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# Management of plaque in people experiencing homelessness using 'peer education': a pilot study

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1 **Management of plaque in people experiencing homelessness using ‘Peer Education’: A**  
2 **pilot study**

3 **Abstract**

4 **Introduction:** People who experience homelessness have poor oral health and limited access  
5 to dental services.

6 **Aim:** To examine whether ‘Peer Education’ could yield improved plaque management  
7 among people experiencing homelessness.

8 **Methods:** A quasi-experimental, one-group pretest-posttest study was conducted, with  
9 follow-up at 1 and 2 months. Participants were living in temporary accommodation in  
10 Plymouth, UK. Plaque levels were assessed using the Simplified Oral Hygiene Index. A  
11 questionnaire and the Oral Health Impact Profile (OHIP-14) were administered. Patient  
12 satisfaction and barriers to dental care were explored by interviews.

13 **Results:** The baseline sample included 24 people with a mean age of  $36.88 \pm 10.26$  years. The  
14 mean OHIP-14 score was  $25.08 \pm 19.56$ ; finding it uncomfortable to eat and being  
15 embarrassed attracted the highest values ( $2.46 \pm 1.53$  and  $2.33 \pm 1.63$ , respectively). Plaque  
16 levels decreased by month 1 and month 2, though the changes were not statistically  
17 significant. Positive changes in confidence in tooth brushing at month 2 were identified  
18 ( $p=0.01$ ).

19 **Conclusion:** Experiencing pain and the opportunity to access treatment were key drivers of  
20 study participation. The study indicated that it is feasible to conduct oral health promotion  
21 projects for people in temporary accommodation. Adequately powered studies examining the  
22 impact of peer education on improving homeless people’s oral health are warranted.

## 1 **Background**

2 Homelessness has risen significantly over the last decade in the UK, where more than  
3 300,000 people are currently homeless.<sup>1</sup> A wealth of literature shows that when being  
4 homeless it impacts negatively on an individual's health and overall wellbeing.<sup>2,3</sup>

5 Extensive research worldwide has shown a link between homelessness and poor oral  
6 health.<sup>4,5</sup> Several studies in the UK have shown that people experiencing homelessness have  
7 higher levels of untreated dental decay and periodontal disease compared to the general  
8 population.<sup>6,7,8</sup> Contributing factors include unhealthy eating habits and oral hygiene  
9 practices, challenging living circumstances, mental health and dependency issues (i.e. illicit  
10 substances and alcohol), and low use of dental services.<sup>6,8,9</sup> With these factors in mind, there  
11 is a need to establish interventions that improve the ability of people who experience  
12 homelessness to care for their oral health and improve access to services.<sup>10</sup>

13 'Peer Education' is an approach where 'educators', who have personal experience of an issue  
14 themselves (in this case, experience of homelessness) work to raise awareness of health  
15 issues among vulnerable people and encourage them to change their lifestyle and engage with  
16 services.<sup>10</sup> One methodology often employed is motivational interviewing, a process of  
17 'working with patients that activates their own motivation and resources thereby enabling  
18 them to change their behaviours'.<sup>11(p 785)</sup> It has been shown to have great potential in assisting  
19 people with poor oral health and established periodontal disease.<sup>6,11,12</sup>

## 20 21 **Aim and objectives**

22 The aim of the study was to examine whether 'Peer Education' could yield improved plaque  
23 management among people experiencing homelessness.

24

1 **Methodology**

2 *Study design*

3  
4 This was a quasi-experimental, one-group pretest-posttest pilot study, entitled ‘Teeth Matter’.  
5 It was a collaborative project between the University of Plymouth Faculty of Medicine and  
6 Dentistry (Peninsula Dental School), Peninsula Dental Social Enterprise (PDSE), the  
7 homelessness and health charity Groundswell, and a residential centre providing temporary  
8 accommodation to homeless people in Plymouth.

9 **Ethical approval**

10 Approval to conduct the research was obtained from the Faculty of Health and Human  
11 Sciences Research Ethics Committee, University of Plymouth (ref: 17/18-854).

