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Co-designing and evaluating oral health promotion interventions for vulnerable groups

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Co-designing and evaluating oral health promotion interventions for vulnerable groups

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Editorial: Co-designing and evaluating oral health promotion interventions for vulnerable groups

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co-design, health promotion, vulnerable children, participatory research, diversity

Editorial on the Research Topic
Co-designing and evaluating oral health promotion interventions for vulnerable groups

This Research Topic (RT) has attracted authors who have engaged with underrepresented groups in oral health and health promotion research. These authors have worked "with", rather than "on" people who are perceived as vulnerable using qualitative and participatory research, public engagement and health interventions to reduce social exclusion and inequities. The nine papers demonstrate the diversity of participatory approaches (1) at different stages of the research process, such as co-creation, co-design, and co-production.

The authors reported on research with diverse groups. Høiseth and Jasbi and Jasbi et al. engaged with adolescents and public dental services to understand adolescents' perspectives on oral health care and promotion, and to explore innovative techniques for dental professionals to promote hope. Booth et al. engaged with ex-offenders and third-sector organisations to co-design a film showcasing the dental experiences of this group before and after their transition out of prison. Cairns and Rodriguez involved "experts by experience" and their health and social care providers to co-design a dental service for adults experiencing homelessness. Chauhan et al. engaged with parents of young children in high caries communities who had limited proficiency in English to explore the accessibility of the "HABIT" intervention. Paisi et al. engaged with a range of participants that included dental and healthcare professionals, peer researchers, community representatives, patients, and support workers to co-design, implement and evaluate a dental service for people experiencing Severe and Multiple Disadvantages in England. Rodriguez et al. scoping review identified literature on the participation of people experiencing homelessness and/or their support workers in co-designing health and oral health promotion materials. Doughty et al. involved people living with HIV, those experiencing homelessness and those who identify as heterosexual in a study that demonstrated how Public and Patient Involvement was embedded in the development of an HIV testing intervention for dental settings. Beaton et al. engaged with oral health practitioners from a national oral health improvement programme in Scotland that evaluated the influence of the Smile4life intervention on the engagement behaviours of practitioners.

Høiseth and Jasbi illustrated the early co-creation that shaped the research questions and design of tailored oral health promotion for adolescents in the #Care4YoungTeeth<3 programme. This clearly required extensive collaboration among oral health professionals, designers and digital storytelling specialists.

Jasbi et al. highlighted the need for multidisciplinary collaboration and equal participation throughout the research process to foster adolescent empowerment during dental consultations. In this way, tailored co-designed interventions were able to transform challenges such as anxiety into positive dental experiences.

Booth et al. illustrated how they actively involved ex-offenders by using films to depict the stigma of people who experienced the justice system. Their approach dispelled the power differentials typically found in traditional researcher-led studies and facilitated inclusive collaboration.

Cairns and Rodriguez used the co-design framework for healthcare innovation to co-design a dental service for adults experiencing homelessness in a city with a high level of homelessness in Scotland.

Chauhan et al. used co-production at the latter stage of their research to inform strategies to improve the uptake of oral health resources. Participants with limited English proficiency described how they used translation tools, sought support from family and friends and recommended including visuals to increase understanding. The authors used this feedback to modify their resources.

Several papers highlighted the benefits of participatory approaches in intervention development for underserved communities. Paisi et al. described how they co-designed, implemented and evaluated a new dental service for people experiencing severe and multiple disadvantages. They emphasised the need for collaborative working, flexibility and support for people managing complex and chaotic lifestyles, and education for the dental workforce in trauma-informed dental practice.

This RT addressed the real-world challenges of participatory approaches. Rodriguez et al. scoping review described the barriers and enablers encountered while co-designing educational resources for people experiencing homelessness, such as recruiting, maintaining relationships, power differentials, time constraints and limited resources. Doughty et al. described their learning from involving patients and the public in developing a HIV-testing intervention from the perspective of finding "one's feet" as a novice PhD student and early career researcher. At the opposite end of the spectrum, Beaton et al. explored practitioners' experiences of delivering the national oral health programme Smile4life for people experiencing homelessness. They shared their own experiences of responding to challenging situations and the ability to act as a "boundary spanner" when exposed to a range of opinions, working environments and cultures of homeless organisations.

The nine articles identified key principles of co-design that enhanced the representativeness and inclusiveness of their findings (2). The principles of trust (Cairns and Rodriguez), empowerment, and non-judgemental attitudes (Rodriguez et al.) through working closely with the community, alongside the need to embrace flexibility (Cairns and Rodriguez, Chauhan et al., Paisi et al., Rodriguez et al.) were highlighted by the authors. The need to build a culture of involvement at all stages of the research process (Doughty et al.), by valuing equal opportunities and levels of participation with well-structured channels to listen to and integrate participants' views (Høiseth and Jasbi, Booth et al.) and multidisciplinary collaboration (Jasbi et al.) was also perceived as an important principle. This approach demonstrates the value of adapting research methods to the preferences and needs of the community.

Why do researchers make the conscious decision to pursue participatory approaches despite these challenges and barriers? We argue in this editorial that researchers choose and are inspired to adopt these counter-cultural empowerment research and engagement approaches that elevate the voices and lived experiences of vulnerable and marginalised communities (3) because of the richness, learning and impact that ensue beyond the research and outcomes. "Co" approaches create unexplained freedom for researchers who learn to embrace the inevitable uncertainty of not knowing – navigating the perilous seas outside the researchers' control. Participatory approaches offer rewards through reflexivity and by fostering intellectual humility, which means being open to new ideas and challenging perspectives. This creates space for deeper thinking, flexibility and critical reflection (4).

This editorial ends with a call to action to encourage innovative participatory approaches, creative methodologies, supporting funding streams and the development of a community of practice to promote participatory oral health research.

Author contributions

VM: Conceptualization, Writing – original draft, Writing – review & editing. ME: Conceptualization, Writing – original draft, Writing – review & editing. AR: Conceptualization, Writing – original draft, Writing – review & editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Exploring the engagement behaviours of Smile4life practitioners: lessons from an evaluation of the national oral health improvement programme for people experiencing homelessness in Scotland

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Introduction: Smile4life is Scotland's national oral health improvement programme for people experiencing homelessness, aimed at reducing oral health inequalities experienced by this population. This study forms part of an evaluation of how the Smile4life intervention was being implemented within Scottish NHS Boards. The aim was to investigate the influence of the Smile4life intervention upon the engagement behaviours of Smile4life practitioners.

Methods: Focus groups were conducted with Smile4life practitioners, to provide an insight into how the Smile4life intervention affected their skills, attitudes and experiences while interacting with people experiencing homelessness and their services providers. A purposive sample of oral health practitioners, including dental health support workers, oral health promoters/educators, and oral health improvement coordinators working in three NHS Boards were invited to take part. One focus group was conducted in each of the three NHS Boards. The focus groups were audio-recorded and transcribed. The COM-B model of behaviour was used as a framework for analysis.

Results: Eleven Smile4life practitioners took part in the focus groups. All had first-hand experience of working with the Smile4life intervention. The average focus group length was 67 min. Working on the Smile4life intervention provided the Smile4life practitioners with: (i) the capability (physical and psychological), (ii) the opportunity (to establish methods of communication and relationships with service providers and service users) and (iii) the motivation to engage with Third Sector homelessness services and service users, by reflecting upon their positive and negative experiences delivering the intervention. Enablers and barriers to this engagement were identified according to each of the COM-B categories. Enablers included: practitioners' sense of responsibility, reflecting on positive past experiences and success stories with service users. Barriers included: lack of resources, negative past experiences and poor relationships between Smile4life practitioners and Third Sector staff.

Conclusion: The Smile4life programme promoted capability, provided opportunities and increased motivation in those practitioners who cross disciplinary boundaries to implement the Smile4life intervention, which can be conceptualised as "boundary spanning". Practitioners who were found to be boundary spanners often had a positive mindset and proactive attitude towards the creation of strategies to overcome the challenges of implementation by bridging the gaps between the NHS and the Third Sector, and between oral health and homelessness, operating across differing fields to achieve their aims.

KEYWORDS

oral health, homeless persons, qualitative, COM-B model, behaviour

1 Introduction

People experiencing homelessness often experience social exclusion, as well as poorer oral health and oral health-related quality of life and a higher prevalence of dental decay than the general population (1, 2). Smile4life is Scotland's oral health improvement programme for people experiencing homelessness. It was developed in 2007, with the intention of addressing the oral health needs of the homeless population of Scotland and reducing the health inequalities experienced by this group. An intervention and supporting resources for practitioners was launched in 2012 (3). The aim of the Smile4life intervention was to build the capacity of NHS and Third Sector[1] staff to address the oral health needs of patients or service users experiencing homelessness, which could include providing information and resources, support, or facilitating access to dental care. Smile4life remains the only health programme in the country focusing on the links between oral health/health and homelessness. The intervention is intended to be delivered by the oral health teams from the NHS boards in Scotland through engagement with health and social care sectors and the provision of training for service users and practitioners. Smile4life adopted the European Typology of Homelessness, acknowledging anyone who was roofless or houseless (residing in insecure or inadequate accommodation) as experiencing homelessness (4). Therefore, service users receiving the Smile4life intervention are a diverse range of people experiencing homelessness, including people in temporary accommodation, rough sleepers visiting soup kitchens or homeless drop-ins, and others in more long-term accommodation.

A process evaluation of the Smile4life intervention was conducted in the 18 months following the launch of the intervention. The aim of this evaluation was to evaluate the implementation of the intervention in the NHS Boards. Interviews with NHS practitioners from across Scotland revealed variation in the adoption and implementation across the NHS Boards (5). The Boards that more readily adopted Smile4life were those with perceived knowledge and skills to effectively communicate and form partnerships with different stakeholders, but other Boards faced barriers to implementing the intervention. This suggested that there was a need for a more in-depth exploration of how Smile4life was being implemented, in order to fully understand the factors that influenced practitioners and organizations, and explore behaviours associated with the delivery of the intervention.

Prior to this study, a participant observation study took place with Smile4life practitioners in three Scottish NHS Boards (1). The purpose was to observe their delivery and implementation of the Smile4life intervention in community and primary care settings. The participant observation study suggested that for the Smile4life intervention to be implemented effectively, there must be a strong triadic working alliance between the Smile4life practitioner, Third Sector staff and service users. The findings suggested that when Smile4life is being delivered successfully, the Smile4life practitioners appeared to be adept and interested in creating chances to interact with service users and Third Sector staff. The observation study also explored differences in how the intervention was being delivered, which had been initially recognised during the earlier process evaluation (1, 5). For example, one NHS Board opted to provide clinical services for people experiencing homelessness, while in the other areas the practitioners focused on providing information and support.

Questions still remained regarding the effect of the Smile4life intervention upon the practitioners' behaviours, and whether it was possible that the intervention itself acted as a stimulus to promote their abilities to engage with clients and Third Sector staff. In order to examine this proposition, it was necessary to return to the Smile4life practitioners and find out their thoughts and opinions about the intervention, and ask them to reflect on their experiences, including how it assisted them in their working practices with homeless service users. Therefore, the aim of this study was to investigate the influence of the Smile4life intervention upon the engagement behaviours of Smile4life practitioners as they worked towards tackling the health inequalities of people experiencing homelessness.

2 Method

2.1 Sample and recruitment

A purposive sample of oral health practitioners working in three NHS Boards were invited to take part. These boards had

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[1] For the purposes of this work, "Third Sector" refers to voluntary organisations, charities, community groups or social enterprises, which operate outside of, but alongside, the public or private sectors.

participated in the earlier observation study. Participants were invited if they worked firsthand with Smile4life delivery, either providing training for staff or delivering oral health advice directly to people experiencing homelessness. The group of practitioners targeted were: Dental Health Support Workers, Oral Health Promoters, Oral Health Educators, or Oral Health Improvement Coordinators.

Recruitment emails were sent out to Oral Health Managers from the three NHS Boards, who were asked to disseminate to their teams. Participants from the earlier observation study were contacted directly. Practitioners that were interested in taking part were told to contact the research team, who then sent them the participant information sheet and consent form to read. After one week, the research team contacted the practitioners, all of whom had agreed to take part, to arrange a date for the focus group.

2.2 Data collection

Focus group discussions were chosen as the data collection method, to provide an insight into how the Smile4life intervention affected the skills, attitudes, and experiences of the practitioners as they delivered and implemented Smile4life. Focus groups also allowed participants, as end-users of the Smile4life intervention, to voice their experiences and opinions about the best ways of delivering the intervention. Seeking feedback from practitioners as part of the evaluation process ensured that the aims of the research team align with the needs of the end-users and allowed the practitioners to be active collaborators in evaluating the intervention (6).

Focus group sessions were conducted in small groups (7–10). Morgan and Krueger recommended that focus groups should be non-judgmental, meaningful and friendly, and Bloor et al. noted that there can be benefits to using pre-existing groups (8, 11). Many of the participants already knew the facilitator (LB), either from the observation stage of data collection or from earlier research that had been conducted as part of an evaluation into Smile4life implementation (2, 5). This ensured that there was a pre-existing rapport between the participants and the facilitator before the focus groups took place. Since the practitioners knew each other and the facilitator, and were part of a pre-existing national group, this allowed them to feel comfortable, for an easy flow of shared experiences to be described and ensured that there was a more true-to-life discussion.

For the focus group discussions, the questions were designed to meet Krueger and Casey's recommendations for good quality, e.g., conversational, short, clear and easy to understand, gradually moving from the general to the specific (12). The questions asked participants about: who they were; their experiences interacting with service providers and service users; the skills needed to be a Smile4life practitioner; the risks involved in Smile4life work; perceptions of homelessness and what helped when interacting with people experiencing homelessness. The full list of questions is presented in Supplementary File S1. Prompts were used to clarify the question or to suggest possible answers if the participant was unsure of how to respond and were often based on the observations made during the previous stage of research. Focus groups were conducted in person. All three focus groups requested that the discussion take place in their place of work. Therefore, a meeting room or office space, where the group would not be interrupted, was the setting for the focus group discussions. Each focus group was audio-recorded, with the recordings being transcribed by LB. No reimbursement was provided to participants for taking part.

2.3 Data analysis

The transcripts were analyzed using framework analysis. Framework analysis is a method of qualitative data analysis suitable for research that has "*specific questions… or a priori issues*" to consider and can be used to "*describe and interpret what is happening in a particular setting*" (13). For this qualitative exploration, the COM-B model was used as the framework. COM-B is part of the Behaviour Change Wheel (BCW), a framework of behaviour change interventions, which was used to underpin the overall evaluation of the Smile4life intervention, of which this study forms one part (12). The BCW is concerned with interventions for behaviour change, specifically developing and/or improving existing interventions. As Smile4life is an intervention aimed at assisting dental health professionals' facilitatory actions when interacting with people experiencing homelessness, it was hoped that by investigating Smile4life using the BCW, recommendations could be made to inform this and future interventions to improve practitioners' interactions and behaviours to promote oral health within the homeless population.

The COM-B model sits at the center of the BCW and focuses on the sources of Behaviour (B): Capability (C), Opportunity (O), and Motivation (M). The use of the COM-B model allows for the identification of factors that influence the occurrence of a behavior (14).

Srivastava and Thomson identified five stages to the data analysis when using framework analysis: (i) familiarization; (ii) identifying a thematic framework; (iii) indexing; (iv) charting; (v) mapping and interpretation (13). From the initial analysis using the three components from the COM-B model, it became apparent that COM-B was an appropriate framework with which to continue analysis—this meant that the themes and codes used to analyze the data were pre-selected based on the elements of the COM-B model. A second read-through was conducted to index any and all data that fitted the COM-B model (e.g., examples of practitioners' capability, opportunity and motivation), and anything else that arose from the data. This process was repeated for each transcript—the indexing from each was then collected together, to establish common themes. This was then entered into a framework matrix, essentially a chart summarizing the data based on the themes that emerged for each category (Supplementary File S2). As part of the final analysis, attention was also paid to identification of boundary spanning activities and roles. This analysis was conducted by hand by LB in the first instance, with regular discussions between LB and RF to review and refine themes.

2.4 Ethical considerations

Ethical approval was applied for and granted by the University Research Ethics Council at the University of Dundee (UREC 15098). Consent forms had to be read and signed before the focus group could take place. All data were anonymised before analysis. No ethical issues arose during data collection or reporting.

3 Results

In total, eleven Smile4life practitioners from three NHS Boards agreed to participate. All were female. While these practitioners had a variety of job titles, all had experience working with the Smile4life intervention. The sample represented the key people involved in the Smile4life programme in their respective Boards. Table 1 illustrates the number of practitioners that took part in each focus group, as well as the diversity of job roles represented in each group. The focus group discussions lasted between 57 and 74 min, with an average length of 67 min.

3.1 Capability

The transcripts were analyzed to determine whether or not the Smile4life intervention had affected the practitioners' engagement behaviours with regard to their psychological and physical capabilities.

Overall, in each of the three NHS Boards, implementing Smile4life facilitated the practitioners' physical capability since it ensured that they had the physical resources (e.g., toothbrush packs provided by their NHS Board, copies of the Smile4life Guide for Trainers) to achieve their behavioral aims. In general, Smile4life also ensured that they had the psychological capability for a consistent service provision. However, elements of both physical and psychological capability also acted as barriers to consistent service delivery of Smile4life, e.g., perception of risk (Table 2).

Availability emerged as the most significant dimension of being physically capable of delivering Smile4life. The practitioners spoke of being physically available, having the appropriate job role to deliver oral health messages, and the availability of people to provide the service associated with the delivery of the programme. In Board 3, for instance, one of the practitioners was in a post that was created solely for the purposes of delivering the Smile4life intervention. The Smile4life intervention gave the staff the means and ensured that staff were physically available (i.e., there was an availability of resources, including staffing), and provided opportunities for increasing psychological knowledge and skills about how to engage with homelessness services. It was, therefore, possible to conceptualize the characteristics of "capable" Smile4life practitioners as having the physical resource capability (e.g., their physical availability) and psychosocial capability (e.g., being dependable/reliable). Comments from the Smile4life practitioners illustrated that they felt that being physically available and psychologically dependable was particularly valuable to Third Sector services and homeless service users who were used to a fast turn-around of outside visitors such as the Smile4life practitioners:

> *"…the (other) services come in and they're not consistent—they don't turn up when they say they're going to turn up, or the person leaves and a new person starts, or the funding is taken away… but now they know we're going to turn up every week,*

TABLE 1 **Focus group participants.**

NHS Board	Number of participants	Gender of participants	Job roles of participants
1	5	All female	Dental health support worker
			Oral health educator
			Oral health coordinator
2	2	All female	Oral health promoter
3	4	All female	Dental health support worker
			Oral health training officer
			Health improvement practitioner

TABLE 2 **Capability category—engagement enablers and barriers.**

Category	Subcategory	Results	
		Enablers	Barriers
Capability	Physical	Availability of physical resources including human resources	–[a]
	Psychological	Knowledge of Smile4life and of homelessness	Perceptions of risk
		Tailoring the intervention	
		The use of incentives as a tool for engagement	
		Availability of skills needed to do the job (e.g., life experience, communication skills, empathy)	Negative perceptions or expectations of homelessness
		Resilience	

[a]- = this subcategory was not found.

> *it's fine. I think that helps, and having the same person, not swapping people round." (Participant1_Board2)*

3.1.1 Physical capability: availability of resources

The availability of physical resources included having toothbrushes packs, a mobile dental clinic, and having the necessary staff to deliver the Smile4life intervention. Toothbrush packs were frequently used as an incentive to help facilitate engagement. In one participating NHS Board, these NHS-regulation packs were supplemented by free samples of Oral-B and other branded products. The practitioners agreed that the offer of a toothbrush pack facilitated discussions with service users about their oral health, as well as providing the tools required to maintain good oral health. In one NHS Board the offer of free samples was extended to Third Sector staff as a way of developing and strengthening relationships:

> *"It's a tool for engagement. I always make sure the staff have got theirs as well… if you're helping them, they're more willing to help you." (Participant1_Board2)*

In Board 1, the Smile4life practitioners were physically capable of engaging with and addressing the treatment needs of people experiencing homelessness because they had access to a mobile dental unit (MDU). The MDU was a physical resource not available in every Board. It acted as the primary setting for the consistent and regular delivery of Smile4life in Board 1 and provided the Smile4life practitioners with the physical space to deliver the Smile4life intervention, to speak to service users and to offer dental treatment. It should be noted, however, that the focus within the MDU was providing dental treatment, not oral health promotion and in this respect was perceived as a potential barrier to the implementation of the Smile4life programme. One practitioner from Board 1 commented during the focus group that they were unsure if the MDU could be considered as an appropriate delivery resource for the Smile4life intervention. Therefore, despite having the physical capability to provide dental treatment and oral health promotion, the MDU appeared to act as a barrier, preventing the Smile4life practitioners in this Board from engaging with homeless services or service users outside of the confines of the MDU.

3.1.2 Psychological capability: knowledge

Practitioners' knowledge emerged as an element of their psychological capability. The practitioners' knowledge was composed of their oral health knowledge and their personal knowledge and experience of working with those in the homelessness sector together with people experiencing homelessness. The following quote is illustrative and implies that the Smile4life intervention facilitated additional learning experiences for the Smile4life practitioners beyond oral health.

> *"If you've done some sort of oral health education, which we had to do for our job, and then training sessions, we attend poverty awareness sessions, health inequality sessions, so we've got a good background on health inequalities, and I think if you've got that, it helps, it can help you understand why these people are there in the first place." (Participant5_Board1)*

While some practitioners had prior experience of working with people that were experiencing homelessness, and therefore, some knowledge about homelessness issues, the majority were not familiar with this population before working on Smile4life. They spoke of "*having their eyes opened*" to the realities of homelessness while delivering Smile4life and how the implementation of Smile4life had increased their awareness and knowledge of homelessness issues. Smile4life had psychologically prepared them for engaging with Third Sector homelessness services and service users.

When asked about their thoughts on homelessness before they began working on Smile4life, the majority of Smile4life practitioners reported that they were initially surprised by the variety in age, background and circumstances of people experiencing homelessness, for example, that people who were experiencing homelessness could be families or older people, not just young, single people or people with a history of alcohol and/or drug use. A common theme that emerged during the focus group discussions was initial surprise that some people experiencing homelessness had come from "*good backgrounds*" or were "*well educated*" yet had ended up homeless. Being involved with the Smile4life intervention had expanded practitioners' views of people facing homelessness, beyond the common negative stereotypes. A better understanding of homelessness aided them when engaging with Third Sector homelessness services and service users.

Practitioners stressed the importance of tailoring the way they delivered Smile4life in order to encourage engagement with and from the Third Sector staff and service users:

> *"You kind of tailor to the best time… it's just trying to make it bespoke to what fits". (Participant2_Board2)*

The importance of tailoring was included as part of the Smile4life training and implementation guidance, suggesting that the practitioners were putting their knowledge of how to deliver Smile4life into practice, in order to increase engagement. Tailoring was also a way of interpreting the needs of the Third Sector service and service users, to facilitate engagement, whereby the Smile4life practitioners were working across sectors (NHS and Third Sector) to provide their oral health services.

3.1.3 Psychological capability: skills

Another key factor of psychological capability was having the psychosocial skills or abilities required to carry out a task. Common themes relating to the required skills emerged from all three focus groups. The practitioners suggested a set of important skills to deliver the intervention: effective communication, specifically listening skills; empathy; conflict resolution; sincerity; approachability; confidence; flexibility; and an ability to be non-judgmental. One Smile4life practitioner summed this up more simply:

> *"You have to be able to be a human being". (Participant1_Board3)*

Another common skill was stated as life experience:

> *"If you're older and bit more mature, I suppose, you have life skills". (Participant1_Board1)*

> *"I think it's because we're old and we have life experience!" (Participant1_Board2)*

When the above skills existed for the Smile4life practitioners it seemed to indicate that they had the most appropriate approach to work on Smile4life, which in turn gave them the chance to engage with people within the homelessness sector. This notion that working on Smile4life was a job that would suit particular people was supported by this statement from one Smile4life practitioner during the focus groups:

> *"You have to employ the right person to do the job, they have to want to do it". (Participant1_Board2)*

This suggested that, although Smile4life appeared to increase practitioners' capability via training and increased knowledge and skills, it still required a certain type of individual who could use the intervention to combine the training with their own life experiences to promote their engagement with homeless service users and Third Sector services.

3.1.4 Psychological capability: risk and resilience

One potential psychological barrier that emerged from the observation study was the notion that working on Smile4life could be perceived as risky, with service users observed as being unpredictable and disruptive. If practitioners felt they were at risk, this could potentially pose a threat to their psychosocial capability to engage with service users. Therefore, a question was posed during the focus groups to find out if the Smile4life practitioners themselves believed their job was risky. Initially, all Smile4life practitioners said "*No*", denying that they felt afraid or at risk while working on Smile4life. However, when asked to elaborate on this, some Smile4life practitioners revealed situations where they had been frightened. For instance, one Smile4life practitioner spoke about her own experience with a service user who had bitten her. Others discussed the methods they used to minimize risk or de-escalate situations should there be any early signs of a potentially risky scenario:

> *"If something kicked off, I know that I could run up the street to get away from it" (Participant1_Board1)*

> *"If they are becoming agitated or swearing, I'll bring it down immediately… you can do things that you know will de-escalate it" (Participant1_Board2)*

Not only were the Smile4life practitioners psychologically capable of overcoming such potential risks, whether by denying there was a risk or devising strategies to de-escalate situations, physical steps were also taken by the NHS Boards to protect the Smile4life practitioners:

> *"In the best possible way, our management are very risk averse! With the intention that they have to keep the staff as safe as possible". (Participant2_Board3)*

Two out of the three participating NHS Boards revealed that they use services such as Guardian24 and Reliance Protect, essentially an emergency service connected to a Smile4life practitioner's ID badge:

> *"There's a pin alarm on here, there's an alert button, people can call in and decide what the situation is." (Participant1_Board3)*

These devices did not remove the possibility of a risky or dangerous situation arising, but they provided a safeguard and may have minimized the sense of risk felt by Smile4life practitioners, which, in turn, would increase their capability to engage with Third Sector homelessness services and service users. In addition, Smile4life practitioners reported carrying their own personal alarms or alarms and radios provided by the service.

3.1.5 Overall capability: summary

It emerged that working on the Smile4life intervention provided the Smile4life practitioners with the capability—both physical and psychological—to engage with Third Sector homelessness services and service users. Because of Smile4life, the practitioners had the physical capability to engage with service users about their oral health. In Board 1, in particular, Smile4life had resulted in the use of a MDU in order to reach service users. However, this also acted as a barrier to further engagement with services, as the MDU was seen as being sufficient, and no further attempts at engagement with other services were made. For those working in Board 1, while it may be surmised that whilst the MDU improved capability in its physical form, the apparent lack of psychological capability reduced the effect of the Smile4life programme to increase engagement with service users and Third Sector services. In all three Boards, Smile4life enabled practitioners to improve their knowledge of homelessness issues, and the skills needed to engage with services and service users, including the importance of tailoring the intervention and the use of incentives to facilitate engagement. In addition, the Smile4life intervention enabled engagement as it challenged practitioners' perceptions about homelessness, increasing their understanding of this population and hence their working behaviours.

3.2 Opportunity

In order for Smile4life practitioners to engage with Third Sector services and service users as part of delivering Smile4life, they had to have opportunities that allowed them to do so—did the Smile4life intervention provide the opportunities they needed

TABLE 3 Opportunity category—engagement enablers and barriers.

Category	Subcategory	Results	
		Enablers	Barriers
Opportunity	Physical	Access to service users	-[a]
	social	Strong relationship with Third Sector	Dental anxiety
		Finding key people	
		Support from NHS Board	Difficulties engaging with the third sector

[a]- = this subcategory was not found.

or were there social influences that influenced the opportunities to enable their engagement behaviours? From the focus group discussions, it became apparent that, for the most part, Smile4life practitioners did have these opportunities. For example, the Smile4life intervention facilitated physical access to service users, but there were also several barriers that prevented engagement with Third Sector services and service users, such as dental anxiety from the staff or service users (Table 3).

3.2.1 Opportunity: physical and social opportunities with third sector

3.2.1.1 Access to service users and relationships with third sector

The most noteworthy way that the Smile4life intervention provided practitioners with the opportunity to engage was by giving the practitioners a reason to access service users. This access allowed them to speak directly to service users about their oral health, give advice or signpost to relevant services. This access, however, was mediated by the social influence of the Third Sector staff, who often acted as both enablers and barriers to this opportunity for engagement with service users. In this instance, the two subcategories of opportunity overlapped, with both physical access and social opportunities impacting upon the engagement behaviours of the Smile4life practitioners.

When Smile4life practitioners could not interact with the Third Sector staff, either because the service was not interested or because of a breakdown in communication, it was difficult for them to implement Smile4life as they could not reach the service users—Board 1's Smile4life practitioners, for instance, recalled particularly negative experiences when interacting with their local Third Sector organisations:

> *"(The services) weren't that keen. They didn't get back to you about it". (Participant4_Board1)*

When asked to expand on possible reasons for this lack of engagement, Board 1's Smile4life practitioners suggested that it was due to these Third Sector services not having the time, or having limited staff, to deal with Smile4life, or having other priorities for their service and their service users, which did not include oral health:

> *"It's not a case of not being interested, it's more a cause of them just saying "we don't have time", "we have other priorities", "we've got enough to do"". (Participant5_Board1)*

The practitioners in Board 1 seemed satisfied with the service provision in the MDU, but all agreed that earlier attempts to engage with services had not been positively received. They described the different ways they had attempted to engage—offering training, providing drop-in sessions—but felt that the services only wanted them to signpost or give out toothbrush packs. It appeared that they had stopped trying to do more than this. Nevertheless, it may be possible to speculate that after so many knock-backs from Third Sector services, Board 1's Smile4life practitioners themselves had become disinterested, did not have time, and had other priorities. Indeed, one practitioner explained that their main priority was an oral health programme for people in care homes.

It seemed that, for Board 1, with regard to opportunities to engage, Smile4life did not always act as an enabling factor in the initial stage of accessing Third Sector services. However, with perseverance, practitioners in other Boards were successful. Board 3, for example, also reported difficulties engaging with Third Sector services initially, but found that they had to make their own opportunities, both social and physical, either at a frontline level or at a strategic level, interpreting the needs of the services, and the most appropriate way to establish a relationship:

> *"It's just getting ourselves established on that agenda". (Participant3_Board3)*

Nonetheless, factors unrelated to Smile4life appeared to increase engagement and this included the prevalence of homelessness within a particular area. In Board 2, for example, the Smile4life practitioners that took part in the focus group were responsible for two different geographical areas within the Board. They spoke of the variety in the way they were welcomed and received by Third Sector services. In one area, where there was a higher homeless population and a faster turnaround in hostels, the staff were more helpful; in another part of the Board's geographical area, where there were fewer homeless people, and service users often remain in one accommodation for a number of years, the staff were a barrier to engagement with service users. The following quotes are illustrative:

> *"In other places they'll do a knock-up in a hostel… there's a poster up the week before, there's a leaflet drop the night before underneath their doors and at room check the staff will say "(The OHP's) down the stairs, do you have any problems?"" (Participant1_Board2)*

> *"Staff I feel are my barrier here… there are ones where I feel I'm hitting my head against a brick wall… when you go in the staff are kind of "oh well, no one wants to see you today" rather than let the clients make that decision. And they're not as forthcoming to knock them out their bed". (Participant2_Board2)*

3.2.1.2 Finding key people

Smile4life practitioners from Boards 2 and 3 acknowledged that Smile4life had facilitated opportunities for engagement with key people within the local authority or Third Sector who were supportive of Smile4life and were in a position to help the Smile4life practitioners access Third Sector services and service users, as commented upon by practitioners working in Boards 2 and 3:

> *"She (a Health and Homelessness lead for a local authority) was a great help, she was another link, she's obviously very senior, very supportive… she coordinated the whole thing for us, which was wonderful". (Participant3_Board3)*

> *"The right individual to make it happen. You need to find the one that can invite you in, the one that can smooth the waters, the one that can give you what you want". (Participant1_Board2)*

The oral health managers or coordinators, some of whom took part in the focus groups, also found key people who could provide opportunities to engage with services and service users by accessing Third Sector managers or local authority leads via meetings and discussions at a strategic level. This allowed Smile4life to be discussed with audiences at a higher level and ensured that the Smile4life practitioners were able to access services that they might not have been able to before:

> *"My senior manager sits at more of a strategic level with the movers and shakers of the service providers… there's still a lot of people that don't know about Smile4life… you can see it start to filter through". (Participant2_Board3)*

3.2.1.3 Dental anxiety

Aside from the need to improve relationships with some Third Sector services, Smile4life, or more generally the combination of oral health and homelessness, was responsible for a range of social factors that could negatively affect opportunities to implement Smile4life. The first of these raised was dental anxiety. This was commented upon by practitioners in two of the NHS Boards, but for different reasons.

In one, the dental anxiety of Third Sector staff was cited as a potential reason for poor engagement from one service to the extent that when the Smile4life practitioner visited this service, one member of staff would try to avoid her. Because of this, the Smile4life practitioner had been provided with an opportunity to engage and began to talk to this member of staff about her oral health and help her overcome her dental fears. The Smile4life practitioner believed that it helped her to engage with the Third Sector staff.

In the other Board, the Smile4life practitioner cited a lack of available resources about dental anxiety. She believed that having such resources would provide an additional opportunity for engagement with fearful service users, since it was one of the main barriers service users faced with regard to addressing their oral health needs. The Smile4life practitioner felt that these resources would provide her with more opportunities to engage with service users.

3.2.2 Opportunity: social opportunities with NHS boards

Smile4life practitioners were asked directly if they would work in oral health and homelessness if Smile4life did not exist. The practitioners stated that while some work in this area would have taken place, it would not be to the extent now that the Smile4life programme existed:

> *"It's one of the priority groups that the Community Dental have to see, so I think we would still see them as patients and signpost them, but I don't think you'd have much interaction". (Participant3_Board1)*

> *"No, because there was nothing happening before… I don't think anything would be happening". (Participant2_Board3)*

Therefore, it would seem that Smile4life was an enabling factor providing practitioners with opportunities to engage with homelessness. However, Smile4life practitioners in Board 2 stated that they would have been tackling oral health and homelessness anyway, with or without Smile4life or policies from the Scottish Government:

> *"It was something that I was interested in anyway… I was bored at work and I thought "nobody's doing this"… at the time our manager would back you and say "have a bash, see how it goes, see what happens"". (Participant1_Board2)*

This quote suggests that the Smile4life intervention provided an opportunity at the Board level to allow their oral health practitioners to engage with the homelessness sector. Therefore, this example from Board 2 suggested that support from the Board—in this instance, the practitioner's manager—also provided practitioners with an improved opportunity to engage with services and service users, as well as validating work already being undertaken.

3.2.3 Overall opportunity: summary

For Smile4life practitioners to engage with services and service users, they needed both physical and social opportunities to do so. These were often interconnected: to gain physical access to service users, Smile4life practitioners had to first build strong relationships with the Third Sector, which they accessed by finding key people to

TABLE 4 Motivation category—engagement enablers and barriers.

Category	Subcategory	Results	
		Enablers	Barriers
Motivation	Automatic	Positivity in the face of negative experiences	–[a]
	Reflective	Success stories from service users	Negative past experiences
		Reflecting on past experience	
		Sense of responsibility	

[a]- = this subcategory was not found.

help them, or by addressing the wider issues of dental anxiety. The role of the NHS Board to facilitate engagement was also noted.

3.3 Motivation

Motivation can be divided into reflective and automatic motivation. Reflective motivation refers to instances where decision-making is based on rational thought, i.e., an individual reflects on a decision, taking into consideration facts and experience. Automatic motivation is where decisions are made based on how a person—or in this context, how a Smile4life practitioner—feels, an emotional response (14). Both opportunity and capability can influence motivation (12). Both reflective and automatic motivation will now be discussed in relation to the focus group discussions (Table 4), as well as how the previously discussed examples of capability and opportunity acted to influence this motivation.

3.3.1 Reflective motivation

3.3.1.1 Success stories

A common example of reflective motivation for Smile4life practitioners was success stories or positive feedback from service users. These served to buoy Smile4life practitioner's motivation to continue delivering Smile4life and to engage with services and service users. The practitioners reported being pleased or satisfied when they thought about the emotional responses from service users:

> *"One of the service users I spoke to… she had lost both her dentures, she'd lapsed with her addiction, she was back in recovery, she said: "I really want to get my smile back, I'm really glad you're here today' and I just thought, that really shows you the need for it". (Participant3_Board3)*

> *"The best one for me, I was up in town shopping on a Saturday and someone came up to me and said, "I'm smiling because of you"". (Participant1_Board3)*

3.3.1.2 Sense of responsibility

Policies regarding oral health and homelessness, such as the Dental Action Plan and the National Oral Health Improvement Strategy for Priority Groups, provided an opportunity for Smile4life practitioners to engage with services and service users but they also motivated Smile4life practitioners (15, 16). As with success stories, the fact that policies existed gave Smile4life an inherent worth and significance, and validated the work undertaken by some of the oral health practitioners already working with people experiencing homelessness. When Smile4life practitioners were asked if they would still approach the oral health of people experiencing homelessness without Smile4life, some Smile4life practitioners noted that they would have to do something because of the existing policies in place that dictate what NHS Boards should do with regard to homelessness. While this motivated Smile4life practitioners, it is evidently a reflective, not automatic, decision for most, and is perhaps considered more of a task that is completed because it has to be, in accordance with policy, not because it was a subject that they were particularly passionate about or had an emotional response to or as one practitioner stated:

> *"Not every employee would want to do that, if it's taking up your own evenings". (Participant2_Board2)*

As discussed in the capability section above, some Smile4life practitioners tailored their delivery of Smile4life to the needs of specific services and used their knowledge of Smile4life to forge their own opportunities to engage and strengthen relationships with Third Sector services' staff and service users. Their engagement behaviours also demonstrated the reflective motivation of the Smile4life practitioners, as it pointed to Smile4life practitioners having reflected on what works and what does not work, and then making a plan to overcome any barriers to engagement. Furthermore, Smile4life practitioners needed to be motivated to tailor their approach and remain flexible so that they could meet the needs of a service by often going above and beyond their normal job role and in this respect cross the disciplinary boundaries between oral health and homelessness and between themselves and their colleagues in the Third Sector.

The willingness to engage and work within the Third Sector indicated that a Smile4life practitioner was especially dedicated to their work. This characteristic was also seen in instances where the Smile4life practitioner felt responsible and hence motivated and duty-bound to carry out their Smile4life work. In the following example the Smile4life practitioner describes a sense of duty and motivation to the service who are providing her with the opportunity to access their service users, as well as to the Third Sector staff themselves.

> *"(If) you don't turn up, it's a waste of their time isn't it? Because they've got lots of things to do on their agenda. So, if you're not*

> *turning up and they've got people who are in pain…" (Participant1_Board2)*

3.3.1.3 Reflecting on past experiences

Reflective decision making could sometimes demotivate Smile4life practitioners as they reflected on their negative past experiences or on their struggles to connect and engage with services. This indicated the extent to which opportunity and motivation were interconnected. Barriers to social opportunities for engagement, for instance, could lead to low motivation and had the potential to affect the Smile4life practitioners' psychosocial capability.

> *"It is a hard slog". (Participant3_Board3)*

> *"We did get involved with one unit, but the uptake with the clients was dreadful, so we haven't done much since". (Participant4_Board1)*

This last quote suggested that current Smile4life actions in Board 1 were being demotivated by past negative experiences to the extent that there had been no subsequent attempts to engage with Third Sector services. The belief about potential consequences appeared throughout the focus group discussions and appeared to demotivate some Smile4life practitioners more readily than others:

> *"We can always go in and hand in toothbrushes and toothpaste, put up posters… but what are they doing with it?… I don't know if all our stuff is sitting in a store room somewhere gathering dust". (Participant2_Board1)*

As discussed in the capability section, certain Smile4life practitioners had the psychological capability to overcome potentially risky situations that occasionally arose when working on Smile4life and engaging with homeless service users. This ability also affected a Smile4life practitioner's motivation, because to be motivated about Smile4life, to continue working in an environment, or with a population, which may be risky, the practitioner must overcome negative past experiences. For the Smile4life practitioners who took part in the focus group discussion, it seemed as if they reflected on their experiences and concluded that although there may be risks involved, they did not feel at risk, nor would they let the potential for risk prevent them from continuing to deliver Smile4life. In this sense they had the psychological capability to not let this potential concern impact their job.

> *"I've never come across a situation where I've thought I'm not safe here". (Participant1_Board3)*

Such comments as, "*(I've) never felt awkward… it's not going to stop me going back*". ensured that the potential risks involved with Smile4life did not detract from a Smile4life practitioner's motivation to carry out their job—indeed some Smile4life practitioners did not perceive these situations as risky. However, there was an acknowledgement in one Board that this attitude in the face of documented risks was perhaps a symptom of Smile4life practitioners' naivety or complacency about their own safety.

3.3.2 Automatic motivation

The capability of Smile4life practitioners to not take offence at others' negative responses to them and towards Smile4life also aided in their motivation to deliver the intervention. This positivity, as illustrated in the following quotes, indicated a more automatic form of motivation, where Smile4life practitioners' own feelings are taken into consideration.

