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The attitudes of dental therapists, dental therapy educators and dental therapy students in the South of England towards domiciliary dentistry: a qualitative study

Robert Emanuel,^{*1} Joshua Quach,² Parul Patel,³ Robert Witton,⁴ Carolina Machuca-Vargas⁵ and Eleanor Taylor²

Key points

Will provide insight into the difficulties facing house-bound patients accessing care.

Will allow an understanding of possible solutions involving DCPs and a skill-mixed workforce.

Encourage DCPs as well as dental practitioners who read to consider engaging with domiciliary dentistry.

Act as part of the evidence base for influencing future commissioning.

Abstract

Introduction Dental therapists (DTs) are members of the dental team with a wide scope of practice, who support the provision of dental care to patient groups including those with vulnerabilities. One such group are older patients who are often unable to attend general dental practices to access their dental care. A domiciliary or 'home visit' may be required to deliver this care in a non-clinical setting.

Aim To identify how dental therapists and dental therapy educators working in Southern England perceive domiciliary dental services and to explore the possible role of dental therapists in providing domiciliary dentistry.

Method A qualitative research design using a thematic approach.

Results A total of five focus groups from the three professional groups were held representing a diverse community of therapists. A number of themes emerged including: knowledge of the domiciliary patient; barriers to the provision of domiciliary care; barriers to accessing domiciliary dentistry; overcoming barriers; and benefits of providing domiciliary care.

Conclusion The concept of DTs providing domiciliary care was in general viewed positively. Several perceived barriers were reported including contractual, education and training issues. These barriers would need to be overcome to improve dental workforce skill-mix in delivery of domiciliary dental care.

Introduction

Dental therapists (DTs) are members of the dental team with a wide scope of practice, and they can effectively support the provision of oral and dental care to a number of patient groups

including those with vulnerabilities. One such group of vulnerable people is older patients who, through chronic illness and frailty, are often unable to attend general dental practices to access dental care. As with medical care for these groups of patients, a domiciliary or 'home visit' may be required to deliver this care in a non-clinical setting. There are currently 5,017 DTs registered with the GDC.¹

Despite many older people retaining their teeth to a greater age and living with chronic illness, there is a decline in dental domiciliary care.² Figures from the NHS Business Services Authority (NHSBSA), which collects NHS dental information, show a 37% reduction in the number of yearly domiciliary dental visits carried out between 2008 and 2019.² This is due to multiple factors including the removal of domiciliary dentistry from the NHS General Dental Service contract alongside other barriers to care which makes access to any NHS dentistry often problematic. This decrease, against a backdrop of an ageing population

and more retained teeth, has increased the need for domiciliary dental care. However, domiciliary dental care has now become an area of dentistry restricted mostly to Special Care Dental Services alongside a small number of independent providers.

A change in NHS regulations allowing DTs to be 'able to accept patients for NHS treatments' was announced by the Chief Dental Officer in July 2022.³ This change allows DTs to work independently without requiring a written treatment plan from a dentist, but still rely on prescription of any medications which need to be used as part of the treatment (including local anaesthetic). The use of all dental care professionals, including DTs, is seen by many as a potential way of improving a failing NHS dental system.⁴ Additionally DTs feel they are being under-utilised in dentistry and believe their diagnostic skills could be used to improve access to dental services.⁵ Thus, could DTs be used to provide domiciliary care? There would appear to be both many opportunities as well

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as potential barriers to this proposition⁶ and so further investigation is warranted. Therefore, the aim of this study was to identify how dental therapists, dental therapy educators and dental therapy students perceive domiciliary dental services in Southern England.

Aims

1. To identify how dental therapists, dental therapy educators and dental therapy students perceive domiciliary dental services in Southern England
2. To explore the experiences of dental therapists, dental therapy educators and dental therapy students working for or in contact with domiciliary dentistry
3. To explore what dental therapists, dental therapy educators and dental therapy students perceive to be the possible future role of dental therapists in relation to domiciliary dentistry
4. To understand the limitations dental therapists, dental therapy educators and dental therapy students perceive there to be in their role within domiciliary dentistry
5. To explore dental therapists' suggestions on how access to domiciliary dentistry could be improved in the UK.