12 **Study design development-**

13 The research team from the University of Plymouth, the peer researcher and educator as well  
14 as the Director of Research from Groundswell, and the lead volunteer from the residential  
15 homeless centre were involved in developing the study design and materials used in the  
16 study. The team all contributed to the development of the protocol, the process of recruiting  
17 participants and the content of the study material (e.g. information sheet, consent form,  
18 posters etc). With regard to the latter, the lead researcher would develop the first draft and  
19 then the rest of the team would comment on the content, design, language, appeal and  
20 acceptability of the material.

21 Two research focus groups with residents in the homeless residential centre (led by the peer  
22 researcher) (N=11), and interviews with relevant stakeholders (i.e. care providers, support  
23 workers, dentists, academics and others) (N=12), were carried out in order to explore optimal  
24 ways of engaging with the target population. The findings also formed the basis to inform the

1 study design and subsequent intervention. All participants provided written informed consent  
2 and all the interviews were audio recorded. Refreshments were provided for participants in  
3 the focus groups. The findings of the focus groups and the interviews will be the subject of  
4 another paper.

## 5 **Recruitment**

6  
7 A convenience sample was drawn from people living in the residential centre. Participants  
8 had to be at least partially dentate (have at least two of the six possible surfaces needed for  
9 the calculation of Simplified Oral Hygiene Index)<sup>13</sup>, aged 18 years or over, and based on the  
10 opinion of the centre's lead volunteer (in consultation with support staff) able to provide  
11 informed consent without their capacity being compromised either by being intoxicated, or  
12 being under the influence of drugs or alcohol. Any of the participants who did not meet these  
13 criteria at the onset of the study were excluded. Mild intoxication to prevent symptoms of  
14 withdrawal was considered acceptable on a case-by-case basis. Those with an acute episode  
15 of mental ill health or who were severely intoxicated at the follow stages (in a way that the  
16 lead volunteer/support staff believed they were not able to participate in an informed basis),  
17 were informed that their absence from a study stage did not preclude them from the next  
18 phase.

19  
20 After obtaining approval from the centre manager, a leaflet/information sheet was distributed  
21 to potential participants with the help of the centre's support workers and lead volunteer. The  
22 lead researcher and a Groundswell peer researcher (with lived experience of homelessness)  
23 visited the centre in February 2018 to present the study in an informal setting, and respond to  
24 any questions participants might have had prior to involvement in the study. Baseline, 1- and  
25 2-month follow-up assessments were conducted at the centre in March, April and May 2018,

1 respectively. Before each visit, the lead volunteer gave a reminder sheet to the study  
2 participants confirming the day of the study and time of appointment. During all the study  
3 stages and following the clinical assessment, participants were offered refreshments.  
4 Participants provided a signed consent form for their participation in the study.

#### 5 *Baseline assessments*

#### 6 *Clinical*

7 The clinical examination was conducted in a room at the residential centre used by other  
8 healthcare professionals. An experienced primary care dentist, blinded to the study  
9 hypothesis and with past experience of providing epidemiological fieldwork for the Adult  
10 Dental Health Survey (ADHS) and the Public Health England's Dental Epidemiology  
11 programme, assessed participants' plaque levels using the Simplified Oral Hygiene Index  
12 (OHI-S).<sup>13</sup> The BASCD criteria were used for the visual examination of teeth that were  
13 decayed (D), missing (M) or filled (F).<sup>14</sup> The threshold for recording caries was dentinal  
14 involvement (D<sub>3</sub>). The degree of urgency for any treatment was divided into 'routine  
15 examination', 'routine treatment', 'urgent' and 'fast track'. This was based on the 2009  
16 ADHS participant feedback categories.<sup>15</sup> Fast track and urgent referrals were discussed  
17 sensitively with participants and made immediately after the initial assessment.

#### 18 *Sociodemographic characteristics and oral health-related quality of life*

19 Information on participants' demographic and lifestyle characteristics, oral health and dietary  
20 habits was collected using a questionnaire developed specifically for the project. This was  
21 previously pilot tested in a Plymouth forum accessed by homeless people (N=10). The Oral  
22 Health Impact Profile (OHIP-14)<sup>16</sup> was used to assess oral health-related quality of life. Both  
23 the questionnaire and OHIP-14 were administered by study personnel.