> *"I think (rejection of Smile4life) it's not necessary at you, so you shouldn't take that on board… I'm never offended if someone says "nope, not interested"". (Participant1_Board2)*

> *"I'm not compliant, I'm not going to be rolled over by them… you're trying to do your job, but you don't want to be made a fool of". (Participant1_Board2)*

Automatic motivation can also be seen in instances where Smile4life practitioners demonstrate a genuine interest in homelessness or discussing empathizing with people experiencing homelessness that they have interacted with during their Smile4life work. This was also apparent when Smile4life practitioners discussed their perceptions and awareness of homelessness—some were already familiar with or interested in homelessness, but others had no idea what to expect when they first started working with this population. For Smile4life practitioners who did have negative preconceptions of homelessness, they confessed that they were initially apprehensive, which negatively influenced their motivation to deliver Smile4life. The Smile4life practitioners soon realized that their preconceptions did not match the reality and that their experiences delivering Smile4life had given them a better understanding of the homelessness experience.

> *"I think I was very much quite ashamed of myself for my preconceived ideas about what homelessness was, and it's actually totally nothing like what you think it is". (Participant3_Board3)*

> *"I was scared… just because I'd never worked with—that sounds horrible—those kind of people… but it was alright once you got talking to them. They're just normal people". (Participant3_Board1)*

3.3.3 Overall motivation: summary

In summary, Smile4life practitioners were predominantly motivated to engage with Third Sector services and service users by reflecting upon their positive past experiences delivering Smile4life. These reflections were often positive. For example, practitioners in each of the three focus groups discussed success stories—instances where they had helped or motivated a service user to improve their oral health. However, some Smile4life practitioners dwelled on previous negative experiences (e.g., rejection from a Third Sector organisation) and let this demotivate them from attempting to engage further with that service. Therefore, while the Smile4life intervention appeared to provide the ingredients for engagement, when previous attempts at engagement had not been successful, or concerns about the risks involved had not been resolved, the Smile4life intervention was unable to motivate those practitioners to engage with homelessness services and service users.

4 Discussion

If we consider the behaviour element of the COM-B model to be engaging with the Third Sector and service users, it is apparent that the Smile4life intervention and programme provided the majority of Smile4life practitioners with the capability, opportunity and motivation to increase their engagement behaviours, but effective communication skills, an open-minded approach and a consistent attitude and desire to overcome barriers seemed to be pivotal. It may be proposed that the Smile4life programme promoted capability, provided opportunities and increased motivation in those practitioners who cross disciplinary boundaries. Williams conceptualized this working practice as the ability to "*boundary span*" (17).

The COM-B model of behaviour appeared to be a good fit for the focus group data. The developing themes first noted in the observational study were apparent, providing a sense of credibility to the findings of the focus group study. It became apparent that there was considerable overlap between opportunity and capability, particularly with regard to physical capability and physical opportunities provided by the Smile4life intervention. Moreover, with regard to opportunities for engagement, the social influences from the Third Sector directly influenced, positively and/or negatively physical opportunities. Furthermore, in agreement with the COM-B model, both capability and opportunity were found to influence motivation, particularly regarding the practitioners' experiences of interacting with the Third Sector.

4.1 Boundary spanners

A key factor influencing the behaviours of Smile4life practitioners was how the Smile4life programme influenced the engagement and relationship between the NHS practitioners and the Third Sector. In Boards which recognised the importance of oral health care within homelessness, Smile4life was successfully delivered, with the establishment of relationships and regular interactions with services and service users. In many respects, it may be proposed that the Smile4life intervention permitted the practitioners, through their improved capability, opportunity and motivation, to engage with a number of different groups within the homelessness sector and in this sense to fit the category of boundary spanners as described by Williams (17).

Williams explained this behaviour in terms of boundary spanning, an essential element to increase ongoing collaboration with regard to public policy, originally focusing on poverty (17). While early research into collaboration focused on participating organisations, research on boundary spanning looked at the role of the individual in the collaboration process. This is an important consideration, as Williams noted that "*feedback from diverse individuals engaged in collaborative working consistently championed the pivotal role of key individuals in shaping outcomes*" (17). During the analysis of the focus groups, Smile4life practitioners sought out key people within the Public or Third Sector who could provide them with opportunities for engagement. This finding suggested that the practitioners spanned within and beyond their organisations to find an individual who would support the delivery and implementation of Smile4life. Without the Smile4life intervention and policy documents such as the Dental Action Plan, the practitioners would not have worked across disciplines to ensure the programme's delivery (15).

To be a boundary spanner, the practitioner would, therefore, be exposed to a wide range of opinions, working environments and cultures as reflected in the Smile4life practitioners who took part in this study. They were knowledgeable regarding the practices and culture of homelessness organisations, as well as the homelessness and housing policies of their local authorities. Their past work experience or awareness of health and homelessness issues, together with opportunities for engagement, appeared to be beneficial for Smile4life practitioners whilst boundary spanning (17).

Williams noted four significant roles of a boundary spanner: the reticulist, the entrepreneur; the interpreter; and the organizer (17, 18). The reticulist aspect of boundary spanning is responsible for networking and communication and managing differing policies between the multiple agencies involved in a task. The entrepreneur is focused on innovation and creativity in the face of policies; part of this creativity and entrepreneurship involves "*risk-taking and opportunism*", both characteristics which could be attributed to Smile4life practitioners (18). The interpreter is responsible for establishing and maintaining relationships via communication skills such as empathy and listening. The last component of boundary spanning is the organizer—the responsibility to plan and coordinate the collaborative process, taking into consideration the transfer of information between collaborative partners. Both of these components were also identified among the Smile4Life practitioners.

The four roles of Williams' boundary spanning theory explain the engagement behaviours promoted by the Smile4life intervention, which include the particular characteristics of some of these Smile4life practitioners (17, 18). The findings suggested that Smile4life practitioners who can use the Smile4life programme to facilitate multidisciplinary working are those who represent elements of all four boundary spanning roles, but particularly the entrepreneur and the interpreter. It may be proposed that the intervention promoted their capability, opportunity and motivation to engage and take on the roles of the entrepreneur and interpreter. In order to do this, the Smile4life practitioners must be creative in seizing all available opportunities. It appeared they did so by tailoring their delivery to the needs of individual services, using incentives to facilitate engagement, and often being opportunistic in approaching service users, sometimes taking risks to do so. Forging opportunities, they worked hard at maintaining relationships and engaging with Third Sector services and service users. In conclusion, it seemed that Smile4life gave practitioners the capability, opportunity and motivation to do so, and to boundary span.

Williams acknowledged that as well as these four components of boundary spanning, practitioners who are boundary spanners must also have the necessary knowledge, which has already been established through the COM-B analysis of the focus group discussions (18). Moreover, Smile4life practitioners had the necessary knowledge and the psychological capability to deliver Smile4life and engage with Third Sector services and service users. Williams also noted that "*the most effective boundary spanner exhibits certain types of personality or personal attributes*", suggesting that extroverted personalities are particularly well suited to boundary spanning, by being positive, upbeat and outgoing, as well as working hard and being committed to the job (18). Comments from Smile4life practitioners in the focus group discussions reinforced the view that not everyone was necessarily suited to working on Smile4life—it takes the "*right kind of person*". The right sort of person being someone who is motivated and capable of using the Smile4life intervention to promote their engagement behaviours to interact effectively with Third Sector services and service users. In Boards where Smile4life practitioners had a strong engagement pattern with Third Sector services, it was clear that the Smile4life practitioners all had characteristics in common, namely: an outgoing nature, good communication skills, and a certain fearlessness to approach people. Moreover, they were able to discuss Smile4life in potentially risky situations. Indeed, these are some of the characteristics that the practitioners themselves identified as being necessary for people who work on Smile4life. In the focus groups, this emerged as an element of psychological capability, indicating that the Smile4life practitioners were the right people to do the job.

4.2 Implications

The findings from the focus groups form part of a larger evaluation of the Smile4life intervention (1, 19, 20). They have demonstrated how Smile4life is delivered within NHS Boards and highlighted areas where improvements, or changes, may be made for future Smile4life work. It is hoped that by understanding ways in which Smile4life delivery could be improved, the intervention will reach a wider range of people experiencing homelessness, and as such, help to meet this population's oral health needs. These recommendations may also be transferable to other health interventions for homeless populations, or for interventions aimed at people with multiple exclusion, such as people in prison or Gypsy/Traveller communities.

By investigating the practitioner factors that influence Smile4life, this research has unpicked the complexity of the implementation of the Smile4life intervention and contributed to our understanding of the interactions between NHS Smile4life staff and Third Sector staff, an essential component of Smile4life delivery that was previously unknown and under-explored in the literature. Other interventions designed to tackle the oral health of people experiencing homelessness are predominantly focused on provision of dental treatment and less often explore non-clinical interventions or the roles of non-dental practitioners (19). As such, investigating the roles and interactions between practitioners (both Smile4life and Third Sector) allowed for greater understanding of how this influenced implementation.

Following the focus groups, additional research has subsequently been conducted, exploring organisational factors, the effect of policy, and variation in, and influences on, the delivery of the Smile4life intervention (20). The critical reflection and learning generated from this study evaluating the implementation of Smile4life has also gone on to inform a follow up co-design project to produce the second Smile4life Guide for Trainers, with participation from people with lived experience and practitioners who use the guide to inform how the deliver the intervention (21).

4.3 Limitations

In all of the focus groups in this research, there were less than six participants and in once instance only two participants; less than the numbers usually recommended in the literature (6–8). However, in all three instances, everyone who was involved with Smile4life in each participating NHS Board took part. Fortunately, at no point did the discussion dry up until the Smile4life practitioners had answered all the questions, and all voices were heard, depending on participants' level of involvement with Smile4life.

Additionally, Kitzinger noted that while there are benefits to conducting focus groups with participants that already know each other, group norms can emerge that makes it difficult for participants to express disagreement or conflicting opinions (7). In the Smile4life focus groups, there was a sense that because the participants knew each other and worked together, they were supportive of each other, and comfortable to express other points of view. However, there were no significant disagreements, perhaps because of group norms or because the Smile4life practitioners genuinely agreed with each other.

In his work on boundary spanners, Williams created a job description for boundary spanners, factoring in their skills, qualifications, experience and their personal characteristics (17). Based on the findings from the focus groups, supported by the observation study, we can conclude that Smile4life practitioners do largely fit this description, at least in two of the three NHS Boards who took part. However, future research could perhaps examine this in more depth and compare Smile4life practitioners to this description more formally, or the job description could be used to identify practitioners that are particularly well suited to working on Smile4life.

Finally, it should be noted that this work took place prior to the COVID-19 pandemic and the current cost of living crisis affecting the UK, which have both posed significant challenges for vulnerable/excluded groups, including those experiencing homelessness, and also for practitioners tasked with implementing interventions such as Smile4life (22–24). The results should be considered with this in mind.

5 Conclusion

In conclusion, the focus groups with Smile4life practitioners revealed that the Smile4life intervention had provided practitioners with the capability, opportunity and motivation to engage with Third Sector services and service users. These factors varied depending on the circumstances of each NHS Board and the individual Smile4life practitioners' personal attributes and working experiences. Analyzing the focus groups using a framework based on the COM-B model allowed several factors to emerge that acted as barriers for the Smile4life practitioners. The most significant of these was the issue of poor relationships between the Smile4life practitioners and the Third Sector staff, reinforcing the findings from the earlier observation study. Additional barriers included unavailable resources, dental anxiety and negative past experiences leading to low motivation to make future attempts at engagement.

Further examination of the focus group discussions suggested that the Smile4life practitioners are those who, by necessity and their strong motivation to make a difference, must operate across fields or sectors, to achieve their goal and benefit service users. Smile4life practitioners demonstrate elements of the four aspects of boundary spanning, and their personalities and skills also point to practitioners who are well suited to the role of boundary spanning, something that had been noted during the previous observation study and had also emerged during the focus groups. Their boundary spanning skills go hand-in-hand with their capability to engage, as well as encouraging them to make their own opportunities, or take advantage of existing ones. Lastly, it is likely that Smile4life practitioners' motivation for engagement was what allowed them to span boundaries, as it allowed them to "*go the extra mile*" in their Smile4life work and overcome risks to engage with service users. This suggests that the Smile4life intervention had influenced the engagement behaviours of practitioners, enhancing their capability, opportunity and motivation and facilitating boundary spanning.

Data availability statement

The datasets presented in this article are not readily available because of restrictions from the ethical committee. Please contact the corresponding author for more information. Requests to access the datasets should be directed to laura.beaton@nhs.scot.

Ethics statement

The studies involving humans were approved by University Research Ethics Council, University of Dundee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

LB: Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. AR: Supervision, Writing – review & editing. GH: Supervision, Writing – review & editing. IA: Supervision, Writing – review & editing. RF: Supervision, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The reviewer MP declared a past co-authorship with the author AR to the handling editor.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/froh.2023.1289348/full#supplementary-material

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Investigating hope in oral health promotion for adolescents: an exploratory study based on observations at the dental clinic

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Introduction: Maintaining well-being is crucial, especially in challenging conditions, considering the common public health issue of dental caries. Within the context of adolescent oral health, this research explores the techniques employed by dental professionals to potentially foster hope -a positive manner that promotes well-being- in adolescents during consultations, opening a window into the realm of patient engagement and well-being.

Materials and methods: Data were collected through observations conducted at public dental clinics in Norway, with the participation of three dental professionals and four adolescents between the ages of 12 and 15 years. The data were analyzed using thematic analysis. Practices were observed from dental professionals in their interactions with adolescents, which align with features of hope.

Result: Three core themes were identified: (1) bonding strategies; (2) verbal and non-verbal strategies for creating positive relationships; and (3) adolescents' empowerment in dental consultations.

Conclusion: Although a new concept within oral health promotion, it seems that dental professionals in this study were observed to be facilitating hope in adolescents when they were providing their dental care. Consideration should be given to the potential for future approaches to be developed for use in dental consultations to facilitate hope strategically. While these approaches are likely to contribute to improving patient-centredness, consideration is needed of challenges and barriers to their implementation.

KEYWORDS

adolescents, hope, oral health, dental health professionals, participatory research, well-being

1 Introduction

Dental caries among children and adolescents remains a significant public health issue (1). It can have adverse effects on a child's quality of life, academic performance, and overall cognitive and psychosocial development (2). Moreover, the risk of dental caries tends to increase as individuals reach the age of 12 (1) due to diet (3), potential declines in oral hygiene practices (4, 5), and independence in seeking or avoiding dental care (6). Despite progress being made in children's oral health, data from Norway indicates that two-thirds of 18-year-olds have experienced dental caries (7), and dental erosion affects 38% of 16-year-olds (8).

Notably, dental anxiety affects approximately 20% of the global population, particularly among children and adolescents aged 3–18 years old (9, 10), and around 13% of adolescents in Norway (11, 12). Individuals with anxiety experience negative thoughts and feelings, which affect their behaviors within the dental clinic and their ability to cope with dental procedures (10, 13). For example, adolescents report anticipating adverse outcomes (like expecting pain or clinical mistakes), reliving past traumatic dental experiences through memories or nightmares, and deliberately avoiding dental visits through tactics like deception or negotiation (10). These negative perceptions of dentistry can go beyond dental anxiety alone (14). For many people, dental visits are often equated with discomfort, pain, or even shame and guilt about the state of their oral health (15).

The phenomenon of hope has been studied extensively in social sciences and applied to health and healthcare settings (16, 17). Hope, which is a multidimensional phenomenon referring to a combination of positive expectations, goals, and thoughts about the future, has been previously investigated in relation to positive health outcomes for adolescents. For example, Berg et al., (18) conducted a study involving 48 participants to investigate the relationship between hope and adherence to pediatric asthma treatment, finding that hope significantly predicted treatment adherence. Hagen et al. (19) similarly discovered that children with higher levels of hope exhibited fewer behavioral problems, suggesting that hope may act as a protective factor against various challenges. In this context, the integration of hope into oral healthcare becomes particularly relevant. Feeling hope and being hopeful can offer a positive outlook and a sense of empowerment, especially in challenging situations. For example, hope has become recognized as a vital aspect of nursing care for individuals facing chronic or complex illnesses (20, 21). The study by Paramos et al. (20) provides a comprehensive list of interventions to foster hope and their corresponding evidence-based outcomes. One example highlighted in this study involves using honest and trustworthy explanations when working with adolescents with oncologic illnesses. The result of this intervention was a reduction in the levels of depression (22), showcasing the potential positive impact of hope-facilitating strategies. Drawing from Olsman's study (17), it becomes evident that cultivating strong relationship between healthcare providers and patient, characterized by compassion and empowerment (23, 24), not only enhances patient well-being but also significantly holds the potential to facilitate hope. This emphasizes the critical role of trust and positive relationships in fostering hope.

While there are many interventions to promote oral health in adolescents worldwide (25, 26) and in Norway (27–30), there has not been any prior research focusing on hope in this context. Hope has the potential to overcome the negativity surrounding dentistry and links well with the need to develop and deliver oral health interventions co-designed to ensure a patient-centered approach is employed. It is particularly relevant given the adoption of broad definitions of oral health and hope's beneficial effects on well-being demonstrated within the expanding field of positive psychology (31).

The World Dental Federation's (FDI) comprehensive definition of oral health emphasizes the profound interconnectedness of oral well-being with general health and overall quality of life (32). This holistic view underscores the importance of nurturing not only physical health but also emotional and psychological facets. Facilitating hope in the dental setting may give patients a sense of responsibility and empowerment to improve their oral health, which is currently lacking.

This paper presents findings from an ongoing project, #Care4YoungTeeth<3. Within the framework of this project, this study aimed to use observation to explore the approaches or techniques dental professionals use to communicate with adolescents aged 12–18 years, and then specifically identify examples that facilitate hope. This work was conducted to explore whether, in the future, an intervention to include hope-fostering techniques could be co-designed for use with adolescents by dental professionals.

2 Materials and methods

2.1 Context

In the realm of health and well-being, the salutogenesis theory, developed by Aaron Antonovsky in 1979, represents a profound shift from a disease-centric perspective towards a holistic focus on the health (33). This theory centers on the concept of "sense of coherence," shaped by an individual's life experiences, which facilitates effective coping with stressors and determines their position on the health Ease/Dis-ease continuum. Salutogenesis delves into the positive aspects of human experience to comprehend how people maintain well-being, even in challenging conditions, akin to Antonovsky's river metaphor. He emphasizes that merely preventing stress is insufficient; individuals must also learn to swim for health promotion (34).

Hope, a positive aspect of human experience, actively involves individuals in maintaining well-being. Daily communications can contain many hopeful interactions and exchanges, contributing to a positive outlook and well-being (35). However, hope entails more than passive optimism; it involves a sense of responsibility and the willingness to put in effort (36). The importance of promoting hope becomes most apparent when considering the consequences of despair, particularly in the vulnerable age group of children and youth (36, 37). Adolescence, characterized by physical, psychological, social, and neurobiological shifts, signifies the vulnerable transition from childhood to adulthood in the second decade of life (38). Meanwhile, lower levels of hope have been observed in adolescents, with only older people reporting lower levels than this group (39). This suggests that there is a need to cultivate hope among adolescents and children for the purpose of health promotion.

Connecting the notion of health promotion to the theories of hope, particularly those of Snyder (40) and Plutchik (41), adds a multidimensional perspective to our understanding.

As defined by Snyder, hope has cognitive elements that include abilities to identify pathways to desired goals and the agency to utilize those pathways (40). A goal is defined as an envisioned outcome that individuals strive to achieve in the future. In the context of oral health, this means setting and working towards specific goals, such as maintaining clean teeth through regular brushing, attending dental check-ups regularly, and reducing sugar consumption. Pathways to achieving these goals require individuals to seek guidance, acquire new skills, and sustain motivation (42). Furthermore, incorporating agency into the narrative accentuates the importance of believing in one's capacity to act and achieve, which requires self-confidence, boundary establishment, and assumption of responsibility. For instance, in oral health, an agency might manifest as initiating a consistent oral care routine, with an example of a pathway being engaging with a dental professional.

Similarly, Plutchik stresses the emotional component of hope as a combination of anticipation and trust (43, 44). Again, these ideas can be readily applied to oral health and patient-dentist interactions.

The synergy of these theories signifies that hope is a cognitive-emotional construct intricately linked to one's goals, pathways, agency, trust, and anticipation.

The #Care4YoungTeeth<3 project is dedicated to enhancing adolescent oral health by co-designing interventions specifically developed by and for adolescents. By affording equal opportunities, adolescents can actively contribute as users, evaluators, informants, and co-designers, thereby considering their unique needs, curiosities, and social norms (45, 46). Embracing participatory research and design principles, the project adopts practice-based approaches and fosters multidisciplinary collaborations as its core strategies. These principles actively engage key stakeholders, including adolescents, dental practitioners, and caregivers, throughout all stages of the project. By incorporating their input, the aim is to ensure that the interventions are tailored to the needs and preferences of the target group, promoting their utilization and value among the adolescents they are designed to assist.

2.2 Research ethics

Before commencing the study, the project's research protocol received approval from the Norwegian Agency for Shared Services in Education and Research (Sikt). The study required written consent because personal data were being collected. Parents or caregivers provided consent for adolescents younger than 16 years, while those aged 16 years and older gave their own written consent. Three versions of information letters were created: one for adolescents above 16 years, one below 16 years, and one for parents and caregivers.

2.3 Research approach

Given the scarcity of research focused on oral health promotion aimed at this specific age group (47) and the need for a thorough understanding of communication and interaction (verbal and non-verbal) between adolescents and dental professionals, a qualitative research approach was chosen. Our set-up included observations of a dental consultation with subsequent interviews of the observed participants. This approach was employed to explore individuals' behaviors and personal perspectives, allowing for a comprehensive understanding of their practices and experiences. A variety of data collection techniques were utilized, encompassing video and audio recordings, photography, note-taking, and sketching, providing a novel method in dental research (9, 48).

The article is based on the data from four video observations, along with audio, pictures, notes, and sketches documenting consultations at two dental clinics. Video recording was chosen as an appropriate approach to record the real-time interaction between health professionals and patients (49). Additional materials like pictures, notes, and sketches were used alongside videos to help recall and reflect on observations. Documenting these condensed notes on the spot is considered highly valuable (50). Authors (KS, AJ) observed the consultations.

2.4 Participants

The first phase of the recruitment process in this study was inviting dental clinics in the region of Central Norway to take part by sending invitation letters by email to the heads of clinics. The participating dental professionals were thoroughly informed about the study. They received a separate written information and consent form, and written consent was obtained before their participation in the observation session and interview. They could ask questions about the study before signing consent and were thoroughly informed about the voluntariness of participating in the study. They performed the consultation with the adolescent as they usually do since we were interested in observing the usual interaction between dental personnel and adolescent (we are aware of the possibility of altered behavior when being observed); this means that the dental personnel did not receive any training or guidance on how and what to ask in this specific visit. However, most dental personnel in Norway received training in communication with adolescents and other patients [for instance, motivational interviewing (MI)] as part of their education or post-education training (51).

Thirteen clinics were invited in December 2021–September 2022, of which two consented to participate. Dental professionals at these two clinics sent information about the study as part of the standard invitation to the adolescents' regular check-ups. If the adolescent was under the age of 16, the letter was also sent to parents/caregivers. Adolescents and/or parents/caregivers were asked to call the clinic if they wanted more information about the study or if they were interested in participating. They were also informed that the clinic could call to ask for interest in taking part in the study. Dental professionals at the two clinics each identified two participants and communicated their contact information to the researchers, who provided further information if needed and obtained written consent.

The participants were chosen based on certain criteria. Participants for this study were adolescents aged 12–18 years old and had a planned regular visit in the period scheduled for data collection. Exclusion criteria included a history of no-show behavior, documented dental fear or anxiety, extensive dental treatment needs, limited communication skills, or personal familiarity with the researchers outside the dental clinic setting.

The two dental clinics participating in the study are in small towns in Central Norway. From each clinic, one girl and one boy ($n = 4$) participated, 12, 13, and 15 years old, while the participating dental professionals were one dentist and two dental hygienists ($n = 3$). All participants have been given pseudonyms (Appendix 1). No demographic information or medical history was collected by the authors during the observations.

For some adolescents, it was the first time they met the actual dental professionals at the visit we observed. In contrast, others had previously met the specific dentist/hygienist in previous visits. We know from interviews with the adolescents (results not shown in the paper) that they felt familiar with the dental professionals, even if this was the first time they met because they were familiar with the clinic.

The consultations observed were regular visits, usually lasting 20–30 min. Intervals between regular dental check-ups in Norway are between one and two years for children. However, if dental professionals suspect dental caries, gingival diseases, or other dental problems, the recall interval is shorter, and a new appointment for the patient is booked in the near future.

2.5 Analysis

After the observations, preliminary, substantive, and analytic reviews of videos were employed (49). The preliminary reviews were conducted shortly after the consultations (Appendix 1). Substantive reviews were initiated after watching the video recordings and familiarization with the key events and activities throughout the consultations. The recorded consultations were transcribed verbatim by one of the authors (KS), capturing verbal and non-verbal elements of dental consultations for subsequent analysis. A thematic analysis introduced by Braun and Clarke (52) was used. Authors (KS, AJ) initially watched the videos and read and reviewed the transcripts to identify thematic patterns illustrating the interactional facilitation of hope in dental consultations. A second round of collaborative, detailed watching and discussion of the videos was conducted by three authors (AJ, KS, MH). A deductive approach was then instructed to classify the data into themes in a shared document. Themes were clustered according to the characteristics of techniques employed. This was done as a collaborative and reflexive process (53) between authors (AJ). Eventually, determining the significance of the themes involved all authors.

3 Results

Our examination of the data identified three primary themes with associated sub-themes, shedding light on dental professionals' existing strategies and techniques, which inherently encompass crucial components of hope (Table 1). These techniques have the potential to instill a sense of hope among adolescents.

3.1 Bonding strategies in dental consultations

A central theme that emerged throughout the dental consultations was the dental professionals' seemingly intentional effort to build relationships with the adolescents. Dental professionals seemed to recognize the significance of the brief moments, starting from the waiting room and extending to the treatment room, to establish a meaningful relationship and foster trust with their young patients. Through a sense of continuity, non-judgmental and empathetic communication, dental professionals worked to create a supportive environment where adolescents could receive pathways and feel valued, understood, and hopeful about their dental care. The outcome of this connection-building effort could be a heightened sense of trust, leading to stronger patient-dentist relationships and enhanced hope for positive dental experiences in the future.

3.1.1 Referring back to previous visits

Dental professionals referred back to the last time the adolescent had visited the clinic. This reference to previous encounters could contribute to a sense of coherence and familiarity, reinforcing the connection between the patient and the dental professionals.

The first thing Katie, the dentist, said to Shone (15-year-old boy): "*Has everything been going well since you were last here?*"

In another consultation, the hygienist Isabel referred back by saying: "*As we talked about last time, right, what we talked about last time, was that your tooth position is a bit- …*"

This approach of reconnections usually happened at the beginning of the consultations, building a bridge between the

TABLE 1 Themes and sub-themes.

Theme	Sub-theme
Bonding strategies in dental consultations	1.1 Referring Back to Previous Visits
	1.2 Non-Judgmental and Empathetic Communication
	1.3 Empathetic Practices
Verbal and non-verbal strategies for creating positive relationships in dental consultations	2.1 Utilization of Positive Language
	2.2 Mitigating Negative Information or Bad News
	2.3 Non-verbal Strategies
Adolescents' empowerment in dental consultations	3.1 Belief in Adolescents' Capabilities
	3.2 Positive Reinforcement and Recognition
	3.3 Encouraging Patient Participation and Empowerment
	3.4 Indirect Advice and Shared Decision-Making

present moment and the previous time. This method serves as a transition to start the conversation and bond with adolescents.

3.1.2 Non-judgmental and empathetic communication

Dental professionals maintained a non-judgmental stance, displaying empathy and understanding towards their adolescent patients. If a patient disclosed brushing habits that did not align with recommendations, dental professionals refrained from blaming or judging them: "*No, well, it's perfectly fine if you forget to brush once in a while*" (Emily). In a consultation, hygienist Emily tactfully acknowledges 13-year-old Nathalie's choice to brush only in the evening. Rather than discrediting her, Emily praises this behavior, emphasizing its importance. She then suggested that if Nathalie could manage it, brushing in the morning would further strengthen her teeth.

> Emily: "*mm, it is, as I said, brushing in the evening is in a way the most important, because then you kind of brush away [i.e., remove] everything that has come [i.e., bacteria] during the day, and then, if you leave the toothpaste [in the mouth] and let it work a little after brushing, that you kind of just brush and spit and go to bed, then the fluoride in the toothpaste strengthens your teeth a bit during the night. So, that [i.e., brushing in the evening] is the most important*".

> Nathalie: "Yeah"

> Emily: "*And then, of course, if you manage to do it in the morning as well because it turns out that those who manage to brush and get fluoride on their teeth twice in a day, …*"

> Nathalie: "*Yes*"

> Emily: "*They get slightly stronger teeth than those who have once a day.*"

They empathized with the patients, acknowledging that occasional lapses were normal and offering pathways to improve oral care practices.

3.1.3 Empathetic practices

Dental professionals demonstrated empathy in various ways. For example, they empathized with the discomfort associated with dental procedures like taking x-rays. They ensured that these processes were completed quickly to minimize any inconvenience, irrespective of whether the adolescent had explicitly stated discomfort/dread or not.

> "*I know these are uncomfortable, so I tend to be quite quick.*" (Emily)

By recognizing the patients' apprehensions and reassuring them that their discomfort was understood, dental professionals could foster a trusting and compassionate environment.

3.2 Verbal and non-verbal strategies for creating positive relationships in dental consultations

A central theme that emerged throughout the dental consultations was verbal and non-verbal communication strategies for establishing a positive relationship. Through positive language, mitigating negative information, employing neutral language for describing challenges, and using welcoming non-verbal communication, dental professionals seemed to nurture an environment where adolescents could feel informed, supported, and confident in actively participating in their dental care decisions and taking charge of their oral health journey. These strategies could emphasize how they contribute to fostering adolescents' agency and gaining their trust during dental consultations.

3.2.1 Utilization of positive language

During the consultations, dental professionals frequently employed positive language, using phrases and words like "*good*," "*great*," and "*perfect*." This positive language was evident in various aspects of the interaction, such as praising apparently insignificant behavior during the consultation, like the adolescent's positioning of the head or issues beyond the adolescents' control, e.g., their occlusion or the condition of their oral mucosa, and assessing adolescents' accounts of their brushing habits.

> "*I can see that you have brushed your teeth very well before you came*" (Isabel)

Specific positive assessments were given when acknowledging the adolescents' efforts, for instance, expressing appreciation for their diligent tooth brushing before the visit. This approach aimed to make adolescents feel supported and confident, ultimately fostering a sense of agency.

3.2.2 Mitigating negative information or bad news

Dental professionals employed different approaches to deliver negative information. Euphemistic Language: (a) Dental problems such as calculus or erosion were referred to as, for instance, "*teeny tiny*", i.e., employing euphemisms to soften the impact of negative information. (b) Positive Feedback before Bad News: The dental professionals seemed to strategically provide positive feedback or praise immediately before delivering potentially concerning news to help buffer the impact of negative information, for instance, when Isabel tells 15-year-old Clara that she has brushed her teeth really well today right before telling her she has gingivitis. (c) Neutral Language and Avoidance of Personal Pronouns: In contrast to the use of personal pronouns ("*you*") for positive feedback ["*I could tell that you know a lot about acid erosion*" (Katie)], neutral pronouns or general phrases were used when discussing challenges or suggestions for improvements, such as "*most people*," "*some*" *or* "*one*", for instance "*we have to practice to be good at something*" (Emily) or "*it is an advantage to brush the teeth last thing at the night*" *(i.e., not* "*your teeth*"*, but* "*the teeth*"*)* (Katie). This approach conveyed that it is normal for adolescents to encounter learning curves and that practice is essential for improvement.

3.2.3 Non-verbal strategies

Employing a holistic approach to non-verbal communication, dental professionals skillfully integrated various techniques to create a welcoming and engaging environment during consultations. Consistent eye contact conveyed attentiveness and connection, while enthusiastic smiles and varied tones of voice fostered positivity and rapport. Complementing these cues, open postures, whether seated or standing, could further establish a sense of trust and comfort. These non-verbal strategies seem key in encouraging adolescents to openly discuss their oral health experiences and concerns, promoting collaborative and effective healthcare interaction.

Common for the dental professionals in the observed consultations is that they complete certain tasks such as examination of the adolescents' mouth before they inform the patient or encourage them to talk. For instance, Isabel walks around in the consultancy room to put some equipment back, get a cup for Clara, and examine the x-ray images on the computer. She then moves back and sits down on the stool next to Clara and makes eye contact with her before initiating dialogue about diet, and Clara admits that she drinks a lot of energy drinks.

3.3 Adolescents′ empowerment in dental consultations

During dental consultations, a prominent technique that emerged was the empowerment of adolescents. Through belief in adolescents' capabilities, positive reinforcement, participation, and shared decision-making, dental professionals not only could instill confidence but also encourage adolescents to approach dental care with a positive attitude. Empowering adolescents may bring about a shift in their perception of dental care, encouraging them to take an active role in maintaining their oral health. Within this approach, dental professionals could actively show a pathway and foster a sense of agency and confidence in their ability to take responsibility for their oral health journey.

3.3.1 Belief in adolescents' capabilities

Dental professionals firmly believe in the adolescents' capacity to take care of their teeth effectively. They verbalized their confidence by indirectly stating, "*I believe in you*," and offering adolescents the responsibility to make decisions about their oral health. By providing more than one suggestion and leaving it up to the adolescents to decide, dental professionals worked to empower them to play an active role in shaping their dental care routine and making informed choices about their oral health.

Pablo told the hygienist, Emily, that he rinses his mouth with water after brushing because he does not like the taste of toothpaste. Emily explains that if he rinses with water, his teeth may not get enough fluoride. She then suggests different options to ensure his teeth still get enough fluoride: testing different toothpaste to find one with an acceptable taste, taking fluoride tablets, or remembering to use fluoride mouth rinse daily. She leaves it up to him to decide.

3.3.2 Positive reinforcement and recognition

Dental professionals expressed satisfaction and appreciation during consultations, applauding effective brushing and oral care practices. These actions might instill a sense of accomplishment and motivation in adolescents to continue their diligent oral care routines. Furthermore, dental professionals harnessed the power of encouragement and resilience-building. They reminded adolescents of past achievements, emphasizing the significance of these accomplishments rather than taking them for granted. By creating a supportive environment that celebrates their successes, adolescents might be encouraged to view oral care as a personal achievement worth valuing. Emily praised Pablo when he remembered the brushing technique she had presented to him earlier in the consultation (even if she had to give him a couple of hints to remember what she had said), and Katie became very enthusiastic when Shone told her that he had just started brushing his teeth in the morning and not just in the evening —"*that's great!*", she said, and added with an enthusiastic tone of voice that if he manages to brush in the morning every day for about three weeks, it will be established as a habit.

3.3.3 Encouraging patient participation and empowerment

To foster a comfortable environment, dental professionals gave adolescents the opportunity to take breaks when needed, providing a "stop sign", in this case, to raise one hand. The possibility to use a stop sign will also give the patient a possibility to contribute to the interaction even when not able to verbally articulate their needs and reduce the risk of feeling a loss of control. The stop sign could contribute to patient empowerment in a dental consultation.

3.3.4 Indirect advice and shared decision-making

Instead of offering direct commands, the dental professionals used indirect approaches to give advice (pathway) and seek input from the adolescents: "*It is wise to have a system for brushing; do you have a system?*" (Emily). They gently asked questions about the patient's diet and habits, allowing them to self-reflect and arrive at their own conclusions.

> Isabel: "*How about soft drinks and sweets and such?*"

> Clara: "*I drink a lot of Red Bull then*"

> Isabel: "*You drink Red Bull, yes. Aa. When you say a lot, what does that mean?*"

> Clara: "*Like that.. a few times a week*"

> Isabel: "*Yes, so it's not just Saturday.*"

> Clara: "*No*" (speaks very softly)

> Isabel: "*No, it's a bit more than that.*"

> The patient nods.

This approach could help the patients feel empowered in making decisions about their dental health and encourage them to take ownership of their habits.

4 Discussion

The analysis of observations involving four adolescents and three dental professionals revealed that dental practitioners currently employ techniques conducive to fostering hope. This presents an opportunity for future interventions designed to explicitly nurture hope. This study explored the techniques, strategies, and methods three dental professionals used to communicate with four adolescents, then identified the elements related to the phenomenon of hope and how these elements seemed to be part of their current techniques. Three core themes and several sub-themes were identified from the observations: (1) Bonding strategies in Dental Consultations; (2) Verbal and Non-verbal Strategies for Creating Positive Relationships in Dental Consultations; and (3) Adolescents' Empowerment in Dental Consultations. These themes explain how dental professionals' endeavors to establish relationships create an environment where adolescents feel informed, supported, and confident in participating actively in their dental care decisions and managing their oral health journey. These techniques potentially deliver pathways, foster agency, cultivate trust, fortify patient-dentist relationships, and ultimately enhance hope for more positive future dental experiences.

Similar and other techniques were reported in behavior management and communication skills literature (54, 55). For example, Coolidge and Kotsanos (54) mentioned nonverbal communication like hand gestures and dental office atmosphere, providing written information before the visit, communication with parents, in addition to eyes, body posture, voice, verbal communication, and empathy. In the other study, Roberts et al. (55) introduced a wide variety of techniques that are universally accepted by pediatric and general dentists, like "desensitization," "tell-show-do," "modeling," and "reinforcement."

The adolescent phase represents a critical period for developing behaviors and habits that can significantly impact oral health outcomes (56). Establishing a strong foundation during adolescence is vital for preventing dental disease, addressing dental anxiety, and creating a positive dental experience. This foundation can serve as a cornerstone for adopting lifelong oral health behaviors. Adolescents and young children are particularly receptive to information and guidance during this formative stage when habits and behaviors are being shaped (57, 58).

The phenomenon of hope fits well with the principles of the salutogenesis theory. This approach encourages us to address beyond immediate treatment needs and consider individuals' overall well-being (59). For example, a study investigating the concept of a sense of coherence in mothers has shown an impact on children's attitudes toward dental procedures (60). This highlights the significance of adopting such holistic approaches in dental care. Moreover, it demonstrates the potential for *intentionally* fostering hope as an intervention to promote health, as the promising outcome (35). For example, introducing an intervention that helps adolescents identify small achievements can facilitate hope (61) in their ability to improve their oral health.

Motivational interviewing and hope share similarities in expressing empathy, fostering agency, and promoting resilience. Considering that only about half of the dental professionals who received MI training are confident in using it (51), hope might provide a structured framework for dental professionals. Our results suggest that elements of hope are already present in dental professionals' approaches to managing adolescent care, potentially strengthening the idea that hope is a relevant construct. Through a more thoughtful integration of hope into a dental practice via, for example, a co-designed intervention, the beneficial effects on adolescents' well-being could be extended. For instance, actively referring to goals, pathways, agency, and trust and discussing how to address these elements of hope from Snyder's and Plutchik's theories could improve adolescents' oral health literacy and potentially lead to oral health improvement. By virtue of their profession, dental professionals are important collaborators in realizing hope and being hopeful toward patients' positive outlook and well-being. Considering that adolescence is a critical phase of transition between childhood and adulthood and, as such, represents a vulnerable period (37, 38), it is essential to acknowledge the importance of intervening on multiple levels, including caregivers, schools, medical professionals, and policies (62).

However, it should be acknowledged that maintaining high levels of positivity and hopefulness would be challenging for those experiencing dental anxiety and with a history of extensive treatment. For these vulnerable groups or people in vulnerable circumstances, it is crucial to recognize the fear and apprehension often associated with dental visits. By emphasizing the potential for co-designed interventions tailored to these vulnerable populations' specific needs and experiences, we can work towards transforming their anxieties into positive dental experiences.

The extent to which dental professionals effectively facilitated hope remains somewhat unclear from our observations. Considering the potential benefits of this approach, we can contemplate establishing criteria for fostering hope in adolescents, which could have wider benefits for all patients. To support dentists in implementing these practices, a multifaceted approach is required. One avenue for intervention could involve setting clear goals for and with adolescents. Indeed, goal setting is one of the most used techniques for health behavior change (63). While this aspect was not explicitly evident in our current results, it appears that dentists may be delegating the responsibility of goal-setting to the adolescents themselves. An alternative strategy might involve collaborative goal-setting between dentists and adolescents, offering them multiple pathways to success tailored to their individual needs. This approach has the potential to be transformative, fostering hope and positive oral care practices among adolescents and patients more broadly. From a design perspective, the idea of "evidencing" (64), i.e., using visual and tangible communication to help people communicate and remember, would be valuable in the context of setting goals together. The future directions section delves deeper into these possibilities and sets the stage for future directions in our exploration of hope in dental health.

5 Strengths and limitations

The strengths of this study lie in its use of the theoretical framework, providing a solid foundation for understanding the complex phenomenon of hope. Additionally, using a novel research method implemented by a diverse, multi-disciplinary research team enhances the depth of the study's insights.

This study has some limitations. Firstly, contacting individuals within the healthcare sector, proved challenging, potentially introducing selection bias due to the inability to reach or include all intended participants.

Furthermore, despite concerted efforts to engage dental professionals, only two of 13 dental clinics accepted the invitation to participate. This restricted the sample size and potentially had an impact on the generalizability of the findings. The relatively small number of dental professionals raises concerns about fully representing this group's diversity of perspectives and practices.