Methods

A qualitative research design using a thematic approach was adopted. Focus groups were conducted with different cohorts of DTs in diverse areas of Southern England between November 2022 and January 2023. Using line-by-line coding, data were analysed using thematic analysis to explore commonalities and differences in participants' views and opinions. Codes were developed into themes to develop an understanding of the data. Participants were assigned into three focus groups:

1. Student dental therapists in their final year of study (SDTs)
2. Dental therapy educators (DTEs)
3. Qualified dental therapists (QDTs).

Qualified dental therapists were recruited through invitations shared within regular British Society of Dental Hygiene & Therapy (BSDHT) newsletters and e-mail communications. Furthermore, participants were encouraged to share the invitation with their DT colleagues in the South of England to enhance recruitment through snowballing. The participants for the qualified group came

from a variety of different backgrounds with representation from GDS practices/salaried services as well as NHS/private. There was also a mix of experience from those more recently qualified to those with many years of practice.

Student dental therapists and dental therapy educators were recruited through invitations shared at the Peninsula Dental School and the University of Portsmouth Dental Academy. The educators came from a diverse group and included mostly DTs but some dentists and also a dental nurse. All of the educators reported many years of being involved in dental education.

The focus groups were carried out using a mixture of approaches to facilitate greater participation. This included face-to-face for the student group, a hybrid online and face-to-face approach for the educator groups, and online only for the qualified dental therapist groups. The focus groups were facilitated by the authors RE and ET using a semi-structured discussion guide, which was developed (and tested) before the focus groups took place. The sessions lasted between 35 and 55 minutes. Transcripts were prepared verbatim.

Initial line-by-line coding and early theme development were carried out individually by RE, ET, PP and JQ. Following initial line-by-line coding, two round-table discussions between RE, ET, PP and JQ were held to agree final coding and through thematic analysis, identify and then agree major and minor themes.

Results

A total of five focus groups were conducted by the team. These consisted of two groups of qualified dental therapists (DTs) (n = 10); two groups of educators (E) from Peninsula Dental School and Portsmouth Dental Academy (n = 9); and one group of final-year dental therapy students (S) from Peninsula Dental School (n = 7) (total of 26 participants).

Following analysis of the transcripts, 5 main themes and 20 sub-themes were identified (Table 1).

Knowledge of domiciliary patients

Health, social and patient-related features

The participants discussed a range of medical, dental and social factors relevant to the older domiciliary patient, showing a foundation of knowledge.

Many of the participants from all groups recognised the complex social situations of

patient experience. In relation to the social complexities, the majority of participants described the potential for the older patient to be socially isolated and lonely owing to a lack of social contact and inability to access care by traditional means:

- 'Part of the population who perhaps can't access care and are then feeling quite isolated and alone' (DTE).

Barriers to provision of domiciliary care

Financial barriers

Financial barriers for both the patient and the DT were a subtheme explored more thoroughly by the qualified group rather than students and educators, with limited NHS contracts and limited funding being the most readily identified barriers. There were also concerns voiced on the suitable remuneration for DTs providing NHS treatment, especially for DTs working for practices or NHS trusts either independently on a direct access basis (that is, for themselves), on an associate basis or as salaried employees. Currently, NHS domiciliary care is not part of mandatory dental services and requires a unique or specialist contract:

- 'It [treatment on a domiciliary basis] has to be justifiable because we're not getting paid enough' (QDT).

Clinical and professional barriers

As well as issues with obtaining valid patient consent and pain management, there were a range of barriers to domiciliary visits identified by DTs in this section and included features such as:

- Limited undergraduate training: 'I remember them giving us one lecture about it, because it was an exam question' (QDT)
- Restrictions on DT prescribing rights. This would include the prescription of local anaesthetic necessary for many operative treatments: 'The main barrier would be not having a dentist on site providing our prescriptions' (QDT).

Infrastructure barriers

The logistical barriers faced when organising domiciliary care were understood and expressed by all three groups. Lengthy car journeys in rural areas were mentioned along with the need for portable equipment and a separate medical emergency kit:

- 'I think the problem with domiciliary is that it's going to be that you haven't the full surgery with you' (QDT).