1 *Intervention*

2 Following the clinical examination, a dentist demonstrated tooth brushing to each participant.  
3 A Groundswell peer educator then used motivational interviewing to develop the  
4 participants' sense of self-efficacy regarding oral health. The peer educator provided basic  
5 oral health information based on Delivering Better Oral Health guidelines,<sup>17</sup> focusing  
6 primarily on brushing twice daily for two minutes with fluoride toothpaste, and reducing the  
7 amount and frequency of sugary food and drinks. The importance of oral health to the overall  
8 wellbeing as well as the importance of maintaining preventive oral care activities after dental  
9 treatment, were highlighted. The peer educator had received a 2-day motivational  
10 interviewing course by accredited Groundswell trainers<sup>18</sup> and basic training by Plymouth  
11 researchers on the 'Delivering better oral health guidelines'<sup>17</sup> that were used as part of the  
12 intervention.

13 'Goody bags' containing toothpaste, a toothbrush, a timer and a leaflet designed specifically  
14 for the study and which included basic oral health messages, were given to all participants. A  
15 poster with the same messages included in the leaflet was placed in each communal bathroom  
16 at the centre. The resources developed as part of this project will be provided in another  
17 publication.

18 **Follow-up**

19 At one and two months after the intervention, the OHIS-S, OHIP-14 assessments, and the  
20 questionnaire were carried out. New toothpastes were also provided and another poster (with  
21 more visuals and less words than the first one) promoting the message to brush teeth twice a  
22 day for two minutes was placed in all communal bathrooms.

23

## 1 **Process evaluation**

2 At the end of the study, semi-structured interviews were conducted with all participants  
3 (N=15) to assess their experience of, and satisfaction with, the intervention. The barriers and  
4 enablers to brushing their teeth were also explored. All the interviews were audio-recorded  
5 and transcribed verbatim. The question framework for the interview is available upon request.  
6 Upon completion of the study, participants were given certificates of appreciation and thank  
7 you cards. They were also given the opportunity to access free dental treatment provided by  
8 Peninsula Dental Social Enterprise (PDSE).

## 9 **Analysis**

10 Bivariate analysis was used to examine the association between age and OHIP-14 scores, and  
11 age and DMFT, at baseline. The Wilcoxon signed ranked test was used to examine change in  
12 plaque levels (OHI-S) and participants' confidence in using the correct tooth brushing  
13 technique after 1 and 2 months. SPSS (v21) was used for all statistical analyses. Statistical  
14 significance was indicated by a p value of less than 5%. The transcripts of the semi-structured  
15 interviews that conducted at the end of the study (i.e. process evaluation) were managed  
16 using NVivo software (v11). The themes were deductively driven to focus the analysis on  
17 areas of interest for the intervention evaluation and ongoing development, The Strengthening  
18 the Reporting of Observational Studies in Epidemiology (STROBE) guidelines were used to  
19 report the study.

## 20 **Results**

21 Figure 1 presents the number of participants at each stage and provides reasons for drop-outs.  
22 19 and 15 people completed the 1 and 2 month follow-up, respectively.

23



1 *Please insert Figure 1 here*

2 The sample at baseline included 24 British men aged on average 36.88 (SD± 10.26, range:  
3 21.20-58.60) years. Supplementary File 1 presents their sociodemographic characteristics.

4 The response rate for the questionnaires at each study stage was 100%. The majority of  
5 participants were single (N=19). Most participants (91.7%, N=22) were smokers, whilst  
6 66.7% (n=16) reported that they did not drink alcohol most days. Seventeen (70.8%) stated  
7 that they had used recreational drugs, and seven were currently using drugs. Eight people  
8 (33.3%) had been prescribed methadone in the past with two of them currently being  
9 prescribed it. Amongst those prescribed methadone, four reported that it was sugar-free and  
10 the rest that it was sugar-containing. Approximately half of the sample (54.2%, N=13)  
11 reported that they currently experienced physical health problems, and 62.5% (N=15)  
12 reported suffering mental health issues. Almost all were registered with a GP (95.8%, N=23),  
13 but none were in ongoing care with a dentist and only three had visited a dentist in the last  
14 year. The last time that most participants had visited a dentist was because they had toothache  
15 or some other problem (N=19, 79.2%); four had attended for routine checkups (16.7%) and  
16 one because the dentist had sent them a reminder (4.2%).

