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CPD

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BRITISH SOCIETY OF DENTAL HYGIENE AND THERAPY
Promoting health, preventing disease, providing skills
Editorial

Welcome to the 2019 issue of the *Annual Clinical Journal of Dental Health*. I hope you enjoy reading it and that you will find something not only helpful for your daily clinical practice, but also to inspire you to become interested in research.

One of the aims of this journal is to promote and support research by dental hygienists, dental therapists and undergraduate students by facilitating an opportunity to showcase their work. It is also about creating an interest in research and stimulating a conversation among our members. Getting involved in research is a great way to enhance your career or enrich your undergraduate education.

Ongoing research in dental healthcare is essential: it provides the profession with new knowledge and insights into the management of oral disease. It equips us with the evidence for things that work, helps develop guidelines for best practice, influences policy and ensures high quality patient care. Just as importantly, it can also show us things that are ineffective: treatments; protocols; therapeutic agents. All of this assists us in our aim to provide optimal, safe and prudent dental care for our patients.

At the recent British Society of Dental Hygiene and Therapy (BSDHT) Oral Health Conference (OHC) it was encouraging to note that there was an increased number of entries this year to the poster competition. For the majority of these researchers, a mix of dental hygienists, therapists and students, it was their first step into the world of research. I would like to think that they all enjoyed the process. It is exciting to be involved in a project that you hope will impact on patient care. Indeed there is some positive evidence that engagement by clinicians and healthcare organisations in research can improve healthcare performance.¹

As Fiona Ord and her co-workers report in their paper (pages 10-14), there is evidence to report that that 50% of UK dental hygienists would like to be involved in research.² I would encourage you to consider writing up your work and sharing it with your peers through the pages of the BSDHT publications.

Essentially, research can conveniently be categorised as either quantitative or qualitative and includes many forms, such as: meta-analysis; systematic reviews; randomised controlled trials; cohort studies; cross-sectional studies; case reports; editorials and opinion pieces. This year we have accepted for publication one meta-analysis, two quantitative studies, two qualitative studies and two literature reviews. Two of the papers in this edition of the journal have been submitted by our colleagues living and working in Australia.

This is the eighth edition of the journal and it is obvious that the objectives we have set are being achieved, as evidenced by the increasing number and quality of the papers that I am receiving. On this basis I would encourage members to attend the research sessions at the OHC 2019, which include oral presentations, the poster competition and the “How to write a paper” workshop. By engaging in these activities I am sure that many of you will be inspired to develop your own research interests.

For those of you already on this journey, I would welcome submissions from the research activity you are currently undertaking, or have completed. The journal is here to support you!

Heather Lewis
Editor

So…just how can BSDHT help you with your research?

References


Risk assessments and SMART targets in oral hygiene: a retrospective analysis of a dental hygienist-led implant maintenance programme

K. Walker1, A. Walker2, N. Yadev3, K. Hare4, C. Campbell5

**Learning outcomes:**
Readers will consider:

- Providing patients with specific and measurable targets for implant homecare
- Using SMART targets to encourage patients to take the lead in optimising periodontal health
- Developing a dental hygienist-led programme for implant maintenance

Aligned with GDC development outcomes: A,C,D

**Key words:** dental implants, oral hygiene, oral health, outcome assessment, dental plaque, risk assessment, SMART

**ABSTRACT**

**Objective:** To evaluate a programme of patient education in oral hygiene techniques in the context of dental implants, using a grading system to evaluate risk and set SMART objectives.

**Methods:** This retrospective service evaluation used aggregated data from annual implant maintenance appointments at a private dental practice. At each recall appointment, peri-implant disease risk was assessed and SMART targets for improvement set, accompanied by education in oral hygiene techniques.

**Results:** Data from 316 patients showed a statistically significant improvement in plaque scores at appointments following setting of oral hygiene targets ($p = 0.001$). From 2015 onwards, oral hygiene education and target setting was given prior to implant surgery. The oral hygiene of these 60 patients at one-year post-surgery was significantly better than that of patients who had not had pre-surgery education (surgery prior to 2015).