Additionally, the study's sample size is limited as it comprises participants exclusively from Norway. To enhance the robustness of the findings, future research should aim for replication with a larger, randomly selected sample of adolescents, encompassing both those with dental anxiety and those without.

The interactions were in Norwegian; the translation and how to interpret them will have influenced the analysis in ways that are difficult to know. Yet, for observing non-verbal language, it is probably a strength that one of the observers did not have full proficiency in the Norwegian language.

The study primarily involved female dental professionals and did not include adolescents with dental anxiety since they were not recruited. Future studies could consider including a more diverse group of dental professionals and adolescents with anxiety for a broader perspective.

Dental professionals and adolescents knew that they were being observed during the sessions. They may have been prone to the Hawthorne effect.

6 Future directions

In the future, this work will be extended with incorporating interviews to gather insights into the experiences of adolescents in dental clinics and examining how the identified hope elements impacted these adolescents. Furthermore, an expansion of this work may involve the inclusion of perspectives from parents through interviews. Through integrating perspectives from both adolescents and parents/caregivers, the intention is to develop interventions to facilitate hope, thereby enhancing their pertinence and efficacy. Additionally, hope-facilitating interventions tailored to the distinct requirements of adolescents will be co-designed and tested.

7 Conclusion

In summary, this study investigated how dental professionals employ techniques during consultations with adolescents, uncovering elements associated with hope in their practices. Three key themes were identified. These themes illustrate how dental professionals' efforts to build relationships create an environment where adolescents can feel informed, supported, and confident in their dental care decisions, ultimately enhancing their sense of hope.

Adolescence is pivotal for shaping behaviors and habits significantly influencing oral health outcomes. Establishing a strong foundation during this period is critical for preventing dental diseases, addressing dental anxiety, and ensuring a positive dental experience, with implications for lifelong oral health behaviors.

As suggested by the results, fostering hope as an intervention can benefit adolescents' well-being. However, it is vital to recognize the challenges faced by individuals with dental anxiety and other circumstances. Tailored, co-designed interventions can transform anxieties into positive dental experiences.

While the extent of dental professionals' effectiveness in facilitating hope remains somewhat uncertain, establishing criteria for fostering hope in adolescents and patients at large, along with collaborative goal-setting between dentists and adolescents, can offer avenues for future research. These strategies could impact hope and promote positive oral care practices among adolescents and patients, emphasizing the importance of multidisciplinary interventions and patient-centered care.

Data availability statement

Anonymized transcripts and notes that support the findings of this study are available from the corresponding author, upon reasonable request.

Ethics statement

The studies involving humans were approved by Sikt—Norwegian Agency for Shared Services in Education and Research. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin. Individuals were informed about the possibility for publication of any potentially identifiable images or data included in this article.

Author contributions

AJ: Formal Analysis, Investigation, Methodology, Writing – original draft, Conceptualization. KS: Conceptualization, Formal Analysis, Funding acquisition, Investigation, Methodology, Supervision, Writing – review & editing. ZM: Formal Analysis, Funding acquisition, Writing – review & editing. MH: Formal Analysis, Funding acquisition, Methodology, Project administration, Supervision, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Appendix 1

Dental clinic A
Consultation 1: Sep 29, 2022
A girl named: Clara, 15years old (born 2008)
Female hygienist: Isabel
Duration: approx. 20 min
Starts around 9 a.m.
Note: she was a bit reserved and quiet

Dental clinic A
Consultation 2: Sep 29, 2022
A boy named: Shone 15years old (born 2007)
Female dentist: Katie
Duration: approx. 22 min
Starts around 12 p.m.
Note: he was quiet and nonchalant

Dental clinic B
Consultation 3: Oct 25, 2022
A girl named: Nathalie 13 years old (born 2010)
Female hygienist: Emily
Duration: approx. 32 min
Starts around 9 a.m.
Note: she was keen and chatty

Dental clinic B
Consultation 4: Oct 25, 2022
A boy named: Pablo 12 years old (born 2011)
Female hygienist: Emily
Duration: approx. 42 min
Starts around 12 p.m.
Note: he was neutral and relaxed

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Adolescents' views on oral health care and promotion in Norway: everyday practices, recommendations, and future visions

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Introduction: In this study, we aimed to understand adolescents' perspectives on oral health care and promotion. Our research was conducted in the context of Norway's oral health care system, where societal factors like income and education influence health disparities. Despite free public dental care for all residents younger than 19 years, challenges persist in promoting oral health among adolescents, a group whose oral health behavior and literacy remain largely unexplored.
Materials and methods: A thematic analysis of an anonymized dataset from 80 adolescents aged 12–20 years was conducted.
Results: Five central themes were recognized: (1) Feeling fresh vs. feeling indifferent: A broad spectrum of attitudes; (2) Bridging gaps, building habits: Collaborative efforts in oral care; (3) "Create good experiences at the dentist so people come back again"; (4) Requested qualities in oral health promoting solutions; (5) Reminder tools for everyday use. Taken together, these themes highlight adolescents' oral health practices and resources, recommendations for dental clinics, and visions for future oral health promotion.
Discussion: Based on the results, the discussion highlights a need for tailored oral health promotion and ideas to reach adolescents in meaningful and effective ways. Reflections on the theme of social inequalities are provided.

KEYWORDS

adolescents, oral health promotion, social inequalities, qualitative methods, oral health practices, recommendations, visions, adolescent perspectives

1 Introduction

Although studies have documented that oral health has generally improved in the European population during the last decades, a recent systematic review and meta-analysis revealed that tooth decay and other oral health issues remain a common burden during adolescence (1). Our context is Norway, where all residents younger than 19 years receive dental care free of charge through the Public Dental Service (PDS) (2). The exception is orthodontic treatment (3). Families usually get financial aid for orthodontic fixed appliances but often pay part of the cost. Youth aged 19–24 also get discounted public dental care. County municipalities manage oral health promotion, prevention, and dental services for children and prioritized groups (3). However, to what extent adolescents in Norway engage in recommended oral health-promotive behavior is, to a large degree, unknown.

Adolescents' oral health behavior and oral health literacy are generally understudied aspects (4, 5). Additionally, structural factors impacting oral health in childhood and adolescence are not well-defined (6), presenting an important area for further enquiry. A study conducted by Høvik et al. (7) emphasized the need for a more nuanced, targeted approach to improve adolescent oral health in Norway. It highlighted several challenges: the broad individual range in caries lesions rates; the need for specialized promotion, prevention, and treatment for high-risk 12-year-olds; and the opportunity for innovative, adolescent-focused promotive and preventative solutions (7).

Adolescence can be understood as a critical transition phase between childhood dependency on caregivers and the expectations of self-determination and responsibility in adulthood (8). This period is marked by significant socioemotional, cognitive, and physical changes, making adolescents particularly susceptible to various risk factors. Adolescents are typically expected to take greater responsibility for their own health, and their health choices must be seen in connection to well-being, lifestyle, health behaviors, and habits (9, 10). In addition, they also encounter new liberties, such as increased access to money and the ability to make consumer choices, adding complexity to this life stage. As adolescents grapple with forming their identities and a sense of belonging, many exhibit a tendency to distance themselves from established norms and question authority (11). This combination of factors can make understanding the consequences of choices particularly challenging. In the field of oral health, factors that contribute to the risk of tooth decay in adolescents go beyond specific deviant risk-taking behaviors, like drug dependencies (7). General contributors include a lack of attention to oral hygiene and poor dietary habits (7). Other factors that contribute to this risk are a history of tooth decay in primary teeth, being male, and either belonging to a family with low socioeconomic status or being part of a foreign-born family (7). Various studies have established significant associations between lower socioeconomic status indicators and higher rates of caries lesions experience among adolescents (12, 13).

Few oral health promotion interventions targeting adolescents have been developed, and even fewer have involved children in research and design processes. While the use of co-creation for service innovation is increasing in the overall health and care sector (14), there is a lack of evidence on both the application and understanding of design in the oral health field (15). Worldwide, the public dental health service largely seems to lack skills and experiences in co-creating interventions, as only a small proportion of systematically reviewed projects appear to have involved patients or the general public (12). This gap leads us to assume that the best ways to promote oral health in adolescents are yet to be identified. Despite improvements in child participation over the last few decades, most oral health research is conducted *on* children, rather than *with* them (16). In the field of oral health, there is a growing recognition of the need for co-creative strategies in developing and implementing services aimed at improving oral health literacy and practices (17). Co-creative strategies are rooted in the idea that a range of stakeholders, like patients, caregivers, and healthcare professionals, collectively possess a comprehensive view of the challenges and motivations affecting oral health. By actively involving these groups in the creation of new or improved services, we can understand and address barriers that contribute to social and health inequalities (18). Furthermore, co-creative approaches can encourage a sense of empowerment and ownership among participants, enhancing the effectiveness of interventions. Hence, such approaches help amplify diverse voices and empower participants, making them active agents in shaping successful and equitable oral health interventions.

We are interested in the perspectives that adolescents have on oral health care and promotion in a Norwegian context. The study background is an ongoing research and innovation project, #Care4YoungTeeth<3, involving the co-creation of oral health products, digital information, and communication tools, and new service touchpoints, with the overall aim of improving oral health of adolescents in Norway. #Care4YoungTeeth<3 is funded by The Research Council of Norway from 2021 to 2025 (project number 320362). The opportunity for children and youth to be fully and directly involved in decisions that impact their lives is a core principle supported by the United Nations Convention on the Rights of the Child (19). However, the viewpoints of children and young people are often either not collected or overlooked in the development of services. Yet, their perspectives offer valuable insights that can improve the quality of local services aimed at this age group. #Care4YoungTeeth<3 has been inspired by the sociology of childhood, which has made a key contribution in framing of children as social agents with agency, competencies, and the ability to participate (20, 21). This framework emphasizes the importance of listening to children's stories and lived experiences, confirming that their perspectives, social connections, and varied cultures deserve scholarly attention in their own right (20). In line with the sociology of childhood and research on child health and wellbeing (22), and human-centered design principles, situating adolescents as health actors and crucial contributors to the success of oral health promotion practice implies specific investigation into their personal accounts and experiences.

#Care4YoungTeeth<3 is led by SINTEF Digital in collaboration with nine official research partners representing PDS, Norwegian, and international research institutions with combined expertise in oral health, design, and co-creative processes, industry actors producing dental products and solutions for digital storytelling, and finally, a non-profit knowledge center called Changefactory (CF) (23). CF is founded on the idea that children and young people possess important knowledge about public services they are in and make use of, like schools, kindergartens, support services, the police, and the legal system. By collecting experiences and advice from children, CF seeks to position children and young people in shaping and improving public services. This study draws on an anonymized dataset provided by CF on the topic of oral health.

CF gathers insights from children about various public systems through annual surveys (23, 24). This information is summarized and shared in reports, films, and books. Young people with direct experience in these systems are invited to disseminate this knowledge to professionals and students in relevant fields. CF actively includes children in vulnerable situations, those who challenge societal norms, and those with limited trust in adults in their surveys. Additionally, young people aged 13–21 serve as professionals, or "pros" (25), in the initiative, presenting insights, offering further advice, and participating in various activities. All "pros" are invited to participate in CF summer camps.

Summer camp is a yearly event arranged by CF to gather children and youth to work on selected topics and to have a good time with activities like songwriting, swimming, crafting, volleyball, and playing games. As a partner in #Care4YoungTeeth<3, CF introduced oral health as one of the central topics to gather adolescents' input on, entitled the "*tooth assignment*".

CF uses a method for gathering data that builds on the action research approach known as Participatory Learning and Action (26). The tooth assignment followed CF's standard procedure for assignments in summer camps, with participants rotating through different stations in smaller groups, each with a specific activity or focus, and two CF adults overseeing each station. CF adults are trained in conducting group discussions with children and young people, and writing verbatim reports. The participants are divided into small groups of to facilitate discussion. The size of each group is intentionally kept small to ensure that everyone has an opportunity to speak (24).

2 Materials and methods

2.1 Research design

The study was guided by the research question: Which perspectives do adolescents have on oral health care and promotion in a Norwegian context? The authors thematically analyzed an anonymized dataset provided by CF. The CF workshop involved 80 adolescents attending two summer camps held in June 2021 in a centrally located town in Norway. Prior to the summer camp, the first author facilitated the CF team including adolescent professionals to co-design the following five questions referred to as the tooth assignment:

1. The dentist and you may have agreed on specific measures for better oral care. Who or what can assist you in remembering to maintain this?
2. What steps do you take or need to take for proper oral care (e.g., brushing, flossing, mouthwash)?
3. What factors influence your willingness or ability to visit the dentist?
4. What do you think is important to know before visiting the dentist?
5. What factors make you feel safe during a dental appointment?

2.2 Participants, procedure, and data collection

The participants were 57 girls, 21 boys, and 2 non-binary individuals. The average age was 16.8 years, ranging from 11 years to 20 years. Other demographic data such as race and ethnicity were not collected.

An employee from CF, who was also involved in #Care4YoungTeeth<3, was present at both summer camps to oversee the activity. A brief introduction outlining the purpose of the tooth assignment was given to all participants. The assignment followed the standard procedure for activities, with participants rotating through different stations in smaller groups of 4–5 individuals, and two CF adults present at each station. One adult posed the questions to the group, while the other made verbatim written documentation. CF provided an anonymized 29-page document featuring transcripts of adolescents' statements in response to the tooth assignment. Most of the statements were written in Norwegian, however some statements were in English. The transcripts contained full sentences and direct quotes.

As a gesture of appreciation, a dental care package consisting of a toothbrush, a flossholder, and a toothpaste was distributed to all participants.

2.3 Ethical considerations

Participation in CF's summer camp requires that written consent is obtained from the individual participants, or in the case of minors under 16, from both the child and their caregivers. For participants living in institutions, separate written permission is procured from the institution they are part of (24). All involved parties receive detailed information about the camp, including a list of contacts for any questions or concerns they might have. CF seeks to make this information easily understandable to ensure that participants are well-informed about the activities they are signing up for (24).

The project's research process has been approved by Norwegian Agency for Shared Services in Education and Research (Sikt), ref. number 346466.

2.4 Data analysis

The authors conducted a thematic analysis on the dataset using an inductive approach, following the methodology outlined by Braun and Clarke (27). The analysis involved several steps: initially, getting familiarized with the data before generating preliminary codes. The CF team had identified some key topics, which were presented and discussed with the #Care4YoungTeeth<3 project team in the fall of 2021. Subsequently, the authors searched for emerging themes, reviewed potential themes for coherence and relevance, and then defined and named the final themes. NVivo software was used to code the transcripts effectively. This process was initially overseen by the first author, who took responsibility for the early stages of analysis and categorization. As part of the first stage of the analysis, a draft of proposed themes along with methodological descriptions was shared orally and in writing with the project team, to establish trustworthiness (28). Selected quotes that were originally in Norwegian were translated into English to support the analysis and for presentation. Eventually, the second author joined to review, validate, and confirm the findings.

3 Results

The results comprise five central themes highlighting adolescents' oral health practices and resources, recommendations for dental clinics and visions for future oral health promotion. These are: (1) Feeling fresh vs. feeling indifferent: A broad spectrum of attitudes; (2) Bridging gaps, building habits: Collaborative efforts in oral care; (3) "Create good experiences at the dentist so people come back again"; (4) Requested qualities in oral health promoting solutions; (5) Reminder tools for everyday use.

3.1 Feeling fresh vs. feeling indifferent: a broad spectrum of attitudes

Participants' attitudes to oral health varied significantly and could be understood to cover a broad spectrum. Some experienced strong intrinsic motivation, with statements like "*I like dental hygiene. It just happens automatically,*" reflecting a sense of satisfaction. Habits also played a part, as one participant stated "*I have gotten into the habit of not being able to go out without brushing my teeth. I do it several times a day.*"

Interactions with dental practitioners were strongly connected to views on oral health. For some, the dentist's guidance was a source of comfort and assurance. One participant mentioned, "*The dentist tells me about a lot of things, which makes me feel safe.*" This kind of interaction could foster a sense of security and may motivate better oral hygiene practices. However, others were driven by fear or embarrassment and avoided visiting dental clinics altogether: "*I'm terrified of the dentist, so I'm not going.*"

Some participants considered oral health was out of their control due to genetic factors, for example one participant noted, "*I have bad genes, so I just get cavities all the time.*" A lack of intrinsic motivation was apparent in utterances like "*Nothing makes me do it unless mom nags for half an hour.*"

Expressions pointing at hopelessness and indifference towards oral health were also identified. For instance, a participant stated, "*I've started to not give a damn in life, everything that comes out of adults' mouths is a bit like whatever.*" Some revealed how dismissive attitudes would extend to various aspects of life, including oral health which was not viewed as a high priority.

External factors also served as motivators to maintain good oral health habits, encompassing both positive incentives and pressure or coercion. While one participant recommended positive reinforcement, saying, "*Don't say it's homework, gives bad associations, but give them a gift, a toothbrush and some floss,*" others were motivated by the tangible repercussions of poor oral health, like high dental bills: "*Mom showed me the dental bill and it's very expensive, it's scary.*"

3.2 Bridging gaps, building habits: collaborative efforts in oral care

The participants viewed everyday oral health as a collaborative endeavor. They identified the importance of having a supportive ally that cares by providing guidance, feedback, and reassurance. Key people in typical everyday contexts were parents, siblings, other family members, caregivers, or motivating friends. These individuals significantly contributed to shaping the participants' oral health habits.

Some participants humorously recognized the necessity of parental reminders. As one participant mentioned, "*I have parents who are a pain in the ass and keep nagging.*" This statement, though expressed with a hint of frustration, underscores how consistent reminders can help enforce good oral health practices. The influence of mothers was particularly commonly noted. Drawing from personal experiences, parents can foster good habits. As one participant recalled, "*It's my dad, who says he himself has such ugly teeth and doesn't want me to get the same as him.*" These past experiences can serve as potent reminders of the potential consequences of neglecting oral health. In addition to offering support, parents who are well-informed play a crucial role in laying the groundwork for success. As one participant expressed, "*Parents should be shown the consequences of not brushing their teeth, because not all adults know why it is important.*"

Beyond biological parents, various caregivers like foster parents play a key role in shaping oral health habits. As participants noted, the importance of good oral hygiene can differ among caregivers, highlighting the influence of diverse family structures. This extends to siblings, friends, and professional caregivers who can also contribute to promoting good oral health. As one participant pointed out, "*Not everyone has parents.*"

Despite best efforts, maintaining good oral health can be challenging due to factors like family dynamics. One participant mentioned that parental reminders can sometimes be ignored, "*They tried to get my mom to remind me to brush my teeth, but then it goes in one ear and out the other because it was something my mom told me,*" emphasizing how family environment and parent-child relationships can negatively impact the success of promoting good oral hygiene.

Participants also highlighted the critical role dental professionals could play in promoting oral health not just in clinics but in daily life as well. They suggested that dentists could actively motivate children to practice good oral hygiene. However, there was a noted shortfall in dental health education in schools, and several participants recommended dental professionals extend their influence by visiting schools to educate young people on oral health. As one participant put it, "*They are good at their job, but not so good at informing children and young people. [They should] visit the school and talk to children.*"

3.3 "Create good experiences at the dentist so people come back again"

The need for tailored communication and detailed information surrounding their dental visits to create positive experiences was emphasized. Before the visit or procedure itself, participants would like to know which procedures would take place, their purpose, and who would be performing them. One participant expressed, "*I want to know a bit about the dentist—who is going to be looking in my mouth?*" Clarity on their rights, such as who could accompany them and, using stop signs for discomfort, whether the procedure would be painful, and potential treatment costs, was considered important. The participants suggested that clinics should provide anticipatory information about the dental visit and a summary afterwards. Some participants also wished to have a say in scheduling their next appointment, promoting a collaborative approach to their dental care.

Once at the clinic, the quality of communication with all dental personnel was considered crucial. Participants valued dental practitioners who were calm, patient, and uplifting, stating preferences like "*create good experiences at the dentist so people come back again*" and "*try to give us hope instead of pushing us down.*" The participants appreciated dental professionals who take the time to motivate and make recommendations. They appreciated marked opportunities for active engagement, such as choosing background music or using a stop signal. Effective communication and consent before physical touch were considered essential for building trust and comfort. As one participant noted, professionals should "*ask if it's okay before they touch you.*"

In addition, rewards played an important role in rounding off the dental visit. The reward system, which in a Norwegian dental clinic context is often associated with concluding the appointment, was frequently discussed as an important marker. For many participants, it served as an essential motivator and contributed to a positive dental visit experience, as illustrated by statements like: "*Everyone should get a reward, regardless of age*" and "*Some may need a reward in advance also because it can have a reassuring effect.*"

Lastly, participants expressed that the dental clinic's ambiance and aesthetics played a significant role in shaping their overall experience. They proposed a multi-faceted approach to make the environment more welcoming. Visually, they suggested the addition of ceiling-mounted entertainment, like films, as a helpful distraction during procedures. They also favored a more inviting waiting room with soothing colors, natural elements like plants and avoidance of intimidating imagery in favor of fun, educational cartoons. Moreover, some participants suggested playing youth-friendly music to enhance relaxation and personalize the patient experience.

3.4 Requested qualities in oral health promoting solutions

Participants preferred oral health promotion solutions with various qualities. This theme highlights six central attributes derived from their suggestions.

3.4.1 Cheerful aesthetics

The participants leaned towards colorful visuals, engaging illustrations, and unique, amusing concepts. One participant humorously suggested, "*If Hello Kitty held dental floss in one hand and a gun in the other, then I would have laughed every time I saw it,*" underscoring the appeal of lighthearted and funny aesthetics. Cartoons, even for teenagers, and temporary tattoos with oral health messages were also welcomed.

3.4.2 Simplicity and affordability

Solutions should be easy to use and low cost, with examples such as step-by-step instructions, demonstrations, and simple to-do lists. Tangible reminders that could be refreshed twice daily were favored, along with easily accessible standard information.

3.4.3 Credibility

Information should come from a trustworthy, professional source to inspire trust and confidence in users.

3.4.4 Timely notifications

Participants valued reminders, such as those for upcoming dental appointments or tailored push notifications, to keep them on track.

3.4.5 Pedagogical and relational aspects

Participants emphasized the significance of clear, straightforward information. Some participants noted the need for explanations, while others favored a more consequential approach, suggesting that "*intimidation works. You don't want to walk around with ugly teeth.*" Other participants advocated for a balanced approach, incorporating elements of humor and positivity.

3.4.6 Preferences in written and visual communication

There were mixed feelings about the use of emojis and the anthropomorphizing of objects, like dental floss. However, participants agreed that messages should be motivating, affirming, and not overly bossy. The messages should be personalized and conveyed in a kind and simple manner.

3.5 Reminder tools for everyday use

Routines, reminders, appointments, and regularity were revealed as important components for building good dental health habits. This theme comprises suggestions for reminder tools to promote oral health in everyday life.

The participants envisioned using both digital and physical resources to encourage and remind people to maintain their oral hygiene. They suggested using digital reminders such as a personalized app with custom alarms, tooth-brushing games, and a fun tooth-brushing song that could also serve as an alarm. In addition, some participants proposed using an app to keep track of dental check-ups and to provide personalized tips based on the last dental visit. Other participants proposed the idea of digital demonstrations, for instance, suggesting the use of "*a series of pictures, or film, 'This is how you brush your teeth, this long you should keep the water in your mouth'*" to provide clear and easily accessible instructions. Participants appreciated the idea of receiving messages or calls as a check-up on their oral hygiene progress.

Physical reminders were also popular. Many participants liked the thought of step-by-step instructions on paper or in brochures. They wanted reminder notes, illustrated flyers, and posters to keep around the house. Some wanted lists on the bathroom mirror. Physical reminders like stickers or tattoos could both remind and reward. Some participants suggested color-changing tools or calendars to track progress.

Creating triggers and incentives was another idea. Several participants suggested acronyms, keywords, or songs to make routines enjoyable. They mentioned powerful visuals like those on cigarette packs to remind them of the consequences of neglecting oral health. Making routines fun included using flavored toothpaste, cool toothbrushes, or funny images.

4 Discussion

Based on the results, possible implications for providing tailored oral health promotion in adolescents are discussed. Furthermore, we consider how the findings may relate to social inequalities.

4.1 Reflections on the key results

The five presented themes comprise adolescents' views on oral health care and promotion in a Norwegian context. The themes, which partially overlap, provide important value for improving services and interventions in terms of oral health promotion.

The participants had a broad range of emotions associated with oral health, from satisfaction and safety to shame and fear, as captured by the theme "*Feeling fresh vs. feeling indifferent:* A broad spectrum of attitudes." The theme emphasizes a variety in attitudes and motivations towards own oral health, along with everyday practices and resources utilized to maintain it. Attitudes and situations related to oral health are not static and can indeed be changed. For some, oral health care becomes a priority only when they are in the right frame of mind, resulting in inconsistent care. Good insight into one's oral hygiene practices does not necessarily make a young person resistant to changing those habits, rather the significance of dental hygiene can be obscured in certain environments or family situations, leading to a lack of prioritization of oral care. As a foundation in oral health promotive work, it is crucial to understand that a variety of factors influence the way we form and maintain health habits. Therefore, there is a clear need for tailored strategies to effectively promote oral health practices among young people, as also confirmed by other studies (7, 29). Emotional and motivational aspects of oral health are critical in shaping healthy habits and serve as an underlying layer to the other identified themes.

The critical role of supportive allies in oral health promotive work is thematized in "*Bridging gaps, building habits: Collaborative efforts in oral care.*" Importantly, the participants recognize that learning about and maintaining healthy habits depends on collaboration. The participants' statements highlighted several factors that can hinder successful collaboration in oral care. These include non-traditional family structures, challenges related to family dynamics, and individual attitudes toward oral care. This underscores the importance of a comprehensive approach to oral health promotion. The participants' suggestions included bridging potential gaps through a strengthened collaboration between homes, dental professionals, and educational institutions. Questions about oral health education, such as in a school context, were not specifically included in the tooth assignment. However, participants raised this as a suggestion for future oral health promotion, in response to some of the questions. For oral health promotion, it appears beneficial to identify the relevant ecosystems that could help adolescents foster healthy habits. As constructive and detrimental habits are often inherited from one's environment, the importance of collaboration to encourage positive oral health habits should guide the development of services and interventions.

Regarding the setting of dental clinics, the importance of supportive relationships in oral care is also underscored in the theme "*Create good experiences at the dentist so people come back again.*" Interestingly, most participants focused on the responsibilities and conduct of dental health personnel in interactions with patients, rather than on their own behaviors. The participants offered recommendations for creating good experiences, focusing on tailored communication and actionable suggestions for improvement. Key points such as pre-visit information, clear communication, personal agency, transparency about cost, and positive reinforcement through rewards were covered. Hence, visiting the dental clinic is far from limited to treating a dental issue, but also about nurturing a sense of comfort and trust, which could encourage an ongoing commitment to oral health. The participants emphasized creating an environment and experience that inspired patients to maintain regular check-ups and ensure optimal oral health. The participants' suggestions correspond to a comprehensive vision for a dental clinic that is not only functional but also engaging and comforting, addressing both visual and auditory aspects to ease potential patient anxiety and encourage ongoing engagement as well as willingness to return for future visits (30). The importance of honesty, humor, and respect in fostering a positive patient-dentist relationship was also emphasized, extending to broader contexts like school visits. These elements collectively influence patient engagement and as such their attitudes toward dental health.

The two final themes, "*Requested qualities in oral health promoting solutions*" and "*Reminder tools for everyday use*", capture a broad array of qualities that participants considered important for oral health promotion and, more specifically, for reminding and motivating adolescents about oral health practices. Central qualities included aesthetics, simplicity, credibility, effectiveness, pedagogical aspects, and communicative preferences, as is also shown in other studies, e.g., (31). Preferred sources included various suggestions for both digital and physical resources. In addition, creative triggers like acronyms, keywords, or songs, and powerful visual reminders were suggested.

Moreover, the value of using positive motivation over scare tactics dominated the participants' recommendations. While some participants did indicate that they would be motivated by pressure or obligation, these approaches can also be viewed as coercive rather than encouraging. As a result, they may generate negative emotions surrounding oral health practices, even if they could be regarded effective in some cases.

The limited discussion about diet and sugary drinks during conversations with the participants was somewhat unexpected but may be attributed to several factors. One possible reason is that adolescents may not fully comprehend the impact of their diet on oral health, leading them to downplay its significance in the discussions and rather place greater emphasis on issues that are more visibly associated with their oral health. Another reason could be that participants might feel discomfort or embarrassment when discussing their dietary habits or might perceive the dental consultation as primarily focused on their current dental condition and treatment, causing them to prioritize discussions about their teeth and oral care routines rather than their dietary choices.

4.2 Reflections on the theme of social inequalities

Social inequalities represent a major public challenge within oral health, hitting deprived areas in both industrialized and non-industrialized countries alike (32). Unequal distribution of resources—such as wealth, income, education, family background, and power—leads to disadvantages in health and quality of life for individuals, families, and societies. Regarding oral health outcomes in children and adolescents, social capital has been shown to be an important factor benefiting health and, hence, useful for planning public health strategies (33). The concept of social capital can be understood as collective resources that emerge within prevalent social networks or in societal structures marked by mutual trust (34). The visible nature of teeth makes oral health a clear social marker, across countries with different levels of socio-economic status and welfare systems.

The theme, "*Bridging gaps, building habits: Collaborative efforts in oral care,*" confirms how support systems like family and educational institutions can act as social capital, making oral health care more topical and accessible. The critical role of social capital becomes even more apparent when considering the emotional and motivational spectrum of oral health attitudes. A rich reservoir of social capital in families typically results in prioritizing oral health, instilling a positive attitude toward it. On the flip side, an absence of such capital usually translates to oral health negligence, leading to a cycle of poor practices and indifference (35).

While social capital plays a role, income and educational levels also significantly shape oral health outcomes. In the Norwegian context, where dental care is free of charge for the target group, it is intriguing to note that cost remains a concern for some participants. This suggests that the issue is more nuanced and hints at two potential issues. Firstly, there might be a general lack of awareness that certain age groups are entitled to free dental care. This gap could result from ineffective communication from health services or cultural and linguistic barriers. Secondly, even in a system designed to be accessible, the hidden or indirect costs can still pose challenges for lower-income families. These costs can range from travel to the dental clinic to taking time off work, and they can create a financial burden that hinders optimal oral health practices. Lack of clear communication about these costs can intensify the problem, leading to apprehensions and misunderstandings. Therefore, while education and income continue to be significant factors contributing to health disparities, the unexpected concern about cost highlights the complex ways in which societal factors can influence oral health (36).

Language inclusivity is another dimension worth emphasizing. First, the participants highlighted the importance of using culturally sensitive language in oral health communication, pointing at youth culture. A second, related point is that individuals who are not fluent in a community's dominant language may hesitate to seek dental services. This could be due to a lack of accessible and understandable information on oral health. Such barriers can be particularly pronounced in areas with significant immigrant populations, underscoring the need for language-sensitive health promotion work (37).

Furthermore, it is vital to acknowledge the educational gaps among parents. Some parents might be unaware of the significance of oral health due to educational disparities in their upbringing. Educating parents about oral health and the long-term consequences of oral health neglect could empower them to guide their children more effectively. By rolling out targeted awareness campaigns that spell out the long-term health and financial implications of oral neglect, parents can be better equipped to guide their children (38). A relevant study is that of Nanjappa et al. (36) presenting a tool that facilitates effective interaction between dental health support workers and families facing socioeconomic challenges.

Lastly, it is important to consider individuals with specific needs, including those diagnosed with conditions like dyslexia, ADHD, or cognitive impairments. These populations encounter unique challenges in accessing and maintaining oral health. Customized interventions, like multi-sensory instructional methods or simplified guidelines, could make a difference. Also, equipping dental healthcare providers with training to cater to these needs can prove instrumental (39). Although participants did not specifically mention these conditions, they strongly suggested the benefits of providing repeated messages and visual support. These are well known means for increased patient attention, comprehension, recall and adherence in health communication research (40).

5 Strengths and limitations of the study

Recent research has emphasized the need for a more nuanced, targeted approach to improve adolescent oral health in Norway, and our study provides more details into what participants from the target group experience and suggest for design of adolescent-focused promotive and preventative solutions in a Norwegian context. The results show how adolescents experience varying attitudes and needs concerning oral health and emphasize the importance of personalized, collaborative approaches. This can be useful for understanding and planning new models for educating adolescents on oral health care. Moreover, aspects that contribute to create positive experiences with dental practitioners, in and outside the dental clinics, are revealed. In addition, qualities that are considered important in health-promoting tools crucial for daily oral habits have been identified. These findings should be useful for improving oral health services and oral health promotion in a Norwegian and Nordic context and are also expected to be relevant for dental professionals and public health organizations in wider international communities with similar welfare systems. Adolescence represents a critical phase of transition in many aspects, and looking specifically at how health services can acknowledge the value of co-creation to offer care that is more tailored applies to many geographical contexts and healthcare systems. Moreover, social inequalities represent a global challenge and our reflections of how the results can be viewed considering social capital could hopefully serve as an inspiration for future studies.

A limitation of the study is that the authors were not present in collecting data. Moreover, details about the participants' backgrounds were not collected. Aspects such as gender differences and residence situation might have significance. The number of responses for and against a specific issue were also not counted. This may affect the conclusiveness of the findings. However, a strength lies in the applied feedback loops in which representatives of the participants actively participated in formulating questions, presenting key points to the project group, and had access to preliminary findings presented both orally and in writing.

As is the case with focus group discussions, conversation flow influences participants' perspectives. A strength can be shared engagement, whereas a limitation can be that some aspects are difficult to raise, like for example the topic of diet which was not a topic brought forward in the data material.

6 Conclusion

Our study sheds light on the perspectives of adolescents on oral health care in Norway, revealing both challenges and opportunities for improvement. Five central themes were identified. These capture adolescents' experiences and desires for oral health promotion, from individual attitudes to dental care experiences shaped by social interactions. The findings suggest that tailored, collaborative approaches could enhance the success of oral health interventions for this age group. We also offer reflections on the theme of social inequalities in oral health care access and literacy. By considering socioeconomic disparities, a long-term research aim is to contribute to a more equitable oral health care system in Norway and potentially in similar international settings.

Data availability statement

Anonymized transcripts and notes that support the findings of this study are available from the corresponding author, upon reasonable request.

Ethics statement

The studies involving humans were approved by Sikt—Norwegian Agency for Shared Services in Education and Research. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

MH: Formal Analysis, Funding acquisition, Methodology, Writing – original draft, Conceptualization, Project administration, Supervision. AJ: Formal Analysis, Methodology, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Developing oral health services for people experiencing severe and multiple disadvantage: a case study from Southwest England

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People experiencing severe and multiple disadvantage (SMD) have disproportionately high levels of dental disease and tooth loss but have limited access to dental care. This paper presents an evidence-based case study of co-designing, implementing, evaluating and refining a community dental clinic for people experiencing SMD in the Southwest of England. It shares challenges, lessons, and solutions. Tailored interventions that coordinate flexible and responsive care are important for facilitating dental access for individuals experiencing SMD. Participatory approaches can deliver a range of impacts both on research and service development. No single fixed model of co-design can be applied in service development, and the choice will vary depending on local context, available resources and joint decision making. Through co-design, vulnerable populations such as those with SMD can shape dental services that are more acceptable, appropriate and responsive to their needs. This approach can also ensure long-term sustainability by bridging treatment pathway development and commissioning.

KEYWORDS

health inequalities, dental health services, homeless persons, participatory research, oral health

Introduction

Nature of the problem calling for innovation

Homelessness, problematic substance use, and repeat offending overlap considerably and are key characteristics of severe and multiple disadvantage (SMD) (1, 2). People experiencing SMD are likely to suffer significant health problems, and be heavy users of emergency services (3–6). They exhibit frailty and die some 30 years earlier than the general population, yet encounter personal and institutional barriers to using health, social and housing services (3, 6–8).

The most socially excluded people experience a "cliff-edge" of stark and persistent inequality, not least in their experience of oral disease (9). They are disproportionately affected by rampant caries, periodontal disease and tooth loss, as well as increased risk of oral cancer (10–13). Their complications of dental disease commonly include dental or orofacial pain, abscesses and infections (14). Oral disease is one of the top five reasons for hospitalisation among people who use heroin (15).

Despite their greater needs, people experiencing SMD are not able to access universal services in an equitable way with a proportionate response from health and social care services (16, 17). Even when the intent is to deliver a responsive service, capacity issues can disadvantage those most in need via the "inverse care law" (18, 19).

Barriers to accessing and receiving timely dental care stem from both the lived experience of SMD and the healthcare system, commonly resulting in late presentation of disease and visits to Emergency Departments for otherwise preventable conditions (16, 20). This has far-reaching impacts on physical and mental health, food intake, and ability to function in everyday life (21). It leads to low self-esteem, stigma, social isolation, and reduced employability (10, 11, 22). As a result, patients may also use drugs and alcohol to cope with dental pain, leading to further deterioration of dental health and perpetuating the SMD cycle (2, 21, 23).

Because oral health problems occupy a crucial position in the life of those experiencing SMD, dental treatment can catalyse benefits in multiple areas of a patient's life (24, 25). Contact with dental health services can offer an entry point to engage with other health and support services such as drug and alcohol rehabilitation, smoking cessation, and immunisations. Dental care can boost morale and self-esteem, opening up pathways to improved overall health, as well as training and employment opportunities (24, 25).

Context in which the innovation occurs

Community-based participatory research is a form of co-design that unites science and practice through community engagement and social action to deliver increased health equity (26). Participatory research is a philosophy in which the research is done *with* those who are its focus rather than done *on* or *to* them (27–29). It is a paradigm, not a method, that guides the research process, emphasising power sharing, which is particularly relevant to socially excluded groups (27, 30). In their framework to promote oral health inclusion (31), Freeman and colleagues called for an evidence-based action plan informed by mixed research methodologies and underwritten by participatory research concepts. Co-design gives privileged exposure to the voices and lived experience of people experiencing social exclusion and consequent health disadvantage (31).

Both professionals and service users are directly affected by the quality of services offered by a healthcare system, and both need to be engaged in related research (27). The views of people affected by SMD on optimal outcomes of dental care or service use may differ from those of providers (32). Therefore, involving them in research promotes contextually sensitive interventions and appropriate approaches to patient care (33). Yet, oral health service design and policy targeting people experiencing SMD have only limited insight from the lived experience perspective.

Considering the burden of oral disease among people experiencing SMD and the disparity between service need and utilisation, facilitating timely high-quality care for them is essential. This is in line with the Long-Term Plan of the UK National Health Service (NHS) (34), which places priority on the health care of individuals with additional needs. The importance of integrating health and social care services for people experiencing SMD is recognised in strategic statements and guidelines (17). In addition, new planning structures in the NHS in England, called Integrated Care Boards, may offer fresh opportunities to commission place-based health inclusion models that design care around the needs of specific groups, and help spread innovation and best practice (35).

Purpose

This paper presents an evidence-based case study involving co-designing, implementing, evaluating and refining a dental service for people experiencing SMD in the Southwest of England, sharing key lessons from a partnership of stakeholders.

Methodological approach

This is a community case study which documents local experience in developing a dental service for people experiencing SMD. It describes and reflects upon, a programme and practice geared towards improving the health and functioning of this cohort. The Community Dental Clinic was established in early 2018 by the Peninsula Dental Social Enterprise (PDSE), the clinical arm of the Peninsula Dental School at the University of Plymouth, Southwest England. PDSE aims to improve oral health and reduce inequalities by provision of quality care to groups who find access to mainstream services challenging (36).

PDSE identified the need to improve access to dental services for one such group, i.e., people experiencing homelessness. It shaped its response by developing care pathways suited to their needs and circumstances based on a range of inputs from diverse data sources. These included community engagement activities, on-the-ground experiences, consultation with local stakeholders, evidence synthesis and primary studies to assess the oral health needs of the local population experiencing SMD and their barriers to care. Stakeholders included dental and other healthcare professionals, university and peer researchers, community representatives, patients, and support workers. Participatory research values guided the process throughout, giving all contributors the opportunity to input ideas. Thereafter, through an iterative process, all authors contributed to and refined the emerging themes to present in this case study.

The history of the innovation

A systematic review of barriers and facilitators to accessing dental care for people experiencing homelessness in the UK found linkages to both the lived experience of homelessness and the nature of the healthcare system (16). The review recommended reconfiguring future services to recognise the target group's diverse and complex needs. Building on these findings, the PDSE academic team and peer researchers from the charity Groundswell collaborated in 2018 in a qualitative study at a homeless hostel (37–39). Groundswell works with people experiencing homelessness and other disadvantages, enabling them to participate in decision making and help create solutions in areas including health (40). The partners paid an informal familiarisation visit to the hostel prior to the data collection and intervention, giving an opportunity to meet residents and share views on oral health.

The study investigated factors influencing oral health behaviours and access to dental care from the perspective of people with lived experience of homelessness plus stakeholders including support workers, dental providers and other health professionals. The results were used to develop an oral health intervention project and feed into the development of the PDSE Community Dental Clinic.

Peer advocates were involved at every stage from the study design to the planning and delivery of the oral health promotion intervention, including data collection from people experiencing homelessness, and evaluation, interpretation and dissemination of findings. Other stakeholders (hostel support staff and other professionals in various supporting roles) were interviewed by a member of the academic team. Data collection focused on discovering what was considered important regarding oral health promotion and optimal dental service provision.