17 Nearly 63% of the sample (N=15) reported at baseline that they brushed their teeth less than  
18 twice a day, and 37.5% (N=9) reported that they were brushing their teeth twice or more a  
19 day. At the 1-month follow up, the corresponding percentages were 47.4% (N=9) and 52.6%  
20 (N=10), respectively. At the 2-month follow up, these figures were 28.6% (N=4) and 71.4%  
21 (N=10). The proportions at 1 and 2-month follow-up were not statistically significant  
22 compared to the baseline ones ( $p_1=0.625$  and  $p_2=0.250$ ). Eight (33.3%) of the participants at  
23 baseline had sugary food items or drinks four times and more daily. Approximately half of  
24 the sample had their sugary items or drinks in between meals (54.2%, N=13).

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*Please insert Table 1 here*

Table 1 shows the clinical characteristics of the study sample. All participants had experience of decay (DMFT>0). The mean DMFT of the sample was 16.58 (SD±8.07), the mean DT was 6.75 (SD±5.76), the mean MT was 7.75 (SD±6.78), and the mean FT was 2.08 (SD±2.93). One participant had a partial upper denture. With regard to treatment needs, one participant was referred for a fast-track examination due to a suspicious oral mucosal lesion and five for urgent care due to pain. Upon study completion all participants but two were assessed as needing routine treatment.

The frequency of problems reported by participants related to oral conditions in the preceding 12 months is presented in Table 2. The mean values of items are presented below (Table 3).

*Please insert Table 2 here*

*Please insert Table 3 here*

The total OHIP-14 score was 25.08±19.56. The highest values were obtained from the items: finding it uncomfortable to eat (2.46±1.53), being embarrassed (2.33±1.63) and being self-conscious (2.21±1.56).

At baseline, there was a statistically significant positive relationship between OHIP-14 total score and age (Spearman's rho=0.631, p=0.001). A significant moderate relationship was also found between age and DMFT (Spearman's rho=0.667, p<0.001). However, age and OHI-S at baseline did not relate significantly (Spearman's rho=0.131, p=0.540). Furthermore, DMFT, but not OHI-S, related to OHIP-14 (rho=0.504, P=0.012; rho= -0.118, P=0.582).

The OHI-S decreased from baseline (median= 0.60) to month 1 (median= 0.40) and to month 2 follow-up (median= 0.35). However, the changes were not statistically significant (p=0.82

1 and  $p=0.23$ , respectively). The confidence of participants in using the correct tooth brushing  
2 technique significantly improved at month 2 ( $N=15$ ,  $Z= -2.53$ ,  $p=0.01$ ).

### 3 **Process evaluation interview results**

#### 4 ***Key drivers for study participation***

5 The main motivator for participants taking part in the study was the opportunity to access  
6 dental treatment in order to improve the condition of their teeth. Feelings of embarrassment  
7 and functional limitation, including pain and difficulty in eating, were common reasons  
8 reported by participants for wanting dental treatment. Participants reported that although  
9 being very conscious of the condition of their mouth, it was very hard to access services.  
10 Some highlighted the impact that dental treatment would have on their confidence and self-  
11 esteem as they felt being judged because of the appearance of their teeth.

12 *“The society is now used to bright white smiles and that aint it? I have been called...all sort*  
13 *of things”* (Participant 4)

14 *“I know for fact that I have got something to gain for... I have been like this now for 3 years*  
15 *now. And it is very embarrassing when I go outside and talk to people. 'Cause I am very*  
16 *conscious that they notice I have no teeth. And I don't want to be like that.... And I want to be*  
17 *able to talk to someone with smile, teeth, everything ...”* (Participant 1)

18 Participants also acknowledged that seeking care was part of seeking a new start in their  
19 lives, particularly in relation to job seeking.