**Conclusions:** Patients respond positively to the setting of specific targets for oral hygiene improvement. In the context of dental implants, it is vital that patients are provided with the knowledge and skills to care for their implants, and are challenged to take responsibility for implant maintenance at home. With this in mind, the use of early target setting prior to surgery has the potential to reduce peri-implant disease and associated risk factors.
Dental implants that are well placed and maintained have been shown to have long-term survival rates as high as 98.8% after 10 years. Despite such high success rates, and even with advances in surgical techniques, implant design, materials and surface modifications, dental implants can be prone to complications and failure.

A strong correlation has been demonstrated between poor oral hygiene and peri-implantitis, hence minimising disease inducing micro-organisms within the oral environment should help prevent its onset. Recently, a new classification framework of risk indicators for peri-implant health and disease has been developed. It is important for the patient to understand risk factors associated with peri-implant disease, and to take responsibility for implant maintenance at home. Therefore, prior to the placement of a dental implant, it is vital that the patient undergoes a course of oral hygiene education to equip them with skills and techniques to care for and maintain their dental implants(s). This will also enable patients to begin caring for the implant(s) immediately after exposure and restoration. Consistent measuring and monitoring of plaque indices and levels of bleeding on probing at clinical appointments assess effectiveness of home care and risk indicators for peri-implant disease.

This provides opportunity for discussion and target setting with patients, alongside education in methods to improve oral hygiene and implant care, as part of a dental hygienist-led implant maintenance programme.

In healthcare, motivation is essential for compliance with a recommended treatment regime/routine. The use of SMART (Specific, Measurable, Achievable, Realistic, Time-bound) objective setting has been discussed as a technique for changing behaviour and can also prove a useful tool for clinicians. This retrospective service evaluation assesses the impact of setting specific targets for patients to improve their oral health, using SMART objectives, in a primary care setting. This structure was used to help motivate patients, monitor their progress, and support behavioural changes with respect to oral health.

**Participants**

Data were acquired from audits of aggregated anonymised annual implant maintenance appointments from a single UK private practice. Data had no identifiers or means of re-identification, therefore patient consent was not sought and no patients were excluded from this study. HRA (Health Research Authority) decision tools (an authoritative decision in line with UK GAfREC and NRES) were used to confirm this service evaluation did not require ethical approval.

**Study design: clinical data and SMART targets**

Clinical data was recorded at each annual implant maintenance appointment and used as a general indicator of oral health (plaque scores, and bleeding on probing around implants). Plaque scores were categorised as follows: ‘good oral health’ (0-15% plaque); ‘requires improvement’ (15-30% plaque); and ‘poor oral health’ (>30% plaque). These risk categories, alongside any relevant contextual data, were then referred to for target setting. Objectives were ‘Specific’ – e.g. moving to a lower plaque score range, or from higher end to lower end of range; ‘Measurable’ – criteria for measuring plaque scores remained the same throughout all appointments, and patients were always told their exact percentage followed by the range into which that fell; ‘Achievable’ – advice and guidance on how to reach set goals was given; ‘Relevant’ – in the context of dental implants, good oral hygiene promotes implant stability, thus reducing complications and minimising implant failure and this was emphasised to patients; ‘Time-bound’ – in this study the deadline was the next dental hygiene appointment. Bleeding on probing scores were also recorded and the correlation between plaque and inflammation was explained to patients. Targets to reduce bleeding were thus incorporated into plaque score targets, and it was explained that a reduction in plaque would also reduce inflammation and hence bleeding on probing.

**Setting**

All dental hygiene appointments and respective implant surgeries took place at one UK private dental practice. Patients who had undergone implant surgery returned to the practice annually for implant maintenance appointments to review oral health and reinforce methods for implant maintenance, with additional appointments based on individual needs. The first part of this study uses data derived from patients who had surgery in 2012 or 2013. ‘Year 1’ refers to patients at their first annual implant maintenance appointment one year following implant surgery (2013/14), Year 2 appointments in 2014 and 2015, and Year 3 appointments in 2015 and 2016. Parameters obtained before (Year 1) and after (Years 2 and 3) SMART objectives were set were analysed.

In 2015, a comprehensive pre-implant hygiene education appointment was developed for patients due to undergo implant surgery, so that patients were equipped to maintain implants as soon as they were placed. Hence the second part of this study analysed Year 1 data from the 2016 audit, summaising patients who had surgery in 2015 and who therefore attended pre-implant oral hygiene education appointments using SMART targets.

