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DOI: 10.1308/rcsfdj.2021.35

Can dental students increase oral health knowledge of the homeless population?

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Investigating the impact of interventions on dental knowledge.

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Keywords: oral health, homeless persons, dentistry, knowledge

The legal definition of homelessness is that a person has no home available and reasonable to occupy.[1] The UK's population of 'rough sleepers' has risen by 169% since 2010.[2] However, research suggests that these figures do not demonstrate the full scale of the problem owing to the 'hidden homeless'.[2] A similar pattern can be seen in Leeds, where there has been a 367% increase in homelessness between 2010 and 2017.[3]

Homelessness is often associated with a chaotic, transient and unpredictable lifestyle, making it unsurprising that the experience has a multifactorial effect on both oral and general health. Ninety per cent of individuals experiencing homelessness reported dental issues after becoming homeless and sixty per cent of these experienced pain.[4] It is widely acknowledged that this vulnerable population is exposed to an increased number of risk factors for oral disease, with one of the most influential being poor access to healthy foods and the necessity to consume cheap, convenient, high energy non-perishables.[5] In addition, these individuals are more likely to experience an inability to frequently clean their mouths through lack of access to oral hygiene aids. Increased drug, alcohol and tobacco misuse and a generalised normalisation of poor dental appearance further contribute.[6]

Sadly, these characteristics tend to go hand in hand with inadequate health education and understanding relating to poor health literacy. The UK's largest study to directly assess the literacy skills of homeless individuals found that over half lack the basic skills required for everyday life.[7] As a result, healthy choices and oral hygiene are often given low priority. Despite people experiencing homelessness generally having high oral health needs, they face the greatest barriers to accessing oral health services, such as insufficient information on local dental services, negative attitudes of oral health professionals, low priority of dental care, anxiety and cost of dental treatments.[8]

Within the homeless population, many factors influence access to healthcare. These include physical, socioeconomic and psychosocial barriers such as competing priorities, embarrassment, anxiety or feeling a lack of control.[4,6,9] The inability to register with a dental practice is a commonly reported factor, with Scotland's Smile4life programme showing that around half of those experiencing homelessness do not know how to find a dentist.[9]

It has been acknowledged that homeless people have specific needs, and it has been recommended that they are actively sought through outreach and are offered flexible and accessible treatment, alongside conventional care where appropriate.[6] Community outreach has been identified as a factor in homeless people accessing dental care, particularly if one-off appointments are made available.[10] Research suggests that more studies are needed to evaluate whether different strategies can improve engagement and care provision for those experiencing homelessness.[11] The aim of this study was to determine whether a dental student-led oral health intervention is feasible, acceptable and produces oral health knowledge gain in those experiencing homelessness.

Methods

Ethical approval was obtained from the University of Leeds Dental Student Ethics Committee (DSEC: FYP2018HOMELESS). A convenience sample of 30 people experiencing homelessness was sought.[12] A questionnaire to determine knowledge about oral health was developed from research literature, with a selection of questions taken from a study by Aggarwal *et al* of patients' knowledge related to oral disease risk factors,[13] and this was underpinned by *Delivering Better Oral Health*.[14] The knowledge questionnaire consisted of ten statements on oral hygiene, fluoride, smoking, alcohol and drug use with 'true'/'false'/'I don't know' answer options.

After the initial questionnaire was completed by the participant, the researcher delivered the oral health intervention in the following domains: oral hygiene (including demonstrating brushing), diet, smoking, alcohol and accessing NHS services. A topic guide was designed to ensure that all domains were covered but this could be adapted to the participants as required. Information was delivered in leaflet form as well as verbally. A post-intervention knowledge questionnaire and acceptability feedback form was then completed.

All research materials (posters, information leaflets, oral health intervention advice and questionnaires) were developed and piloted with the clients and staff at St George's Crypt Care Centre (a care shelter for the homeless) in Leeds city centre. The staff at the Crypt helped to identify potential participants for the study using the following inclusion criteria: 18+ years old, able to read English, able to understand the study and the consent process, and not under the influence of alcohol or drugs. All participants were consented by the research team.

Six sessions were convened over a two-week period on a drop-in basis. Each intervention lasted approximately ten minutes with one researcher acting as a facilitator, leading the discussion, and another coordinating the data collection from the questionnaires. The analysis of the data was undertaken in SPSS® Statistics (IBM, New York, US), and descriptive statistics and a two-tailed paired t-test were used to compare the questionnaire results from before and after the intervention. Free text answers and comments were incorporated into the results to provide context and expand on points that the participants felt were important.