Realising a co-designed dental service

In response to our study findings and in line with Freeman and colleagues' inclusion oral health framework (31), PDSE established a dedicated dental pathway for people experiencing homelessness to fill identified gaps in service provision (24). At its launch, the PDSE Community Dental Clinic was a pro-bono contribution to the local community (24). A salaried dentist provided routine and urgent treatment, all without cost to patients. Subject to patient consent, appointments were arranged in coordination with support staff or volunteers who provided appointment reminders, transport to the clinic, and chaperoning during treatment, as needed.

Recognising the voluntary sector as an important partner for statutory health services, supporting improved health, well-being and care outcomes (41), a close collaboration was established with a local volunteer with years of experience in the homelessness sector. This helped ensure that voices from that sector were continuously heard in developing and delivering the service.

Evaluation and iterative redevelopment of the service

Following establishment of the Clinic's initial model of care, an outcome and process evaluation was carried out in 2020 to determine its impact and acceptability for patients, and examine barriers and facilitators to using and providing the service (24). Based on the evaluation findings, plus community outreach experience and opportunities created by the local commissioning organisation (NHS Devon) funding the service (42), some changes have been put in place since October 2022. These address identified gaps and recommendations for improvement:

1) Referral criteria: These have broadened from those experiencing homelessness to those experiencing SMD. Referrals are now accepted from any of the seven organisations in the Plymouth Complex Needs Alliance (43).
2) Patient documentation: A bespoke patient information sheet and referral form have been developed to enable tailored care.
3) Referral and appointment process: The PDSE Dental Outreach Team (as opposed to PDSE Administration) receives referrals via a dedicated email address, processes them, and communicates appointments.
4) Outreach activity: The Dental Outreach Team visits referring organisations to meet prospective patients in an environment where they feel comfortable to introduce dentistry in a positive way, and reduce stigma and apprehension.
5) Integration: Active integration has been established with supported housing, and social and health services.
6) Patient satisfaction: A satisfaction questionnaire is administered to patients completing treatment.
7) Patient and Public Involvement (PPI): A PPI group comprising people experiencing SMD, support staff and other professionals has been established to improve service delivery and identify further opportunities to support the community. They will contribute to a mixed methods evaluation of the service to explore factors influencing integration with other health and social care services.

The patient journey

Once a referral has been received at the dedicated email address, the patient is registered, and patients and/or support staff are contacted (depending on consent) to ascertain clinical urgency and communicate appointments (see Figure 1).

Two days prior to the appointment date, a text reminder is sent to the patient and copied to the respective community organisation. Support staff are encouraged to accompany patients as needed.

Each patient is offered an assessment and one complete course of treatment by a fully qualified dental clinician. Those requiring urgent treatment are allocated an emergency appointment to resolve the immediate concern before moving to routine treatment.

Patients who cannot be contacted via their support worker or community organisation, or who fail to attend two visits, are discharged from the service, but can be re-referred once they are in a position to undertake treatment.

To avoid the disappointment and de-motivation of a long lead-in time, once clinic capacity is reached, the waiting list is shut. Support organisations are informed of the opportunity to make referrals again when capacity becomes available. Notwithstanding this, two emergency slots for patients experiencing SMD and requiring urgent treatment remain available each week.

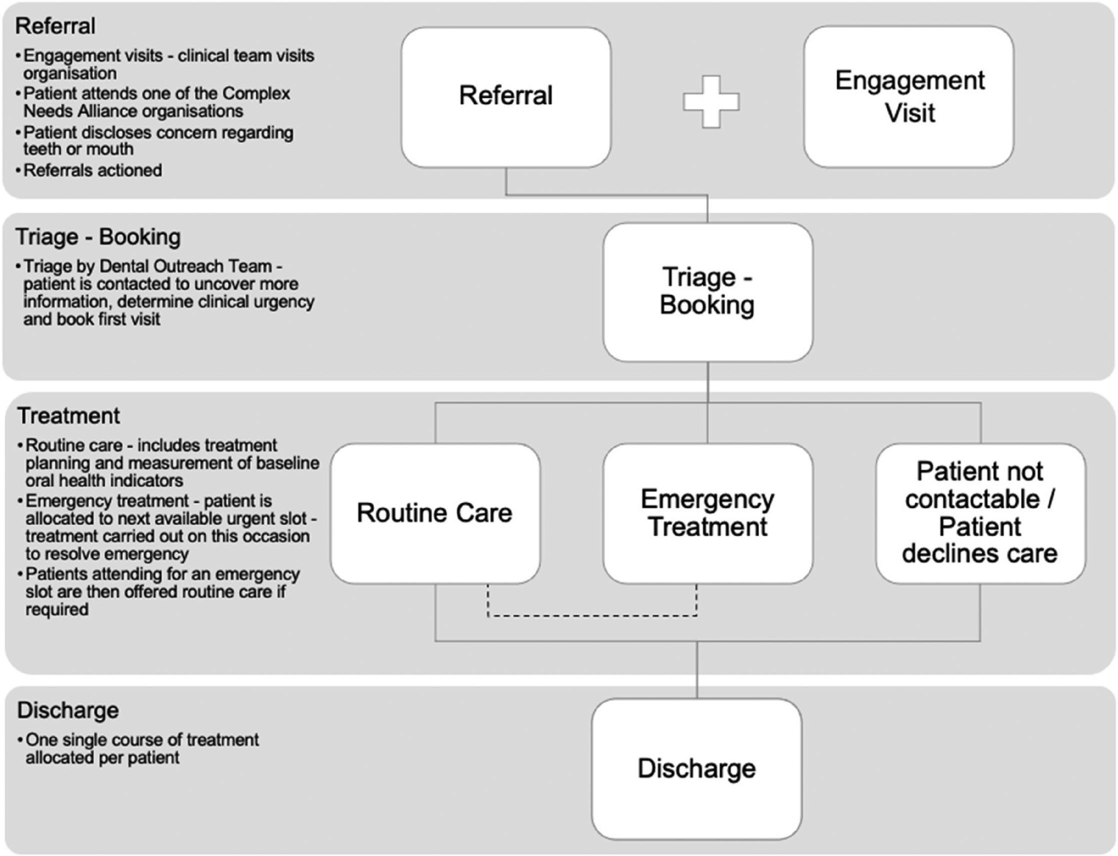

FIGURE 1
Patient journey.

Lessons learned—recommendations

During the co-design, delivery, evaluation and redevelopment of the above service, we have learned many valuable lessons that we believe will support others who wish to create inclusive dental services for SMD groups. Below are key lessons that have been identified through a group discussion and refined over time, using various data sources described earlier (i.e., in "Methodological approach"). Both the SWOT analysis (Table 1) and other key lessons learnt reflect facilitator-led group exercises.

The concepts distilled into the SWOT analysis are developed below.

TABLE 1 SWOT analysis of the service.

Strengths	Opportunities
- Dedicated co-ordinator processing referrals, booking appointments etc. - Support staff engaged with the programme e.g., accompany patients - Links with support organisations - Outreach visits to break down barriers - Flexible attendance policy - Embedded evaluation - Integration with other health services	- Continuous learning through service evaluation - Introduction of a patient passport - Trauma informed practice and organisational change - Dental workforce education - Stimulation of broader health engagement by patients - Cross referrals to other services - Education and outreach opportunities for students
Weaknesses	**Threats**
- Missed appointments and lost clinical time - SMD patients' reliance on emergency care - SMD patients' low readiness to engage with routine dental services.	- High demand and nature of SMD - Overwhelming number of referrals - Limited clinical time - Difficulties in contacting patients - Patient anxiety - Strain on wider dental care system

Effective partnerships

In our work, all collaborators in the participatory research partnership hold equal positions in the team. Prerequisites for effective collaboration include collectively setting clear goals and expectations, power sharing, encouraging joint working, and valuing individual contributions and differences (44). These are fostered by establishing transparency, creating a friendly setting and conditions for trust, and building relationships and agency for all, with training where appropriate.

The diversity of people experiencing SMD should be reflected in the co-researchers. Their individual skills and capabilities may vary, calling for support from academic colleagues to help them fulfil their roles (44). Co-researchers with lived experience are likely to have been exposed to trauma in similar circumstances to the research participants. It is important to be mindful of their wellbeing, with appropriate support mechanisms and regular debriefing (45).

Tailored innovations facilitate access

Provision of general dental care in England has experienced progressive strain, resulting in significant access constraints (46). This is particularly acute in Southwest England. Moreover, service commissioning and delivery models are designed for the general population, lacking the flexibility to accommodate complex lives and needs (47). Previous incentives from NHS comissioners have not always had successful uptake, possibly for not accommodating challenges in reaching Units of Dental Activity targets, which are a common feature of dental contracts in England.

Access to care for people experiencing SMD should meet immediate needs alongside building personal resources and resilience to achieve a happy and healthy future (i.e., "recovery"). Teeth often tell the tale of a life filled with attrition, and only through recognising the importance of planned and supported dental care alongside mental and physical health care can recovery be fully supported.

The current "one size fits all" model of dental access does not consider the underlying factors perpetuating the oral health equity gap for this cohort, carrying the risk that any interventions developed will fail those who are the most vulnerable (14, 18). A dedicated clinic that operates with the flexibility required to meet complex needs and lives can mitigate that risk. Box 1 lists some characteristics of an environment within which the service can flourish, as suggested by patients and other stakeholders through research and practical experience.

Coordinating flexible and responsive care

Most operational challenges to running the PDSE Community Dental Clinic stem from the high demand and the nature of SMD. The number of referrals received can be overwhelming, often exceeding available clinical time and requiring prioritisation of patients in discussion with the clinical team. Reaching patients, particularly those with no fixed abode and possibly without a mobile phone or credit, can be difficult, leading to reliance on support organisations/workers to make contact. Patients with co-morbidities and poor mental health often find attendance challenging. Some are very anxious and need help to ensure and sustain their attendance.

Having a dedicated co-ordinator processing referrals, booking appointments and responding to emergencies and cancellations helps establish a relationship with patients and support staff, facilitates communication with patients, and improves service efficiency. Outreach visits to meet potential patients in their own environment promote good working relationships with support organisations and patients, and break down barriers. Adaptability and empathy in the face of unforeseen situations, and flexibility around appointment timing may be crucial for patients with addictions who follow certain medication routines and/or who may risk withdrawal unless accommodated. Longer appointments support building of trust and confidence for anxious patients, explanation of procedures, and agreement on treatment plans.

Further suggestions from patients and support workers are given in Box 2 below.

Supporting patients to utilise services

A key factor for an effective service is minimising clinical time lost through missed appointments. Whilst failure to attend is to some degree inevitable across all patient groups, those experiencing SMD often have chaotic lifestyles, making communication around appointments more difficult and missed

BOX 1 Developing an oral health service for SMD patients.

An oral health service for people experiencing SMD should meet three requirements: (i) prevention and access to dental hygiene, (ii) a responsive service for emergencies, and (iii) high-quality restorative care to support recovery. This would include

- Situation-appropriate support for self-care:
  - access to clean running water
  - provision of sanitary spaces
  - access to dental supplies in hostels and drop-in centres
  - education about dental hygiene
  - reinforcement of good routines.
- Linkage to dental services taking into account patients' circumstances:
  - dental treatment offer prioritised and matched with need and readiness for treatment
  - a timely response through sufficient capacity to offer emergency and ongoing treatment
  - ability to locate and communicate with people who may not have a fixed abode or access to a mobile phone
  - accessibility through multiple services within which professionals are aware of a simple referral process
  - peer support and flexible support in the community to foster and build engagement.

BOX 2 Patient and support worker feedback on the clinic environment

- Have clear signage pointing to and on entrance doors to help new patients.
- Provide low music to soften "the overbearing silence" in the waiting room.
- Have a TV with subtitles in the waiting room to help distract and calm nerves.
- Display photographs of the dentists without masks "to know what their smiling faces look like".
- Put activity-focused pictures on ceilings/walls in clinical spaces to divert the mind away from the treatment.

appointments more likely (16). Discussing and recording consent for sharing information with support services from the outset can allow service providers to liaise with them to remind patients and reschedule appointments if the patient is not able to attend.

A baseline policy on patient attendance, applied with a degree of flexibility, can help establish expectations from the beginning and ensure consistency. Discussing the reasons for a missed appointment with the patient or their support worker can help accommodate lifestyle factors in treatment planning and increase the chances of success. Knowing where a patient is in their addiction and recovery journey may have implications for their ability to embark on extensive treatment plans requiring multiple appointments, as opposed to only receiving urgent care.

Introducing a "Patient Passport" accessible to service providers could assist SMD patients in recalling pertinent health information, alleviate pressures on them to retell traumatic experiences, and allow them to flag personal likes and dislikes about health treatments.

Support staff role

Through spending a lot of time supporting people with health and social care needs, homelessness support workers hone their skills in handling difficult conversations, recognising important conversational cues, and building relationships with clients who distrust other professionals (47, 48). However, since people experiencing SMD rely heavily on emergency care, workers may tend to focus less on initiating general and prevention-oriented health conversations (49). Research is needed to investigate how to enhance their confidence, skills and knowledge to have more effective conversations, achieving improved signposting and healthcare advocacy (48). Encouraging people to start speaking about health issues, including oral health, can start a journey to a healthier life based on higher health aspirations, self-advocacy and ability to support themselves in the future (48).

Outreach improves patient engagement

Outreach visits provide the dental team with a greater depth of knowledge and understanding of the day-to-day challenges that patients and support workers encounter. Hence, we organise frequent visits to the community. People experiencing SMD are no strangers to shame, oral health-related stigma and dental anxiety (16, 50). So, reaching out to them at places where they feel safe and comfortable (e.g., residential programmes; drop-in centres) and through street outreach helps break down barriers of fear and anxiety (38, 39). Triaging on outreach visits achieves introduction to the clinical environment and personnel in a relatively gentle way.

Trauma-informed practice is a priority

People with complex lives and needs related to homelessness and other aspects of SMD are highly likely to have experienced trauma and stigmatisation in both healthcare encounters and interactions with society at large (16, 21, 24, 51). Adverse past experiences with health services can have a profound impact on patients' engagement (13), sometimes manifesting as behaviour outside what would otherwise be considered acceptable in a clinical setting. However, negative reactions from staff to challenging behaviour can deter patients from attending future appointments.

There is evidence that engagement is promoted through approaches that are friendly, non-judgemental, and culturally sensitive (17). Our ongoing evaluation of the Community Dental Clinic and feedback demonstrate the importance of patients being treated with respect and humanity, first and foremost as a person to be helped rather than as a problem to be solved. Practical measures including sensitive waiting room arrangements providing adequate privacy, information management to avoid patients having to repeat personal details which may be retraumatising, tactful offers of assistance with filling in forms, and space on referral forms to alert the dentist to any additional needs or experience of past trauma requiring an appropriate and sensitive response.

Trauma informed approaches are increasingly recommended as a means to empower individuals to participate in their own healthcare and thereby promote better outcomes (34, 52, 53). However, an evidence base for the effectiveness of such approaches in the dental sector is limited, justifying further research.

Dental workforce—education

Dental professionals require a holistic and empathetic understanding of the entire patient population, and dental faculties must realise their responsibility to orient educational and research activities to society's current and future health needs (54). Education systems train graduates to be competent in diagnosis, treatment planning and technical skills. However, the limited integration of outreach into traditional dental curricula means that the mind-set of graduates is not often community oriented. Dental educators should promote an understanding of inclusion health, with practical opportunities for students to work with marginalised populations.

The Inter-Professional Engagement programme at the Peninsula Dental School provides such an approach (55). Through experiential and peer learning, the students develop insight into community-wide patient care needs. The students graduate with a truly rounded set of skills, taking awareness and openness to innovation into their professional careers.

Embedded evaluation—being a learning institution

Services benefit from embedding evaluation into their workplans to create learning opportunities from the outset. Documentation of the use of the PDSE Community Dental Clinic and engagement by partner organisations and patients has provided a clear picture of the dynamics of the patient population, their use of the service, and its acceptability. It has identified gaps and opportunities in service provision, leading to changes in operation to better serve patient needs. Further research on identifying patient-centred data and indicators of "small" or "soft" outcomes that are meaningful to individuals will enhance understanding of patient experiences (56).

Integration with wider healthcare and SMD services

With high levels of multimorbidity and social care needs among people experiencing SMD, interdisciplinary working is an effective and productive way of organising care around the individual, drawing on greater awareness of the interaction of homelessness and health, and cross-referrals among services. This is consistent with the joint guideline published by the National Institute for Health and Care Excellence and the Centre for Homelessness Impact (17).

The PDSE Community Dental Clinic currently operates in partnership with the Health Inclusion Pathway, Plymouth. This model of multidisciplinary service provision coordinates care across outreach, primary, secondary and emergency healthcare, social care and housing services for people experiencing SMD. By embedding access to dental care in a service directly aimed at this population group, it is hoped to make it more easily available and more readily engaged with.

Discussion

We have explained how we have used co-design to develop an effective, responsive dental service for SMD groups, and have reflected on the lessons learned through the design, delivery and evaluation of the service. The acceptability and appropriateness of the service were evidenced by all stakeholders (patients, providers, support staff, researchers) through formal and informal feedback (e.g., evaluation of the service, feedback questionnaires, stakeholder group meetings and PPI) and rate of attendance at the PDSE community clinic. Acceptability and appropriateness are interrelated, and include considerations about the opportunity for individuals to participate in their own care and be empowered to make decisions (57). This includes meeting their cultural values and norms while addressing their health needs (58).

Reflections on participatory research

A number of studies throw light on approaches to co-design (33, 59, 60). Our approach is similar to "experience-based co-design", which collects user experiences and uses them to formulate interventions or pathways (61). In this approach, stakeholders are recognised as possessing both explicit and tacit knowledge; working together in a group helps surface the latter and facilitates the creation of new shared meaning visible to all stakeholders (33, 60). In our work, people with lived experience were involved separately from other stakeholders (e.g., support staff, clinicians) to minimise discomfort caused by power dynamics. To look at this further, through PPI, we are exploring the possibility of incorporating "experience-based co-design" more fully into service development.

The role of participatory research

People experiencing SMD often have low health expectations and commonly have decisions made on their behalf, stifling their opportunity to exercise agency (62). Yet from our experience, the extensive knowledge that people with lived experience have of the structures behind SMD equips them to be a vital part of the solution, contributing at practical, policy and political levels. Involving them can help ensure the acceptability, appropriateness, effectiveness and sustainability of services. It can help build patients' trust in services and service providers (17) and enable them to become partners in their dental treatment rather than simply recipients of care.

Also important are the views of other stakeholders, making the research a partnership involving academics, service users, and dental care professionals, as well as workers from the third sector and other health and social care fields (27).

Benefits of participatory research

The value of participatory research cannot be overstated. There is no current standardised description of its impact, but studies have identified common effects including improved research plans, learning among partners and academic researchers, and impact on policy makers (63). Increased relevance of research to patients, healthcare professionals and other end users is undeniable, avoiding research waste (64).

Formal and informal feedback processes documented benefits felt by all of our stakeholders through improved study quality, relevance of research tools and outcomes to end-users, and generation of more honest research data. Deeper insight was gained into the factors that affect access to dental services by those experiencing SMD, because patients reported feeling more comfortable speaking to peer researchers who "had been where (they) are", and thereby better able understand them (37). The academic team gained wider perspectives and knowledge of the subject area and of participatory research itself. In line with findings from other studies (44), co-researchers benefited through acquiring new skills, personal development and improved confidence. Individuals experiencing SMD gained improved access to treatment.

Challenges and drawbacks of participatory research

The lack of methodological and terminological standardisation surrounding participatory research, and the lack of practical knowledge on how it can best be designed and performed, poses challenges in conducting meaningful public and stakeholder engagement (65). A better picture is needed of how it can best be performed in the context of dental service development. As suggested by the International Collaboration for Participatory Health Research (27), the appropriateness of any given model of participation is dependent on local context, available resources, and joint decision making. A lack of clear conceptualisation could be addressed by sharing lessons and experiences of what actually happens, reflecting on the process of participation and collaboration, and capturing positive outcomes, challenges and negative experiences (65, 66).

In line with published research (44, 64), we found that participatory research required increased time inputs and costs, and substantial flexibility and effort by all team members to foster partnerships and motivation. Negotiating power dynamics and/or relinquishing power can be challenging, along with balancing differences in perceptions, priorities and preferences, which may result in compromised study designs and apparent tokenism (67). Forming partnerships at an early stage can help with power relationships, with active listening on the part of the academic team to make partners feel heard, and assigning clear roles from the outset to help mitigate tensions. There is also a need to build trust through consistency and explicitly actioning recommendations made by those with lived experience.

Clinical governance regulations may impede adherence to principles of participation in health services evaluation, calling for organisational changes to improve capacity for partnership work. For example, interviewing patients without being employed by dental services may be challenging because of issues of confidentiality.

Conclusions

Current dental policy in England fails to address the needs of people experiencing SMD. As a result, oral health inequalities continue to widen. Developing and providing more equitable and inclusive dental care pathways will necessitate much greater recognition of the needs of this cohort, including multi-disciplinary input and additional service requirements. Alongside this, more work is required on developing appropriate funding models so that dental providers and teams have the flexibility and capability to provide urgent and routine care in a sustainable way.

Our case study confirms co-design as a powerful approach with the potential to provide socially excluded populations with services that are more appropriate, acceptable, and responsive to their needs, at the same time as meeting providers' capabilities. Moreover, it allows for a bridge between treatment pathway development and commissioning, ensuring long-term sustainability of services.

Our long-term vision is for a radical system change that would recognise the need to prioritise vulnerable groups in the community. There is a need to explore a radical service redesign involving people with lived experience, incorporating research on how co-design can best be utilised. Services are likely to fail if they are simply transactional, using people as passive units of service need rather than being redesigned with people and taking into account how they live their lives. Their voice is important in co-designing and co-producing services that will offer excellence in treatment, provide equitable and tailored access, and achieve optimal outcomes in line with specific needs.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material. Further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans (which are cited in this work) were approved by The University Research Ethics and Integrity Committee (UREIC)- University of Plymouth. The studies were conducted in accordance with the local legislation and institutional requirements.

Author contributions

MP: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. LW: Data curation, Formal Analysis, Investigation, Methodology, Resources, Software, Validation, Visualization, Writing – original draft, Writing – review & editing, Conceptualization. RA: Data curation, Formal Analysis, Investigation, Software, Writing – original draft, Writing – review & editing. JD: Data curation, Formal Analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. LG: Data curation, Formal Analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. BJ: Data curation, Formal Analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. EM: Data curation, Formal Analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. AM: Data curation, Formal Analysis, Writing – original draft, Writing – review & editing, Investigation, Methodology. AN: Formal Analysis, Investigation, Methodology, Resources, Writing – original draft, Writing – review & editing, Data curation. SR: Data curation, Formal Analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. RW: Data curation, Investigation, Writing – original draft, Writing – review & editing, Formal Analysis, Methodology.

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Conflict of interest

RW is the Chief Executive Officer of PDSE.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Embedding patient and public involvement into a doctoral study: developing a point-of-care HIV testing intervention for dental settings

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Introduction: Patient and Public Involvement (PPI) can have a positive impact on research. PPI can make research more meaningful and appropriate as well as preventing research waste. For decades, patient advocates with HIV have played a key part in public health and research. This article presents the PPI activity undertaken during a doctoral study. The aim of this article is to demonstrate how PPI was embedded into a doctoral study that explored the feasibility of HIV testing in dental settings.
Methods: Patients and the public were invited to be involved with the feasibility study through various organisations and charities. A comprehensive PPI activity strategy was devised, and appropriate funding was obtained. Patients and the public were predominantly consulted or collaboratively involved with several aspects of the study.
Findings: Patients and the public positively contributed to the intervention development and the resources supporting its implementation. As a result, the study resources (i.e., questionnaire and information leaflets) were easier to read, and the intervention was more appropriate to the needs of patients. Furthermore, the training and focus groups conducted with dental patients and people with HIV benefitted from input of people with lived experience.
Conclusions: PPI can be embedded within doctoral studies provided there is sufficient funding, flexibility, and supervisory support. However, PPI activity may be impacted by limited resource and *a priori* research protocol and funding agreements.

KEYWORDS

patient and public involvement, HIV, oral health, screening, public health

Introduction

Globally there are 39 million people with HIV (PWH). Although the annual incidence of HIV has been decreasing in recent years, late diagnosis of HIV has remained a consistent global public health problem (1, 2). In the UK there are more than 100,000 PWH. Multiple approaches have been adopted to tackle late diagnosis of HIV, one of which has been the expansion of HIV testing into non-specialised health settings and community spaces (3). Dental practices have been identified as a promising setting for opportunistic testing for HIV (4). Dental professionals have successfully been trained to use finger prick and oral swab point-of-care tests and have implemented testing programmes in dental settings in the US and Canada (5–7). Patients report high levels of acceptability of HIV testing, particularly when these interventions are delivered in urban areas and in community dental clinics providing dental care for underserved populations (8, 9).

Patient and Public Involvement (PPI) can be a useful tool in designing interventions for health improvement to maximise their acceptability to the patient population. HIV activism ensured that PWH were involved and embedded in the design and conduct of much HIV health research. The civil society movements in HIV led to radical changes to the health research agenda and shaped the global AIDS response. For more than two decades, UNAIDS have recognised the value of HIV advocates' involvement in research and have promoted the principal of Greater Involvement of People with AIDS (10–12).

Three key arguments in support of PPI are the normative, substantive and process perspectives. Normative (democratic) arguments consider PPI as important to upholding the values of justice, fairness, democracy and public accountability; a means to empower patients and the public (13). Alternatively, subjective (consequential) arguments position PPI in terms of its utility, consequences, or end outcomes for the benefit of research, for example, effectiveness, quality or relevance, validity or, representativeness. Process value systems are concerned with the conduct of PPI; this domain includes a focus on partnership, equality, respect, trust, openness, honesty, independence, and clarity (13). These approaches to defining the value of PPI are not at odds with one another, and can be complimentary e.g., with more equitable power sharing comes greater involvement and public accountability which can lead to improved quality of end outcomes.

In recent years PPI in healthcare research is increasingly well recognised and is now a mainstay of applications for research funding and ethical reviews. PPI is a key component of good research practice. Involvement of patients and the public are encouraged at all stages of the research process from concept through to dissemination and planning next steps (14). The benefits of PPI have been highlighted through improved retention and recruitment to clinical trials, benefits to study methodology and dissemination of innovations. Perhaps most importantly, PPI ensures that the interventions are tailored to meet the needs of participants and enhance the relevance and acceptability of interventions, thereby reducing research waste (15). However, alongside the burgeoning understanding of the value of PPI are concerns about tokenism and "box ticking", thereby undermining the authenticity of the power sharing process fundamental to PPI (16).

Due to the wide variety of involvement strategies and different levels of involvement, it can be challenging to evidence the impact of PPI (17). Additionally, inconsistent reporting of PPI limits the usefulness, replicability and understanding of "how it works, in what context, for whom and why" (18).

There is an absence of literature describing how to operationalise PPI in doctoral studies (19). As a result, doctoral candidates may be discouraged from incorporating PPI in their research. Therefore, the aim of this article is to describe the approaches to PPI embedded into a doctoral study which explored the feasibility of implementing HIV testing in dental settings and to share the lessons learned throughout this process.

Methods

Ethical approval was granted by the Essex, East of England, National Health Service Research Ethics Committee (IRAS 221512).

The HIV dental study

The focus of the HIV Dental feasibility study was to design and implement an evidence-based point-of-care HIV testing intervention to be used in general dental practice and community dental settings. The mixed-methods feasibility study comprised of two phases. In the first phase, the intervention design was informed by a systematic review and focus groups undertaken with dental patients, PWH and dental professionals. In the second phase, the HIV testing intervention was introduced into dental settings and evaluated through a combination of clinical data, patient questionnaires, interviews with dental patients and professionals, and direct observation. The overall outcome was to ascertain whether HIV testing in dental settings was feasible and acceptable for implementation as a full-scale trial or roll out.

PPI activity was embedded within the intervention design process and was critical to the study literature development, focus group conduct and dental professional training aspects of the doctoral research study described in this article (22). PPI activity was planned into the grant application for the study and costed appropriately to enable the researchers to engage with patients and the public at multiple points. PPI activity planned for later aspects of the study was impacted by multiple contextual factors which are described in detail in the outcomes section of the manuscript.

We have applied the Guidance for Reporting Involvement of Patients and the Public—Short Form (GRIPP2-SF) checklist to the PPI activity undertaken as part of the doctoral study in order to provide rigour to the reporting process in this article (18). The GRIPP2 was developed to improve PPI reporting standards. It is the first international guidance for reporting patient and public involvement in health research. The checklist consists of two forms: short (SF) and long form (LF) versions. GRIPP2-SF includes five items and is primarily used for studies where PPI is a secondary focus. As per GRIPP 2 short form we have (1) reported the aim of PPI in the study, (2) provided a clear description of the PPI methods used in the study, (3) reported the outcomes of PPI, (4) commented on the extent to which PPI influenced the study positively and negatively, (5) reflected on what went well and what did not to enable others to learn from this experience.

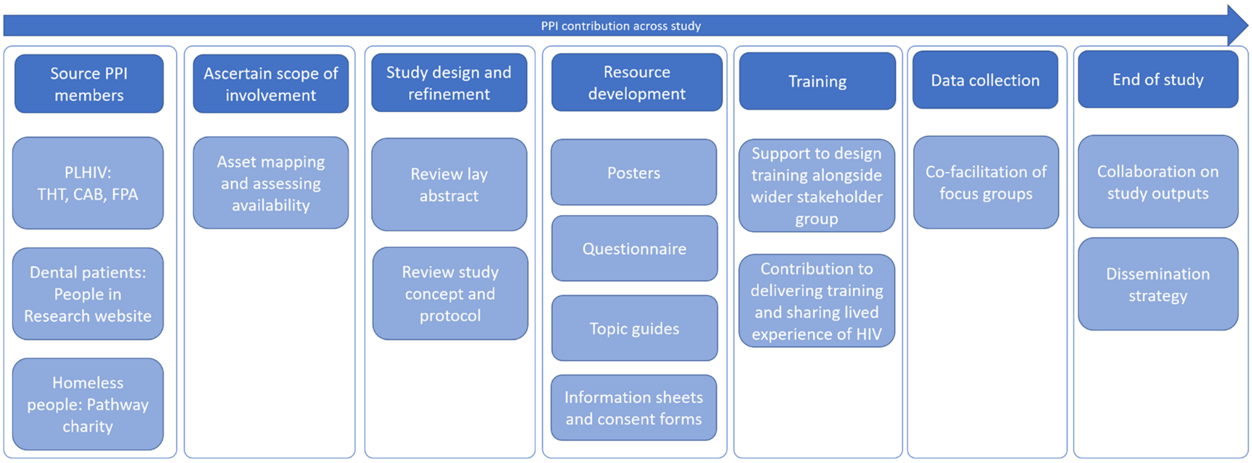

FIGURE 1
Stages of involvement of PPI during the doctoral study[1].

Patient and public involvement

For the purposes of this study we adopted the National Institute for Health and Care Research (NIHR) definition of PPI: "Research being carried out "with" or "by" members of the public rather than "to", "about" or "for them"" (20). This definition is in line with other PPI-focused research papers published in the field of HIV prevention research.

There are five key approaches adopted by most PPI frameworks: power-focused, priority-setting, study-focused, report-focused, and partnership-focused. The PPI activity described in this article was study-focused (13). To that end, we attempted to build a culture of involvement at all stages of the intervention design process with an aim to improve the quality and appropriateness of the intervention. The PPI strategy was designed *a priori* with input from AH, who provided key insights both from his lived experience of HIV and past experience of leading national level HIV research studies e.g., the HIV stigma survey.

In this manuscript the level of PPI involvement is describe as either consultative, collaborative or user-led participation. Consultation takes place when researchers seek participant views to build knowledge and understanding of their lives and experience; they tend to be one off activities with no ongoing commitment. Collaboration affords more partnership between researchers and members of the public. for example, by enabling active engagement in resource design, undertaking research, policy development, and shared-decision making. User-led participation takes place where members of the public are empowered to initiate their own agenda and participate in self-directed engagement (21).

An overview of the PPI activity embedded within the HIV Dental Study is presented in Figure 1. Information on PPI activities, who was involved and how they were involved is detailed in Table 1.

Researcher positionality

To provide further context to the reader, the study described in this article was undertaken by the lead author (JD). JD is a white woman and a dentist who was working in the clinical discipline of special care dentistry with a professional focus on providing dental care for inclusion health groups (e.g., people experiencing homelessness, sex-workers, drug users). At the time of conducting the study, JD was an NIHR-funded Doctoral Research Fellow (PhD student). JD was newly introduced to PPI in research through the grant application process and the subsequent PhD study that resulted from the approval of grant funding.

Characteristics of PPI

The study PPI members had diverse characteristics which provided a range of perspectives for the study. PPI contributors included: (1) three people who regularly attended the dentist who did not have a known diagnosis of HIV, (2) three people who had lived experience of homelessness and had accessed homelessness-specific dental services, and (3) four people PWH. Within the group of PWH were heterosexuals, men who have sex with men (MSM), women, people of White and Black African ethnicity.

People with lived experience of homelessness were invited to contribute to PPI activity because the study was being conducted

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[1] Terrence Higgins Trust (THT), Community Advisory Board (CAB), Family Planning Association (FPA).

TABLE 1 Summary of patient and public involvement activity across the HIV dental study.

Aim of activity	Patient and public involvement details	Extent of engagement	Approach
Plain English Summary review and study rationale discussion (1 session)	Consulting with PPI group Patients in Research website, Terrence Higgins Trust, Family Planning Association, PPI contacts, Pathway Homeless Charity, Community Advisory board. Close working with AH throughout to understand the HIV landscape and the potential issues that could arise when implementing HIV testing in dental settings.	Consultation	Panel meetings face to face and online and email communication.
Introduction, asset mapping and availability questionnaire (1 session)	Formalising the study PPI advisory group from the above organisations.	Consultation	Face to face meetings. Email communication. Online questionnaire.
Developing study resources (3 sessions)	Three PPI members with lived experience of HIV, three people who had attended a dentist in the last twelve months and two people with lived experience of homelessness. Collaboration with wider study stakeholders including public health dentists and health researchers	Collaboration	Face to face meetings.Email communication.
Designing training (1 session)	PPI members (one PWH, one dental patient) and wider stakeholders for the study including general medical practitioner, health researcher and dental hygienist.	Collaboration	Hybrid method meetings. Email communication.
Delivering training	Co-delivering training. Identified key expert by experience with presentation skills through local sexual health services	Delivering a presentation, supporting role play activity	Face to face group session.
Data collection	Co-facilitating focus groups. Identified key expert by experience through Pathway Homeless Charity.	Collaboration	Face to face meetings.

in two dedicated dental services for homeless people. PPI members were identified through the Pathway Homeless Health charity. The members of the PPI group who were living with HIV were contacted through the UK Community Advisory Board (UKCAB), Terence Higgins Trust (THT), and the Family Planning Association (FPA). Others were brought into the group through their contacts with the existing study PPI members with HIV. Specifically, a Black African woman who might not otherwise have considered PPI activity because of cultural stigma agreed to contribute after being invited to the study by a highly motivated PPI member.

Dental patients who had attended a dentist within the last 12 months were also invited as PPI members and were Identified through the People in Research website which advertises opportunities for public involvement in NHS, public health and social care research in the United Kingdom. Once the study funding had been awarded, PPI members were identified and invited to meet and greet sessions where the purpose and process of PPI was described.

Past experience of research varied among the PPI group. All but one of the PWH, two of the three people with lived experience of homelessness and one of the dental patients had previously been involved in research.

Logistics and composition of PPI sessions

The location and timing of the PPI sessions were planned flexibly to accommodate the schedules of the individuals involved. The sessions were held in a private room within the grounds of University College London. The PPI members were reimbursed with £20 gift vouchers per hour of time; shop-specific gift vouchers could be requested. Transportation costs were covered through the study budget up to £15 Oyster travel card or PPI members could choose to phone in to the group meeting or speak over the phone individually (22). Each session lasted between one and two hours. In total, there were six PPI group sessions held to design the intervention and study resources, and two sessions where PPI attended to co-facilitate or deliver site intervention training. PPI members were often involved in mixed groups which comprised of PPI and wider stakeholders including a general medical practitioner, dentists, dental hygiene therapists, public health dentists, health researchers and sexual health professionals.

Mechanisms supporting involvement and level of involvement

Level of involvement refers to the extent to which patients and the public were empowered to lead aspects of the study. The involvement matrix describes the extent of involvement in activities, processes, and decision-making. Involvement can take three different forms: consultation, collaboration or patient and public led/directed. Predominantly, throughout this study there was a process of consultation or collaboration. During the conceptual stages of the study, AH provided guidance and insight on study design, grant application content and HIV research funding bodies. The interaction with AH was fluid and flexible, consisting of face-to-face informal meetings, telephone conversations and email exchanges.

Once study funding was approved, PPI activity was conducted in a more formal and structured way. Communication with AH as the key PPI advisor remained regular and informal as well as his attendance at organised PPI meetings. At this stage asset mapping took place to identify the skillset already possessed by the PPI group, their willingness to be involved across a range of study activities and availability to attend meetings.

Activities were simplified to support engagement and facilitate involvement by all. For example, topic guides were cut up into individual questions and placed in piles of yes/no/maybe to indicate whether they were important to aims of the project or not. Posters that were to be used to recruit dental patients to test for HIV were designed by patients and the public who sketched out images to illustrate the types of pictures and text to use.

Stages of involvement

In this doctoral study, PPI were involved from the conception of the study through to the intervention development and delivery of training (Figure 1).

At the grant application stage patients and the public reviewed the funding application and Plain English summary abstract; this was facilitated through UK CAB and THT/BASHH PPI panel. Once the grant application had been approved, an ongoing PPI group was set up to help design the study resources, intervention and training program.

Most PPI members expressed willingness to take part in piloting of the focus group topic guide, co-facilitating focus groups, contributing to dissemination and public engagement, and assisting with interpretation of transcripts from interviews or focus groups. Although PPI members were keen to be involved in all aspects of the study, the need for training was identified. Fewer than half of participants had experience of transcript analysis or designing study resources such as posters. JD was an inexperienced researcher in the early stages of the project and did not feel sufficiently knowledgeable to develop bespoke training in research methods for PPI. Unfortunately, this meant that involvement was limited in some of the latter research stages such as coding and thematic analysis.

PPI members were involved in discussion and refinement of the study protocol, adaptation, and production of the study resources, including information sheets, questionnaire, waiting room posters to recruit patients to test for HIV, and topic guides. Aspects of training which were supported by PPI activity included the development of: (1) a script advising dental professionals how to ask patients if they wished to have a HIV test, (2) presentation from the perspective of someone with lived experience of HIV and (3) PPI-supported role play activity designed to support dental professionals to offer HIV and manage the delivery of reactive test results.

PPI members were also involved with the wider research and experts' team. For example, some PPI members chose to attend wider stakeholder group meetings to develop the training programme. The existing skills of PPI members were utilised by creating opportunities for co-facilitation of focus groups, delivering training sessions, and supporting role play sessions with dental professionals. Due to a number of contextual factors including maternity leave, end of study funding, PhD completion, and the Covid-19 pandemic led to a faltering of contact with PPI group members which is described in detail in the discussion.

Measuring impact of PPI contributions

In the research literature, there is a lack of consensus about the best approach to defining and measuring PPI impact. In this study, the lead researcher (JD) created summaries of involvement sessions to record the ways in which PPI had impacted upon the study. After each PPI meeting, a session summary was sent to each attendee to highlight explicitly how their views and ideas had informed the study design and conduct. These session summaries were retained by the research team to evidence the contribution of the PPI members. No formal qualitative or quantitative processes were undertaken to measure the PPI impact on the study.

Outcomes

Although there were multiple activities undertaken by PPI members, there were three overarching aims for the PPI involvement in the study:

1. Assess the appropriateness of the research topic and intervention design,
2. Review the paper-based study resources,
3. Support the practical delivery of aspects of the study (where feasible and appropriate to do so)

The impact of the PPI activity was documented using a "you said, we did" impact log, that was accompanied by researcher reflections on the process; similar approaches have been described in the PPI literature (23). Additionally, we did a PPI survey after each group session to understand to what extent PPI felt that their views had been listened to and acted upon.

Assessing the appropriateness of the research topic and intervention design

PPI members expressed support for the intervention concept and understood the rationale behind the study. They explained that a key benefit of the intervention was that it provided another opportunity for people to test for HIV in a novel healthcare setting. Additionally, they felt that the dental setting could reduce the stigma associated with testing in sexual health settings, and that the focus should be on normalising testing.

Initially the research team had proposed the intervention was delivered by dentists. In contrast to this, the PPI group felt that it would be appropriate for any dental professional (including dental nurses and dental therapists or hygienists) to perform HIV testing. As a result, the intervention was adapted to invite the whole dental team to be involved in testing processes.

Reviewing the paper-based study resources

PPI members reviewed several study resources including lay summary, patient-facing questionnaires, information sheets, consent forms and waiting rooms posters. PPI was fundamental to the grant application process. The Plain English summary was made easier to read using shorter paragraphs and sentences and language changes included describing test outcomes as "preliminary positive" rather than "reactive". Other aspects of the patient-facing study resources that were changed because of PPI recommendations included:

- clarification around the cost implications for the HIV test,
- explaining that a universal (rather than targeted) approach to testing would be used,
- recognising national campaigns such as "can't pass it on" and U = U[2],
- changing the questionnaire language from "thinking" to "feeling" throughout,
- removing superfluous questions from topic guides and making the questions easier to understand.