**Results**

Aggregated anonymous data were acquired from annual maintenance appointments, and are summarised in Table 1. As this data was anonymous, no further characteristics are available. Compliance with annual attendance decreased between first and subsequent annual implant maintenance appointments, with 316 (100%) patients attending their Year 1 appointment, decreasing to 223.

<table>
<thead>
<tr>
<th>Year</th>
<th>Appointment*</th>
<th>Date of appointment</th>
<th>No. Patients</th>
<th>Retention rate</th>
<th>Mean no. implants per patient ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>2013 and 2014</td>
<td>316</td>
<td>-</td>
<td>2.68 ± 2.33 (Range 1 to 10)</td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td>2014 and 2015</td>
<td>223</td>
<td>71%</td>
<td>2.82 ± 2.29 (Range 1 to 10)</td>
<td></td>
</tr>
<tr>
<td>Year 3</td>
<td>2015 and 2016</td>
<td>165</td>
<td>52%</td>
<td>2.46 ± 2.10 (Range 1 to 10)</td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>2016</td>
<td>60</td>
<td>N/A</td>
<td>2.16 ± 1.53 (Range 1 to 7)</td>
<td></td>
</tr>
</tbody>
</table>

*approximate number of years after surgery

Table 1. Annual implant maintenance appointments.
RISK ASSESSMENTS AND SMART TARGETS IN ORAL HYGIENE

(71%) for Year 2 and down to 165 (52%) by their Year 3 appointments. In addition, aggregated data from patients attending Year 1 appointments in 2016 were analysed, representing a cohort for whom pre-implant oral hygiene education was routine.

During annual implant maintenance appointments, a clinical examination was carried out in conjunction with the education of patients in oral hygiene techniques. A bespoke plan was agreed with patients for optimal oral hygiene in the home environment, and targets set for improvement. Aggregated data from clinical assessments at Year 1, Year 2 and Year 3 post-implant surgery were analysed (Figure 1). These data were set internally to categories of ‘good oral health’ (0-15%), ‘requires improvement’ (15-30%) and ‘poor oral health’ (>30%), aligned with categories of low, moderate and high risk respectively. At the patients’ first post-surgery implant maintenance appointments (Year 1, prior to hygiene education and target setting, total of 316 patients), oral health was variable: 93 patients (29%) fell into the ‘poor oral health’ category, with only 125 patients (40%) having ‘good’ oral health. At this Year 1 implant maintenance appointment, patients were educated in home care and plaque score ranges used to set targets for encouraging improvement. Subsequently, at Year 2, a decrease in patients with poor plaque scores was observed: 29 of the 223 returning patients (13%) had >30% plaque, categorised as ‘poor oral health’. This decrease was accompanied by an increase in percentage of patients with ‘good’ oral health from 125 out of 316 (40%) to 137 out of 223 (61%). This change was found to be statistically significant with p<0.001 (Chi-Square test), indicating improvement in patient home care. Results at Year 3 were found to be similar to Year 2, and there was no statistically significant difference between Year 2 and Year 3, suggesting that patients’ oral care routine at home had been maintained during this time. Of note, this decrease in plaque scores correlated with a decrease in inflammation, with bleeding on probing seen in 48/316 patients (15.2%) in Year 1, down to 14/223 patients (6.3%) in Year 2 (chi-square p=0.001).

In 2015, pre-implant oral hygiene education was introduced, again using SMART objective-setting. Year

![Figure 1](http://example.com/figure1.png)

Percentage of patients in each plaque score range at routine implant maintenance appointments (Year 1, 2 and 3). Lower plaque scores were seen in Year 2, after oral hygiene education was given at Year 1 appointment. (Chi-Square test; p<0.001)

![Figure 2](http://example.com/figure2.png)