20 *“If you want to move on and get job, you know, move on to flats and stuff, you have to have*  
21 *good teeth really aint you”* (Participant 7)

22 *“I don't want to go back to fishing anymore. I have done it for twenty years. I have one son,*  
23 *one life and that all what I want to do now. I want to get in touch with other jobs than*  
24 *fishing.....that's what I am working one at the minute...Just be happy and with a nice white*  
25 *smile. It will make a big difference. ...”* (Participant 6)

#### 26 ***Successful study elements***

1 The participants were very satisfied with the project and there was nothing negative that they  
2 reported about the study. What they liked most was the opportunity to get treatment after the  
3 study, the friendliness and professionalism of the staff, the fact that barriers between them  
4 and dentists had broken down and that they had been shown how to brush their teeth. For  
5 some, emphasis on the personal qualities of the study team related to previous bad  
6 experiences when visiting a dentist. Furthermore, some of the participants acknowledged that  
7 prior to the study the only time that they were shown how to brush teeth was when they were  
8 at school. Being aware that the advice to patients can change, they highlighted that they were  
9 not confident (prior to the study) that they were using the correct tooth brushing technique.  
10 Little waiting time in between study stations was also greatly valued by the participants.

11 *'It's a really nice study, to be honest with you. Everybody is really polite and nice. And you*  
12 *don't feel you are in danger in any way, shape or form. I mean, I can remember being a kid*  
13 *and going to the dentist. It was the scariest thing you ever come across.'* (Participant 9)

#### 14 ***Peer research and education***

15 Although participants acknowledged that when it came to dental treatment, they would  
16 “obviously want a trained professional”, the presence and support from someone with lived  
17 experience of homelessness made them feel more connected with the project. It also made it  
18 easier for them to engage in a discussion. This is because they had been through the same  
19 ‘journey’ and could speak in a language they understood (“my kind of language”). Knowing  
20 the background of the peer educator also made it easier for them to take her advice. The fact  
21 that she did not over-explain was also highlighted as one of the elements of peer education  
22 that they liked.

23 *“Because if they've been through it, then they can understand it and properly input it to me,*  
24 *in a better way that someone who hasn't lived it.”* (Participant 5)

25 *“I understood what they had experienced, respected them and felt it back-two-way respect.*  
26 *They were good as gold. They are good people who we need involved in helping*  
27 *us”* (Participant 2)

1

## 2 ***Barriers to brushing teeth during the study***

3 Established unhealthy habits and mental health issues were common barriers to brushing  
4 teeth during the study. The latter also hampered participants' ability to participate in other  
5 activities unrelated to dental health. Some also reported that tooth sensitivity made it difficult  
6 for them to brush their teeth.

7 *'It's more habit than anything'* (Participant 1)

8 *'..at least three or four times a week I get really bad depression and I don't really want to*  
9 *participate or do anything really... I sometimes don't even get dressed, I don't bother with*  
10 *my meals ...I just stay in my room and I don't get out.'* (Participant 3)

## 11 ***Enablers to brushing teeth during the study***

12 In terms of enablers, provision of information (i.e. leaflet) and resources (i.e. toothbrush,  
13 timer) were among the most common reasons participants gave as to what helped them brush  
14 their teeth during the study. Furthermore, realising that brushing was effective, had helped  
15 remove bad breath and that it would prevent further deterioration of the teeth (which would  
16 have eventually led to embarrassment), was another reason that motivated participants to  
17 brush their teeth. For some, this related to emotional attachment to their children.

18 *"I don't want my daughter to see me with horrible teeth. I pick her up from the school. I*  
19 *don't want her to see her dad with no teeth or bad teeth, I don't want that."* (Participant 4)

20

## 21 **Discussion**

22 The current study is the first in the UK to carry out a dental intervention for people who are  
23 homeless using the concept of peer education. It demonstrated that people who experience  
24 homelessness have a high number of missing and untreated decayed teeth, as well as a low  
25 number of filled teeth. Plaque levels were generally low. These results are consistent with  
26 previous findings.<sup>6,19</sup> A low F component of the DMFT indicates poor access to dental care,

1 and is confirmed by the finding that none of the participants were registered with a dentist.<sup>7</sup>  
2 Treatment needs were also extensive with the majority of participants requiring more than a  
3 routine examination. This suggests that more accessible dental care pathways are needed for  
4 people experiencing homelessness in Plymouth. Peninsula Dental Social Enterprise is  
5 currently responding by developing a service where people who are homeless can access  
6 dental treatment free of charge.