To illustrate a crucial change to the study resources, a group of people with lived experience of homelessness chose to thoroughly redesign the study waiting room poster. The graphics changed from an empowered young person pointing a finger ready to test for HIV, to a person having an ordinary interaction with a dental professional sitting in a dental surgery chair. The poster wording changed accordingly. The ambition of the PPI members was to normalise the process of HIV testing at the dentist, as opposed to focusing on empowerment to test. The concept of normalising HIV testing had far-reaching implications for the study and ultimately contributed to the rationale behind adopting normalisation process theory as one of the key underpinning theoretical frameworks for the study.

Involvement in practical aspects of the delivery of the study

Some PPI members were confident, engaged, and willing to lead or co-lead on aspects of the study. For example, one PPI member was willing to deliver a talk during the training session for dental teams. He devised, prepared, and delivered the talk independently, sharing his lived insight about HIV infection and the legal changes that support PWH e.g., The Equality Act 2010. Another PPI member agreed to co-facilitate a focus group with people with lived experience of homelessness. During the focus group, he felt confident to ask questions and to share his own experiences of homelessness. The importance of his presence during the focus group is exemplified by the following dialogue:

> **Homeless male participant**: *"[…] I don't know what your experience of homelessness is."*

> **PPI facilitator**: *"I have experience of being a homeless person."*

> **Homeless male participant:** *"Oh, oh, now I'm going to ask other questions […] Were you on the street?"*

> **PPI facilitator**: *"Yes, yes."*

> **Homeless male participant**: *"And for how long?"*

> **PPI facilitator**: *"On and off. For like three years."*

> **Homeless male participant**: *"But do you actually think, I mean I don't know who you mixed with or where you were…"*

> **PPI facilitator**: *"I'll tell you exactly what I was thinking about, what I was thinking about was when I, because I was a junkie as well […] when I was sharing a spoon, with someone who had HIV, and I didn't have it. And I found that a couple of years later he died. You know what I mean, right?."*

Discussion

The PPI activity described in this study was wrapped around a doctoral research study. There is an absence of literature describing how to operationalise PPI in doctoral studies (19). Thus, this article provided a clear and transparent account of PPI within a doctoral study, highlighting the benefits and challenges.

PPI was important and influential to the PhD study design and conduct. It was a fundamental component of the successful grant application process and was recognised by the appraising research ethics board as a strength of the application. Input from PPI members led to changes in the wording of some resources and total redesign of others. Additionally, conversations with PPI members, changed the theory underpinning the intervention design for the study from an empowerment focus to normalisation of the intervention. As a result, involving patients and the public in the doctoral study enhanced the appropriateness of the study conduct and the resource design. Although many aspects of the study were limited to consultation, where it was feasible to do so collaboration and patient led aspects were supported.

Doctoral students have described barriers to PPI including additional planning, time, inadequate support from supervisors, funding for reimbursement and refreshments (19). In this study, PPI activity was scheduled into the grant application, supported by the supervisory team, and was costed for in the study funding budget, which enabled the researchers to engage with PPI at multiple points during the study. Hughes and Duffy (24) describe PPI activity on a conceptual spectrum from undefined involvement through to user-led research. Based on this typology, the PhD study described in this article progressed PPI activity beyond undefined or targeted consultation, to embedded consultation. Embedded consultation is characterised by regular

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[2] Undetectable=untransmissible (U=U). U=U means that people with HIV who achieve and maintain undetectable viral load cannot sexually transmit the virus to others.

consultation throughout the research cycle and the range of methods and people for consultation. However, the study did not progress PPI to co-production or user-led research.

PPI is reportedly more common in study types including mixed-methods, qualitative and intervention trial designs such as the study described in this article. However, PPI is less commonly applied in cohort studies or systematic reviews of analysis of secondary data (25). Though PPI activity was embedded into the interventional aspect of this study, it was not integrated into the systematic review that formed a crucial part of the intervention design process. The implications are that our narrative interpretation of the systematic review findings was limited to the researcher perspective and interpretation. In future studies, we would recommend PPI is embedded throughout systematic/literature reviews as part of good PPI practice for doctoral studies. In this way, PhD students can ensure that the follow-on components of their study are grounded in literature which has been collected and synthesised in a way that considers the lived experience of patients and the public and their priorities.

This PhD study illustrated pockets of PPI good practice by ensuring PPI was appropriately planned and costed and feedback was given to patients and the public about how their involvement had shaped the study. However, similar to other studies in primary care research, good practice in PPI was lacking in some areas. For example, PPI members were not involved in producing information for participants as the study progressed (e.g., writing blogs) or in interpreting the findings of the study (25).

Often the extent to which PPI members participated in the study conduct was limited to consultation rather than collaboration or enabling PPI to lead on aspects of the study. However, the fluidity of involvement across several aspects of the study enabled PPI members to contribute to the study in ways that were most meaningful and interesting to them. Further, PPI members were offered opportunities to meet with members of the wider study stakeholder team which enriched the discussion and created differing viewpoints.

An important barrier to involvement in some activities was the lack of availability of formal PPI training (e.g., co-facilitating, qualitative analysis). PhD researchers may be in the early stages of their research career, learning about and concurrently implementing research methods in their doctoral studies. As a result, PhD students may not feel confident to deliver bespoke PPI training on research topics which they themselves are in the infancy of competence building. Based on the experience of PPI throughout this doctoral study, our recommendations include providing PPI training to PhD student researchers at the beginning of their studies or in the lead up to application for doctoral funding programmes.

Though PPI activity underpinned the development of the protocol and research question, the power was not distributed uniformly in the researcher-PPI dynamic. As the study was undertaken as part of a Doctoral Research Fellowship, JD had overall responsibility to deliver the study and a PhD thesis within a set timeframe. These professional obligations to the University and funding body created barriers to equalising the power distribution in the researcher-PPI dynamic.

Reflections and critical perspective

The following section critically reflects on practical and ethical issues encountered when PPI is undertaken within the independent study programme required of a PhD student

1. Power sharing between PhD researcher and PPI members

At times it was challenging to effectively distribute power equally between the PhD researcher and the PPI group amid competing priority of adhering to the study timeline. The PPI process added time to the preparatory stages of the study. Synthesising all the views from the stakeholders into a comprehensive list of study amendments and balancing these with the commitment to the study protocol took a considerable amount of time. Avoiding micro-managing and allowing PPI members ownership over their sessions was essential for the power sharing process. There were three PPI members who had pre-existing experience of co-facilitating, presenting, or writing scientific papers. In the absence of availability of PPI-specific training, the scope for involvement was limited for some PPI members. We provided transparency following all PPI activity by sharing a “you said, we did” impact log with all patients and the public and the wider team immediately after the meeting. In this way, we evidenced the important contribution of PPI to the study design and conduct. The study’s PPI lead was also fundamental to the outputs from the research study and is recognised as a co-author on this manuscript. Three other key patients and the public who had actively contributed throughout the study were approached to co-author the manuscript but could not contribute at this time.

2. Equality, diversity, and inclusion in PPI

The NIHR Diversity and Inclusion group recommend strategies to ensure PPI activities are inclusive (26). In this study, we tried to ensure inclusivity by: reflecting on the power relationship between the researcher and people who may be from groups lacking power e.g., stigmatised or socially excluded populations. We valued the PPI group members contribution by providing a survey where they could highlight existing skills and areas of the study in which they wished to be involved. We used language carefully, avoiding jargon and were receptive to PPI feedback to simplify any scientific information that they found difficult to understand. We provided inclusive locations for meetings including university premises, local community centres or meeting rooms, and telephone/online alternatives. We collaborated with key community organisations including Pathway homelessness charity and multiple HIV charities to identify patients and the public to support the study. Through these approaches we were able to identify a diversity of voices of different genders, ethnicities and sexual orientations.

3. Finding ones’ feet in the early career researcher PPI journey

In the early stages of the study, supervisor mentorship and support was crucial to creating a bespoke PPI activity plan and to identifying the organisations to approach to source patients and the public. The supervisory team (FB, RGW and SP) provided regular and consistent guidance, whilst allowing the PhD candidate (JD) the space to develop PPI skills and to enact the PPI plans in a way that honoured her vision for the thesis. The supervisory team were readily available to consult on research methods for the duration of the study. Traditionally, doctoral students are expected to complete their work independently. This study challenges historical norms by highlighting the richness that lived experience can bring to the PhD research experience and the benefit it can have for deepening the early career researcher's understanding of the reality of living with health conditions such as HIV. Additionally, involving patients and the public in studies ensures that the PhD has relevance and is important to the target populations and is thus more impactful.

4. Limitations to the PhD researcher resource

As the study progressed and the focus moved toward enacting the practicalities of the study (e.g., implementation, data collection, and evaluation) communication with PPI members tailed off. There were a number of factors that impacted responsiveness and engagement. For example, the lead researcher conducting the study was doing so as part of a PhD; therefore, all PPI activity was coordinated by JD. During the implementation phase, two key things happened; firstly, JD broke from her studies during a period of maternity leave. Secondly, during maternity leave, the Covid-19 pandemic led to the early cessation of the study, major amendments to the study protocol and prevented face-to-face interactions. Upon returning from maternity leave, the focus of the study turned to practical analysis of study data and writing up of the PhD thesis within the available timeframe prescribed by the funding body. As a result, PPI activity ceased at this point in the study. Where PPI members were consulted on specific aspects of the study, the one-off nature of their involvement was explained from the outset. For the more actively engaged participants ongoing relationships and information-sharing were maintained through email communication or over the telephone.

5. PhD funding mechanisms

There was limited funding available for PPI activity prior to successful attainment of the study grant. Fortunately, existing PPI groups such as the Community Advisory Board and Terrence Higgins Trust, made possible the reviewing of the Plain English Summary and the proposed research questions and study design. Further, AH generously contributed his time due to his personal interest in bringing HIV testing in dental settings to fruition. Once funding had been confirmed, a new challenge emerged. Costings and plans for proposed PPI were submitted to the core funding body before the study commenced. However, as the study progressed, it became evident that more PPI input than was initially proposed would have been beneficial. This highlights the mismatch between the one-off funding application submission process and iterative approaches which might be required to fully involve patients and the public throughout the life of a project as new involvement needs emerge. Due to the temporal limitations of the study, all PPI members were made aware from the outset that the project timeline was restricted to the PhD funding envelope.

Conclusion

This study demonstrates that even at an early stage in a research career, PPI can be integrated into doctoral studies and can encourage researchers to continue to consider PPI as they progress onward to research independence. PPI has the potential to benefit doctoral studies and offers an opportunity to familiarise the early career researcher with involvement processes. With sufficient funding, flexibility and support from the supervisory team, doctoral researchers can make their research more appropriate and acceptable through PPI activity. However, the responsibility for the research lies predominantly on the shoulders of the PhD student; therefore, if the researcher is compromised (e.g., during periods of maternity leave) PPI activity and continuity may be negatively affected.

Data availability statement

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by HRA East of England, Essex, Ethics committee REC reference: 18/EE/0316. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

JD: Conceptualization, Funding acquisition, Methodology, Project administration, Resources, Visualization, Writing – original draft, Writing – review & editing. JP: Conceptualization, Writing – original draft, Writing – review & editing. MP: Conceptualization, Writing – original draft, Writing – review & editing. AH: Conceptualization, Methodology, Project administration, Writing – original draft, Writing – review & editing. FB: Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. SP: Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. RW: Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/froh.2024.1359132/full#supplementary-material

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Co-design of health educational materials with people experiencing homelessness and support workers: a scoping review

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Introduction: People experiencing homelessness are often marginalised and encounter structural barriers when seeking healthcare. Community-based oral health interventions highlighted the need of well-trained practitioners for the successful engagement of service users and behaviour change. However, a lack of adequate information and specific training has been previously reported. The adoption of inclusive approaches, such as co-design, to develop tailored and meaningful health promotion training and educational materials capable of addressing the specific needs of this group is required. Co-design entails active involvement of different groups in research processes that acknowledge participants' needs and expectations. This scoping review aims to identify the available literature on the participation of people experiencing homelessness and/or their support workers in co-designing health and oral health promotion training/educational materials, approaches adopted, and barriers and enablers to develop these materials.

Methods: The Joanna Briggs Institute (JBI) Scoping Review Methodology informed the development of the scoping review. The protocol was registered on the Open Science Framework. Six electronic databases (Medline (OVID), PsychInfo (OVID), Scopus, Web of Science, Applied Social Sciences Index and Abstracts (ASSIA) (ProQuest) and CINHAL) were systematically searched using MeSH terms. An extensive grey literature search, consultation with experts and hand searching of reference lists took place. Records were screened independently and in duplicate using the Rayyan Qatar Computing Research Institute (QCRI) online tool, followed by qualitative content analysis involving descriptive data coding.

Results: Eight studies/materials were included. Key approaches adopted to co-design, enablers and barriers were captured. The enablers were inclusivity, a safe environment for positive participation, empowerment and flexibility, the barriers were difficulty in recruiting and sustaining participation, power differentials, and limited resources.

Conclusion: The evidence in this area is limited. This scoping review provided foundations for further research to examine the impact of different components of the co-design process including the environment in which the co-design process is conducted. Further studies with experimental design and reported using appropriate study design frameworks detailing active components of the co-design process would strengthen the evidence base in this area.

KEYWORDS

homelessness, co-design, oral health, health, health promotion, training, education

1 Introduction

People experiencing homelessness are socially excluded and face structural barriers to accessing healthcare, leading to high physical and psychosocial morbidity and mortality (1). In the UK, the definition of homelessness extends beyond the mere absence of shelter, and instead encompasses a range of interconnected aspects such as experience of extreme poverty, domestic violence, job loss, and inability to afford rent (2, 3). As a result, individuals who are experiencing homelessness face a myriad of interconnected challenges stemming from their diverse and complex health and social needs (4). These intricate physiological, socio-economic, and psychological issues require joint multi-sector efforts to fully comprehend and tackle (5). Gaining a better understanding of the context and social determinants of health that may be affecting individuals experiencing homelessness is crucial for practitioners, in order that practitioners feel equipped to embrace a more inclusive approaches that will engage this population, ensuring their continued involvement in health care interventions (6, 7). Previous research about community-based oral health interventions has confirmed that well-trained and motivated practitioners are a key component that leads to engagement of service users and subsequent behaviour change (6, 8).

Whilst it is crucial for practitioners to establish trust with marginalised populations, a lack of adequate information and/or specific training to aid with this has been reported (7). Therefore, improved training and educational resources could help practitioners to engage, build trust and therefore discuss a broader range of sensitive health topics (9). Alongside this, people with lived experience of homelessness have expressed that they could be listened to more and be better supported when accessing services (10).

Therefore it is vital to involve people with lived experience of homelessness and their support workers in the development of health educational and health promotional materials and interventions, to ensure the resources are meaningful and acceptable (11). It has been found that involving people with lived experience can lead to effective strategies to address health needs and improve policies to tackle health inequalities (12, 13). The World Health Organization (WHO) has recently launched a framework to support meaningful engagement with a view to enhancing policies and services (14). The framework includes principles such as power, equity, inclusivity, contextualisation, elimination of stigmatisation, and institutionalisation of engagement (14).

Co-design is a participatory approach that brings individuals together to collaborate and combine their knowledge, skills, and resources to accomplish a design task (15). Co-design transcends mere consultation, originating from participatory design (15), it involves the meaningful engagement of end-users who are recognised as experts by experience (16). This approach is particularly powerful for socially excluded groups, empowering individuals by acknowledging their views and experiences (11). Furthermore, co-design serves as a pivotal approach for tackling stigmatisation and promoting inclusivity, the creation of co-designed materials counteracts societal stigmatisation (17). Co-design techniques have been reported to result in increased applicability and acceptance of research questions, outputs, participants' engagement, increased knowledge of different contexts, and an improved community network for the researcher (18).

Hence, it is imperative to scrutinize existing literature regarding the involvement of individuals who are homeless and/or their support workers in the creation of health and/or oral health educational materials through a co-design methodology, to elicit evidence to support best practice. Prior to conducting this review, a search of the literature for existing reviews of any type found no evidence synthesis addressing our aim. In the absence of any review, a scoping review methodology was chosen to scope the literature and identify evidence gaps.

To accomplish the main aim, three specific objectives were outlined:

(1) To summarise the literature in the field of co-designed health and/or oral health promotion training/educational resources that involved people experiencing homelessness and/or their support workers.
(2) To identify co-design approaches used in the development of training/educational materials such as health promotion guides, toolkits, workshop, and training programmes.
(3) To explore barriers and enablers to co-design health and/or oral health training/educational materials.

2 Methods

This scoping review was undertaken following the methodology established by the Joanna Briggs Institute (JBI) (19). An initial search in April 2021 of Scopus, PROSPERO (International prospective register of systematic reviews) and Open Science Framework (OSF) found no existing scoping or systematic reviews on this topic. A protocol for this scoping review was registered within the OSF database *a priori* (number osf.io/7hbac). Due to lack of research team capacity in 2021 and impact of the COVID-19 pandemic the search for the included literature in our review was last done in August 2023. A scoping review is an essential first step to inform future studies related to co-design of health promotion materials for people experiencing homelessness.

The reporting of this review aligns with the PRISMA extension for Scoping Reviews—PRISMA-ScR, we used population, concept and context to develop the review question and the eligibility criteria (20).

- Population: People experiencing or at risk of experiencing homelessness and/or support workers that work with people experiencing homelessness.
- Concept: Co-design approaches to produce health and/or oral health promotion training/education materials.
- Context: All settings and period considered.

This review outlines co-designed health and/or oral health promotion training/educational resources that involve people experiencing homelessness and/or their support workers. The research question was: (1). What is the range and nature of the existing empirical and non-empirical research using co-design approaches involving people experiencing homelessness and/or their support workers, to produce health and/or oral health promotion training/educational resources?

2.1 Search strategy

The search strategy was developed with the support of a Librarian, using specific Mesh terms and keywords (Supplementary Appendix S1), representing four broad themes: homelessness, health, oral health, co-design, and education and training material (Table 1).

The literature searches were conducted in six electronic databases: Medline (OVID), PsychInfo (OVID), Scopus, Web of Science, Applied Social Sciences Index and Abstracts (ASSIA) (ProQuest) and CINHAL. In addition to database searches, supplementary search methods were employed including hand-searching reference lists of included studies, a grey literature search such as conference papers, reports, guides, toolkits, manuals, and website information using the Google Scholar-Advanced Search tool (Figure 1). Further, the authors contacted a range of international experts/stakeholders in this field to elicit further published materials. A grey literature search and contact with experts/stakeholders was deemed essential by the authors to ensure no relevant materials were missed and to comply with JBI Scoping Review guidance. Any published literature, such as papers published in peer-review journals, guidance documents, tool kits, knowledge exchange packages, reports, websites, and book chapters were in scope. Study methodology or quality did not impact decisions to include material. Any study design (including qualitative, quantitative and mix-methods studies) was within the scope.

2.1.1 Contact with relevant stakeholders and experts in the field

This component provided unique feedback from group of stakeholders into the literature. The research team approached nineteen stakeholders (such as people with lived experience in homelessness, health practitioners, health educators, WHO officers, policymakers, and senior academics) by email or videocall to identify any further material that could meet the eligibility criteria.

2.1.2 Data selection

Following the electronic database search (final search August 2023), articles that met the eligibility criteria were stored in EndNote, and any duplicate copies were removed manually (SS). The finalised list was imported to Rayyan Qatar Computing Research Institute (QCRI) (21), where titles and abstracts were screened blind and in duplicate (SS and TW)Any conflicts were resolved through discussion with an additional reviewer (NM). Subsequently, at least two reviewers (SS, TW, AR, CBD) independently read the full text of the eligible studies to confirm the inclusion of the studies in the review. Discussion took place with a third reviewer to resolve any conflicts. The PRISMA-ScR (Figure 1) demonstrates flow of papers in this review. Inclusion and exclusion criteria are presented in Table 1.

2.2 Quality assessment, data extraction and data synthesis

Although quality assessment is not a mandatory step in scoping reviews, we elected to undertake an assessment of the quality of the published studies included in this review to enhance utility of the output from our review and provide a view on the overall quality of research in this field. To maintain objectivity for those included studies where members of the review team were authors, an alternative team member assessed quality. The quality was assessed using the relevant JBI Critical Appraisal Checklist for Qualitative Research (22) and the MMAT Mixed Methods Appraisal Tool (23) dependent on study design. The quality report results (Supplementary Appendix S1). General database search terms were not used to determine inclusion in the review. After screening the included studies for quality two studies were considered high (9, 24) two studies were considered medium (25, 26) and one study was considered low (27).

TABLE 1 Eligibility criteria.

Inclusion Criteria	Rationale
Article in the English language	The dominance of English in academic research allowed wide access to pertinent information, yet limitations in resources and time, restricted searches in other languages.
All periods	There is no rationale to exclude any search period because the aim is to explore all existing literature on the topic.
Studies/materials need to address the development of health and/or oral health promotion co-designed training/ educational materials. Co-design was not specifically defined, as it was likely that there would be variance in the terms used in the global literature.	The studies/materials focus on health and/or oral health promotion addressing on health equity and social justice agenda.
Studies/materials with a population of people experiencing or at risk of experiencing homelessness and/or their support workers	The studies/materials involved people with lived experience and support workers who work with this population to develop relevant training/ educational material.
Exclusion Criteria	**Rationale**
Studies/materials involving participants younger than 16 years old.	It is not the target population of the study.
Studies/materials that do not follow the co-design process	The research/materials focus is the meaningful involvement of end-users in developing materials, which is more than consultation.
Reviews of the literature	The focus of the research is on the experiences from empirical studies.

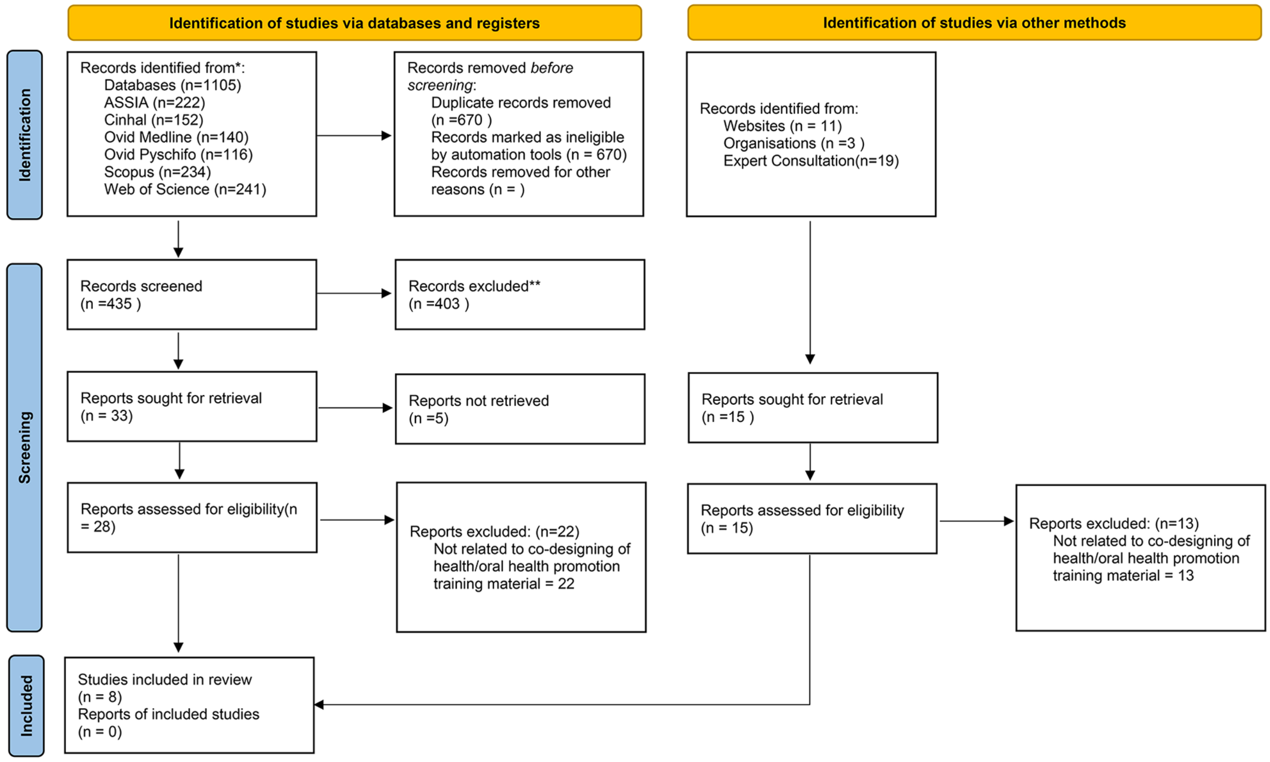

FIGURE 1
Review profile.

The data extraction form was adapted from JBI (19) and was carried out independently by two researchers (SS and TW). The information extracted was title, authors, year of publication, journal of publication, type of publication, country of origin, aim, study sample, methodology, co-design approach, type of training/educational material developed, training aims, summary of key findings, and recommendations. Thematic analysis (28) was undertaken to construct themes from the included literature using the study objectives as a framework.

3 Results

A total of 1,105 papers were retrieved in the electronic literature search, and after the removal of duplicates, they were reduced to 435. Following title and abstract screening, twenty-eight papers were included for full-text screening. Twenty-two were excluded after full text screening, resulting in the inclusion of five papers (Figure 1). Two further resources were found via a grey literature search ($n = 1$) and the contact with experts/stakeholders ($n = 1$).

3.1 Study characteristics

In total eight papers/resources were included: five journal articles (9, 24–27) a conference paper (29), a training resource (30) and a workshop guide (31). All the papers/resources were published from 2018 to 2022, with five from the UK (9, 27, 29–31) two from Australia (24, 25) and one from Sweden (26). A summary of key characteristics of included evidence is presented in Table 2.

One study focussed on people sleeping rough (25), one study focussed on young people from 18 to 22 years old (9) and the other three studies (24, 26, 27) did not specify any age or any special circumstances of participants in the homelessness context. The types of educational / training materials developed from the five studies were diverse in nature and aims. The intervention from Mullins et al. was a three-pronged information strategy including an informal magazine, a website, and a dissemination event that developed a “Homelessness Protocol” with information to help those who are rough sleepers (25). A web app called “Ask Izzy”, containing information on services’ in Australia was developed by Burrows et al. (24). Two studies developed educational programmes focusing on wider health promotion issues: Rodriguez et al. (9) co-designed a workshop programme exploring eight health and social participation topics (including oral health, mental health, healthy diet, drug abuse, resilience among others) and Wikström et al. (26) co-designed the development of a sex educational programme focused on three themes: (1). body and anatomy, (2). Sexuality, consent drugs and safer sex and (3). relations and relationships. One study co-developed a psychoeducational training program focused on mental health skills and wellbeing (27).

TABLE 2 Study characteristics.

Title	"No-one has listened to anything I've got to say before": Co-design with people who are sleeping rough	Strengthening Social Interactions and Constructing New Oral Health and Health Knowledge: The Co-design, Implementation, and Evaluation of A Pedagogical Workshop Program with and for Homeless Young People	Co-designing a training package to promote health/oral health for people experiencing homelessness	Smile4life A co-designed educational and training resource	Technology for societal change: Evaluating a mobile app addressing the emotional needs of people experiencing homelessness	Sexual and reproductive health and rights (SRHR) education with homeless people in Sweden	Corrigendum to "The My Strengths Training for Life$^{\text{TM}}$ program: Rationale, logic model, and description of a strengths-based intervention for young people experiencing homelessness"	Do Not Give Up On Us. A workshop guide for health promotion and civic engagement
Authors	R M Mullins, B E Kelly, P S Chiappalone, V J Lewis	A Rodriguez, L Beaton, R Freeman	A Rodriguez, C Biazus-Dalcin, N McGoldrick, L van Blerk, C Murray, R Freeman	A Rodriguez, C Biazus-Dalcin, J Marshall, R Gorman	R Burrows, A Mendoza, S Pedell, L Sterling, T Miller, A Lopez-Lorca	E Wikström, E M Eriksson & M Lindroth	J Cumming, R Whiting, B. J. Parry, F. J. Clarke, M. J.G. Holland, S. J. Cooley, M. L. Quinton	A Rodriguez, C Biazus-Dalcin, L van Blerk
Year of publication	2021	2019	2021	2022	2022	2018	2022	2022
Journal/place of publication	Health Expectations	Dentistry journal	14th European Public Health Conference 2021	Discovery Research Portal—University of Dundee, UK	Health Informatics Journal	Sex Education	Evaluation and Program Planning	Discovery Research Portal—University of Dundee, UK
Type of study/ material produced	Journal Article	Journal Article	Conference paper	A co-designed educational and training resource	Journal article	Journal Article	Journal Article	A workshop guide
Country of origin	Australia	Scotland, UK	Scotland, UK	Scotland, UK	Australia	Sweden	UK	Scotland, UK
Aim	To describe and evaluate a co-design project involving people with experience of rough sleeping to identify health, social and legal issues faced when sleeping rough.	To use critical consciousness as an educative tool to co-design, implement, and evaluate a series of oral health and health pedagogical workshops to strengthen social engagement and to construct new health knowledge with and for homeless young people and their service providers.	To co-produce training resources to support front-line staff in discussing and promoting health and oral health for people living with homelessness.	To enable practitioners and support workers from different backgrounds to provide evidence-based, tailored oral health promotion sessions through meaningful conversations with their service users	To the design and evaluation of the web app Ask Izzy	To describe and critically reflect upon the implementation of the Snacka Sex educational programme	To describe a multi-faceted strengths-based psychoeducational intervention for improving wellbeing and social inclusion of young people experiencing homelessness or at risk.	To provide structured activities and suggested resources to be explored in eight workshops topics on health promotion and civic engagement by third and health sector practitioners interested in improving engagement, health knowledge and the participation of young people they interact with.
Study Sample	81 people with recent rough sleeping experiences. A twelve-member working group, including seven men, four women, and one non-binary person, with diverse backgrounds: four born overseas, two culturally diverse, 4 LGBTQI, and one Indigenous.	Thirteen young homeless individuals (8 females, 5 males, aged 18–22) and five NGO staff (2 males, 3 females).	People with lived experience of homelessness, practitioners and students from the health and third sector, and policymakers	N/Applicable	30 participants (14 with current and lived experience of homelessness; 15 service providers, one software company)	85 participants (40 staff members, 45)	6 focus groups with 15 young people (10 male, 5 female; all current residents of the Service) and 18 frontline staff (6 male, 12 female).	N/Applicable

(Continued)

TABLE 2 Continued

Title	“No-one has listened to anything I've got to say before”: Co-design with people who are sleeping rough	Strengthening Social Interactions and Constructing New Oral Health and Health Knowledge: The Co-design, Implementation, and Evaluation of A Pedagogical Workshop Program with and for Homeless Young People	Co-designing a training package to promote health/oral health for people experiencing homelessness	Smile4life A co-designed educational and training resource	Technology for societal change: Evaluating a mobile app addressing the emotional needs of people experiencing homelessness	Sexual and reproductive health and rights (SRHR) education with homeless people in Sweden	Corrigendum to “The My Strengths Training for Life^{TM} program: Rationale, logic model, and description of a strengths-based intervention for young people experiencing homelessness”	Do Not Give Up On Us. A workshop guide for health promotion and civic engagement
Co-design approach	A background survey followed by a working group (WG) with 12 weekly meetings. Interviews with participants of the WG. The analysis followed a deductive approach aligned with co-design principles (inclusion, equity, capacity building, and a purposeful approach).	The workshop program development was guided by Paulo Freire's principles (Dialogical Approach, Critical Consciousness, Action for Change) and involving three phases with the goal of encouraging participant reflection and co-creation of strategies for positive and healthy life changes. The program's evaluation was measured through direct observation, recorded workshops, post-workshop in-depth interviews, and post-workshop questionnaires. Content analysis was employed.	Community-based participatory research that used online workshops	The guide was co-designed through interviews and workshops representatives of with seven organizations (from health and third sectors) and individuals with homelessness experience.	Emotion- Led approach with a Living Labs process to design the web app, bringing together the different perspectives and capabilities from academia, industry, government, and citizens. Involved the following phases: discovery phase, research phase, vision phase, initial design and prototyping phase, design validation phase, and evaluation of the effectiveness of the app (semi-structured interviews conducted six months after the launch of the App).	The study had four phases (preparation, creation, realization, and evaluation) Both staff and service users were engaged in shaping the SRHR education by gathering their input, feedback, and experiences through surveys, staff meetings, field notes, and group sessions.	The intervention used Community-Based Participatory Research (CBPR) principles. It was iteratively developed through action research cycles, including a literature review, focus groups with young people and staff, and an initial pilot work with 15 participants. Feasibility was assessed through face-to-face community-based sessions and an outdoor residential course.	This workshop guide involved active collaboration from young people and third sector practitioners that attended eight workshop sessions to provide key elements/content added into the resource.
Methodology	Mixed methods	Qualitative Research	Qualitative Research	N/Applicable	Mixed methods	Mixed methods	Qualitative Research	N/Applicable
Type of training/ educational material developed	An informal magazine: Zine A website: (http://www.needtoknowhomeless.org.au/). A dissemination event (information, stories, encouragement and advice for individuals experiencing homelessness).	Pedagogical workshop programme on health promotion and social participation.	Educational materials (e-book on health promotion, comics books on barriers to access services, and a guide to promoting oral health) compose this training package.	A co-designed educational and training guide on oral health for those working with people experiencing homelessness.	Web app “Ask Izzy”.	“Snacka” Sex educational programme	The My Strengths Training for Life^{TM} program—MST4Life	A workshop guide on health promotion and civic engagement.
Training aims	To address health, social, and legal issues related to rough sleeping.	To provide an approach to increase young people's knowledge on wider health issues and health literacy and strengthen their social interaction with service providers and peers to support community action.	To help practitioners to improve their knowledge and ability to promote health/ oral health with people experiencing homelessness or at risk of becoming homeless.	To support practitioners and support workers with delivering training underpinned by evidence-based information on oral health	To provide useful information to improve the everyday life and well-being of people who are homeless.	To enhance sexual health among homeless people by discussing sexual and reproductive health and rights (SRHR)	To provide opportunities to improve the mental skills and strengths, wellbeing and social inclusion of young people experiencing homelessness or at risk.	To support students and practitioners from the health and social care sectors to be more sensitive and prepared to engage, and to discuss health promotion issues in a creative and meaningful way.

(*Continued*)

TABLE 2 Continued

Title	“No-one has listened to anything I've got to say before”: Co-design with people who are sleeping rough	Strengthening Social Interactions and Constructing New Oral Health and Health Knowledge: The Co-design, Implementation, and Evaluation of A Pedagogical Workshop Program with and for Homeless Young People	Co-designing a training package to promote health/oral health for people experiencing homelessness	Smile4life A co-designed educational and training resource	Technology for societal change: Evaluating a mobile app addressing the emotional needs of people experiencing homelessness	Sexual and reproductive health and rights (SRHR) education with homeless people in Sweden	Corrigendum to “The My Strengths Training for Life$^{\text{TM}}$ program: Rationale, logic model, and description of a strengths-based intervention for young people experiencing homelessness”	Do Not Give Up On Us. A workshop guide for health promotion and civic engagement
Summary of the findings	The co-design process successfully implemented principles of inclusion, equity, respect, capacity building, and purposefulness. Participants stated meaningful and valuable interventions.	Critical consciousness as an educational tool supported: 1. “trust building and collective engaging”. 2. “Constructing knowledge and developing skills provided to increase young people's knowledge, health literacy, and strengthen their social interaction”.	The preliminary findings show that lack of empathy from practitioners. Participants stated that continuity of care and stigma are barriers to accessing services.	N/Applicable	Findings show significance of considering the perspectives of both homeless individuals and service providers. Findings show the value of a living lab approach for addressing complex social issues like homelessness.	The “Snacka Sex” educational programme successfully provided homeless adults with knowledge and a safe space to discuss sexual health, rights, and norms.	Training programmes for self-regulation improve physical, mental, and social health and. Training programmes support positive transitions to independent living.	N/Applicable
Recommendations	Codesign needs sufficient resources and commitment. Need to involve people who are homeless and maintain their involvement.	Use Freire's educational approach as a framework to promote health and oral health for young people experiencing homelessness. Importance of interaction with the NGO settings.	N/Applicable	N/Applicable	Use the voices of people with lived experience and service providers to design and evaluate interventions. Use living lab as an approach to codesign.	Organisations should actively be involved in codesign as they recognize and advocate for service users.	Support the use of TIDieR checklist as a valuable framework for systematically describing MST4Life$^{\text{TM}}$.	N/Applicable

3.2 Methods and co-design approaches of included studies

The five studies had different co-design elements and phases: Semi-structured interviews (9, 24, 25) surveys, preparatory meetings with staff from the partners organisations and people with lived experience, and workshop sessions (9, 25, 26). Three studies presented information on elements/principles related to the co-design process they viewed as key (9, 24, 25). Mullins et al. highlighted inclusion as a core principle that should be aligned with the following elements: selecting appropriate group members; making participation a positive experience; and clarity of expectations at every stage of the research (25). Rodriguez et al. used critical dialogue, critical consciousness, and action for change from Critical Pedagogy in the co-design process (9). Burrows et al. choose the living lab approach, bringing together the different perspectives and capabilities from academia, industry, government, and citizens, to create the mobile app with a holistic view (24). Two studies (9, 24), two guides (26, 29) and one conference abstract (25) used the term co-design, and Burrows et al. (23) used the term co-creation to describe their approaches.

3.3 Barriers and enablers of co-designing health and oral health training/educational materials

Barriers and enablers in the co-design process to develop educational/training materials were identified and are presented in Table 3.

3.3.1 Barriers

3.3.1.1 Difficulty in recruiting, supporting and sustaining participation in the co-design process

Mullins et al. described difficulty in recruiting individuals that are perceived as marginalised, especially those individuals under the age of twenty-five (25). Mullins also described challenges during data collection due to lack of participants' previous experience in research such as the lack of access to software or skills to participate in online meetings (25), whilst Wikström et al. described literacy levels amongst participants impacting on ability to participate in reading and writing activity (26). Mullins et al. highlighted how participants' health issues or personal circumstances impacted their ability to continue to participate (25). Burrows et al. stated that one of the challenges was to sustaining participation and maintain the “momentum” after the delivery of the web app (24) as users had to return to the app after seven days via peer-to peer recommendation to feed into the evaluation process. The COVID-19 pandemic negatively impacted the dissemination phase of Mullins's output (25). The need to adapt the training program to various accommodation lengths and community settings presented a challenge for Cumming et al. (27).

3.3.1.2 Power differentials

Mullins et al. identified power differentials as a challenge, e.g., participants becoming dismayed when their preferred idea was not deliverable due to the current systems in place beyond the control of the co-design process (25).

3.3.1.3 Limited resources

For Wikström et al. the lack of continuity of certain activities due to limited funding was an issue (26). Cumming et al. (27) described the need for continuous evaluation and review of evolving needs of heterogeneous groups, demanding consistent effort and resource from the project.

3.3.2 Enablers

3.3.2.1 Inclusivity

Diverse and interconnected actions to ensure inclusivity of participants in different aspects of a co-design project were outlined. With regards to recruitment, identification of appropriate and established partners who already hold participants' trust and have an in depth knowledge of their life contexts resulted in effective methods to contact participants (9, 25). Reimbursement for participants' time e.g., meal vouchers, and referrals for support services to address diverse needs were offered as a way to increase participation and inclusion (25, 27). A gift pack to generate interest in one of the events was provided by Wikström et al. containing information about HIV and hepatitis, hepatitis vaccination cards and local sexual health services as well items of hygiene and safe sex (shower cream, body lotion, lubricants, condoms, and confectionary) (26).

During the initial design stages of studies, preparatory meetings with staff from the partners' organisations guided the development of tailored and inclusive sessions based on the needs of the participants, likely contributing to their positive feedback about the research (9, 26). To include people with writing and reading difficulties into the sessions, visual materials such as pictures and short films were used (26), as well as accessible language (25) and the use of different ways to facilitate self-expression such as games, drama, drawing, and collage were also offered (9).

3.3.2.2 Safe environment for positive participation

Cummings et al. Mullins et al. and Wikström et al. set ground rules for and with participants by formulating a group agreement outlining behavioural expectations for a respectful interaction, such as showing respect for different opinions, and maintaining confidentiality about other participants' stories (25–27). Rodriguez et al. created a welcoming atmosphere by establishing a non-judgmental listening, creative, and pleasant environment which involved shared meals, and informal chats to build trust between participants and researchers before the activities (9). A safe environment was also reinforced by participant's well-being being monitored during sessions (25) through a deeper understanding of the needs and concerns of participants (24, 27). Good channels of communication between participants and researchers/facilitators led to participants feeling welcomed, safe, happy, committed, enthusiastic, and with a strong sense of belonging to the project (9, 25). Mullins et al. showcased that

TABLE 3 Enablers and barriers in the co-design process to develop the educational/training materials.