Plaque scores (A) and bleeding on probing (B) in patients at Year 1 annual appointment after implant surgery. (A) Chi-Square test: p<0.001; statistically significant difference; (B) Fishers Exact test: p=0.003; statistically significant difference found for plaque scores and bleeding on probing scores between patients who did/did not have pre-implant hygiene appointments.
1 plaque scores of patients who did not have pre-implant education (Year 1 in 2013/14) were compared with the cohort who had attended a pre-implant oral hygiene education appointment prior to implant surgery in 2015. For the purposes of this analysis, data from the former represents a historical control group where the only difference between groups was absence/presence of pre-implant target-setting and oral hygiene education. This data is summarised in Figure 2A where, one year post-surgery, 46 of the 60 patients (76.7%) who had attended pre-implant oral hygiene education appointments had ‘good’ plaque scores. This was compared to those patients who had not received pre-implant education, where only 125 of 316 patients (40%) had ‘good’ plaque scores), with the difference found to be statistically significant (Chi-Square test p<0.001). A statistically significant (p=0.003) decrease in BOP around implants was also recorded in the group with pre-implant oral hygiene education (Figure 2B).

Discussion

This study was undertaken to assess the effectiveness of a maintenance protocol and oral hygiene education for patients undergoing implant treatment, which in turn can influence implant stability and long term clinical outcomes. Previous studies discuss the impact of maintenance therapy on the prevention of peri-implant disease,16,17 with emphasis on routine supportive maintenance therapy.16 Oral hygiene therapy has been highlighted as a prevention tool, as mucositis was found to potentially progress into peri-implantitis if left untreated, but was reversible if adequately treated.17 Furthermore, implant maintenance appointments have been shown to reduce the incidence of peri-implant disease by minimising risk factors such as plaque.18,19

Often, emphasis is placed on the frequency of maintenance appointments to promote and sustain implant stability.20 However, there is still some variation in patient understanding and expectations of implant treatment, in particular with reference to the subsequent care required.21,22 The data presented here assessed the effectiveness of patient-centred education in oral hygiene and implant maintenance, with patient set targets at annual maintenance appointments based on a graded assessment of risk. This grading system reflected both clinical parameters and patient contextual data. Quantitative analyses indicated a significant increase in patients with good periodontal hygiene the year after target-focussed oral hygiene education was given. Moreover, subsequent data obtained at three years post-surgery suggested that this improvement was sustained, at least for those who continued to attend annual clinical appointments. When implementing this maintenance programme it was felt that setting a single target, rather than multiple targets for improvement, would provide patients with a specific focused goal that was easy to understand. Therefore, plaque scores were used for target setting with patients, although the correlation between reduced plaque and reduced inflammation and bleeding on probing was explained to patients. The improvement shown here in plaque scores correlated with a reduction in bleeding on probing.

In addition to this data, and perhaps most importantly, analysis of a second set of Year 1 post-surgery data - from patients who had bespoke oral hygiene education prior to implant surgery – demonstrated lower plaque scores when assessed at Year 1 post-surgery appointments than counterparts who did not receive this early intervention. A correlating reduction in BOP was also observed. This emphasises the effectiveness of providing education in ‘patient home care’ early in the implant treatment process, and the resulting positive impact of good oral health.

It is vital not to overlook the importance of identifying specific objectives for patients to focus on. This approach to goal-setting can drive behaviour change and encourage self-management.23 Here, the use of plaque score ranges, rather than individual plaque scores, gives a memorable, measurable and achievable target to aim for. Ensuring the patient understands the relevance of good oral hygiene for implant longevity provides additional motivation.

The use of three target ranges is not dissimilar to the traffic light system frequently used for risk assessment in healthcare; here we place the patient in a risk category depending upon plaque score range, and treat and set targets accordingly. This system has the potential to be further developed.

This study has some weaknesses in design due to its retrospective nature. The overall periodontal status of patients and implant and reconstruction type were not recorded in this aggregated dataset, limiting more in depth statistical analysis. However, the good sample sizes and statistical analyses of aggregated data show the positive impact of SMART targets for improving oral health. Prospective studies with this in mind would further validate results.

Conclusions

It is vital that patients are provided with the knowledge and skills to care for their implants, as plaque accumulation is associated with peri-implant mucositis, which can be reversed if plaque is eliminated. Patients responded positively to SMART targets for the improvement of oral hygiene set in response to risk analysis, and improvements in periodontal health were sustainable. Moreover, early risk analysis and associated target-setting prior to surgery resulted in improved oral hygiene earlier in the treatment process.

This report provides quantitative evidence from a primary care setting supporting use of risk assessments and SMART targets as part of a dental hygienist-led implant maintenance programme. This should be implemented prior to implant surgery, in order for patients to take an early lead in reducing risk factors associated with peri-implant complications and failure.
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Declaration of Interests

No sources of funding were received and the authors have no conflict of interest to disclose.