7 This study showed that reported tooth brushing frequency at baseline was low, whilst tobacco  
8 use and sugar intake between meals were high. Taking into account that low tooth brushing  
9 frequency, tobacco use and snacking in between meals are associated with poor oral health,<sup>17</sup>  
10 future studies to identify successful means to promote preventive daily oral care activities and  
11 improve self-confidence and efficacy for people who are homeless are needed. Exploring the  
12 reasons for poor adherence to preventive activities can help the focusing of the messages to  
13 promote behavior change.<sup>20</sup> Consideration should also be given to the fact that people in  
14 temporary accommodation may not have a lot of options with regard to the food choices  
15 available. This indicates the need for a collaborative approach involving management, as part  
16 of creating a supportive environment to behavior change.<sup>20</sup> Furthermore, when clinically  
17 appropriate, doctors should be encouraged to prescribe sugar-free methadone for those who  
18 are recovering from drug addiction.

19 Following the intervention, plaque levels improved, however the changes were not  
20 statistically significant. Given the extensive treatment needs and poor oral health among  
21 participants and the anticipated small effect size, it is encouraging to note the positive, albeit  
22 non-significant reduction in plaque levels along with clear improvement in toothbrushing  
23 confidence. It demonstrates that peer education along with demonstration of toothbrushing  
24 technique by a qualified professional could be useful in reducing plaque for people who are  
25 homeless and promoting their engagement with dental care. Further, adequately powered

1 studies including randomised controlled trials are needed to examine the effectiveness of this  
2 concept in improving oral health for people experiencing homelessness.

3 Embarrassment and self-consciousness were key issues affecting participants' oral health-  
4 related quality of life. Previous research has indicated that embarrassment at the condition of  
5 their teeth and the subsequent impact on self-esteem can itself act as a barrier preventing  
6 homeless people from visiting a dentist.<sup>6,8,9</sup> The condition of the mouth can also make  
7 homeless people self-conscious when interacting with others and it also affects their  
8 confidence when seeking to enter the job market.<sup>6</sup> In the present study, embarrassment  
9 appeared to be a significant factor motivating participants to seek treatment. Participants also  
10 acknowledged that seeking dental care felt like a step towards reclaiming their life. This  
11 finding, in line with previous studies, gives support to the hypothesis that oral health  
12 intervention can become part of a homeless person's journey towards stability and potentially  
13 improve their quality of life.<sup>6,21</sup> Giving participants in research projects the opportunity to  
14 access free dental treatment is highly recommended and could also act as an incentive for  
15 both participation and retention in the study.

16 The intervention, which was evidently well received by the participants, took into account the  
17 understandable embarrassment and inhibitions of people who have a history of  
18 marginalisation and difficulties in accessing services. The absence of any negative comments  
19 for the study was very encouraging but may also indicate low expectations of people who  
20 experience homelessness for efforts aiming to improve their oral health and their appreciation  
21 for projects aiming to improve their health. Engaging with those who support homeless  
22 people and giving people who have experienced homelessness the opportunity to participate  
23 in the development of the project has proven invaluable in ensuring participants' enjoyment  
24 of and commitment to the study. The significance of input of both peer researchers and key  
25 workers in the study design, development of research tools, tailoring the health messages to

1 the particular group, and in study implementation cannot be overstated. Tailoring messages  
2 can also help maximise behavior change.<sup>20</sup>