Title	Enablers	Barriers
"No-one has listened to anything I've got to say before": Co-design with people who are sleeping rough	• Selecting individuals based on commitment to attend research activities and diverse experiences of rough sleeping (Inclusivity). • Ensuring tangible benefits (reimbursements, meal vouchers, referrals for support services) • Promote a sense of belonging and value during activities. • Promote a safe environment and use group agreement outlining behavioural expectations. • Be flexible and promote informal interactions. • Monitoring participant's well-being during sessions • Clear communication and consent agreements.	• Difficulty in attracting marginalized groups for participating in research. • Difficulty in recruiting individuals under 25 years old. Natural attrition impacting the continuity of participants in the co-design process. Possible power differentials. Negative effect of COVID 19 • Lack of access to software or skills to participate in online meetings
Strengthening Social Interactions and Constructing New Oral Health and Health Knowledge: The Co-design, Implementation, and Evaluation of a Pedagogical Workshop Program with and for Homeless Young People	• Welcoming space by establishing a safe and non-judgmental environment. • Sharing meals, and informal chats before the workshops (including participants and research team). • Selecting key partners. • Using Critical Consciousness to explore sensitive topics and encourage critical reflection. • Good communication and flexibility from researchers. • Acknowledgement of participants' previous knowledge.	• Sustainability.
Technology for societal change: Evaluating a mobile app addressing the emotional needs of people experiencing homelessness	• Using emotion-led approach. • Using of a living lab approach to involve various stakeholders. • Discussing realistic expectations of the service users.	• Maintaining momentum with the delivery of the web app. • Resources to sustain the process
Sexual and reproductive health and rights (SRHR) education with homeless people in Sweden	• Good engagement of participants. • Preparatory meetings to support the development of inclusive sessions. • Tailored to needs and desires of the participants. • Prioritising ethical aspects by not collecting detailed sociodemographic data increase participation. • The dual role of implementers and researchers provided deeper insights into the situation studied and allowed for active involvement in the change process.	• Terminologies and concepts. • Adapting to various accommodation lengths and community settings. • Challenges with financial and human resources associated with the constant adaptations needed.
Corrigendum to "The My Strengths Training for Life$^{\text{TM}}$ program: Rationale, logic model, and description of a strengths-based intervention for young people experiencing homelessness" [Evaluation and Program Planning 91 (2022) 102045]	• Collaborative research methodology. • Long-term successful partnership with stakeholders. • Sharing lessons learned for the benefit of policymakers and practitioners. • Flexibility and adaptation to needs and contexts. • Employing various formal and informal methods to engage stakeholders. • Embracing reflective practice	• Terminologies and concepts. • Adapting to various accommodation lengths and community settings. • Challenges with financial and human resources associated with the constant adaptations needed.

when working with people experiencing homelessness it is essential to show empathy, respect, and equal treatment (25). Trust building among participants and collective engagement were perceived as key elements that form a safe environment for positive and active participation (9). This is characterized by the existence of opportunities to have open discussions, with spontaneity and creativity, by hearing and sharing sensitive experiences, and life circumstances (9).

3.3.2.3 Empowerment

Rodriguez et al. described empowerment of participants to have their voices heard and needs understood by those providing services, as well as changing unhealthy habits, as a positive outcome of participation (9). In addition, Mullins et al. and Burrows et al. reinforced how participation in those studies made participants feel their voices were heard and valued (24, 25). The acknowledgement of participants' previous knowledge and life experiences resulted in increased self-esteem, mutual learning process and the construction of new relationships between participants and their service providers (9). Hegemonic ideas about people experiencing homelessness as people with lack of motivation to engage with health services/practitioners might be linked with a paternalistic style of interaction adopted by professionals (a top-down approach, with just one way of communicating) that led to feelings of passivity and powerlessness for those marginalised groups using the services (9). Mullins et al. described how constant reinforcement of the project's goals and the participants roles led to empowerment and active participation (25).

Critical consciousness, formulated by Freire, is characterized by the depth and commitment of how individuals interpret current problems (9). Rodriguez et al. (9) stated that the critical reflexion about participants' life during the workshops, as part of critical consciousness, allowed the exploration of sensitive topics that encouraged participants to question structures of power in society. By doing this, participants felt confident to critically think about their status, identities, self-stigmatization, and responsibilities that leads to socio-political engagement for change (9). The impact of participating in co-design studies resulted in a range of opportunities for capacity building (25) such as the development of certain skills: active listening, health literacy, critical dialogue, and confidence to share their views about health-related issues (9). The opportunity to share similar stories helped participants to support others in the same situation (9, 25), and to make a collective agreement for behaviour change into health habits (9).

3.3.2.4 Flexibility within the project

Flexibility from researchers in response to the needs of participants was an enabler for the co-design process (24, 25). Cummings et al. (27) highlighted that methodologies and models in research should respond to these needs and embrace reflective practice (27). The constant collection of participants' feedback during the process was perceived as important (9) enabling successful ongoing adjustments and appropriate changes being made in each phase of the study (26).

4 Discussion

Our findings suggest that components of the co-design process such as inclusivity, safe environment, empowerment, and flexibility can increase participation of people experiencing homelessness in research and in the development of educational materials. We have identified enablers to facilitate this process, the included studies demonstrated that stigmatised and vulnerable groups such as people experiencing homelessness, despite being perceived as "hard to reach" groups, are willing to take part in research if they felt included and could have their voices heard in a safe environment. A review by Ní Shé et al. (32) found that engagement with seldom-heard groups needs to occur in safe, accessible, and inclusive spaces. Therefore, importance of providing an emotionally safe environment for positive participation based on principles of respect, non-judgmental listening, with meaningful opportunities for participants to feel that their views and lived experience have been acknowledged is required.

In our review, participants' feelings of being safe to express themselves within the research environment resulted in a feeling of empowerment, leaving them confident to share their views on issues that were important to them. There are other studies that reinforce the links between the provision of a safe environment and the empowerment of participants as enablers for participation when mutual trust, equity, and empathy are embedded in all phases of the research process. Schiffler et al. (33) identified clients were reportedly empowered to achieve their personal goals when co-designed mental health interventions were provided in their living environment, including home, work, and other places that they identified as safe and favourable. Flexibility was perceived as a key element to be applied across the different research's stages as an important strategy to involve people who might otherwise be excluded of participating. Life crisis and financial issues can be challenges for participation. The findings of our review suggests that incentives are an enabler in the codesign process, which concurs with the review finding by Ní Shé et al. (32) where necessary costing and flexibility in payment should be included when designing research with vulnerable groups. Flexibility related to researcher's attitude of being sensitive to participants' feedback and expressed needs during the process resulted in positive changes on research activities (time, duration, ways of delivering). Therefore, the context and needs of people experiencing homelessness are complex and diverse and research processes with less rigid structures can better allow the accommodation of necessary changes.

There were benefits in using co-design identified from the review. The included study by Rodriguez et al. reported impact from the co-design process with reported improvement in individual's critical consciousness, health literacy and behaviour change (9). It also helped strengthen their social interaction with service providers and their peers towards a more critical involvement with their communities. Social justice to achieve health equity should be core practices for health promotion interventions. Participants felt empowered when conditions for active involvement are in place and when they receive equitable treatment. These elements are essential to undoing oppressive forces existing in power structures (5, 34–36). Tindall et al. identified that co-design was helpful in balancing the power differential and providing support when participants usually feel reduction in their power especially in mental health settings where there are inherent power imbalances (37).

Health promotion interventions using participatory research methods such as co-design are successful because they consider the context and the specific needs of target audiences (38). Three of the included studies highlighted how important it is to have an in depth understanding of the context and needs of participants in order to tailor the research activities to enable participation (9, 25, 27). This led to empowerment of participants that felt more equipped to take informed decisions and change towards a healthier life. Health promotion is a process that enables people to increase control over and improve their health (39). Knowledge exchange programmes with public engagement activities have recommended the involvement of young people experiencing homelessness in the co-design of training resources to be used by practitioners (7). Adding to this, the participation of socially excluded groups, such as families, children and young people experiencing poverty and homelessness, using co-design approaches have benefited from the construction of new oral health and health knowledge (9, 40). Therefore, an alternative approach is necessary to empower people, enabling their active participation and to take charge of their own lives and environments (41).

The perceived barriers to codesign in research of increased time and financial expenditure are corroborated by Slattery et al. (18) e.g., there is not enough time allocated or enough focus on development of the skills needed to build trust and long-term partnerships within the community.

4.1 Research gap

This review identified substantial gaps in the literature. Only five studies used co-design methods in the development of health and/or oral health educational/training materials with people experiencing homelessness and/or their support workers. We suggested that limited time and resources to conduct research with co-design elements are key factors for the limited evidence. The provision of inclusive resources that ensure wider participation of people experiencing homelessness from the recruitment to dissemination phases is challenging and requires constant training, reflexive practice, and skills "development from researchers". The use of reporting frameworks relevant to study design in the existing literature is limited and reduces the ability to identify all the active components in the co-design process, future studies in this area should utilise study design appropriate reporting frameworks.

4.2 Strengths and limitations

To the best of the authors' knowledge this is the first review to bring together and examine research on co-design of oral health and health resources with participation of people with lived experience in homelessness. Two long-term partner organisations working in the homelessness sector reviewed the first draft of this manuscript and made their comments. The use of JBI methods to inform the review, registration of protocol, extensive search strategy and contact with a substantial number of national and international stakeholders' experts in the field were the key strengths of our review. A Quality Appraisal of the included studies, although not a requirement for scoping reviews was completed, providing a greater sense of the overall quality of existing research in this field. A limitation of the search strategy was our focus on English language only publications.

5 Conclusion

The evidence in this area is limited. This review provides foundations for further research to examine the impact of different components of co-design including the environment in which the co-design process is conducted. The identified enablers to co-design health and/or oral health educational/training materials suggest that an active and positive engagement with participants promotes meaningful experience of participation, resulting in participants' empowerment and increased knowledge. An in-depth knowledge of the diverse contexts and views of people experiencing homelessness through the investment of time and creation of good channels of communication, trust and positive interaction enables their voices to be heard, validated, and used to develop resources that can help practitioners with the non-stigmatisation of these groups in healthcare settings and society. Training or educational programmes/materials that include the views of people with lived experience of the health issues to be addressed have an increased chance of success in to improving service users' lives and wellbeing. Future endeavours should foster increased collaboration with individuals with lived experience of homelessness to co-design health and oral health promotion training/educational materials. Further studies with experimental design and reported using appropriate study design frameworks detailing active components of the co-design process would strengthen the evidence base in this area.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

The protocol for this review was registered with the Open Science Framework and can be accessed from the following web page: https://osf.io/7hbac.

Author contributions

AR: Conceptualization, Funding acquisition, Supervision, Writing – original draft, Writing – review & editing. SS: Writing – original draft, Writing – review & editing. TW: Writing – original draft, Writing – review & editing. CB-D: Conceptualization, Writing – review & editing. NM: Writing – review & editing, Conceptualization.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/froh.2024.1355349/full#supplementary-material

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A stakeholder co-design approach to designing a dental service for adults experiencing homelessness

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Introduction: The homeless population faces a “cliff edge of inequality” when trying to access essential dental services. There are several additional barriers to accessing dental care in comparison to the general population and the heterogeneous nature of patients presents a significant challenge when designing dental services to meet their needs. Following the Smile4Life report in 2009, there is limited up-to-date and population-specific evidence available for the optimal model of service delivery.

Aim: This study aimed to co-design principles for a prospective dental service for adults experiencing homelessness.

Methods: A qualitative methodology was used to incorporate experts-by-experience into elements of co-designing a dental service for adults experiencing homelessness. The study combined elements of an experienced-based co-design framework for healthcare innovation with community-based participatory research. Focus groups with people experiencing homelessness and healthcare practitioners were conducted to identify principles for any prospective dental service, as well as several barriers and enablers to establishing a homeless dental service. The findings were transcribed and analysed using thematic analysis on Nvivo software.

Results: From the qualitative analysis five key themes emerged: (1) Impact and expectations of oral health while experiencing homelessness, (2) Barriers to accessing dental care; (3) Practitioner’s views about homelessness and access to care; (4) Barriers to designing a homeless service and (5) Enablers for co-designing a new model of dental care delivery for the homeless population.

Five key principles for a new model of homeless dental service were identified: (i) Services designed to address the needs of patients; (ii) Services delivered in a safe and welcoming environment (iii) Training and consistency of staff; (iv) Focus on dental education (v) Developing peer mentoring and peer support.

Conclusion: While the barriers to accessing dental care while homeless are well established and understood by healthcare practitioners, more work is required to gain consensus on the most effective way to deliver an innovative a sustainable dental service for patients experiencing homelessness. Previous negative experiences, lack of readily available information on services and barriers to access in the current system could be addressed by developing peer mentors within the homeless community, empowering individuals to share their knowledge and skills to support others in improving their oral health.

KEYWORDS

co-design, dental services, homelessness, inequalities, qualitative research, participatory research, dental services for adults experiencing homelessness

1 Introduction

Homelessness is not only a profound form of social exclusion but also a pressing global public health concern. Social, economic, cultural and political factors affect the extent and severity of an individual's experience of this social exclusion (1). It is the intersectionality of multiple disadvantages (2), combined with poverty (3), that often leads to an individual becoming homeless. Because health is considered to exist on a gradient (4), Freeman argues that individuals at the lower end of this scale are more acutely affected by the 'causes of the causes' of ill health (2). These vulnerable groups are also affected by the inequitable distribution of health resources, identified by the inverse care law, which that recognises individuals with the highest level of health needs in a society, often face the greatest barriers to accessing appropriate care (5).

In particular, the homeless population have a greater experience of ill health in comparison to the general population (6), but also faces additional psychosocial barriers to accessing healthcare (7). These additional barriers often drive patients, who are already vulnerable, to disengage from mainstream health services and this lack of opportunity for preventative advice and treatment increases the incidence of comorbidities (8) and leaves patients facing a "cliff edge of inequality" (2). Aldridge described the extent of their ill health experience as "extreme health" (8) and Freeman et al. built on this concept to suggest the same social determinants of health affect an individual's oral health and labelled this phenomenon "Extreme oral health" (2).

Patients experiencing homelessness generally have; higher levels of dental anxiety than the general population (7), higher levels of dental disease requiring treatment (7), increased missed appointments due to their chaotic lifestyle and are more likely to have been stigmatized for the presentation of their teeth and mouth (9). This frequently leads to patients only attending emergency dental appointments when in pain (10) which can be challenging for general dental practitioners to accommodate within the current model for delivering services. The challenges of delivering effective dental care for this population are well established in the literature, however, because of the heterogeneous needs of the homeless population's oral health (11), there is no "one size fits all" approach to developing effective services.

Freeman suggested the adoption of co-design to empower vulnerable groups facing social exclusion would lead to developing interventions that understand and remove the exclusory elements that underpin many services for people experiencing homelessness (2). Participatory research (12) helps policymakers to understand the views and experiences of individuals experiencing homelessness and incorporate them throughout the design and implementation stages of service development (13).

In Scotland, 32,242 households were assessed as homeless in 2022–23 (14). The true number is thought to be much higher, as these statistics don't account for the "hidden homeless" population that is staying in temporary accommodation or sofa surfing. It is important to build a robust evidence base of solutions to improve the oral health of this vulnerable population, tailored to their specific needs. Therefore, this study aims to co-design an innovative, sustainable dental service for adults experiencing homelessness.

2 Methodology

A qualitative methodology was used to incorporate experts-by-experience into elements of co-designing a dental service for adults experiencing homelessness. In this context, experts by experience were defined as "someone who can articulate lessons and suggestions from their own 'lived' experience of homelessness and health care challenges (15). The study combined elements of experienced-based co-design framework for healthcare innovation (16) with community-based participatory research (17). This was done to identify the key principles, barriers and enablers to establishing a dental service from the perspective of people experiencing homelessness and healthcare practitioners. This research followed, and adapted, the participatory and multi-disciplinary co-design framework (16) composed of three stages: Pre-design, Co-design, and Post-design (Table 1).

Experience-based co-design and participatory research can be valuable tools to address the power imbalances (18, 19) between marginalised groups and those in positions of authority when designing services. This type of research empowers community members to identify their needs and work collaboratively with researchers to facilitate any changes to policy or practices as required (16).

2.1 Participant recruitment

Research participants were recruited by the principal investigator (DC) and divided into two groups. Group 1 was formed by six people experiencing homelessness called the "experts by experience". Group 2 was formed by six practitioners involved in developing or delivering oral health promotion and dental services.

Regarding group 1, a purposive sample of people experiencing homelessness was formed through activities delivered in partnership with two NGOs. Informal patient and public involvement (PPI) sessions were organised at a weekly soup kitchen, where members of the community were invited to participate in research and share their views on accessing dental care while experiencing homelessness. Following guidance from the National Institute for Health and Social Care Research (20) participants received compensation for their participation, in the form of £30 shopping vouchers. However, participants were not aware of the voucher, or its value, before accepting to take part in the focus group. Participants were also made aware that they could withdraw at any time of the research process. The second

TABLE 1 Seven steps in the co-design framework for healthcare innovation.

Pre-design	Co-design	Post-design
Step 1—Contextual inquiry - Participant observation and patient public involvement was conducted in soup kitchens, homelessness services and on the streets that surrounded the area where key homelessness services were based - Understanding the oral health needs and expectations of individuals experiencing homelessness to inform discussion in the focus groups - Discussing the research question with managers and practitioners in health Boards and third sector to inform discussion in the focus groups **Step 2—Preparation/Planning for participation** - Engagement with participants from both groups (people with lived experience of homelessness and health care practitioners). - Informal Patient and Public Involvement (PPI) sessions to frame the issue and inform - Selection of a facilitator - Providing participant information sheets to both groups - Sourcing materials to support data collection (recording device/location…) - Testing the instruments and making necessary change	**Step 3—Framing the Issue** - Focus groups (Group 1 and 2). - Presentation of generative design work. - Participants and facilitator engaged in critical reflection of their experiences - Appreciative inquiry—highlighting the positive aspects of attending a dental clinic to inform **Step 4—Generative Design Ideas** - Identification of oral health needs and expectations about accessing dental services - Knowledge exchange about actual experiences attending dental services while experiencing homelessness - Identification of challenges in accessing dental services - Starting a process of re-imagining/re-creating a new model of dental service provision **Step 5—Sharing Ideas** - Identifying principles to base the foundation of this new model - Discussing what must change in actual services - Consolidation of the process of re-imagining/re-creating a new model of service delivery - Shared vision for the future	**Step 6—Data Analysis** - Preparation (transcription, analysis framework) - Organizing (coding) - Reporting findings **Step 7—Requirement translation** - Combination of first and second focus group to identify key themes for service development - Identify feasible priorities to consider - Action items identified 43

Adapted from M Bird (16).

group of participants was recruited through the network of the principal investigator. Recruitment emails were sent to practitioners working within the National Health Service (NHS) linked with national homelessness programmes. This second group was comprised of General Dental Practitioners, Oral Health Educators; NHS Managers; and a Dental Public Health Specialist.

2.2 Seven steps in the co-design framework

In Table 1, the seven steps in the co-design framework for healthcare innovation, adapted from M. Bird (16), were presented.

2.2.1 Step 1: contextual inquiry

Step 1—The contextual inquiry for this research was based on both researchers' experience working with adults experiencing homelessness in Scotland. The principal investigator (DC) had previously led work to establish a charity organisation focusing on oral health improvement for the homeless community, and for many years worked directly with local soup kitchens to deliver dental supplies and dental advice. In addition, both researchers (DC; AR) have been actively involved in previous national and local health needs assessments of this population (7) and in the development of a service mapping framework (21) to inform policy and service design. Some of the key challenges identified through these needs assessments prompted this research question. The importance of involving and listening to the voices of socially excluded groups facing homelessness regarding the most effective model of delivering dental care is a key principle of this study.

In Step 1 participant observation was conducted in homelessness services. Informal patient and public involvement sessions (PPI) were carried out to engage with adults experiencing homelessness, in order to assess their willingness to share their experiences accessing dental care while homeless. Individuals who were happy to share their knowledge were invited to attend a well-established community hub for adults experiencing homelessness, where the first focus group was delivered. Participants from this first focus group were also invited to attend the second focus group. Healthcare practitioners in group 2 were recruited within NHS boards.

2.2.2 Step 2: preparation and training

In Step 2, the principal investigator acted as facilitator for the conduction of both focus groups. The facilitator had extensive experience working with service users and members of senior management within the NHS boards and third-sector organisations. The role of the facilitator was to contribute to the conduction of the focus groups, tailoring the communication style for each group accordingly, to make participants feel as comfortable as possible in sharing their experiences and knowledge. The facilitator used Tables 2, 3 as a guide to facilitate conversation among participants.

The third-sector organisation, Simon Community Scotland, helped to establish the optimal approach to engaging with patients experiencing homelessness through their extensive experience working with the community homelessness and by offering the use of space in their multi-functional Hub. The Hub is a psychologically informed environment (22) for adults experiencing homelessness that is designed to be an inclusive space that makes individuals feel safe and comfortable.

Both focus groups were held in the Simon Community Hub. An audio recording device was used to record participants'

TABLE 2 Themes, descriptive questions and prompts for workshop 1 (experts-by-experience with lived experience of homelessness).

Themes/topics to be explored—workshop 1	Broad descriptive questions
Knowledge/Awareness/Needs of Participants in Relation to Oral Health	What do you understand is having a healthy mouth? What behaviours or habits do you have that contribute to your oral health? (Good and bad) Do you go to the dentist for check-up or only when in pain?
Experiences trying to access a dentist in the last 18/24 months…	Describe your experiences trying to access the dentist? *(Positive and Negative experiences)* How did those experiences make you feel?
Reactions/aspirations to different models of dental care used throughout the rest of the UK…	Current model—Attend general practice? Supported to attend general practice? Designated service—Hospital/Community location? Emergency treatment only?

TABLE 3 Themes, descriptive questions and prompts for workshop 2 (experts-by-experience with lived experience of homelessness and healthcare practitioners).

Themes (topics to be explored)—workshop 2	Broad descriptive questions
Needs and contexts of people experiencing homelessness	Introduce previous discussions from the first focus group around barriers and enablers… Consider current service provision… In what ways does it meet the identified needs of patients?
Service components	What should a high quality dental service for adults experiencing homelessness look like? In an ideal world (blue sky thinking): What should the core values of the service be? What difficulties might arise trying to set up a service? Realistic roadblocks to overcome?
Service design and healthcare system integration	Given topics discussed today and expertise of participants, detail options for a prospective dental service for adults experiencing homelessness. Relative to your field of expertise, how feasible are these options? Can this dental service be linked into other homeless services?

responses, which was tested in the location before each workshop. Participants were provided with a participant information sheet in advance of the focus group and the contents of this and the consent form were read aloud to compensate for any reading or writing comprehension issues. Participants in both groups were asked to sign a consent form before starting. Support was offered for any participant requiring assistance to better understand the research process.

2.3 Co-design

2.3.1 Step 3–Step 5

The co-design process involved Step 3: Framing the issue; Step 4: Generative design ideas and 5: Sharing ideas.

Informal PPI sessions were used to gather insights from individuals with lived experience of homelessness and their recent or historic experiences accessing dental care. This information was then used to inform the broad descriptive questions and themes to be explored during the focus groups, to allow participants to expand on their experiences and generate innovative ways to overcome barriers to accessing care.

Table 2 highlights the themes explored and broad descriptive questions in the first focus group with Group 1 (experts-by-experience with lived experience of homelessness). Table 3 illustrates the themes explored and broad descriptive questions used in the second focus group with Group 2 (Experts-by-experience with lived experience of homelessness and healthcare practitioners).

Research participants engaged in critical dialogue and reflection during both focus groups and shared their views and experiences towards the conceptualisation of a model of care that would meet the needs of adults experiencing homelessness. Key themes presented in Tables 2, 3 were used to guide the discussion in each respective focus group.

TABLE 4 Participant's characteristics for both focus groups.

People with lived experience (PwLE)	Gender	
Participant 1	Male	
Participant 2	Female	
Participant 3	Male	
Participant 4	Male	
Participant 5	Female	
Participant 6	Female	
Facilitator	Male	
Health Care Provider (HCP)	**Gender**	**Role**
Participant 1	Male	General Dental Practitioner
Participant 2	Female	Public Dental Service Clinician/Clinical Service Manager
Participant 3	Male	Specialist in Dental Public Health
Participant 4	Female	Oral Health Educator/Oral Health Improvement Manager
Participant 5	Female	Operational Manager for Oral Health Improvement Manager
Participant 6	Male	Participant with Lived Experience of Homelessness
Facilitator	Male	Same Facilitator as other focus group/primary investigator

Table 4 highlights key characteristics of participants in both focus groups.

Some of the participants of Group 1 (people with lived experience of homelessness) had known the facilitator through engaging at a charity soup kitchen, which established trust and open communication between the group. Many of the participants in Group 2 had previously worked in healthcare services alongside each other, which quickly established a rapport among the group.

2.4 Post-design

2.4.1 Data analysis

The key themes and information from the first focus group were analysed and used to inform the discussion in the second group. In an iterative process, the audio recording from the first group of participants was transcribed by a single researcher, using the 6 stages of thematic analysis identified by Braun and Clarke (23), to interpret the data. These were: data familiarisation, generating initial codes, searching for themes, reviewing potential themes, defining and naming themes, and producing the report. After the researchers (DC, AR) independently examined the data, they met together to discuss their categories and themes. When a disagreement occurred, further discussions ensured that a consensus was reached. Key themes were identified from the first focus group and used to inform the discussion of participants from the second group. This was done to give the practitioners a context to consider when discussing service design and delivery, to ensure they fully understood the multi-dimensional and relational elements of social exclusion experienced while homeless (2). The data collected from the second focus group was analysed and interpreted using the same process on Nvivo software.

2.4.2 Requirements translation

Once both focus groups had been transcribed and sorted into initial codes and themes, the results from both groups were compared to identify common suggestions for a future homezless dental service. This included the principles embedded in the service provision, barriers to accessing healthcare services, the barriers to establishing any service from a practitioner perspective and the underlying principles that policymakers should consider to when designing a dental service for people experiencing homelessness.

The results from each feedback, once combined, were developed into mind maps using MindView software. This helped to give a visual representation of the key themes discussed in both groups to compare and contrast the responses given.

Ethical considerations: Ethical approval was obtained from the Research Ethics Committee at the University of Dundee (UREC number UOD-SREC-SDEN-2022–007). Participant information sheets were provided, and consent forms were required to be completed before taking part in the study. All of the data were anonymised and confidentiality was ensured.

3 Results

The qualitative findings are described below. Five key themes emerged from the combination of the data analysis from both groups.

The group of participants with lived experience of homelessness highlighted the first two research themes: (1) The impact and expectations of oral health while experiencing homelessness, and (2) The barriers to accessing dental care while experiencing homelessness. The group of participants composed of practitioners highlighted the following themes: (3) Practitioner's views about homelessness and access to dental care; and (4) Barriers to designing a dental service for experiencing homelessness.

Both groups of participants discussed theme 5: Principles for co-designing a new model of dental care delivery for people experiencing homelessness. The results from each group were combined and identified five key principles for establishing an inclusive new model of dental health service that can respond to the health needs and aspirations of people experiencing homelessness.

3.1 Focus group 1: the views of people with lived experience of homelessness

3.1.1 Theme 1: impact and expectations of oral health while experiencing homelessness

The negative impact of poor oral health while experiencing homelessness was a strong theme throughout the discussion, with participants reporting experiencing stigma and judgement as a result of poor oral health. Participants reported they had faced stigma and judgement from society due to the condition of their teeth, which harmed their mental health and overall confidence—particularly when applying for jobs. One participant with lived experience of homelessness (PwLE) reported:

> *"People assume that if you've got rotten teeth or teeth missing or brown teeth that, automatically, he's on drugs… Or he can't be trusted, or he's been begging. It's all those judgmental words that come out of people…" [PwLE participant]*

Despite facing discrimination because of the aesthetics of their teeth, participants had relatively low expectations for what constitutes a healthy mouth. Most of the participants were focused on having a mouth that was "functional" and "not in pain", while other participants wanted to avoid embarrassment while talking with others and/or having to pause and think about the ingestion of particular foods they would like to eat.

3.1.2 Theme 2: the barriers to accessing dental care

Three sub-themes on the barriers to accessing dental care were identified: (i) Chaotic life structure; (ii) Lack of Trust; and (iii) Previous bad experiences with a dentist. Knowing what these barriers are can inform policymakers and practitioners when designing inclusive and sustainable dental services to empower patients to overcome them and improve their oral health.

3.1.2.1 Chaotic life structure

The most common barriers that were discussed to accessing healthcare were linked to a chaotic life structure while someone is sleeping rough or living in temporary homeless accommodation, such as experiencing or suffering violence or drug misuse.

Participants were not satisfied with temporary hostel accommodations, reporting a high prevalence of drug use, violence, and poor living conditions. This challenging environment left them feeling "*emotionally exhausted*" as they had to deal with multiple demands, and they were keen to leave the accommodation as quickly as possible—often without seeking dental care services or completing their oral hygiene routine. Another PwLE highlighted:

> *"Especially when you're staying in a hostel you just get used to getting up and out… One morning you'll brush them and the next you won't, it's just one of those things you need to remember." [PwLE participant]*

While staying in homeless accommodation, there was constant upheaval and often episodes of extreme violence, which was particularly traumatic for some participants and significantly impacted their mental health. Participants indicated they had become used to "*living out your bag*", because of moving about regularly or rough sleeping, and it was difficult to maintain a regular oral hygiene routine because of this.

The abuse of substances was another factor that inhibited a healthy routine identified by participants as habits like smoking marijuana and falling asleep before brushing their teeth at night. Participants openly discussed their previous issues with substance misuse and highlighted that vulnerable drug users are often targeted in the hostel accommodations by drug dealers, which makes recovering from any dependency even more challenging in this environment.

Significantly, one participant reported that he had a positive experience being supported by a member of staff in a hostel that used a harm reduction approach, and he found this to be particularly supportive in helping him in recovery.

These challenges to engage with mainstream services continued every day after leaving the hostel, as it is common to be "scattered from the east to the west" within the homeless system—and as a result, is not unusual to have to walk long distances to access services or support.

3.1.2.2 Lack of trust

Building trust with staff was challenging for participants as they reported being referred to multiple different services and service providers while experiencing homelessness. The need to constantly repeat their experiences and often retell traumatic events often led to frustration, being "*passed off from this person to that person*" within the homeless system, which led one PwLE to respond that:

> *"They are not bothered about you or your outcome, you're just another person to them. You're just another one on the list." [PwLE participant].*

This attitude is illustrated by the phrase "*services make problems not solve them*" which highlights the lack of trust that participants in services delivering for their needs. They identified reception staff demanding identification and proof of address, which many participants did not have, as a barrier to registering at a dental practice, and also led to them feeling judged negatively.

Most participants reported only seeking dental treatment when they experienced extreme pain, however, the majority admitted calling their GP to seek dental advice or access medication for dental pain.

The group also discussed that there was a lack of readily available information on how to access dedicated homeless services. Word of mouth was identified as a very effective way of disseminating this information, especially through a central location such as a drop-in service.

3.1.2.3 Previous bad experience with a dentist

Participants detailed several negative experiences when attending a dentist, some of which had left a lasting negative impact on individuals. In particular, the approach and mannerisms used by dental professionals often came across as "*being told off*" and lectured, which they felt was "*judgmental*" and that the dentist had failed to make any effort to listen to them and understand their perspective. This was particularly evident when participants discussed dental practices issuing fines when they missed appointments, which they felt were unfair and unrealistic.

Participants reported a significant amount of anxiety around different dental procedures, with the use of the injection to numb the teeth reported as the most common. Because most participants were anxious about other factors like the noise of the drill, as well as an injection, many reported delaying seeking treatment until they could not cope with the pain. They felt that dental treatment was very invasive, and because of previous trauma and a lack of trust between the patient and the dental professional, it left one participant feeling quite vulnerable when lying back in the dental chair.

The attitude and mannerisms of dental staff left patients with a negative perception of dental care professionals, which was a significant barrier to accessing dental services for most participants.

3.2 The views of healthcare practitioners

3.2.1 Professional views of homelessness and access to healthcare

The second focus group was composed of dental care professionals (DCPs) who shared their understanding of the barriers to accessing dental care while experiencing homelessness. The group demonstrated a very good understanding of the barriers to mainstream dental care, many of which were similar to the barriers identified by service users in the first workshop.

In general, previous negative experiences with a dentist were identified as causing high levels of anxiety among patients. While this is not unique to patients experiencing homelessness, participants in this group identified several factors combined, such as stigma and judgement coming from professionals, to make it particularly difficult for these patients to overcome this hurdle. There was consensus that patients experiencing homelessness usually delay seeking dental treatment until absolutely necessary, which often means they present for emergency appointments in extreme pain.

Participants identified that the people experiencing homelessness generally have an extremely chaotic lifestyle that can be challenging to navigate. They also identified that the needs of patients who have recently been made homeless are very different to those who have been in the system for a long time and that the current system is not tailored to address their needs. Issuing fines and deposits was acknowledged as a barrier for patients on a low income to finish dental treatments and this was also applicable when patients were asked to provide identification, despite often having no fixed address or access to benefits. Participants felt this approach needed to be changed as it can have significant negative impacts on patients trying to access basic dental care.

3.2.2 Barriers to designing a dental care service

Participants gave their views on what would be the main barriers to designing and implementing a designated homeless dental service. These barriers were sub-categorised into governance, financial sustainability and the limitations of the current system.

3.2.2.1 Governance

There were several issues raised about the governance of any potential homeless dental service to be created, particularly if the service is based in a community location. Seeking to learn from existing models of care for marginalized groups, the discussion focused on the challenges of using a non-NHS premise to operate NHS services—and the issues this raises about who is responsible for running the service. In particular, the maintenance of equipment and instruments was highlighted as a potential problem. The established model of a mobile dental van to provide dental treatment for vulnerable groups as people experiencing homelessness in disadvantaged areas was discussed for comparison. The existing challenges with communication between organisations and sectors were also acknowledged as a barrier to establishing any new service. Participants agreed that organisations tend to work in "silos" and currently, communication is largely between individuals and not strategically across organisations. Participants suggested these links are difficult to maintain when members of staff that have established this inter-sectoral communication, move on from the organisation—especially when different services use different operating systems.

This was a concern and needed consideration when designing a multi-disciplinary service, as effective communication between organisations was identified as essential for delivering services that meet the diverse range of needs of the patients.

3.2.2.2 Financial sustainability

Sustainable staffing costs were also discussed, including the possibility of making a salaried post within the NHS that would take responsibility for operating the service. However, participants indicated that consideration would have to be given to both the initial cost of recruiting employees and the recurring "on-costs" when establishing a new service and importantly whether funding could be repeated to keep the project running in the long term.

The commissioning of a mobile dental van brought up examples from other health boards that indicate this model would potentially carry a significant up-front cost to establish, without necessarily improving the accessibility or quality of care for patients. It was suggested that funding may be available for establishing innovative projects for vulnerable groups, however, participants identified that an issue with current funding is that it is predominantly non-recurring and this poses a significant challenge to the sustainability of any service.

3.2.2.3 Limitations with the current dental system

The limitations within the current dental system were also highlighted as a significant barrier to co-designing a new model of dental care service. In particular, the policy of lifelong registration with a dentist makes it difficult for patients who have moved away from a particular area to access dental treatment in a different location. Participants indicated this issue is compounded by the ongoing problems accessing mainstream NHS dental practices. Multiple participants with lived experience of homelessness (PwLE) reported in the first focus group that it was easy to book an appointment with a local dentist prior to Covid-19, however, this has changed following the pandemic. One of the health care practitioners (HCP) acknowledged the additional challenges that not exist trying to access care:

> *"Because of Covid, nobody is taking on new patients. There has been a problem, which has been multiplied… You've got the patients trying to register and there's nowhere to put them. The situation is difficult and it's been made worse, currently, by the Covid situation." [HCP participant]*

Participants also identified a significant overlap between individuals experiencing homelessness and other vulnerable groups—such as prisoners or patients accessing addiction services. The impact of life in prison on the oral health of individuals and the challenges to access dental care after being released. Alongside other priorities that community returners face, which do not include oral health, were discussed. As the public dental service is the mainstay for delivering care for these vulnerable patients, participants recommended strong consideration should be given to how we include these groups in any future service provision.

3.3 Focus group 1 and 2 combined responses on principles to co-design a new homeless dental service

The final theme emerged from both groups of participants and identified five principles that should be embedded in the co-design of a new model of dental care for people experiencing homelessness:

(i) *Services designed to address the needs of patients;*
(ii) *Services delivered in a safe and welcoming environment;*
(iii) *Training and consistency of staff;*
(iv) *Focus on dental education;*
(v) *Developing peer mentoring and peer support.*

There was significant convergence between participant's responses in the first and second focus groups around the barriers and challenges accessing dental care while experiencing homelessness. There was a similar convergence of ideas around the value of education and using peer mentors to deliver information to "hard to reach" groups. The main area of divergence of opinions was around the ideal location any prospective dental service, with HCP participants illustrating the challenges and costs associated with establishing a new service, while PwLE participants reinforced their barriers to accessing care within the current system.

3.3.1 Services designed to address the needs of patients

Participants identified that any service should be tailored to be effective in addressing the needs of the homeless population: "*A service that fixes problems not makes them*" *[PwLE participant]*.

Participants with lived experience of homelessness revealed that if a designated homeless dental service could be established, and delivered 'differently compared to a "normal" high street dentist', they would be more likely to attend. Trust and positive relationships previously established with patients were considered essential and it was suggested that a similar approach to create an integrated homeless dental service could be a platform to engage patients with other health issues such as substance misuse.

However, the views of dental care professionals were that reaching and treating vulnerable groups such as homeless patients was the remit of the Public Dental Service. Because of this, there was a need to consider patient groups facing social exclusion and guarantee that any service is inclusive and sustainable. As the oral health needs—and priorities—of someone experiencing homelessness can change dramatically, often from day to day, any service should try to accommodate this:

> *"It's almost like the need for two services, someone that has an acute problem who needs their toothache fixed. How do we deal with that acute problem, and actually when people are ready and engaged, how do we get them fit and integrate them back into general practice." [HCP participant]*

Participants discussed this model positively, highlighting it as a way to resolve acute dental problems, while also achieving long-term engagement through building trust and rapport. The potential benefits of a "*one-stop shop*" service were discussed particularly as a way to manage patients' acute anxieties and give them a positive dental experience:

> *"That sort of concept of a one-stop shop that can solve many problems is brilliant. And that will certainly address some acute problems for individuals, regardless of what that service is. Whether it's dental or whatever.... Once you've got past that (initial) bit and people want to make that change" [PwLE participant]*

The second group of participants identified the potential of practitioners who already work in national programmes to support these patients in attending dental appointments by sending personalised and positive reminders and accompanying them in some sessions.

3.3.2 Services delivered in a safe and welcoming environment

Building on the theme that any potential service should be designed around the needs of its patients, both groups identified the importance of an appropriate and welcoming environment to deliver care that should make patients feel safe and comfortable. One participant highlighted that this should be "*colourful*" and "*bright to the eye*" while others in the first group focussed on it being easily accessible, based in an area that they are familiar with and based in a location where they wouldn't have to travel long distances to utilise. A common theme identified by both groups was the need for any service to have an element of flexibility built into it. A healthcare practitioner who has experience working with patients experiencing homelessness reported their approach to managing their diary around the needs of patients:

> "We would maybe double book them or try to put them in at a time that we knew we would have a wee bit of flexibility… Without turning someone away, because we would never really want to do that. It was just about managing things, and understanding from both ends. And that is difficult" *[HCP participant]*

3.3.3 Training and consistency of staff

Participants mentioned the importance of communication style and the approach used by staff in any service as playing a significant role in improving client engagement. In particular, the first group of participants indicated they found regular staff changes very unsettling. Because many patients experiencing homelessness have faced judgement and stigmatisation accessing healthcare, they reported it was difficult to open up about previous traumatic experiences that often drive many of their anxieties and subsequent unhealthy behaviours. When they did build this relationship with a practitioner, they reported finding it frustrating having to repeatedly recount their trauma to a different professional:

> *"Just say you had something that you're insecure about. And say you're in a dentist and I tell you that, right? But you don't put that on paper, that's just something between me and you. See two or three weeks later, it's a new guy… and he doesn't know that." [PwLE participant]*

Having staff well-trained to understand the barriers to maintaining a healthy mouth while experiencing homelessness as well as more information on how to access dental services was perceived as essential to make patients feel welcomed and comfortable discussing their oral health.

Participants reported that when feeling listened to and being offered achievable solutions to their issues this helped them build positive relationships with dental care professionals. More training on trauma-informed care was perceived as a gap among dental professionals. As well as ensuring the staff recruited are empathetic and compassionate, most participants agreed that appropriate training should be delivered to all dental care professionals to make sure they understand the needs of their patients as the majority of them likely never experienced social exclusion and vulnerability to this extent:

3.3.4 Focus on health education

Education was another central feature of both focus groups of participants. Experts by experience in the first group indicated they would benefit from having more access to information about improving their oral health and how to access dental services:

> *"If you knew how to manage them and you learned what was bad for them and so forth. If you were to bring more knowledge, you would bring more comfort to people" [PwLE participant]*

Healthcare practitioners in the second focus group identified that Smile4Life's remit is to deliver oral health training to "*as many people as possible*" to upskill and develop key workers within homeless services. These individuals are then able to give advice and support to patients on their oral health concerns, as well as signposting effectively to available dental services.