Author contributions:

1. Karen Walker is the dental hygienist at The Campbell Clinic. This paper focuses on her system for educating patients in implant homecare, and she worked with Colin to initiate data collection to demonstrate this. She has worked with the rest of the authors to develop data collection and to turn this audit into a manuscript.

2. Anna Walker is a research nurse. She is responsible for data collection, and for liaising with Kath Hare on data analysis and interpretation.

3. Nishant Yadev is a part-time dentist, part time researcher. He co-wrote the manuscript and supported data collection.

4. Katherine Hare is the Research Coordinator at the Campbell Clinic. She coordinated data collection, analysed the data, and co-wrote the manuscript.

5. Colin Campbell is the Primary Investigator at The Campbell Clinic. He initiated and ran the project, and also contributed to data analysis.

References


Practice demographics in three randomised controlled trials undertaken in dental primary care settings

FS. Ord¹, HJ. Braid², RC. Floate³, KJ. Sim⁴

**Learning outcomes:**

- Identify examples of primary care based dental research funded by National Institute for Health Research (NIHR).
- Explore primary care practice demographics across deciles of multiple deprivation.
- Identify changes in dental caries and registration rates across UK nations

eCPD aligned with GDC development outcomes: B,C

Key words: primary care, dental practices, recruitment demographics, scale and polish, dental recall, dental caries, primary teeth

**ABSTRACT**

Dental research has predominately been conducted in secondary care – dental schools and hospitals - however most of the dental care provided is delivered in the setting of primary care. Three dental trials (FiCTION, INTERVAL and IQuaD) explore the effectiveness of different treatment options in the primary care setting of dental practices.

**Aim:** To provide an overview of the geographical and deprivation demographics of recruited dental practices across these three randomised controlled trials.

**Methods:** Ethical approval was sought and granted. Dental practices (dentists) were recruited through research-active groups across the United Kingdom. Practice postcodes were used to assess levels of deprivation.

One hundred and seventy-five (175) primary care dental practice sites were recruited across the three trials from the following sectors: independent, corporate and NHS community salaried service. Three dental practices were recruited across all three trials, and twenty practices participated in two trials. Recruited practices were distributed across all deciles of multiple deprivation. The majority of recruited practices were recruited from the five most deprived deciles. Most practices were in decile 3 (decile 1 is most deprived).

**Results:** The three dental trials were able to recruit a variety of primary care dental practices to participate over the trial periods. The trial results show distribution of dental practices with differing degrees of multiple deprivation across the United Kingdom, for each of the trials.
**Background**

Dental research has predominately been conducted in secondary care – dental schools and hospitals. In the United Kingdom, up to 95% of treatment is delivered within primary care. As the majority of dental treatment is carried out in primary dental settings, it is important that research conducted in those settings is representative of the general population.

In England and Wales many Clinical Commissioning Groups, previously Primary Care Trusts (PCTs), are now seeking to secure adherence to best practice guidance as part of their clinical governance responsibilities when commissioning dental primary care services.

The need for robust evidence to inform healthcare is growing and research results gained in a primary care setting add to the evidence base for clinical dental practice, demonstrating benefits for patients and dental staff.

The number of primary dental care studies receiving support from the National Health Service National Institute for Health Research (NHS NIHR) is increasing. Between 2010 and 2011 there were 12 dental studies supported by the NHS NIHR and between 2016 and 2017 46 dental studies received support. The mission of the NHS NIHR is to: “provide a health research system in which the NHS supports … leading-edge research focused on the needs of patients and the public”.

Support for primary care studies can also be sought from clinical research networks within each of the four home countries in the UK. Each nation has a clinical research network that supports trials through the various stages of setting up, undertaking and delivering, and completing a trial taking place in primary care. These networks are the Health and Care Research (Wales), Northern Ireland Clinical Research Network (NICRN), NIHR Clinical Research Network (England) and NHS Research Scotland Primary Care Network (Scotland).

Scotland is also fortunate to have the Scottish Dental Practice Based Research Network. Established in 1998, its aim is to encourage, facilitate and conduct high quality research in the primary care setting, and to disseminate information relevant to the provision of evidence-based primary dental care.

