ unhelpful voicing of their own dental anxieties in front of the child, or becoming frustrated and chastising the child when they wouldn’t cooperate. More recently qualified GDPs spoke of the pressure and judgement they perceived when dental treatment of children didn’t go to plan, in

addition to the discomfort of feeling ‘watched’ by parents. This is perhaps a projection of their own uncertainty regarding managing children in the early years post qualifications and their own worries over whether they are doing the ‘right thing’:

‘So in that particular scenario, eh you know, just in terms of self-perception, you know, you feel like, you know, is this parent starting to question my judgement because I’ve laid out a comprehensive treatment plan and I wouldn’t have laid it out, had I thought it wasn’t achievable and yet there’s direct evidence that, you know actually, the child didn’t do it, so you know, does this dentist know what they’re doing?’ (Interview 3, qualified 2015).

GDPs were asked to reflect on what they felt their role was in the care of children with MIH. Most participants agreed their role was to identify it, educate the family regarding its presence and to provide preventive care, alongside any initial restorative care. The importance of the GDP as the orchestrator and overseer of the whole patient journey, rather than for single courses of treatment elsewhere, was highlighted. Regarding the more severe cases, there was disagreement, with some feeling confident to carry out all necessary treatment unless cooperation was insufficient and others feeling that planning and treatment would likely be a ‘nicer’ experience for the child with clinicians more skilled and knowledgeable about paediatric dentistry. Participants also discussed their observations regarding the management of children with MIH by other dentists and colleagues. Some commented that GDPs that had come before may have misdiagnosed MIH, often as ‘fluorosis’, which participants had to then inform the patient and family was incorrect. This led to confusion and participants felt they had to work harder to regain the trust of the family. In addition, this also had the potential to create missed opportunities for optimal care. Some felt that some GDPs may cut corners with the care of children generally due to the time-pressured and target-driven system of remuneration:

‘Um, but sometimes, you know, you get the impression that people think, ok, you’ll lose money on adult treatment, but you would make that money back on paediatric treatment. You know, just a quick GIC [glass ionomer cement] or something, which is a horrible way to think about it. But I think, I do get the impression that there are dentists that do things like that’ (Interview 4, qualified 2016).

Discussion

This study has highlighted the uncertainties faced by GDPs when trying to manage children with MIH in England. Although some of the challenges have been reported previously, such as difficulty achieving anaesthesia, the interviews identified broader issues, such as the current system of NHS dentistry which restricts the amount of behaviour management, prevention and aesthetic treatment GDPs feel able to provide. In addition, the long waiting times for treatment in hospital settings mean children who are in need of specialised care reside in an effective treatment 'no-man's land' for months, with little support for GDPs during this period. The British Dental Association has identified that even before COVID-19, some children were already waiting over 12 months for a dental GA.³⁰ With dental services in both primary and secondary care severely affected by the COVID-19 pandemic,³¹ this is likely to be further exacerbated over the coming years, as services attempt to clear patient backlogs.

Until now, no qualitative research has been carried out to explore the perceptions and experiences of clinicians caring for children with MIH; however, surveys have identified some key challenges. Kalkani *et al.* conducted a survey of 31 GDPs and speciality trainees in paediatric dentistry within the UK.³² Sensitivity of teeth and behaviour was often a challenge for both groups. Speciality trainees were much more likely to access second opinions from specialists in paediatric dentistry or orthodontics than GDPs. Multiple surveys of GDPs' knowledge and experience of MIH have also been completed in the Middle East, South East Asia, Australia and Chile.^{33,34,35,36,37} Behaviour management was often discussed as the most significant barrier to care for these children.

Issues such as uncertainty when treatment planning poor prognosis FPM; bonding and survival of restorations; and management of dental anxiety were discussed by participants in these interviews and have also been reported in previous quantitative research. When planning, the main area of uncertainty was regarding decision-making for FPM and many participants opted to refer these patients to specialists in paediatric dentistry or orthodontics where it was perceived they might receive the 'right' care. Taylor *et al.* found that UK-based GDPs were more likely to restore a poor prognosis FPM than specialists, who were more likely to extract, indicating

there is not a consensus generally.³⁸ Kalkani *et al.* also found that UK GDPs were significantly more likely to experience difficulty deciding the prognosis of an MIH tooth in comparison to trainees in paediatric dentistry.³² Guidelines exist in the UK regarding planning for enforced extractions of poor prognosis FPM;¹² however, the definition of the poor prognosis FPM remains abstract. More recent studies have suggested that perhaps extraction of FPM is overused in the UK.¹⁴ It appears that a poor prognosis FPM is therefore an arbitrary measure, which those with less specialised experience may find difficult to make. Further research to refine the evidence base regarding decision making is necessary.

Failure to achieve good LA during treatment has been discussed as a barrier to care in multiple studies, but the significance of this varied, with 23.5–57.6% of GDPs reporting this as an issue in previous studies.^{35,39,40,41} This has also been demonstrated in decision-making for primary teeth, where the challenges in LA administration led to deviation away from treatment which involved LA.²⁵ Patient anxiety regarding dental injections is well reported and is particularly high in young children (19% of four- to six-year-olds).⁴² Dower *et al.* found that the biggest cause of anxiety for GDPs during injections were anxious patients (67%) and children (16%).⁴³ It fits, therefore, that invasive treatment of MIH-affected teeth can be emotionally draining.