Table 1 Major themes, sub themes and features (cont. on page 4)

Major theme	Subtheme	Features
Knowledge of the domiciliary patient	Health-related features	Medical complexities/conditions Dementia/Alzheimer's and mental capacity problems Poor oral health due to neglect Physiological frailty Diverse health presentation
	Social-related features	Social complexities Diverse situation
	Patient-related difficulties	Patients resistant to change Communication barriers Alienated by technology Lack of awareness of domiciliary services Oral health being a low priority
Barriers to the provision of domiciliary care for DTs	Financial barriers	Cost and remuneration Limited funding NHS funding and contracts
	Clinical and professional barriers	Difficulty providing evidence-based dentistry Treatment plan expectation and choice Clinical governance and quality of treatment Direct access, prescribing rights and CQC requirements Lack of undergraduate training Pain management Obtaining consent Clinician preference
	Infrastructure barriers	Travel time and resources Operating conditions and lack of regulation Equipment and training Medical risks and emergency drugs
	Physical and health barriers	Physical strain on operator Clinician health
	Patient-related barriers	Private provision of treatment Domiciliary dentistry and the dentist's traditional role Limited knowledge of how to refer/access domiciliary care
Barriers to accessing domiciliary dentistry for patients	Lack of availability and awareness	Lack of available services Limited access to urgent or reactive services Lack of awareness/knowledge of services available Limited knowledge of referral pathways
	Physical and communication barriers	Physical disability Communication barriers between patients and healthcare professionals
	Financial barriers	Cost of healthcare Lack of NHS funding
Overcoming barriers	Resources and funding	Additional funding Resourcing fully
	Links and referrals	Links with social care Links with NHS systems (ICB/ICS) Clear referral pathways including 'refer-up' pathways
	Service delivery	Mobile unit Own entity/specialist domiciliary service Utilisation of digital technology Pragmatic treatment plans Own performer number for NHS
	Workforce development and support	Goodwill/charity of DTs Better skill mix utilisation including dental nurses Better regulation Prescribers' rights Mentorship and support Additional undergraduate/postgraduate training plus CPD Supervision and team structure Support of dentists Appropriate remuneration
	Patient awareness and education	More awareness of how to seek domiciliary care

Physical and health barriers

Barriers associated with working in an unfamiliar, non-clinical environment were discussed and

included comments on physical posture and their potential effects on clinician health:

- 'You might see them in their bed. So you

were again limited to how much you could do because you had to think of your own back' (QDT).

Table 1 Major themes, sub themes and features (cont. from page 3)

Major theme	Subtheme	Features
Benefits of providing domiciliary care	Benefits for patients	Opportunity for prevention Holistic approach to care Opportunity for oral cancer screening Improved quality of life
	Benefits for DTs	Rewarding/job satisfaction
	Benefits for caregivers	Opportunity to train care home staff
	Benefits for healthcare system	Preventative focus rather than reactive

Patient-related barriers

One reason provided by participants was the lack of awareness from the patient's viewpoint of domiciliary care being available.

Barriers to accessing domiciliary dentistry

Lack of available services

There appeared to be both a lack of available services and lack of knowledge of the required referral pathways:

- 'I'm not sure what would be available down here for domiciliary patients' (SDT).

Physical and communication barriers

Communication between the dental and care staff can be difficult. This was a common theme discussed:

- 'Sometimes you can turn up and the right person doesn't know you're coming' (QDT).

Overcoming barriers

Resources and funding

All groups suggested that to overcome the many barriers to domiciliary dentistry, adequate resourcing and funding were paramount for the success of a service. In general, the groups were positive to the idea of DTs being involved in domiciliary care, but money would be needed to reimburse appropriately in line with the therapists' skills and time:

- 'Well there needs to be more funding available, for it to be able to take place' (QDT).

Links and referrals

Links and referrals were discussed along with the idea of 'attaching' practices to care homes.

Service delivery

Service delivery optimisation was an area discussed by all the groups. Ideas suggested included use of a mobile dental unit or van; use of IT solutions to aid 'remote' working; use of pragmatic treatment plans and for domiciliary dentistry to be considered as its own entity:

- 'A mobile unit you could take to reach the centre' (QDT)
- 'Intraoral camera if you've got a lesion that you're concerned about' (QDT)
- 'I understand that you can't always do everything you would if the patient could get into the surgery' (QDT).