There was convergence amongst the HCP participants in the second focus group, who championed having empathetic clinicians who understand the complex needs of their patients as a significant factor in promoting engagement. Highlighting that many healthcare practitioners have not experienced the adversity and additional barriers to accessing care faced while experiencing homelessness, one HCP participant explained:

> *"Most people who work in healthcare, most people not all, they've never understood vulnerability. They've never experienced vulnerability. They can be taught it, they can read it in a book or a journal article, but they don't understand it." [HCP participant]*

Building on this, another HCP participant emphasised the importance of providing tailored training to healthcare practitioners to ensure they have the suitable skills and understanding required to manage patients with additional support needs—and the positive impact this can have for the patients:

> *"If you knew how to manage them [people experiencing homelessness] and you learned what was bad for them and so forth. If you were to bring more knowledge, you would bring more comfort to people" [HCP participant]*

3.3.5 Peer mentoring and peer support

When re-imagining an inclusive model of dental care the possibility of creating community champions and dental peer mentors within the homeless community was discussed by participants. The first group identified several benefits of having peer mentors and peer support in dental teams in a new model of dental care and felt this would make them feel more comfortable attending the dentist if they were supported by someone that they knew:

> *"What's good if you do go down the line about peer mentoring, is somebody that we know… would make us look forward to going to something like that." [PwLE participant]*

In addition, participants highlighted that people with lived experience being trained as oral health peer mentors would be positively impacted on their level of education and improved chances of employment as well as extra motivated to make new changes to their current situation in the homeless system:

> *"When you come off the streets, if you've got those certificates while being homeless, that shows a good character—somebody who wants to be motivated and wants to have a say and wants to make a difference in the position they are in." [PwLE participant]*

Finally, participants identified as 'community champions' or dental peer mentors would act as a powerful point of reference to disseminate information amongst this population. Because each participant engages with multiple different services, providing training to these experts by experience to deliver oral health advice and signposting, would allow them to act as a link between services and service users helping people who don't engage with mainstream services to access this vital information.The recruitment of appropriate personnel for this role was highlighted as a key factor in making it successful by a healthcare practitioner in the second focus group:

> *"Whether they are clinical champions or community champions, if you have someone who has lived it, gone through it, can empathise and relate. Then their success at bringing other people on that journey is going to be far better than somebody who has just read it in a book." [HCP participant]*

4 Discussion

The barriers to accessing dental care while homeless identified by both groups are in line with the evidence from other studies (24–27). The comparability with these studies demonstrates that the social exclusion (2) and barriers to dental care experienced while homeless are a consequence of multiple different social, economic, cultural and systematic factors (28), and not the fault of the individual.

While the barriers to dental care are well established for the population, significant debate exists around the most effective way to deliver equitable dental care for patients experiencing homelessness (24, 25, 29, 30). In this study, healthcare professionals promoted the idea of an inclusive dental service, catering to the needs of multiple patient groups facing social exclusion, beyond people experiencing homelessness such as asylum seekers or individuals fleeing domestic abuse.

This study identified that the different stages of an individual's journey through homelessness were significant factors in a person's ability to engage with services and decide to make these positive changes. While factors around governance and recurring financial stability were identified as significant barriers to setting up an inter-sectoral dental service, multiple studies demonstrate the benefits of having some form of community outreach element to health promotion for these patients (31, 32). It is important to work with individuals experiencing homelessness to build their confidence and reduce the stigmatisation and othering that they are regularly subjected to.

Following the inclusion oral health framework (2), Paisi found a community-based homeless dental intervention to be a "highly successful, acceptable and accessible" model for dental care (33).

Hwang suggested that specific homeless services were effective at meeting the immediate needs of individuals, but that generic services integrated into healthcare systems deliver higher quality care (32). This implies that some form of integrated outreach service to address patients' immediate needs can serve as a platform to build engagement and empower patients to see the benefit of making positive changes in the future. Daly confirmed this by highlighting that health services catering to the specific needs of homeless people provided a "safe environment which was in effect a comfort zone" and allowed them to establish "trusting networks and build their own social capital" (29). Trust and avoiding the need to repeat traumatic episodes to multiple different practitioners was an important theme discussed by participants with lived experience of homelessness, and it is important to consider how any prospective dental service would seek to build this between practitioners and patients.

This study reinforces the need to develop models for peer mentoring and peer support being included in dental services to facilitate patients' engagement and help others overcome their barriers to accessing care by sharing their experiences. The study suggested these models could be based in community locations, with links to third-sector organisations, and look to establish strong working links with healthcare and statutory services. It was recognised thatin line with the inclusion oral health framework, further training should be delivered at undergraduate and postgraduate levels to ensure that the new generation of dental care professionals can understand the holistic needs of their patients and deliver trauma-informed care (34).

The benefits of training individuals, who have lived experiences of homelessness, to act as link workers between groups and services as dental peer mentors (35) was also a key finding in this study. However, participants recognised that as well as empowering individuals in the community to upskill (36) and take on additional responsibilities, peer mentors are already established within the community and connected to multiple different services. By utilising peer support in the capacity of link workers, homeless patients could have a bridge between healthcare services. Because missed appointments are a waste of vital resources (37), this model has been shown to improve the efficiency of clinical time, improve uptake of services and generally enhance sustainability and patient satisfaction for any service (33).

While sustainable alternative funding streams were identified as being a challenge to secure, the participants in the second focus group highlighted that establishing a service outside of the NHS remit would still be required to meet significant amounts of governance and regulation standards. This reinforces the need for third-sector organisations and healthcare providers to prioritise partnership working to meet the diverse needs of patients and service users. Effective frameworks for frictionless engagement between third-sector organisations and health providers should be considered to facilitate communication and information sharing between the sectors.

4.1 Future research

Qualitative and quantitative, peer-led research is required to identify the preferred method of service delivery for homeless patients. Consideration should be given to pilot studies that investigate the effectiveness of different models of care as well as the cost-benefit analysis of an intervention against the impact of missed dental appointments.

Further research is also needed on the barriers to inter-sectoral communication, to improve and streamline this to develop multi-disciplinary services. More research on peer mentoring, peer education and peer research would contribute to empowering individuals in the community and reduce the barriers to accessing dental care for others by acting as link workers between essential services.

4.2 Limitations of the study

Despite all the focus groups reached the number of participants usually recommended in the literature (between 6 and 8) the data was collected just post Covid-19 pandemic and lockdown. This increased the challenges to engage with homelessness services and recruit participants. Many services contacted and willing to support the study were unable to contribute as they were also reestablishing their work routines and communication with service users.

The potential influence of the principal investigator on the responses from research participants was mitigated by the strong long term trust build relationship formed with homelessness services that mediated the access to research participants. These local organisations guided the process of constant assessment and reassurance of participants being totally comfortable to express themselves.

In addition, this study covered one city in Scotland and did not reached a variety of homelessness participants and contexts such as those experiencing homelessness and living in rural areas of the country, those with severe mental health issues such as long term depression and anxiety that would not attend meetings in unfamiliar locations and in company of other participants they do not know. This may limit the findings being wider generalised.

While it is impossible to capture every view of adults experiencing homelessness, it would be beneficial to have more experts with experience to encapsulate a wider variety of inputs, including from third-sector managers and service providers.

5 Conclusion

While the current dental health system in Scotland is not fully tailored to respond to the holistic needs of patients experiencing homelessness, involving people with lived experience can be central to the process of reimagining new models of dental care focusing on reducing the health inequalities of vulnerable populations. These new models should be co-designed with people with lived experience and embedded in principles of trust, flexibility and peer mentoring. Practitioners taking a non-judgemental approach, aligned with a trauma-informed care environment and a well-trained workforce, would have more chances to effectively respond to the needs of people experiencing homelessness.

Data availability statement

On request, the thematic analysis data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was obtained from the Research Ethics Committee at the 191 University of Dundee (UREC number UOD-SREC- SDEN – 2022-007). Written informed consent for participation in this study was provided by the participants.

Author contributions

DC: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft. AR: Methodology, Resources, Supervision, Writing – review & editing.

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Conflict of interest

The author DC was the chair of the Glasgow Dental Initiative Charity at the time of the research. The decision to fund participant's gift cards was taken through the Glasgow Dental Initiative Board of Directors. Participants were not aware that these gift cards would be issued until after the focus groups had finished.

The remaining author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/froh.2024.1355429/full#supplementary-material

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Exploring and enhancing the accessibility of children's oral health resources (called HABIT) for high risk communities

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Background: Within the city of Bradford in West Yorkshire, South Asian and Eastern European communities have an increased risk of childhood tooth decay, especially among families with Limited English Proficiency. Tooth decay is preventable, with national guidelines advocating home-based behaviours (toothbrushing with fluoride toothpaste and reducing sugar intake). In England, Health Visitors have opportunities to undertake oral health conversations during universal visits for children aged 0–24 months. The HABIT (Health visitors delivering Advice in Britain on Infant Toothbrushing) intervention provides structured oral health conversations, underpinned by complex intervention methodology. A feasibility study found HABIT acceptable to parents, feasible to deliver and led to improvements in home-based behaviours. However, the reach of this original study was limited to those proficient in English. This new study focused on exploring and enhancing the accessibility of the HABIT intervention to parents with Limited English Proficiency.

Method: Twenty-four parents participated in interviews and focus groups, with 21 requesting support from interpreters. Community centres and WhatsApp were used to maximise inclusivity. Interviews and focus groups, followed a topic guide and the "Think Aloud" technique, were professionally transcribed, managed in NVivo, and thematically analysed. Team discussions facilitated analytical rigour. Recruitment continued until data saturation.

Results: Three themes were developed: (1) Navigating linguistic barriers; (2) Engagement through visuals; and (3) Addressing oral health challenges. Parents employed diverse strategies to interpret resources, including Google Translate, as well as family and wider community members. Consequently, the HABIT resources were modified to include simple text, subtitles, and translation tools. Parents highlighted the benefits of shorter oral health messages with clear visuals to help understanding, and this strategy was applied across all resources. Challenges surrounding children's resistance to toothbrushing, high sugar intake within their wider families and communities, and limited dental access were all raised. The HABIT resources were updated to address these challenges.

Conclusion: Collaborative community engagement has enhanced the HABIT resources, enabling access for high-risk communities to preventive oral-health programmes thereby promoting health equity.

KEYWORDS

intervention, oral health advice, limited English proficiency (LEP), oral health accessibility, dental caries, prevention, early years, community engagement

1 Introduction

Dental caries is one of the most prevalent childhood diseases globally, and a major public health priority (1, 2). In England, by the age of five, approximately a quarter of children are affected by dental caries (3). There are significant variations seen in both the prevalence and severity of dental caries; in the least deprived areas of England the prevalence of dental caries is 13.7%, with this figure rising to over a third at 36% in Bradford, a city in West Yorkshire with some of the most deprived areas across the country (4).

Dental caries is, however, preventable, with national guidelines identifying strong evidence for key oral health behaviours such as brushing twice daily with a fluoridated toothpaste and limiting the intake of sugary foods and drinks (5). Whilst many parents are aware of these behaviours, there is a research gap surrounding how to support families from high-risk communities to undertake these optimal oral health behaviours at home.

This current paper sits alongside a wider research project known collectively as HABIT[1] (Health Visitors delivering Advice in Britain on Infant Toothbrushing). HABIT is an oral health intervention that supports Health Visiting teams to have effective oral health conversations with parents of young children. Co-designed with parents and health visiting teams in Bradford, HABIT is underpinned by robust behaviour change theory and has been formally tested in a Medical Research Council funded feasibility study (6). This found HABIT to be acceptable to parents, feasible to be delivered by Health Visiting teams and led to improved oral health behaviours over a three-month period (7). The study protocol outlines the key components of the intervention, including the development of parent facing resources designed to support the highly valuable oral health conversations taking place between Health Visiting teams and parents of young children (8). These resources are an example of good practice and include a website, printable leaflets, dental models for toothbrushing demonstrations and six educational videos.

While the HABIT intervention demonstrates promising outcomes in enhancing oral health awareness and practices among parents, one of the limitations of the feasibility study was the lack of participation from parents with Limited English Proficiency (LEP) (7). With disparities in health outcomes persisting, marginalised populations (including those from minority ethnic communities) often face greater challenges in accessing essential oral health information and services (9). Just under half of Bradford's population identifies as within a Minority Ethnic group, with the Asian or British Asian population accounting for 32.1% of the district's total in 2021 (10). The challenges that these communities face in accessing healthcare are well documented (11, 12), with language barriers specifically leading to reduced comprehension of health information (13), increased likelihood of medical errors, delayed or inadequate care, and lower levels of patient satisfaction (14).

After the initial stages of this project, further funding was secured from Better Start Bradford's[2] Innovation Fund. A key objective of this research was to work with local communities at high risk of early childhood caries to ensure accessibility of the HABIT resources for parents with LEP.

1.1 Aim

To explore and enhance the accessibility of the HABIT resources for parents/guardians with LEP.

2 Materials and methods

2.1 Research design

The research employed an exploratory qualitative study design, with reporting guided by the Consolidated Criteria for Reporting Qualitative Research (COREQ). Data was collected using in-depth interviews and focus groups and analysed using Thematic Analysis at the semantic level. This approach focuses on identifying explicit and surface-level meanings of the data, interpreting data in a way that stays close to the participants' stated experiences and perspectives (15). Ethical approval was obtained for the study from the University of Leeds Dental Research Ethics Committee. Ref: 180620/PD/301.

2.2 Sample

In collaboration with Bradford Community Dental Service and the funder (Better Start Bradford), two communities with a high prevalence of dental caries in young children were identified: South Asian and Eastern European. Participants were eligible if they were: (1) living within the Better Start Bradford area (Bowling and Barkerend, Bradford Moor and Little Horton), (2) had caring responsibilities for at least one child aged 0–4 years old, and (3) had LEP or English as a second language.

Participants who met the eligibility criteria were approached for participation by community workers familiar to them. The community workers shared the participant information sheet and subsequently obtained written consent. For those unable to read English, community workers provided translation assistance for both the information sheet and the consent form. Participants were given the option of attending their local community setting or via WhatsApp video/voice call to undertake the subsequent interviews/focus groups.

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[1] https://www.toothbrushinghabit.com/

[2] https://www.betterstartbradford.org.uk/

For interviews conducted via WhatsApp video or phone, participants signed the consent forms, and they (or their community worker) sent a photograph of the signed document back to the researchers undertaking this study. All participants were informed about the nature of the research, emphasising that their involvement was voluntary. They were also made aware of their right to withdraw consent up until the audio transcription stage. Recruitment continued until data saturation occurred. When arranging the interviews/focus groups, participants were asked if they wanted the community worker to help to interpret the discussions.

2.3 Data collection

Interviews and focus groups were undertaken by two female researchers (AC and AS) from different disciplines (Psychology and Dentistry). AC is an experienced qualitative researcher (CPsychol, PhD, BSc), and AS is a dental therapist and researcher (Grad Dip DHDT, PG Cert in Health Research). The researchers were unknown to the participants.

Community workers participated in discussions with the research team before the interviews to clarify their role of strictly translating the communication between the researcher and participant. Although the community workers did not receive formal training, their extensive experience in community engagement and their work with Better Start Bradford ensured expertise. The community workers participated in debrief sessions with AC after each interview to reflect on their experiences and contribute to the iterative refinement of the interview approach.

2.3.1 Individual interviews

Interviews were carried out through the online instant messaging service WhatsApp video, a secure app that uses end-to-end encryption or by telephone and lasted between 30 and 45 min. These interviews were arranged by community workers through Better Start Bradford, and these workers were virtually present for four interviews. The researcher (AC) initiated the three-way video call, ensuring all were present and the video and audio connections were clear. Three interviewees felt they were able to engage in a conversation without the support of a community worker, and therefore, a two-way video interview was conducted.

2.3.2 Focus groups

The focus groups were undertaken by two researchers (AC and AS) in various community settings, including community centres, primary schools and at English for Speakers of Other Languages (ESOL) classes. These sessions lasted between 30 and 60 min. A community worker was present for all focus groups ($N = 4$) to interpret discussions.

All interviews/focus groups followed a semi-structured topic guide (see Supplementary File). This included (1) an exploration of current children's toothbrushing practices within the community, and (2) an exploration of the parent-facing HABIT oral health resources. The researchers initially posed the interview questions in English to the participants, and where the interviewee was not fluent in English or required additional support, the community worker translated the researcher's questions into the appropriate language in real-time. The interviewee's responses were then translated back into English by the community worker. The participants were encouraged to employ the "Think Aloud" technique (16). Guided by the topic guide, this allowed participants to verbalise their thought processes in real time, thereby gaining deeper insights into their perspectives and understanding of the subject matter. Following each interview or focus group, the researchers conducted field notes and debriefed.

To ensure an iterative process, the HABIT resources were edited and improved in real time. Any adjustments were then highlighted within the following set of interviews and focus groups for further feedback and revision suggestions.

2.4 Analysis

Focus groups and interviews were recorded, and the English content of the discussions was professionally transcribed verbatim. Transcripts were checked and anonymised before the data was analysed at a semantic level using the following steps of Thematic Analysis (15):

1. Familiarisation
2. Coding
3. Searching for themes
4. Review themes
5. Defining and naming themes
6. Producing the report

During familiarisation (phase 1), the data was actively read in search of meanings and patterns before coding using NVivo (phase 2). The coding of the initial interviews was undertaken by AC, and as the study progressed to focus groups, the second researcher (AS) joined, contributing to the refinement and coding of the subsequent interviews and focus groups. The next phase involved refocusing on a broader level at "themes" rather than individual "codes" (phase 3) before reviewing (phase 4). Each theme was then refined and explicitly named, aiming to capture the essence of each theme (phase 5). Theme identification was derived solely from the data and was undertaken by AS under the supervision of AC. Each phase was reviewed by both researchers to facilitate analytical rigour, to ensure consistency and to discuss emerging themes, before collaborating for the final defining and naming of themes in phase 5.

3 Results

3.1 Overview

In total, 24 individuals took part in the study, and reasons for non-participation were not sought. Further demographics are

TABLE 1 Participant demographics.

Ethnicity	Total participants	Those requiring interpreting services	Gender		Familial role		
			Male	Female	Mother	Father	Grandparent
South Asian	12	8	1	11	11	1	0
Eastern European	12	12	3	9	8	3	1

provided in Table 1. Interviews with parents ($N = 7$) took place between February 2021 and June 2021, during a peak wave of the COVID-19 pandemic, by one researcher (AC). A total of four focus groups with parents ($N = 17$) took place between November 2021 and December 2022 and lasted between (20–35 min). Of those focus groups, there were two groups of 5 parents, one group of 3 parents and one final group of 4 parents.

In evaluating the broader accessibility of the HABIT resources, three main themes were developed (1) Navigating linguistic barriers, (2) Parental engagement through visuals, and (3) Addressing oral health challenges. The themes and subthemes can be found below in Table 2. How the themes from the thematic analysis directly informed the enhancements of the HABIT resources are then outlined. For consistency and ease of reference in this paper, all participants will be collectively referred to as "parents".

TABLE 2 Themes and subthemes.

Theme	Subthemes
1. Navigating linguistic barriers	1a. Use of Google Translate to interpret HABIT resources
	1b. Seeking assistance from family and wider community members
	1c. The role of visuals to help interpretation
2. Parental engagement through visuals	2a. The role of visuals to help to reinforce key HABIT messages
	2b. Resources need to be short and concise
	2c. The resources should be visually pleasing
3. Addressing oral health challenges	3a. Children being resistant to toothbrushing
	3b. High sugar consumption within the wider family and community
	3c. Difficulty accessing a dentist

3.2 Theme one: navigating linguistic barriers

Parents employed diverse strategies to interpret the HABIT resources, including Google Translate, help from family and wider community members and visual aids. These strategies underscore the critical need for HABIT resources to be available in an individual's first language, ensuring better understanding of the content and messages conveyed. As one interpreter explained:

> *Interpreter (I): "She'd [i005] only really understand it if it was in her language."*

3.2.1 Use of google translate to interpret HABIT resources

One prominent sub-theme was the use of digital interpretation tools. Parents frequently described how they used Google Translate as a primary method for interpreting the HABIT resources. This was a necessity due to the language barriers:

> *Parent (P): Yes, be better maybe in Romanian language maybe, it is better…it's normal use translate.*

> *I: Okay, so is that how you normally do it, you put it in Google Translate. That's really good…do you all have the access?*

> *P: Yeah, every single person got the access to the [Google Translate]" - Focus Group 25.10.21*

The parent's response, "it's normal use translate", indicates Google Translate is a common and accepted practice, where "every single person got the access to the [Google Translate]" suggests the widespread availability and accessibility of this tool within their community. The need to use Google Translate highlights a gap in the HABIT resources, specifically the absence of built-in language translation features within the website. Subsequently, the HABIT website incorporated a translation feature, aiming to reduce dependence on Google Translate and help understand the content of the website (see Figure 1).

For the leaflets, a specific section has been added to encourage parents to use Google Translate. For the videos, a translation feature has been embedded. This allows parents to access the content in their preferred language using YouTube's translation capabilities. This integrated approach across the website, videos and leaflets ensured language barriers were minimised and acknowledges the community's widespread use of the Google Translate App (see Figure 2).

3.2.2 Seeking assistance from family and wider community members

Another subtheme highlighted how parents with LEP may seek assistance from family members, friends, or community members to translate the HABIT resources.

Some participants highlighted broader health barriers, particularly when understanding written communication from a wider range of healthcare professionals, such as GPs. One parent shared an example of this:

> *P: Because when it's like the [GP] letter…anything I can't understand, I ask some people here, my children or my friends who understand English, they can explain me everything, yeah. No, I have support people here, they can tell me anything I can't understand, so that is no problem, yeah. - i003*

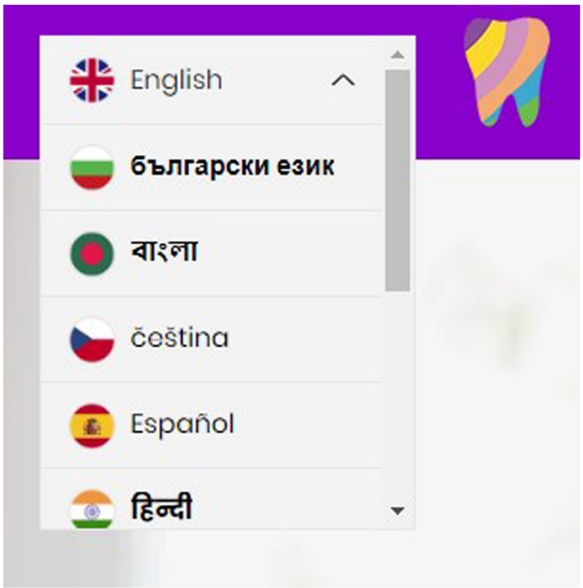


FIGURE 1
Embedded translation tool within the HABIT website.

How to find a Dentist

To find your closest NHS dentist, scan the QR code below

https://www.nhs.uk/nhs-services/dentists/how-to-find-an-nhs-dentist/

FIGURE 2
A screenshot of google translate on the HABIT leaflet.

This narrative reflects the reliance on informal support networks to translate health resources and demonstrates the roles within families and the wider community. It is particularly interesting to note how children often became important in this translation process, with children supporting their parents in navigating language barriers. Parents similarly reported their experiences with community members for translation assistance:

> *I: "Some can understand even they just see the video, but I can translate it, but it's okay in the video because video we can see everything." - i003*

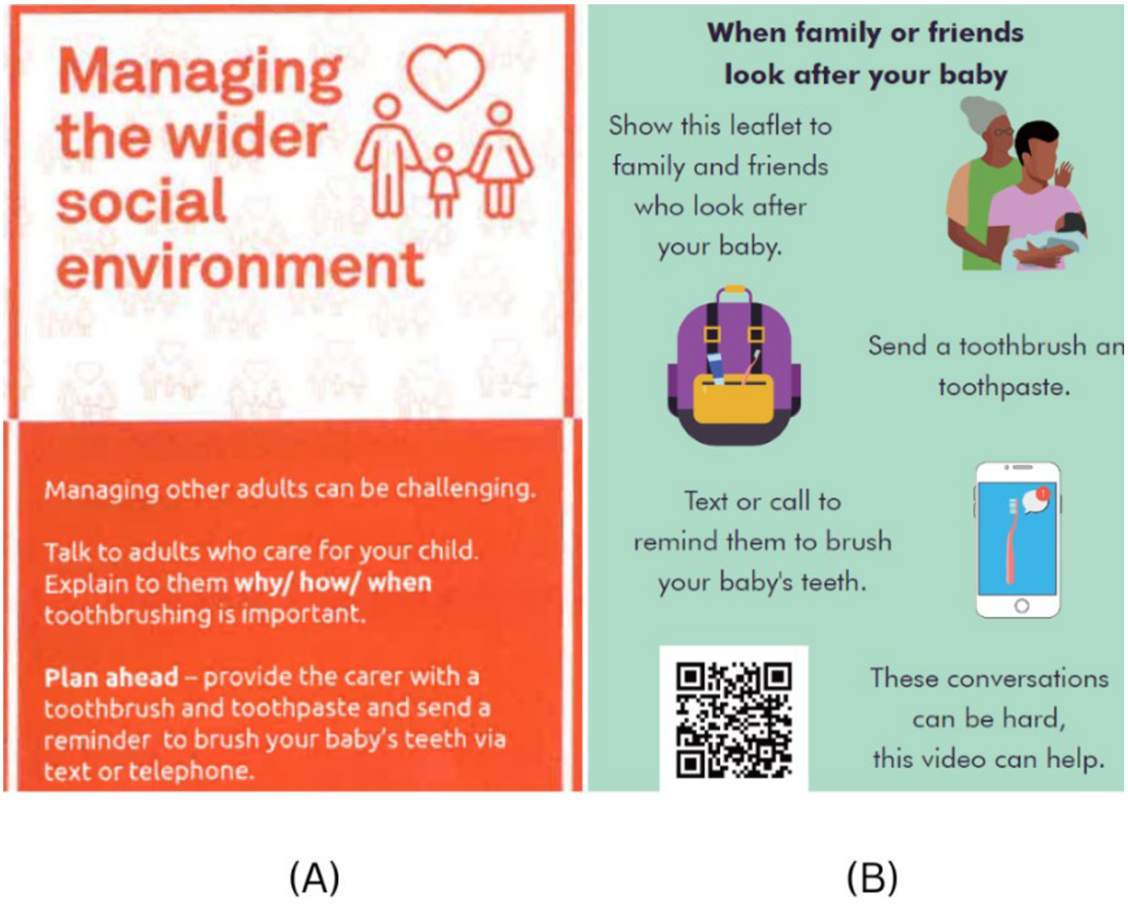
Both highlight how support networks can help overcome language barriers. The support from younger family members, particularly, highlights the need for HABIT to be accessible and understandable across different age groups and language abilities. This included simple language choices and avoiding complex dental terminology. Figure 3 demonstrates how the language in the HABIT resources was simplified to be clearer and more concise. This, in turn could facilitate easier translation, particularly by younger family members who may play a crucial role in interpreting the HABIT resources for parents. The leaflet was evaluated utilising the widely used Gunning FOG (Frequency of Gobbledygook) index to ensure that the resources reflected an appropriate readability level for the target audience, with a final score of 5.08 indicating accessibility to those with a reading age of below 11 years old (17).

3.2.3 The role of visuals to help interpretation

This sub-theme highlights the significant role that visual aids (including images and videos) had in interpreting the HABIT resources, particularly in overcoming language barriers. Parents specifically pointed out that when textual content within the HABIT resources posed challenges in translation or interpretation, visual components helped with their understanding:

> *P: "For one example, looking the video, no need speaking. Because you understand without talk. Image explain everything." - Focus Group 25.10.21*

The narrative suggests that visuals, particularly the video resources within HABIT, helped communicate oral health messages in a universally understandable way. The parent's narrative that "image explains everything" highlights how visual aids can provide clear information, reducing the reliance on text-based explanations and therefore linguistic barriers. As such, further enhancements were made to ensure that the visual components were not only clear, but also directly aligned with the spoken language. For example, instead of displaying a range of drinks the visuals now illustrate just water and milk when discussing drinks that are safer for the teeth.



Managing the wider social environment

Managing other adults can be challenging.

Talk to adults who care for your child. Explain to them **why/ how/ when** toothbrushing is important.

Plan ahead – provide the carer with a toothbrush and toothpaste and send a reminder to brush your baby's teeth via text or telephone.

When family or friends look after your baby

Show this leaflet to family and friends who look after your baby.

Send a toothbrush an toothpaste.

Text or call to remind them to brush your baby's teeth.

These conversations can be hard, this video can help.

FIGURE 3
Example screenshot of both the previous (A) and recent (B) versions of the HABIT leaflets.

3.3 Theme two: parental engagement through visuals

It became evident that visual aids were not only essential for aiding interpretation but could also influence parents' willingness to engage with the resources. A key aspect was how these visuals were presented, including the length and complexity of visual materials and their overall aesthetic look.

3.3.1 The role of visuals to help to reinforce key HABIT messages

Parents for example, suggested that visual aids could help reinforce the key messages of the HABIT resources:

> *P: "you know, like in some, usually they have those diagrams in dentists and stuff, like sugar, and have like of course not to eat, like basically telling you not to eat that and that's bad for your teeth, so like, what's good for your teeth and what's bad for your teeth"- i002*

The parent's reference to diagrams commonly seen in dental clinics demonstrates how parents may favour clear, illustrative diagrams. Their recollection of these specific diagrams indicates not only an understanding of the content but also their engagement with the dental resource. The parent remembering these visuals from a dental setting suggests that such diagrams effectively capture attention and reinforce oral health messages. This was similarly shared with another participant when discussing the HABIT videos:

> *P: "It's okay in the video because video we can see everything because they show in the video, it's very good, because they show us what is good and what is bad. Which is the health food and which is the bad food, no."- i003*

This parent's preference for the video format indicates its potential as an engaging and informative tool. The positive responses to these formats meant that the HABIT resources were further refined to ensure that the videos were easy to access and that the QR code linked to the video was included on the leaflet. Furthermore, the leaflet was further enhanced to include diagrams and visuals alongside key oral health messages. Figure 4 showcases part of the updated HABIT leaflet, where a corresponding visual aid accompanies each key message. For instance, the message “only use a smear of toothpaste” is visually represented by an image of a toothbrush with the correct amount of toothpaste. This imagery is illustrative and instructive, providing a clear image of the recommended amount. Such visuals contribute to the overall appeal of the leaflet, making it more engaging for the parents to review and follow. This not only captures immediate attention but could also help to reinforce vital oral health messages, making them more accessible and memorable for parents.

3.3.2 Resources need to be short and concise

Another aspect of the HABIT resources, as highlighted by parents, was the need for short and concise information, especially within the HABIT videos:

Start to brush your baby’s teeth as soon as their first tooth appears.

Brush your baby’s teeth last thing before bedtime and one other time in the day.

Brush all sides of each tooth, don’t forget the back ones.

FIGURE 4
Example of HABIT leaflet “Brushing your baby’s teeth”.

> *P: "I think four minutes too long, because basically, the message in it and it's, you can tell by straight away, the first two. It's nice to hear the people, but it's the same thing innit, the importance of brushing the teeth, the effects long-term" - i007*

The parent perceived the initial part of the video as sufficient for conveying the essential message, implying that prolonged repetition may lead to parents not watching the rest. While the participant valued hearing from other parents, the narrative highlights how these should be carefully integrated. As such, the HABIT resources were adapted to ensure that videos were shortened to an average of two minutes, focusing on delivering the key messages in an engaging format that succinctly conveys the key messages.

3.3.3 The resources should be visually pleasing

As expressed by parents, an essential aspect of the HABIT resources was the need for these resources to be informative and visually engaging. This preference underscores the role of aesthetic appeal in capturing and maintaining interest. Through an interpreter, one participant provided valuable insights into this by comparing the HABIT leaflet with traditional, text-heavy GP letters:

> *I: [i004] doesn't like the usual letter, it's just full of lines and, you know, you're not really interested because you can't understand it anyway, so if it's short and big words, like headlines, then it would be a lot easier for them to understand.*

For parents with LEP, lengthy documents filled with dense text could potentially be overwhelming and difficult to engage with. The participant's comment about preferring "short and big words, like headlines" suggests that breaking down information into smaller, easily digestible segments can significantly enhance understanding and engagement. Headlines or key points in larger fonts can help convey essential messages without overwhelming parents, a sentiment shared by another participant:

> *I: "Firstly, she [i004] says pictures would make it easier, but then even writing, if you give a big heading, like in bold, and then give, like, tips underneath that, then it probably would be better."*

These recommendations highlight the importance of combining visual elements, like pictures, with clear and concise written content. This could potentially help prevent parents from becoming disinterested, as suggested by this participant. As such, the HABIT resources were further refined with key design elements that improve visual clarity and appeal (see Figure 5). This included key messages that were headlined with phrases such as "your baby's teeth are important" to draw attention and provide a quick, clear understanding of the topic. In addition to the textual changes, the visual aspects of the resources were also enhanced. The imagery and colour schemes were carefully selected and revised to make the resources more visually engaging.

3.4 Theme three: addressing oral health challenges

This theme captures the barriers experienced by parents in maintaining their children's oral health. These include difficulties in managing children's resistance to toothbrushing, navigating high sugar consumption within their wider family and community settings, and accessing dental care services.

3.4.1 Children being resistant to toothbrushing

When discussing their experiences with toothbrushing, many parents in the study shared instances where their children showed a lack of interest or resistance to engage in toothbrushing:

> *P: "morning for example, if I wake up now, she wouldn't wanna brush her teeth. She'll say to me she'll do it later or, and if I do try and encourage her, she'll just for a couple of seconds, she doesn't wanna brush it for longer."- i002*

Interestingly, this participant's narrative suggests that toothbrushing is perceived as a task which can be postponed or negotiated rather than an essential part of their routine. The parent's attempt to "encourage her" to brush her teeth highlights the role of parents to motivate their children to develop good oral health habits. A significant challenge highlighted in this narrative, and shared by many, was ensuring that their children brushed their teeth for the recommended length of time. The participant further elaborated on this challenge and described how this became more difficult as the child grew older:

> *P: "I could only go with my personal experience, you know, that kids sometimes they're reluctant to brush their teeth, or not brushing it long enough, because with my little one, at first she was really good, she was brushing from top to bottom, her back teeth, but now she just puts it in her mouth and she won't brush it for long, she doesn't like it now."- i002*

This account illustrates the transition from a parent-led to a child-led toothbrushing routine. In the initial stages, the participant was actively involved in supervising the toothbrushing process, as evident from her description of her child brushing "from top to bottom, her back teeth". As her child grew older, however, a shift was observed. The child's approach to toothbrushing changed as she became more independent but less thorough, which was shown by the child putting the toothbrush in her mouth and brushing for a shorter duration. While parents were aware of their roles in motivating or reminding their children, they also acknowledged that toothbrushing may not be done consistently or thoroughly. This was reflected by other participants:

> *I: "She [i004] says to the kids to brush their teeth and they find it quite boring."*

Baby teeth are important for eating and speaking.

Baby teeth are important for smiling and confidence.

Getting into good routines with your baby will help when they grow up.

You can help stop tooth decay so your child has a healthy smile for life.

FIGURE 5
Images included on the "Your baby's teeth are important" section of the HABIT leaflet.

The refinement of the HABIT resources, informed by the findings from participant narratives, focused on two key aspects: the importance of parents brushing/assisting with their child's toothbrushing, and the need for strategies to make brushing more engaging for children. Firstly, the updated HABIT resources underscore the importance of continued active parental involvement in the toothbrushing process, even as children grow older and seek more independence. This is reflected in the recent update to the UK's Delivering Better Oral Health (DBOH) guidelines (5), where the use of the word "supervised", which is relatively ambiguous, has been replaced with the more direct instruction for active participation; "adult involvement ensures the correct amount of toothpaste is used, enables them to prevent children eating or licking toothpaste from the tube and that all teeth are brushed thoroughly". The HABIT resources have remained consistent with this messaging throughout. All videos and images used clearly displaying the parent actively brushing their child's teeth, and any related language making it evident that this level of engagement in brushing is necessary.

Secondly, the strategies to make toothbrushing a more positive and engaging activity for children have also been further refined, by incorporating interactive and educational content. This refinement was determined and developed based on participant feedback and insights gathered during the study. The website offers fun and informative play ideas for making oral hygiene and healthy eating more interesting for children and encourages the adoption of healthy habits in a way that is enjoyable for the whole family. These elements are also integrated throughout the leaflet and videos. Making the toothbrushing experience more enjoyable for children enables better support for parents and caregivers, thereby enhancing the overall effectiveness of the resources. This development process ensures that the HABIT resources are user-friendly and effective for these communities.

3.4.2 High sugar consumption within wider family and community

Parents frequently discussed the challenge of managing their children's sugar intake within the broader context of family and community dynamics. Their narratives underscore the complexities and barriers encountered in managing the consumption of sugary foods and drinks. One participant highlights these challenges:

> *P: "I'm not buying too much candy but my husband, when he go out anytime, he bring the candy and you know like, sweets, you know. So this is not, it's not nice, so he give the children, so that's why she have this problem."- i003*

Despite one parent's efforts to maintain a healthier diet, her child's tooth decay was identified as a consequence of her husband's actions. Her expression, "it's not nice", not only conveys her dissatisfaction but also underscores her recognition of the direct impact these sweets had on her child's dental health. This phrase, coupled with the frequency implied by "when he go out anytime", heightened the sense of frustration and lack of control she felt. This conflict within the household reflects a broader challenge parents described, managing not only their practices but also navigating the differing approaches of other family members and cultural norms.

3.4.3 Difficulty accessing a dentist

Parents encounter several barriers trying to access an NHS dentist. The narrative from one participant who faced difficulties in accessing affordable dental care in England, is indicative of the broader challenges encountered by parents in obtaining treatment:

> *"I: Do you see the dentist here? [England]*

> *P: No. Here is very expensive, you have to go Romania.*

> *I: So you normally go to Romania to see the dentist?*

> *P: Yeah." - Focus Group 01.11.21*

This narrative highlights cost as a barrier to accessing dental care. Interestingly, this participant found it more feasible to travel to another country for dental services, underscoring the challenges some parents had finding affordable dental care locally.

Similarly, other parents described their difficulty in accessing dental care for their children:

> *P: "One of the elder children have got a lot of problems with teeth and they need a dentist, they're not getting the dentist." – i006*

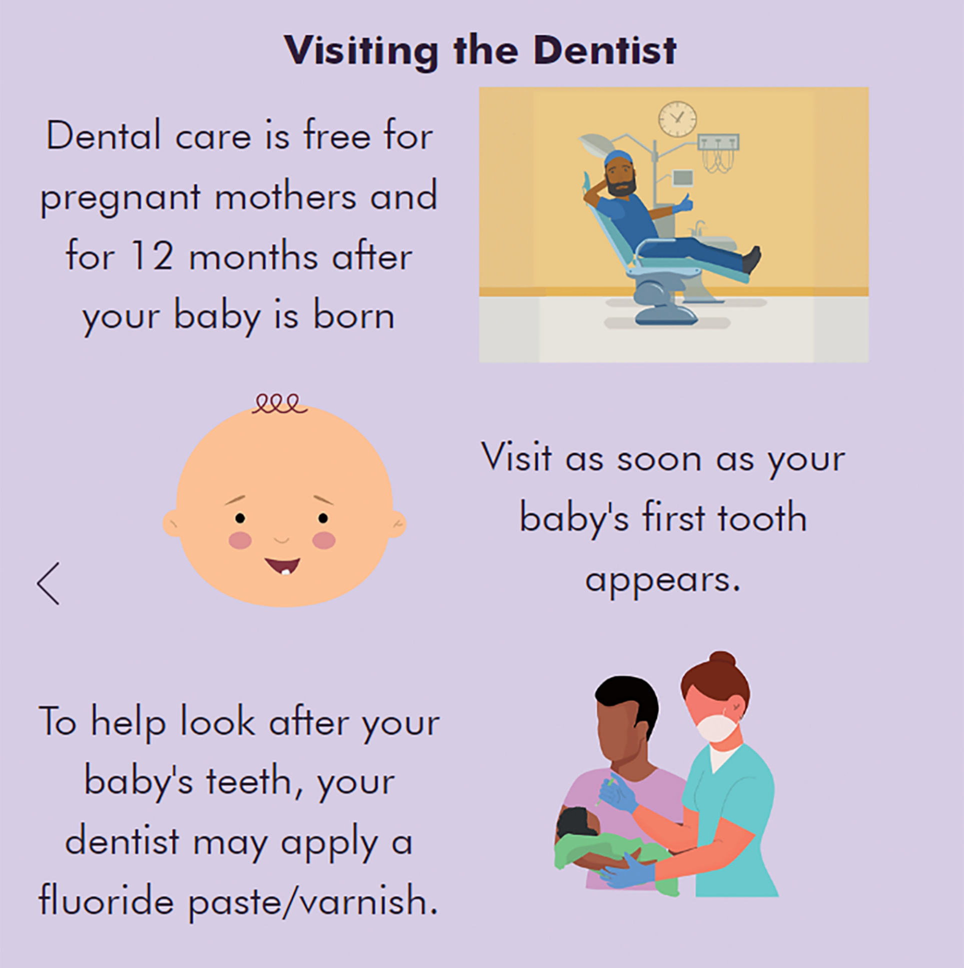
The narratives from the study highlight a gap in awareness among parents about the availability of free or lower-cost dental care options within the NHS. More specifically, parents are unsure how to access these services in urgent situations when a child is experiencing dental pain. Parents may not be fully informed about the NHS provisions that offer free dental care for children up to the age of 18 years, expectant mothers, and those who have given birth in the last 12 months.