Results

Thirty participants (26 men and 4 women) were recruited. There were no dropouts. Almost half (49%) of the knowledge-based oral health questions were answered correctly in the pre-intervention

questionnaire. This rose to 86% after the intervention (Table 1) ($p<0.001$). The single largest increase in knowledge by a participant was 80 percent.

The statement that participants responded to correctly most often was: 'Smoking stops people from losing their teeth.' In the questionnaire prior to the intervention, 26 participants (87%) answered correctly and 28 (93%) answered correctly following the intervention. Another question that was commonly answered correctly related to: 'You should brush your teeth only once per day.' This was answered correctly by 24 participants (80%) and by 27 participants (90%) before and after the intervention respectively.

The statement with the fewest correct answers in the first questionnaire was 'You should brush your teeth straight after vomiting', with only one participant (3%) answering correctly. However, after the intervention, 24 participants (80%) answered correctly, making this the most improved question.

The acceptability feedback forms showed that all participants found the session useful. Twenty-nine participants (97%) planned to change their oral routine, with one edentulous participant not planning on making any changes. One participant said: 'I'm more motivated to take care of my mouth and feel I can brush in the correct way now.' Another commented: '*I will try and reduce or maybe even stop smoking.*' Twenty-three participants said they would like another session. Explanations given by those who did not want a further session included: '*Information was given clearly – don't think I would benefit from hearing it again*' and '*I don't come here often for another session.*' Twenty-six participants (87%) said they would try to find an NHS dentist. Many stated that they found it hard to find a dentist who would accept them or that they had been discharged from dental practices because of missing appointments.

Participants were given the opportunity to comment on or recommend changes that would benefit the intervention. Examples included: '*Hopefully, I won't have to come again because I will find a dentist*' and '*Useful session but reminds me of school. I didn't like school.*'

Discussion

This study was designed to test the feasibility and acceptability of a dental student-led oral health intervention to increase oral health knowledge in those experiencing homelessness, who have a high level of complex medical and physical needs (including drug and alcohol dependencies), which are likely to contribute to poor oral health.[15] There was a significant improvement in the oral health knowledge of participants after the intervention. Gaps in participants' knowledge included lack of awareness of the recommended brushing regimes, the relationship between diet and oral health, and the benefits of fluoride use.

Participants found the session useful, with many planning to change how they care for their mouths. Most participants said they would not alter the session and attitudes towards the intervention were positive. Many participants were motivated to find an NHS dentist, possibly owing to their improved understanding of dental services. Tailoring the health advice was crucial when engaging with the participants as well as encouraging behaviour change.[16]

Table 1 Number of correct answers for questionnaire before and after intervention

Statement	Correct answers before intervention	Correct answers after intervention
You should brush your teeth for a MAXIMUM of one minute each time you brush.	11 (37%)	24 (80%)
Cleaning between your teeth with items such as floss should be carried out ONLY ONCE a week.	12 (40%)	26 (87%)
You should brush your teeth ONLY ONCE per day.	24 (80%)	27 (90%)
You should brush your teeth straight after eating or drinking acidic foods or drinks.	8 (27%)	26 (87%)
You should brush your teeth straight after vomiting.	1 (3%)	24 (80%)
Fluoride toothpaste weakens teeth.	11 (37%)	26 (87%)
Eating sugary food slowly throughout the day is BETTER than having it all at once.	11 (37%)	25 (83%)
Smoking STOPS people from losing their teeth.	26 (87%)	28 (93%)
The MORE alcohol you drink, the LESS dental infections you will get.	22 (73%)	25 (83%)
Smoking and alcohol DO NOT increase the chances of getting mouth cancer.	20 (67%)	26 (87%)
Correct answers	**146 (49%)**	**257 (86%)**

The proportion of respondents who knew how often they should brush their teeth increased from 80% to 90% following the intervention. Brushing twice daily is a key message used to promote good oral health. Although it was answered well overall, three participants (10%) still answered incorrectly.

Knowledge of the impact of cigarette smoking on oral health was good despite most participants reporting that they currently smoke. Tobacco use is high among those experiencing homelessness, with 85% of homeless people smoking compared with 18% in the general population.[4] These individuals face significantly more challenges in smoking cessation than the general population, including coexisting substance abuse, raised nicotine dependence and increased prevalence of mental health problems as well as a culture of tobacco use.[17] This helps to explain why smoking among people experiencing homelessness is ubiquitous despite recognition of the associated risks. Smoking cessation advice and signposting to further help plays a vital role in the shift towards better oral health.[9]

With regard to risk factors for oral cancer development, knowledge was poor. This was in keeping with findings from the Groundswell study.[4] Another paper found that 79% of 325 homeless people did not know that tobacco use could lead to oral cancer.[18] The same study also noted that 11% of the participants had to be referred for head and neck evaluation, with 9% needing treatment for malignancies.