Workforce development and support

Workforce development and support was deemed to be a crucial factor in the future provision of domiciliary care by DTs. Comment on subthemes included postgraduate education/CPD, mentoring and support, and prescribing rights:

- 'Further training post-grad, I think is essential' (DTE)
- 'We certainly need training and I don't necessarily know if it would fit in undergraduate training or whether it would come more as a post-qualification training' (QDT).

Benefits of providing domiciliary care

Benefits for patients

There were deemed to be multiple benefits for patients including opportunity for preventive care, oral cancer screening, and a more holistic approach to care.

Benefits for dental therapists

Job satisfaction was a common benefit reported by all the groups:

- 'I'd say broadening horizons and seeing different experiences, becoming more adaptable and learning, I guess, new skills and how to manage thinking outside of the box, so it may be quite beneficial' (QDT)
- 'It's quite rewarding and it may not be a big money spinner but if you get the opportunity to get involved in it then I would highly encourage people to because it's really, really valuable and it's really rewarding; and I loved it when I was doing it' (DTE).

Benefits for caregivers and care facilities

These included the wider health promotion opportunities afforded by DTs to train staff.

Benefits for healthcare systems

Benefits to the healthcare systems as a whole included providing treatment with a preventive focus personalised to individuals.

Discussion

Access to dental care for the population, especially NHS dental care in the UK, is currently problematic.⁷ Since the 2006 NHS dental contract changes where domiciliary care and treatment were effectively removed from the GDS for those without a specialist contract, the amount of dental professionals providing regular care has effectively ceased to exist outside of the salaried services. Against this backdrop of a shrinking workforce is the ambition of the NHS to fully utilise all registered dental professionals, in an attempt to ensure continuity of all aspects of dental care by maximising the skill mix of these professionals.⁸ With new guidance and change in NHS dental regulations, the time now seems right to fully explore the ideas of utilising skill mix in all aspects of dental care including for those individuals who are unable to leave their homes and require care on a domiciliary basis. It is now appreciated and understood that for patients in care homes to have increased access to dental care will rely on fully utilising a skill mixed workforce.⁹

From the discussions with the DTs, SDTs and DTEs interviewed, perhaps the two greatest barriers to providing care are suitable financial/contractual arrangements to make any projects set-up, cost-effective and rewarding, as well as undergraduate/postgraduate education, to support interested practitioners in developing careers in this both interesting and very necessary field of dentistry. There are currently no mechanisms for setting up domiciliary-specific services for DTs to provide NHS care under a

standard contract. Flexible Commissioning, a system developed to 'improve access to dental care, develop skill mix care delivery and improve evidence-based prevention', would appear to address all the issues identified with providing domiciliary dental care, and support of the whole dental workforce should be utilised to develop novel services.¹⁰

To encourage DTs to engage with care provision, special focus will need to be given to ensuring that the workforce is educated to deliver a variation on what would be considered 'day-to-day' dental care. Discussions with the educators who took part in this project highlighted the fact that ideally a lot more education is needed. Not only will this improve the knowledge of DTs, but it will also add value to their clinical competencies and self-confidence. In addition, SDTs and QDTs alike reported a scarcity of levels domiciliary care exposure during their undergraduate training and were unable to identify any postgraduate training opportunities. Comments such as 'we certainly need training and I don't necessarily know if it would fit in undergraduate training or whether it would come more as a post-qualification training' were expressed. The solution to overcoming educational barriers will rely on domiciliary care being included in both undergraduate and postgraduate training programmes, even briefly at undergraduate level. Additionally, graduate programmes in domiciliary care for all professional dental groups will need to be developed for keen qualified individuals, including DTs, to improve their knowledge and skills. As mentioned by some of the educators, inclusion of specific training in the DT foundation training programme would also be beneficial. NHSE Workforce Training and Education are working to develop a suite of training and education. Unsurprisingly, of the qualified DTs participating in this study, those with experience in domiciliary care usually reported this being gained while working for salaried services.