3 Peer researchers and educators are experts by experience and thus their input into a project is  
4 essential in ensuring its acceptability to the participants. Regardless of an in-depth knowledge  
5 of the available literature in the field, there were crucial to this study elements that the  
6 researchers and clinicians were unable to confidently decide upon until input was provided by  
7 Groundswell (i.e. reference to drug addiction, ill mental health, dress code and others).  
8 Furthermore, the semi-structured interviews evidenced that the presence of someone who has  
9 shared their experience made participants feel that they could connect and be better  
10 understood. Prior to the conduct of any study adopting the concept of peer education, it  
11 would be valuable to explore with patients/participants what they would be looking for in a  
12 'peer'. For example, if it might go further than being someone who has also experienced  
13 homelessness, to be someone they can identify with from a wider lifestyle context, e.g. from  
14 the same local community as themselves, or a similar small city, same gender, similar route  
15 into homelessness. It could also be someone who lives nearby and knows the local challenges  
16 homeless people experience and the places they tend to frequent, and services they use.

17 The link with the lead volunteer within the centre was also pivotal for the recruitment,  
18 follow-up and management of participants. This also helped established rapport between the  
19 research team and the participants, and ensure that the intervention was acceptable to the  
20 particular group of participants. Actively involving the staff in project development and  
21 management, and raising their awareness and knowledge on oral health matters (based on  
22 evidence based knowledge) can help empower and support behavior change and ensure the  
23 sustainability of the project.<sup>20</sup> Loss of participants at follow-up was due to circumstances  
24 beyond their control and when developing projects with follow up stages, consideration  
25 should be given to the changing living circumstances of people who live in temporary



1 accommodation. Although a longer-term study would be better able to assess the impact of  
2 behavioural change, this may also result in higher attrition rates due to the aforementioned  
3 reason.

#### 4 **Limitations**

5 The present study is based on a small convenience sample of people who are homeless and it  
6 was not powered to detect statistically significant changes in plaque measurements. However,  
7 it identified positive trends in plaque reduction and provides estimates of the variability of the  
8 main outcome to inform power calculations for a subsequent full-scale randomised control  
9 trials. It also provides estimates for the calculation of the likely response and attrition rates.  
10 Furthermore, although generalisability may be limited, our participant characteristics reflect  
11 national figures, such as high number of males and British nationals, high prevalence of  
12 mental health problems and poor oral health habits.

13 Periodontal conditions are common among people experiencing homelessness and, therefore,  
14 the use of a periodontal index such as Basic Periodontal Examination (BPE)<sup>22</sup> would have  
15 provided a better picture of the treatment needs of our participants. Although we initially  
16 planned to include the BPE, it was later decided that it would be better to omit this index as it  
17 may have caused discomfort to participants and could have potentially worsened their  
18 anxiety.

#### 19 **Conclusions**

20 Poor oral health is common among people who experience homelessness. The present study  
21 indicated that it is feasible to conduct oral health promotion projects for people in temporary  
22 accommodation. The need to manage pain and to have access to dental care were identified as  
23 the two major drivers to participation in the project.

1 Peer education could be a useful means of improving plaque management of people who are  
2 homeless and of promoting their engagement with dental care. Well-powered studies  
3 examining the effectiveness of this concept on improving self-care, oral health and access to  
4 dental services are warranted.

## 5 **Key points**

- 6 • The first project in the UK to explore the concept of Peer Education in improving  
7 plaque management among people who are homeless;
- 8 • Provides an insight into engaging people experiencing homelessness with dental care;
- 9 • Identifies the main issues affecting homeless people's oral health-related quality of  
10 life.

## 11 **Acknowledgements**

12 The authors are extremely thankful to the Oral and Dental Research Trust for providing  
13 funding for this study. We also thank the charity Well Connected for providing the goody  
14 bags distributed at baseline, and PDSE for providing us with the clinical equipment and  
15 consumables. Many thanks to Stephan Morrison from Groundswell for leading the focus  
16 groups. A very big thank you is due to the dental team and administration staff at PDSE,  
17 particularly Christina Worle, for providing care to our participants free of charge. The study  
18 would not have been possible without the support of the lead volunteer and our participants.

## 19 **Conflict of interest**

20 The authors declare no conflicts of interest. The funders had no role in the analysis or  
21 interpretation of data.

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