Comments made by participants in our study were noted as free text responses to support the contextualisation of answers. Some participants who did not want to access NHS dental services (despite having knowledge of how to do this) were aware of their dental needs but felt too fearful to attend. On reflection, it would be beneficial to explore the origin of this fear in this population as this can be multifactorial and complex in nature.[19] It was heartening to hear that participants felt they could express themselves honestly as one participant said the session 'reminds me of school'. It would be prudent to co-design future oral health interventions to promote self-efficacy, engender a health repertoire and ensure the tone of engagement is meaningful.[9]

The feedback showed that 75% would be willing to attend a similar session in the future. However, some felt that the information delivered in the single session was adequate. Twenty-three participants said they would benefit from further engagement with dental students as repetition and reinforcement are key features of an effective oral health promotion programme. Identification of those wanting more support may be crucial to the intervention's success.[14]

It is important to note that St George's Crypt Care Centre has quarterly visits from Dentaid's mobile emergency treatment unit. This could mean that those taking part in the study are more accepting of oral health advice as they have had contact with oral health professionals previously. With a regular programme, the benefits would be twofold: the participants gain access to reliable advice, and dental students have an excellent opportunity for the development of social awareness and communication skills. Although communication forms a significant portion of the undergraduate curriculum, students would reap benefits from being challenged by a population of such diversity who require the finely tuned communication skills that dentists strive to achieve. This leaves students better prepared and more confident in treating this population group, thereby breaking down another barrier to care.[20]

Oral health promotion delivered at accessible locations has been found to be a facilitator for achieving good oral health, aligning with this study.[8] Dentists have reported structural issues that act as a barrier when providing dental care to people experiencing homelessness, suggesting that they are too difficult to treat under the current NHS contract and propose that this should be changed.[21] Flexible commissioning aims to increase access to prevention and dental care for the entire population. This concept could facilitate dental team members going out into vulnerable populations (such as homeless people) to provide advice and care.[22]

Our sample contained men (80%) and women (20%), which is representative of the wider homeless population of Leeds (82% male, 18% female).[23] This is encouraging given that quantitative research has found constructing a representative sample of the homeless population to be a confounding challenge.[24] Confidentiality was a strength of the study as no identifiable information was collected from participants, thereby retaining anonymity. The study design meant that drop-out threat could be eliminated owing to participants not having to return. The one-to-one approach facilitated a reliable outcome as participants could ask questions if unsure and give honest feedback. Participants read questions aloud, which helped the conversation flow naturally, and any misinterpretation could be captured and clarified.

The findings of this study should be interpreted with caution given the small population used. Findings could be verified or rejected with a large scale study encompassing a variety of homeless shelters.[25] Although this study has been successful in utilising individuals accessing the care centre, those who are not accessing these facilities have not been reached, requiring further attention.

The questionnaires and information delivered were underpinned by current evidence-based recommendations for prevention of oral disease; Delivering Better Oral Health outlines how effective communication can support behaviour change.[14] This research therefore attempted to increase participants' awareness of their oral health through a concise, tailored oral health intervention, which was supplemented with simple oral health literature and signposting to local NHS dental services.[26] This was also

a limitation of the study, with no assessment of whether knowledge was retained over the longer term or confirmation of whether there was behaviour change. This would be required to establish the intervention's longevity. Although the present study showed that participants were receptive to the information delivered, there was no evidence of induced behaviour change.[16]

The transient nature of this population meant that a cross-sectional study design was most practicable although this was not without limitations. The staff at St George's Crypt Care Centre explained that their clientele are unpredictable and voiced concerns about their ability to maintain appointment times. This was instrumental in the study design: a one-off intervention limited to a single session. Studies conducted at a single point in time can be susceptible to non-response bias, resulting in a sample that is not necessarily representative of the population because of differences between those who opt to take part and those who do not.[27]

Conclusions

This study demonstrates that dental student-led oral health education for those experiencing homelessness is feasible and accepted by this population. Participants were receptive to the information and found it useful to speak to the students about oral health. They benefitted from a knowledge gain relating to their oral health (albeit potentially short-term). Our study will hopefully provide an incentive for UK dental schools to include direct involvement with the homeless community in their curriculum. Nevertheless, this was a small scale pilot study and the results must therefore be interpreted with caution. However, future dental professionals cannot afford not to leverage the power of oral health education in this already vulnerable population.

Acknowledgements

The authors would like to thank the staff at St George's Crypt Care Centre for their support as well as the participants for their valuable time and input.

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