A number of IT solutions and teledentistry were mentioned as a way of overcoming access issues, allowing a clinician to provide remote advice and consultations for patients unable to access the surgery in person.¹¹ This would inevitably be useful in domiciliary dentistry where DTs working in the field could access

help and advice from a dentist online back at the main clinic. Additionally, DTs providing prevention to those unable to attend the clinic for an appointment would appear as a logical next step for involvement of these DTs in providing preventive domiciliary care to those housebound patients, whether they live at home or in residential care.

When including any form of dental care, it is also worth mentioning how both the public (NHS) and private sectors are both necessary to meet the dental needs and demands of the whole population if these are to be met. Ideally, practitioners from both sectors where possible should be encouraged to explore dentistry for those unable to attend the surgery. This will be a growing area that needs to be considered, especially with regards to the maintenance and long-term care for those implants, which is primarily a private treatment option.

Conclusions

The concept of DTs providing domiciliary care was in general viewed positively. With the increase in elderly population, the improvement of the skill mix, particularly by increasing the use of DTs, is essential to meet this population's needs. However, a number of barriers exist including contractual, financial and education/training issues, and these would need to be overcome to make such practice possible. Future work should be developed to encourage and enable those DTs who are keen to provide a different and unique form of dental care to the older population.

Ethics declaration

The authors declare no personal conflict of interests. HRA approval was sought and given July 2022 by HRA and Health and Care Research Wales (Ref. 22/PR/0712). The participants gave verbal consent to take part and have their comments used in this study. The consent was recorded as being given.

Data availability

Data can be provided by the corresponding author upon reasonable request.

Author contributions

Robert Emanuel, Eleanor Taylor, Joshua Quach and

Parul Patel were involved in all stages of the research process, including research design, recruitment, interviewing, analysis and writing of the research manuscript. Robert Witton and Carolina Machuca Vargas were involved in research design, introduction to their colleagues at Peninsula Dental School and Portsmouth Dental Academy, and writing of the research manuscript.

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References

1. General Dental Council. Registration Statistical Report. 2023. Available at https://www.gdc-uk.org/docs/default-source/annual-reports/gdc_registration-statistical-report-22-23-v3_a.pdf (accessed July 2023).
2. Emanuel R, Mintz A. The decline of domiciliary dentistry. *BDJ In Pract* 2021; **34**: 12–13.
3. NHS England. Better access to NHS dental services under new reforms. 2022. Available at <https://www.england.nhs.uk/2022/07/better-access-to-nhs-dental-services-under-new-reforms/> (accessed February 2023).
4. Bhandal S. The time is now to save NHS dentistry. 2023. Available at <https://dentistry.co.uk/2023/02/06/the-time-is-now-to-save-nhs-dentistry/> (accessed February 2023).
5. Quach J, Wanyonyi-Kay K, Radford, D, Louca C. The perceptions and attitudes of qualified dental therapists towards a diagnostic role in the provision of paediatric dental care. *Br Dent J* 2022; DOI: 10.1038/s41415-022-4393-5.
6. Emanuel R, Quach J, Taylor E. Could dental therapists have a role in domiciliary dentistry? A discussion of barriers and considerations for domiciliary practice. *BDJ Team* 2022; DOI: 10.1038/s41407-022-0956-1.
7. Bissett G. Hundreds of dentists doing only one NHS check up a year. 2023. Available at <https://dentistry.co.uk/2023/04/19/hundreds-of-dentists-only-doing-one-nhs-check-up-a-year/> (accessed May 2023).
8. NHS England. Building dental teams: supporting the use of skill mix in NHS general dental practice. 2023. Available at <https://www.england.nhs.uk/long-read/building-dental-teams-supporting-the-use-of-skill-mix-in-nhs-general-dental-practice-long-guidance/> (accessed May 2023).
9. Health Education England. Advancing Dental Care Review: Final Report. 2018. Available at <https://www.hee.nhs.uk/our-work/advancing-dental-care> (accessed May 2023).
10. Hearnshaw S. Flexible Commissioning – a new approach. *BDJ In Pract* 2022; **35**: 18–21.
11. Eaton K A. The development of digital dentistry in the UK: An overview. *Primary Dent J* 2022; **11**: 94–98.



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