The enhancements made to the HABIT resources were refined to reflect the identified needs and gaps in knowledge among parents with LEP. This included information about dental care being free (see Figure 6). This information is crucial as it clarifies dental access for expectant and new mothers, encouraging them to seek necessary dental care without the concern of cost barriers. The leaflet has therefore been updated to provide clear instructions on how to find a dentist, including information on accessing emergency dental services, particularly for children in pain (see Figure 6). Furthermore, a new video was created to specifically address the process of going to the dentist. This visual guide is designed to cover the key areas of concern for parents and to set expectations for what a visit to the dentist entails, making the information more accessible and engaging.

These findings underscore the difficulties that parents face while instilling good oral health habits in their children. Their actions and intentions can both be influenced by behavioural resistance, their broader social environments, and the systemic barriers to healthcare access that are often experienced.

4 Discussion

This study aimed to explore and enhance the accessibility of the HABIT resources for parents and guardians with LEP. The findings provided insights into the cultural, linguistic and health-related factors experienced by two communities identified as at a heightened risk of tooth decay (South Asian and Eastern European). It was clear that challenges surrounding engagement with the HABIT resources extended beyond language to the wider oral health barriers unique to each group, and these insights consequently played a crucial role in the refinement of the HABIT resources. These adaptations ensured that the intervention remained relevant and responsive to the evolving needs of the local population for which it was targeted. This was



Visiting the Dentist

Dental care is free for pregnant mothers and for 12 months after your baby is born

Visit as soon as your baby's first tooth appears.

To help look after your baby's teeth, your dentist may apply a fluoride paste/varnish.

FIGURE 6
Signposting to dental services included within the HABIT leaflet.

achieved through extensive community engagement, thematic analysis, and iterative modifications including simple text, translation tools, visual aids and shortened videos.

High sugar consumption was identified as one key barrier to oral health for both communities. For both South Asian and Eastern European communities, the high sugar consumption reported by parents is often not solely a dietary choice and can be deeply rooted in cultural norms and traditional customs (18, 19). The current study found this was often influenced by wider community members. Furthermore, Roma communities globally experience additional obstacles to healthy eating such as low incomes, lack of time, and difficulties in accessing appropriate preparation facilities (18, 20). It is evident that traditional health messages highlighting the impact of high sugar consumption (such as those seen in the initial version of HABIT), may not reach communities with LEP (21). This indicated a need to refine HABIT to be more culturally aligned with the unique traditions and experiences of these diverse communities, and calls attention to an area that wider health interventions need to be mindful of when addressing the broader barriers prevalent within a local context. By doing so, this approach ensures that health interventions are both effective and culturally sensitive, thereby enhancing their acceptability and impact within these specific population groups.

The current study also found that individuals with LEP used various methods to navigate and understand the HABIT resources. Similar to Pandey et al. (14), who explored immigrants with LEP experiences of healthcare access, the current study found that parents with LEP relied on language interpretations from their family or individuals within their community. Interestingly, however, our findings identified that children were frequently asked to interpret health resources. Pandey et al. (14) noted that the reliance on untrained interpreters such as family members or others from the community can lead to misinterpretation. The involvement of children in this role further heightens this risk, especially when traditional health resources may involve complex dental/medical terminology (22). Family members, however, may be the only available interpreters for those with LEP, and while non-professional interpretations may not be optimal, they are practical in lieu of other options for accessibility. Recognising this, enhancements were implemented in the HABIT resources specifically to support young interpreters, including simple language and readability checking. These modifications, which can be applied to broader health interventions, aim to ease the reliance on children and ensure that health messages are accurately conveyed to, and understood by, adult community members.

As professionals working within the community, Health Visitors are in a good position to help harness the collective experiences of vulnerable groups to identify and develop solutions that address their unique needs (23, 24), which can be extended to those with LEP. While translation apps like Google Translate were highlighted as useful tools in bridging language gaps (25), they do not replace the direct, meaningful conversations facilitated by Health Visitors. These professionals play a vital role in ensuring that health messages are not only accurately conveyed, but also understood in their intended context. The current study indicates that the integration of visually engaging resources, such as those enhanced for the HABIT intervention, is an important part in this process. Highlighting the importance of visuals to capture attention (through the use of colours), help with memory retention (through the use of imagery) and facilitate understanding (through the use videos), the study suggests that these types of resources could be a powerful supportive tool for Health Visitors to utilise when conveying oral health messages to those with LEP.

Recognising the involvement of family and wider community members for parents engaging with health information is also crucial, and in being aware of these dynamics Health Visitors can tailor their conversations more effectively. Within this context, testing interventions such as HABIT in parent and family-led activities could support the continued co-design of more effective resources. Parent-driven methods in peer groups can facilitate the exchange of both knowledge and support amongst wider family members and communities (26), which would encourage a more inclusive approach to oral health education. Leveraging community readiness in this way should contribute towards closing the current disparities in healthcare communication and accessibility, empowering community members by ensuring their voices and perspectives are integral in shaping the solutions that affect their lives.

In strengthening community action through active engagement, health practitioners can foster environments where health information is not only more accessible, but also more relevant to the specific needs of the population. This approach aligns with the principles of the Ottawa Charter (27) and emphasises the importance of participatory health promotion strategies. Critically, it underscores the significance of considering the socio-cultural contexts in which health behaviours occur, which should enhance the effectiveness of health interventions and ensure that they are both equitable and sustainable.

4.1 Future directions

Looking towards future enhancements of the HABIT intervention, an integrated approach across the early years services across the Bradford district will be a significant focus. Expanding the reach of the resources into community centres, family hubs, preschools and local clinics will increase its impact and ensure a more diverse audience, so with this in mind, the value of HABIT within other early-years settings is an area to be explored. Coordinating an integrative strategy will require consistent training for a range of professional disciplines and effective communication across the various stakeholders involved.

Longitudinal studies and service evaluations will also be required to assess the long-term impact of the accessible intervention on oral health behaviours and outcomes. The original feasibility study of HABIT reported improvements in plaque reduction and oral health behaviours. Tracking changes in oral health practices within vulnerable communities as a direct result of accessible interventions will provide further opportunities for evaluation.

4.2 Strengths and limitations

The inclusion of South Asian and Eastern European communities, typically underrepresented in oral health research, is a significant strength of this study, as these communities are at high risk of tooth decay (28). Working closely with neighbourhood engagement workers and community organisations, such as Better Start Bradford, significantly enhanced the recruitment and engagement process and led to meaningful adaptations in the research methodology. The use of WhatsApp as a communication tool was a suggestion from our partners, given they worked closely with these communities and were aware of their preferences. Future research should welcome the opportunities that similar collaborations can bring, as this can help to ensure communities are not overlooked in research and are given both a voice and an opportunity to participate. Overall, this works to ensure that the outcomes of the research are culturally relevant and prevent the widening of health inequalities.

Despite challenges posed by the COVID-19 pandemic which delayed recruitment, the study utilised WhatsApp videos to undertake interviews. This relatively novel approach in traditional qualitative research not only maintained communication throughout the pandemic, but also leveraged WhatsApp's widespread use throughout communities to enhance engagement with underserved groups. While this is considered a strength of the study, the limitations should be noted. Firstly, the use of WhatsApp meant that participants required a stable internet connection. Our discussions with research partners indicated that these communities frequently used WhatsApp, in preference to other digital platforms such as Zoom, Teams and Googlemeet. This meant that only individual interviews could be offered through WhatsApp as it is designed for individual communications or small group interactions and therefore impractical for larger focus groups. Once COVID-19 restrictions were lifted, alternative face-to-face methods were introduced. This shift aimed to accommodate those who might have been unable or unwilling to participate using this digital format. Recruiting participants through neighbourhood engagement workers and community organisations may also have limited participation to those who were actively engaged with the services and the activities Better Start Bradford provided.

Nevertheless, the use of inclusive methodologies like WhatsApp and collaborations with community networks played a significant role in enabling underrepresented communities to participate in oral health research. This approach demonstrates the value of adapting research methods to the preferences and needs of the community, thereby making studies more inclusive. By using both digital and face-to-face methods, and by working closely with community partners, the study was able to reach a broader cross-section of the community, enhancing the representativeness and inclusivity of its findings in the context of oral health.

5 Conclusion

Three key themes were identified when exploring the accessibility of the HABIT oral health resources for parents with LEP, and included navigating linguistic barriers, parental engagement through visuals, and addressing oral health challenges. The complexities of systemic barriers and cultural nuances were evident throughout and highlighted the impact of these experiences on the parent's overall access to oral health information and dental care. The findings derived from this study emphasised the importance of supplementing the existing HABIT oral health conversations between Health Visitors and parents with resources using an enhanced multimedia approach; prioritising culturally appropriate strategies that were easier to engage with for an audience with varying levels of English. Ultimately, this led to the significant refinement and improvement of the HABIT resources.

Author's note

PD and KG-B are the principal investigators for the grant and with co-applicants (AC, TZ and AS) oversaw the design and delivery of the research. EF and AC led the writing of the manuscript with major contributions from KG-B and PD. RF led the facilitation of the interviews and acted as a Project Oversight Manager.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by University of Leeds Dental Research Ethics Committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

AC: Writing – original draft, Formal Analysis, Investigation. AS: Data curation, Formal Analysis, Investigation, Writing – review & editing. EF: Writing – original draft. TZ: Writing – review & editing. RN: Writing – review & editing. KG: Writing – review & editing. PD: Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/froh.2024.1392388/full#supplementary-material

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Co-designing a film showcasing the dental experiences of community returners (ex-offenders)

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Background: The oral health of over 90,000 individuals in UK prisons is four times worse than the general population. A recent scoping review on the oral health of prisoners inside the justice system highlighted the lack of research about what happens when they transition out of prison to become community returners.

Objectives: To co-design a film to showcase the dental experiences of community returners before and after they transition out of prison, change perceptions and inform oral health research priorities.

Methods: This action research involved five community returners, recruited through third sector organisations, who attended virtual workshops. Participants in the first workshop designed the storyboard; community returners incorporated their own stories into fictional characters to portray their lived experiences. They developed the character stories and wrote the script in the second workshop. A community film production company produced the film and used professional actors who had contact with the justice system to depict the characters in the film.

Results: The final film, titled “My Story, My Words, My Mouth” explored themes such as self-care oral health behaviours, dental care provision in prison, access to healthcare, stigmatisation, disclosure and improving oral health to support societal reintegration. The film was screened at an open event for stakeholders and included a question-and-answer session and recorded videos where viewers shared their feedback to inform future research projects.

Conclusion: Co-design can be an empowering platform to hear the voices of community returners. Using the medium of film an oral health promotion tool can build understanding about the oral health needs of underrepresented groups. This egalitarian and power-sharing approach can also provoke critical discussion and actively involve underrepresented people in research that impacts their lives to develop strategies, to set priorities and improve their oral health.

KEYWORDS

community research, patient and public partnership, co-creation, co-design, catalyst film, participatory action research, arts-based research methods, social exclusion

1 Introduction

Release from prison is a challenging time for ex-offenders, more positively referred to as community returners (1). Community returners face substantial health inequalities with higher mortality and morbidity risks than the general population (2–5). People who have experienced incarceration also have higher levels of mental health disorders, higher rates of suicide (6, 7) and those within prison experience dental decay at four times the rate of the general population (8). The transition period for people struggling with substance misuse issues can also make them increasingly vulnerable to overdose or relapse (9, 10). Despite these inequalities, community returners are less likely to access health services because of multiple barriers (11). Some of the reasons cited in the Care for Offenders Continuity of Access report are; past experiences of breakdowns in trust, being homeless, having a disordered lifestyle, long waiting times to be seen by healthcare services, negative perceptions of healthcare and a lack of flexibility from healthcare services (12, 13). Freeman et al. found in their qualitative research that community returners often do not access dental services because of fear of being judged or discriminated against by dental healthcare professionals (14). However, contact with the criminal justice system provides an opportunity for individuals to engage with healthcare and adopt health promoting behaviours while they are in prison in many countries (15). As oral health plays an integral role in an individual's self-confidence, ability to socialise, seek employment and their overall wellbeing, good oral health is essential in supporting community returners to successfully navigate life on release from prison (16–18). While there is some evidence about access to dental services for people in prison, there is a paucity of knowledge about the perceptions community returners have of accessing dental care on release and the feelings about their own oral health.

Film is an impactful medium that can be used as an alternative methodology to convey the complex intricacies of an individual's lived experience. Film has been used in several ways within health research to portray complex concepts, advocate for social change, capture current perceptions, promote discussion around sensitive topics and engage socially excluded populations (19, 20). Whilst film has predominantly been used within disciplines such as sociology and anthropology (21) this powerful methodology is translating through to health and dental research with the improvement of digital accessibility further enhancing this shift (19, 22, 23). Interestingly, a scoping review exploring the use of film in public health research showed that a quarter of the studies using film within their methodology did so to explore sensitive topics suggesting that this is an appropriate methodology to facilitate discussion around socially sensitive issues (23). Storytelling is an effective tool that can help raise awareness of public health messaging, advocate for community change and present a collective voice on complex issues which why it was selected as the methodology of choice to convey the dental experiences of community returners (24, 25).

Co-design is a process by which active collaborations are formed with stakeholders to improve or solve predefined health problems (26). A co-design approach acknowledges the value individuals with lived experience can bring to research (27). Those with a lived experience are best placed to guide research and shape health services to improve their health. Co-design uses a collaborative approach that requires a philosophical shift away from a traditional research hierarchy towards a shared decision-making model (28). The principle of co-design rests on actively involving those with lived experience to ensure that the end outcome meets their needs, expectations and has meaningful impact. It is believed that using a co-design approach can reduce research waste through narrowing the gap between the perspective of researchers and the expectations of the communities they serve (29). Furthermore, co-design can act as a powerful inclusion health tool to engage populations that have previously been "othered" and faced exclusion, with research being conducted about them rather than with or alongside them (30). The degree to which co-design is used can vary greatly from participation at the research design stage alone through to continued engagement throughout the entirety of a research project. With this, the aim of co-design varies, and it can be used as a tool to set research priorities, contribute to protocols, direct study design, or contribute to outcomes such as health education material (31). However, it is vital that co-design is embedded within research methodologies rather than being considered at a later stage or used as tokenistic engagement.

This paper describes a unique participatory action research approach used to co-design a film addressing the highly relevant oral health experiences of community returners. The aim of this paper is to showcase how a co-design approach can be used to create a catalytic film to bring the voices of those with a lived experience of the criminal justice system to the forefront. We describe the process of utilising connections with third sector organisations for recruitment, establishing power-sharing dynamics, providing participants with opportunities to develop new skills in script writing and using the medium of film to share lived experiences. This process is an example of how co-design can be used to facilitate inclusive collaborations to integrate the voices of those with a lived experience of the criminal justice into oral health research.

2 Methods

This patient and public involvement and engagement (PPIE) project utilised a co-design approach with the aim of creating a catalyst film to showcase the oral health experiences of community returners. A participatory action research methodology was used, community returners were empowered to stimulate change through the medium of film to improve awareness of the oral health challenges they have faced due to their history of contact with the criminal justice system (32). Participatory action research focuses on the purpose of enabling action, for this study the action output was the development of a film to showcase their lived experiences with the aim of stimulating conversation, raising awareness, and informing future research priorities. This approach was selected as it allowed participants to contribute data, in this case their lived experience which formed the concepts for the film, analyse these and then decide on which action should follow by way of determining the film content. This process was repeated as the initial outline of the film allowed for reflection and adaptation of the content by the participants, see Supplementary Information (S1). Participatory action research requires the researchers to have a conscious awareness of pre-existing power relationships and actively advocate for power to be shared with the community returners. This notion was fundamental to the ethos of this project and underpinned the design and execution of the study.

The Queen Mary University of London Research Ethics Committee (REC) were consulted, and ethical approval was not required as this was an engagement project (32). However, ethical standards were adhered to throughout with participants being sent participant information sheets prior to joining the project and signing informed consent forms (33). The upmost care was taken to ensure the confidentiality of those participating to allow them to have a safe space to freely express their views and share their experiences. Participants were offered the option to meet with the research team prior to joining the project and given the opportunity for the participant information sheet to be verbally explained to them prior to deciding whether they would like to take part in the project. In addition to this, the research team were mindful throughout the project of the importance of ensuring that the experiences generously shared by community returners were portrayed sensitively, respectfully and were an accurate representation of their lived experiences.

2.1 Recruitment

Community returners were recruited to join the project and co-design the film storyboard and script. Recruitment began in January 2023 and the research team used multiple approaches to present the opportunity to a range of community returners. There is a lack of information as to the best methodologies to use to recruit those who have had contact with the criminal justice system so to combat this several methods were used. Initially, third sector community partners (community and voluntary sector organisations) were used as gatekeepers to this cohort. There are several third sector groups who work closely with community returners to offer support in numerous ways such as providing employment opportunities, influencing criminal justice policy, offering mentoring, and supporting the families of people within the criminal justice system. Third sector organisations were contacted, provided with a brief of the project, and asked if they would be able to aid recruitment. The organisations varied in how they supported recruitment, some were able to reshare a recruitment advert on their established social media pages, others published the opportunity in their newsletters disseminated to those they support and a couple of organisations hand selected individuals through support workers that they felt would be interested in the opportunity. In addition to recruiting through third sector groups, a flyer advert was created which was shared on social media. A snowballing approach was also used by which those who were interested in taking part in the project were welcomed to invite peers.

2.2 Workshop one—identifying oral health issues

The aim of the first workshop was to bring community returners together to discuss which topics surrounding oral health they wanted to depict in the film and how they wanted to present them. The research team met prior to the workshop to outline the first workshop structure. Both workshops were hosted virtually via Microsoft Teams and participants were given a £75 voucher for each half day workshop they attended. This monetary value was set to adhere with the National Institute for Health and Care Research's payment guidance for researchers and professionals (34). The voucher type chosen was selected as it allowed participants the most freedom in where they were able to use the voucher. It was decided that the workshops would be hosted virtually to give attendees the option of using pseudonyms and keeping their cameras turned off so that they had the option of remaining anonymous to other attendees. Special consideration was taken to ensure that potential participants were not digitally excluded by providing the option of paying for data to allow attendees to take part using a mobile phone if they did not have access to a laptop or the internet. Consent was taken from the participants to record both workshops through Microsoft Teams. The purpose of recording the workshops was to ensure that the community returner contributions were accurately recorded in the film contents and script. Once the script had been finalised these recordings were deleted and none of the content was formally thematically analysed. Outputs were also documented by a member of the research team present at each workshop who acted as a notetaker.

Prior to workshop one an online pack was sent to attendees Supplementary Information (S2). The pack included a brief overview of the project, the agenda for the workshop, examples of previous films created by the film production organisation and another film discussing prison health (35). These resources were sent along with thought-provoking questions about the potential styles and storyboards that could be used for the film. The storyboards were used as a prompt for discussion in the workshops as well as being a necessary step required in creating a film. The pre-workshop pack helped to communicate with participants what to expect in the first workshop and set clear aims for the workshop.

During the first workshop a short presentation was given by the research team to attendees to introduce the project, the research team, and the aim of workshop one. It was emphasised that the aim of the first workshop was to determine which issues the community returners felt were important to present to the audience, the style of film they wanted and to outline the storyboard for the film. Ground rules were established early in the workshop following the introductions. The emphasis for these ground rules were on ensuring participants understood that this was a co-design project, all opinions are equally valued, the thoughts of others respected even if they differ from that of another participant and that personal experiences shared in the workshops should remain confidential. The only exception to the rule of confidentiality was in the case of any adaptations of experiences individuals volunteered to be put forward to be included in the film storyboard or script. Establishing these ground rules helped to facilitate an environment in which everyone involved with the project felt able to communicate their thoughts knowing that their ideas would be respected and valued. The workshop lasted half a day and was facilitated by two members of the research team.

2.3 Workshop two—telling the stories

The second workshop was held one month following the first workshop and all those who attended the first workshop were invited to join. As with the first workshop a pre-workshop pack was sent to attendees via email, this pack was put together by the research team and included aspects for the group to consider suggested by the film production organisation (S2). The pre-workshop pack for workshop two contained the aim for the workshop, the agenda, a summary of the storyboard that was decided in workshop one and the outline of the characters that would feature in the film based on the discussions from workshop one. The aim of the second workshop was to write the script for the two community returner characters presented in the film. To best facilitate the co-writing exercise the group was split into two with three participants writing the content for one character and the remaining two participants writing the script for the second character. Each of these groups were facilitated by a researcher who acted as a scribe to document the scripts written by the participants.

2.4 Filming

The filming, production and editing of the film was conducted by the community organisation, Mile End Community Project (MCP) (36). MCP teaches film production to young people living in a deprived area of East London to equip them with the skills needed to better their own lives and the lives of those in their community. This organisation was identified through their existing connections with the Queen Mary University of London Public Engagement team who funded this project (37). Following the first workshop a member of the research team met with the film production company to discuss the storyboard for the film. Feedback was given by the film production company, Mile End Community Project, on the proposed storyboard design and the logistical aspects of capturing the desired content. This feedback was relayed to the community returners and considered when writing the script during the second workshop. The film production company were able to utilise their experience of working on previous community film projects to offer advice on aspects relating to filming. Two professional actors were hired through Synergy Theatre Project, an organisation that provides practical art experiences for community returners, individuals in prison, and those at risk of offending (38). As the two actors both had a lived experience of the criminal justice system, they were sent the scripts in advance and offered the opportunity to make adaptations to reflect their own experiences of being community returners. All filming was completed over the course of a single day in a variety of locations including a film studio, outside a tube station and in a dental hospital. Once filming was completed and the first draft was edited the research team offered their feedback to ensure the edit accurately reflected the content of the workshops whilst meeting the aims of the project. Evidence based facts published in existing academic literature were added to the film to provide a context to the character stories and included prior to the credits.

The final film was then viewed by the research team who identified six main themes and issues raised through the film by the community returners. These themes related both to historical factors that impacted the oral health of community returners and elements of their life on release that made achieving good oral health difficult. To illustrate each of these themes for consideration, quotes were extracted from the film transcript created by the film production company to add closed captions to the film. These themes and quotes are presented in Table 1 of the results section.

3 Results

The results of this project are presented in line with the key principles outlined in the National Institute for Health and Care Research (NIHR) Learning for Involvement Guidance for Co-producing a Research Project (39).

The content for the film was derived from suggestions provided by the community returner group and the lived experiences they shared with the group; this content has been summarised in Table 1. Five community returners were recruited, three females and two males. The community returners varied in how long they had been in prison, the categories of prisons they had stayed in, number of sentences served and time since release. During the first workshop during which the structure of the film was determined it became apparent that the community returners had a range of different oral health experiences. For example, some of the participants had been very motivated with strict oral health and wider health promoting behaviours prior to being convicted. Other members of the group reflected on how they had competing priorities prior to conviction and looking after their teeth was not *a priori*ty for them. This meant that whilst some individuals had entered prison with good oral health and having previously regularly accessed dental care, this was not the case for most of the group.

Although the focus of the film was to depict oral health experiences on release from prison, the group wanted to convey their oral health experiences whilst in the prison system and felt this was important to help the viewer to understand the challenges they experience on release. All participants spoke

TABLE 1 Themes explored in the film and associated reference in the film.

Themes explored in the film	
Themes explored	Reference in the film
Self-care oral health behaviours	"I would say the motivation, to look after myself changed, and everything's so expensive. You know, like I make, I make two pound a day. So when it comes to making a decision, do I buy toothpaste or do I buy phone credit? Speak to my family. It's…it's a hard decision to make."
Impact of poor oral health on general health	"Having all those teeth removed, screwed up my digestion."
Dental care provision in prison	"When I first came in, I put a request in to see the dentist. I had this excruciating pain in one of my teeth and just nothing happened. So, I just had to spend the time alone in the cell in agony for 18 months and then they moved us, I moved prison. So, I had to start the whole thing all over again. Right back to the bottom of a brand new list."
Stigmatisation	"I called up my old dentist. It took me weeks cuz I was, I was terrified. I was terrified of, what do you think? You know, where had I been? Or did he know where I was? If he did, what did he think? Cause I think about it, a lot. I think about going back a lot."
The role oral health plays in societal reintegration	"After lots of struggle and lots of dental appointments, I finally managed to get my teeth fixed. I'm at a better place now where I'm happy with my teeth and I'm confident to smile."
Community returners' experiences of not being able to access their prison health records after they returned to community settings, leading to embarrassment at having to disclose their prison histories to healthcare staff	Receptionist: "I'm really struggling to find you on the system. What was your last address?" Male character: "Um HMP… HMP Durham".

about the barriers they experienced in accessing regular dental care whilst in prison and one of these experiences is presented in the final film. Barriers discussed included being unable to get to dental appointments due to prison lockdown protocols, long waiting lists to get a dental appointment or dentists only seeing emergency cases and not offering routine care. The group also referred to the effects reduced access to dental care in prison had on their oral health on release. These implications extended to the wider consequences of poor oral health on their overall wellbeing such as impacting nutritional intake and contributing to decreased self-confidence.

Participants wanted to capture in the film how a community returner might feel accessing dental care for the first time on release. Individuals discussed the challenges around the practicality of obtaining a dental appointment when they are often no longer 'registered' to a dental practice or might have relocated to a new geographical area since their release. For those who returned to the same location on release they felt apprehensive about returning to a dental practice where the staff could be aware of their contact with the justice system. A common theme raised was how overwhelming exposure to busy areas can be and how challenging it can be to navigate getting to dental appointments. Both concepts were explained by the group as being due to the contrast from their confined and regulated lives in prison. They spoke about become accustomed to the sounds and daily routine of prison life and how different this is to their lives is on release as they re-gain their autonomy.

On the theme of disclosure, some of the participants shared with the group how they felt they needed to explain to dental professionals why their teeth had become so bad by disclosing their history of incarceration. Others did not want to disclose their criminal justice histories but felt cornered into doing so as they needed to explain why they had either breaks in the medical records or missing records. In relation to accessing both medical and dental care, participants explained that they often needed to discuss with receptionists why they might have either missing or outdated health records. When they were able to access care, a few participants spoke about needing to recap their medical health histories as the clinicians treating them were unable to see information relating to healthcare provided in prison. This created a feeling for the participants that they needed to continuously start from the beginning and lacked continuity in their medical and dental care.

3.1 Sharing of power

Power sharing was fundamental to creating a truly co-designed film that accurately represented the lived experiences of the five community returners. Power imbalances between academics and those with a lived experience can lie within hierarchical cultures, further compounded by wider socioeconomic determinants (39). If power imbalances exist, then those with a lived experience may feel unable to express their true views or there is the risk in co-design projects that the views they express are not actioned by the research team. One of the key steps in facilitating the sharing of power was setting clear expectations and ground rules early in the participatory activities, giving responsibility to those taking part in the workshops to form the storyline and content for the film. Whilst a member of the research team facilitated and took accountability for this project, power was shared throughout the co-design project as the film storyline, characters and script were all designed by the community returners who selected which themes they wanted to present in the film. The responsibility and decision as to which themes were outlined in the film was given to the community returners. The themes they chose to portray are shown in Table 1. This expectation was clearly outlined from the start of the co-design process, highlighting that this film was a platform for them to express their experiences and which issues they felt others should be aware of in relation to the oral health of community returners. This power sharing was facilitated by regular communication with participants at all stages of the study, acknowledging their views and contributions, summarising their outputs from each of the sessions, and asking them to make the final revisions of the script. Their names or pseudonyms were included in the credits of the film (after their authorisation) and audience feedback from the open exhibitions of the film were also shared with participants (37).

3.2 Including all perspectives and skills

The co-design process required the inclusion of experiences, skills, and beliefs of all those taking part in the project. This was particularly important in this project as we had a range of participants who were experts of their own lived experiences. It was vital that the project was able to portray these varied experiences. For example, participants had different criminal justice histories in relation to the length of sentence they served, the type of prisons they had been in and how long it had been since they had been released. We welcomed this diversity amongst the participants and the trusting relationships formed between the group provided an open and safe space for all individuals to feel comfortable to participate.

After the first workshop it became apparent that the group had two quite different experiences in relation to their oral health journeys through the criminal justice system. Some members of the group had shared that they had poor oral health when they entered the justice system and that oral health had not been *a priori*ty for them. This poor oral health had been further exacerbated by limited access to dental care in prison. On the other hand, for some members of the group had been motivated to look after their oral health prior to being convicted but this motivation waived once they entered prison and lost autonomy over their dietary choices, routines and had restricted access to oral hygiene products. Equally, individuals had varying experiences of accessing care on release, whilst all participants had struggled to access care, one individual was further in their journey and had gone through oral rehabilitation which positively impacted their wider wellbeing. To share all these perspectives, it was decided to have two community returner characters in the film to allow all participants to actively contribute to their storylines and scripts.

To enhance engagement and improve accessibility to participating, several steps were taken to make the workshops a safe and inclusive space. Firstly, during the expectation setting and ground rules section in the first workshop we reinforced how although individuals will have a range of experiences and views, all are equally valid and respected. Secondly, prior to each workshop a document was sent to all individuals via email so they knew what would be discussed and had the opportunity to consider their contributions in advance. Thirdly, in the second workshop the group was split into two groups with each group working on one character that best related to their own lived experience. By individualising the task to the participants and reducing the number of competing options this increased the contributions made by each individual to the final film.

3.3 Respecting and valuing different types of knowledge

The ethos of this project from the initiation was that our role as academics was to provide a platform and space to express the views of community returners. As researchers, we had little prior knowledge in this area due to a scarceness of published literature relating to the oral health experiences of community returners. Starting from this perspective allowed the community returner group to lead the creative process through their experiential knowledge. Due to the nature of the project there needed to be an emphasis of all parties being of equal importance to produce the final film alongside true collaborative working. Each party was able to provide an area of expertise that was of equal importance to producing the final film. The research team were required to logistically coordinate the project, workshops and receive funding to support the film. The community returners were essential in providing the content and direction for the film. The community film organisation was involved throughout the process, offering guidance as to what makes an engaging film, conducting the filming itself and editing the film to translate the vision of the community returners into the final output. The actors with lived experience were crucial to conveying the script to an audience and ensuring that the stories depicted were realistic. At multiple stages throughout the project there was a feedback loop to the research team who coordinated the feedback and responded accordingly to ensure that valued opinions were put into practice. An example of this is that the community returners had felt that it would be important for the audience to get a sense of what it feels like to be alone in a cell in prison and how certain cues in the environment can cause a community returner to think back to their time inside. The original cut of the film did not include any sound effects so the views of the community returners were relayed to the film team so that they could add accurate sound effects prior to and during a flashback scene. This proposition was also discussed with the actors on set who offered their own suggestions as to which sound effects could be used to emulate the prison environment.

3.4 Reciprocity

The journey that led to the creation of the final film was equally as important as the quality of the final film produced in this project. Reciprocity is the concept that those involved with the project gain something for participating and feel both needed and valued (39). All of those involved with the project should benefit and be recognised for the work that they contribute. This notion was at the heart of the project and considered from the grant writing stage through to the screening of the final film. Reciprocity took many forms in this project. The community returners themselves benefitted by being financially compensated for their time in the form of a voucher. They developed their own connections with other community returners on the project who shared similar lived experiences and were at different stages of their journeys. Additionally, they developed skills around script writing and storytelling. The reception to the film and feedback was relayed to the community returners who participated and has increased their confidence to continue to be involved with similar projects in the future. The contributions of the community returners were acknowledged, and participants were offered the option of being named or using an alias in the credits for the film. They were also invited to the film screening and offered the opportunity to invite friends and family to share their work. The community returners discussed how they valued the opportunity to be involved with the project and were able to contribute their experiences to raise awareness of the oral health challenges they face. Additionally, they felt a sense of achievement at being able to see their contributions depicted in the final film (37).

For the community film organisation this film was their first experience of creating a film that was not a documentary. This film script provided them with a collaborative space to explore a new medium of film and showcase these skills for future projects. This was also their first experience of being part of an oral health project and gave them an appreciation as to the role oral health plays in an individual's wider wellbeing.

The research team were able to benefit from the study in several ways. The completion of the project provides evidence that recruitment of engaged community returners is possible, and they share the opinion that improving oral health inequalities in this population is important. The themes outlined in the film provide avenues for future research endeavours and possible areas to target interventions to improve the oral health of community returners. The use of co-design methodology has developed skills for the research team in power sharing, advocating for others, facilitation and how the arts can be used to convey complex concepts.

3.5 Building and maintaining relationships

Underpinning the previous values lies the importance of strong relationships between all parties involved in a co-design project. Successful co-design projects are built on the foundation of compassionate and trusting relationships. Without this key element engagement can be lost, intermittent or participants can feel unable to express their true lived experiences. These relationships precede and transcend the project itself. For example, the recruitment of community returners relied heavily on prior connections that had been made with third sector organisations who support those impacted by the criminal justice system. Building these connections and clearly outlining the expectations of the project, the potential impact of the work and the mutual benefit to community returners meant that they felt confident enough to promote the opportunity to those they support. A facilitator in this was also that when the research team communicated the motivation for conducting this project, third sector groups were able to relate to the need to conduct this work having supported individuals who had spoken about the impact poor oral health has had on their lives. The opportunity being advertised through credible third sector groups was integral to recruiting engaged community returners. It has been cited that community returners have a lack of trust for those in positions of perceived authority (10), therefore, having the opportunity circulated through trusted organisations set the foundations for the project.

Building on this, valuing those involved with the project ensured trusting relationships were sustained. Steps that helped to achieve this were ensuring that expectations were met, and communication was consistent throughout. These relationships have been supported through ensuring that all the individuals involved have been credited for the knowledge they have contributed to the work. From a research team perspective, to develop meaningful relationships with those involved in the project it was important to acknowledge some of the potential barriers including preconceptions, unconscious bias, and power dynamics. Having an awareness and appreciation of this allowed for proactive approaches to overcome these barriers to facilitate honest and open conversations. During the workshops, the research team stepped outside of their day-to-day role and acted simply as facilitators and active listeners for the discussion, allowing the community returners to speak about their experiences. The relationships were further strengthened by delivering on promised outputs, such as emailing community returners following the workshops to thank them for their contributions, distributing anonymised synopses of the workshop discussions, providing the participant vouchers and sharing the final film with them.

4 Discussion

Participatory research such as the co-design method used in this film has several benefits including increasing the impact of research and improving the relevance of outcomes produced to service users (40). The process of co-design research also provides a platform for shared learning alongside system partners whilst having a positive emotional impact on those who take part, such as an increase in self-confidence and feelings of pride and accomplishment (41). The preliminary stages of research should focus on determining the research priorities through engagement with target populations to reduce research waste (42). This co-design participatory action research approach to engaging community returners was both successful and impactful. The community returners felt empowered to share their lived experience and ingrain these into the stories of two fictional characters. Furthermore, when they were shown the final film the community returners felt that it encompassed their lived experiences and portrayed their stories accurately.

The themes that they felt were most important to convey in the film were self-care oral health behaviours, access to dental care in prison, a fear of stigmatisation when accessing care on release and a lack of continuity in relation to their health records. Using this co-design approach revealed some themes that have not previously been cited in the literature or considered as research avenues by the academic team conducting the project. An example of this is how when the community returners discussed their experiences of accessing healthcare on release, they spoke about feeling cornered into disclosing their criminal justice history as receptionists often struggled to find their healthcare records. They elaborated on this barrier to care and spoke about how experiencing delays in accessing their health records had impacted their continuity of care and delayed treatment (43).

The community returners were able to reflect upon how their oral health experiences varied throughout their life course. The film presents experiences relating to oral health self-care behaviours prior to incarceration, during prison and then on release. The script touches upon how the prison environment influences oral health both directly through challenging access to dental care but also indirectly due to a lack of autonomy over selecting their diet, accessing oral hygiene aids, and self-managing dental pain. Another consideration raised by the community returners is how on entering prison maintaining the motivation to continue self-care behaviours is difficult. The contributing factors for this reduction in motivation included restricted access oral hygiene aids, mundane daily routines and reduced social contact with family and friends.

4.1 Limitations

The co-design process recruited and continually engaged five community returners which is a relatively small number considering approximately 48,000 individuals are released from prison each year in England alone (44). The small sample number reduces the generalisability of the final film as it is possible that the experiences portrayed in the film are not reflective of those experienced by other community returners. However, during the two workshops the participants shared similar thoughts, if a community returner did not personally have lived experience of a topic raised, they were able to relate to it through the stories of other individuals they had encountered through their journeys in the criminal justice system. This validation of comments shared and similarity in themes raised suggests a consensus was reached. Furthermore, the scope of this project is not such that we can comment objectively on the impact the film output has had on the oral health of community returners or stakeholder perspectives. Instead, this engagement project acts as a platform to facilitate future research surrounding the oral health of community returners and explore co-design methodologies to improve their engagement with healthcare research.

One of the challenges of conducting co-design is that for true co-design to exist trusting relationships need to be built which takes time, self-awareness, and emotional investment (45). For a co-design film such as this to be successful it must remain true to the stories it is conveying. From a researcher standpoint, this can be challenging, it requires relinquishing control to participants and embracing uncertainty surrounding the project outputs.

4.2 Implications for policy, practice and future research

This co-design project adds to a limited body of evidence surrounding the oral health of community returners and their experiences of accessing care. It provides an indication as to how to actively engage those with a lived experience of the criminal justice system in research that can positively impact their oral health. Since the film has been created it has reached a wide audience including those who work in the criminal justice system or support community returners (37). The film was aired at an open screening held in East London that was attended by academics, dental professionals and those who work in the third sector supporting community returners. Through discussion between the research team and attendees at the screening, the feedback shared from viewers of the film highlighted that they had not previously considered the oral health challenges community returners face and found the film powerfully conveyed these, improving their awareness and allowing them to consider what they can change in their roles to improve the oral health of this group. Alongside raising awareness, the film can be used as an educational and training tool, a catalyst for promoting change in current practice and identifying future research priorities. The film was selected to form part of an annual training session hosted by NHS Education for Scotland which was attended by those working in the national oral health improvement programme for people in prison, Mouth Matters (46). The film allowed practitioners to think beyond supporting oral health in the prison environment alone and consider the lasting influence criminal justice contact can have beyond release. An example of this is that attendees who had an oral health promotion role in their local communities but did not have a prison in their local area considered for the first time that they would have community returners residing in their region. This allowed them to consider how they could support the improvement of oral health in those individuals and help them to access dental care.

The contents described in the film as conveyed through the lived experience of community returners indicate that oral health forms a piece of their larger societal reintegration journey. The community returners have demonstrated how oral health is an important issue for them, influencing wider aspects of their wellbeing such as nutrition and self-confidence. It is hoped that the themes selected by the community returners to be showcased in the film can act as the basis for highlighting future research priorities. The themes indicate where there is the need for development of the evidence base to support improvements in practice and understanding (43). The methodology showcased in this project may also be transferrable to better understanding the oral health experiences of other populations that face exclusion but remain underrepresented in the literature.

5 Conclusion

In conclusion, we suggest that co-designing catalyst films is a useful methodology to share the lived experiences of community returners. The methodology utilised in this project allowed community returners to be included in the co-design of a film and demonstrates that they can offer invaluable contributions not previously considered by the research team. This co-design project empowered community returners to use their voices to provide a platform to shape future research through selecting which themes they felt were most important to their oral health experiences.

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found below: https://www.youtube.com/watch?v=S_UupJJxbaA.

Ethics statement

The Queen Mary University of London Research Ethics Committee (REC) were consulted, and ethical approval was not required as this was an engagement project.

Author contributions

JB: Conceptualization, Data curation, Funding acquisition, Methodology, Project administration, Resources, Visualization, Writing – original draft, Writing – review & editing. HM: Data curation, Methodology, Resources, Supervision, Writing – original draft, Writing – review & editing. AR: Conceptualization, Funding acquisition, Methodology, Supervision, Writing – original draft, Writing – review & editing. VM: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Methodology, Resources, Supervision, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/froh.2024.1391438/full#supplementary-material

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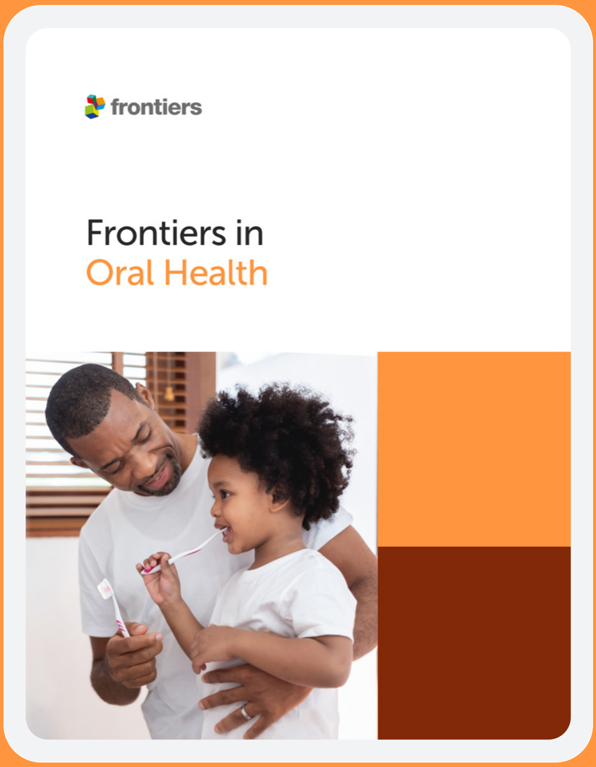

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