After treatment, the uncertainty continued as many worried whether their restoration would last due to compromised bonding. Jalevik and Klinberg reported that restorations were replaced four times as often on MIH-affected teeth, which is in keeping with the experience of the GDP in this study.¹⁶ Crombie *et al.* found providing adequate and long-lasting restorations was an issue for 87.4% of GDPs surveyed when treating children with MIH.⁴¹ Techniques to improve retention have been discussed in the literature, such as the addition of an adhesive before placement of the fissure sealants⁴⁴ and application of sodium hypochlorite before etching to dissolve the excess protein in hypomineralised enamel.¹⁸ Although useful, these techniques may be difficult to achieve in dentally anxious children. Participants reported compromising on their ideal restorative materials, which left some feeling demoralised and reinforced the fear that they might be 'doing the wrong thing'.

When it came to managing the child, the importance of the relationship between GDP,

parent and child was key to enabling treatment to take place. Parents who counteracted methods used by the dentist created uncertainty regarding treatment outcomes, as both GDP and parent competed for attention of the child. Previous research has shown both positive and negative influence on the behaviour of the child due to parental presence during dental treatment, although results were not significant in either study.^{45,46} This highlights the importance of regular appointments with the GDP so that the dynamic and relationship between parent, child and dentist may be developed and is a key facilitator of positive interventions for management of children with MIH.

The current system of remuneration for GDPs in England using Units of Dental Activity has been criticised extensively in the past for its perceived shortcomings⁴⁷ but has not been explored in relation to MIH. In the interviews conducted by Marshman *et al.*, GDPs reported that the current infrastructure of NHS dentistry was responsible for the perceived time pressures regarding giving preventive advice.²⁵ Likewise, in Dailey and Threlfall's studies, time pressure and perceived insufficient remuneration influenced both prevention and use of PMC.^{22,23,24} The participants of this study expressed that the current system of NHS dentistry was too restrictive and didn't encourage a focus on prevention. Likewise, no payment exists for using enhanced behaviour management skills and the additional time this may take when treating children, particularly those with MIH. In England, per course of treatment, a GDP receives approximately £10 for all preventive care, including fissure sealants and fluoride varnish, examination and radiographs. When it is considered that children with MIH are more likely to be anxious and are at greater risk of developing caries, GDPs face the option of losing money when attempting treatment for more severe cases in primary care, or referring into the secondary care system where these children may face a long wait to be seen by a specialist. In addition, most participants were unwilling or did not feel able to provide aesthetic treatment to children or adolescents, despite being knowledgeable about potential options. It is evident that the system of NHS dentistry in England may restrict GDPs in providing care for children with MIH.

Referral was utilised to manage the uncertainties and complexities discussed thus far. It was also utilised to access services

unavailable in primary care, such as GA. Humphreys and Albadri found that the majority of patients referred into a specialist dental hospital in the North West of England with MIH required extractions of FPM under GA.²⁰ As discussed above, there were many reasons for referral but all involved reaching a barrier where the participant felt unable to proceed, both clinically and emotionally. Unfortunately, the number of specialists in the UK has plateaued over the last 20 years, while the population of children continues to grow, increasing the number of children on waiting lists as demand outstrips supply.⁴⁸ This has placed additional pressures on the whole system of dentistry for children within the UK, including in primary care.

Strengths and weaknesses

A downside of telephone interviews is that the information collected may not be as in-depth as face-to-face interviews.⁴⁹ Most participants talked freely for long periods of time; however, better probing may have taken place in person, with the interviewer able to read non-verbal cues. As expected, more recently qualified, female GDPs contacted the researcher to participate. The purposive sampling technique aimed to minimise this bias. No GDPs qualified over 20 years approached the research team to participate, which may be in part due to increased professional and personal commitments, but may also be related to familiarity with MIH as a concept. The results are therefore biased to reflect the experience of the dentist qualified within the last 20 years. In addition, no GDPs were recruited from outside of England and therefore, findings may not reflect the experience of GDPs within the rest of the UK. A London bias exists, which perhaps shows a greater interest or perceived greater issues with children's dentistry in this region. The sample of ten participants is relatively small and therefore it is possible that further development of themes may have occurred with analysis of a larger sample.

Reflexivity

The interviews were carried out by a single person (JH) who had prior training in qualitative research. Participants were not made explicitly aware of the interviewer's position as a postgraduate doctoral student in paediatric dentistry; however, email correspondence to exchange consent forms was from a university email address.

Participants received information regarding the aims and objectives of the study before the consent process. The interviewer's knowledge of clinical dental practice allowed for relaxed conversation with the participants without need for explanation of technical terms. The analysis is framed within the context of the first author's knowledge and experience of clinical paediatric dentistry. To increase rigor, a second researcher (EM) read the transcripts and reviewed the coding and the evolution of themes were agreed by the whole research team.

Conclusions

The challenges of managing children with MIH was experienced by participants as uncertainty. Often, referral was used to manage this; however, ultimately, this did not result in the participant overcoming these same barriers in the future, due to a lack of integration between primary and secondary care. Barriers within the system of the general dental service made managing children with MIH difficult and participants relied on colleagues in secondary care who do not work within that system to manage severe cases.

Funding information

No funding was received for this work.

Ethics declarations

The authors declare no conflicts of interest.

Author contributions

Judith Humphreys: conceptualisation; methodology; formal analysis; investigation; resources; data curation; writing – original draft preparation; writing – review and editing; and supervision. Sondos Albadri. Fadi Jarad, Rebecca Harris and Emma Morgan: formal analysis and project administration. Emma Morgan: investigation. Stephen Clayton: project administration.

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