Whilst support for clinical practice based (primary care) dental research is becoming more prevalent, there are further opportunities for randomised controlled trial development in practice. Randomised control trials provide high quality evidence which helps to inform guidance and change clinical practices. However, in the past, clinical dental trials were conducted with sample sizes not having sufficient statistical power to detect a meaningful change.

The NHS NIHR has funded three randomised controlled trials, sponsored by the University of Dundee, to explore three important topics of oral health and treatment. Each of the three trials is a multi-centred, primary care based, parallel group, randomised controlled trial.

Filling children’s teeth, indicated or not (FICTION), aims to determine which of three caries management approaches is most successful for primary teeth. Children are randomised and treated according to one of three treatment approaches: conventional caries management (drill and fill) with best practice prevention; biological management of caries (sealing-in) with best practice prevention; or best practice prevention alone.

The “investigation of NICE technologies for enabling risk- variable-adjusted-length” (INTERVAL) will explore the clinical and cost effectiveness of three different periods of dental recalls intervals. The three recall intervals are: a fixed-period extended twenty-four month recall interval; a risk-variable-adjusted-length recall interval (risk-based recall) based on the NICE Guidelines; and a fixed-period conventional six month recall interval.

Improving the Quality of Dentistry (IQuaD) aims to compare the effectiveness and cost-effectiveness of theoretically based, personalised oral hygiene advice (OHA) or periodontal instrumentation (PI) at different time intervals or their combination, for improving periodontal health in dentate adults.

This article will explore the recruitment demographics of primary care dental practices to these three randomised controlled trials across the United Kingdom. The aim was to recruit participants from a range of practices across varying levels of social economic deprivation, to ensure the data gathered would be representative of the population.

**Methods**

This paper reports on the geographical and deprivation demographics of primary care dental practices recruited to three randomised controlled trials. Ethical approval for the INTERVAL and IQuaD trials was sought and granted by Fife and Forth Valley Research Ethics Committee. FICTION ethical approval was granted by East of Scotland Research Ethics Service. Local Research and Development approval was sought from the Health Boards and Trusts in which recruitment of practices would be undertaken.

**Recruitment of dental practices**

Dentists were recruited through local postgraduate dental research networks, advertising in professional dental publications and presentations at national conferences.

The trial office sent potential dentist participants a personalised invitation letter to attend a local information and recruitment session, where the reasons for and design of the trial and practice involvement were described. Dental professionals were given the opportunity to discuss participation with the trial team. For those dentists who were unable to attend, information packs about the trial were posted or emailed from the trial office.

Trial team members telephoned dental practices to follow-up the notes of interest of involvement. For the FICTION trial, interested practices were visited by a member of the trial team to confirm suitability prior to an invitation to join the trial. Dentists were asked to provide written consent to participate and a signed declaration agreeing to adhere to the trial protocol. A site briefing and training session was arranged with the dentist, practice staff and trial office staff. Original signed and dated dentist consent forms and a declaration agreement were held securely as a part of the trial site file at the trial office. Copies of consents and agreements were made and returned to dentists.

**Demographic analysis**

To establish the geographic spread of practices across the United Kingdom, practice postcodes were used. The recruitment area for each trial is delineated on the results maps (Figs 1-3). To demonstrate the distribution across
indices of multiple deprivation, each practice postcode was checked against the Scotland Index of Multiple Deprivation (2012), England Index of Multiple Deprivation (2015), Wales Index of Multiple Deprivation (2014) or Northern Ireland Multiple Deprivation Measure (2010) as appropriate. Standardisation between the regions was possible through use of deciles.

Results

One hundred and seventy-five (175) primary care dental practices were recruited across the three trials. Sixty-two (62) recruited to FICTION, fifty (50) to the INTERVAL dental recalls trial and sixty-three (63) to IQuaD. Three dental practices were recruited across all three trials and an additional 20 practices participated in two trials. The types of primary care practices included independent, corporate, and NHS community salaried service.

There was a good geographical spread of practices across the recruiting areas for the FICTION (Fig. 1), INTERVAL (Fig. 2) and IQuaD (Fig. 3) trials.

Table 1 illustrates the percentage variation of deciles of multiple deprivation across each of the three studies. It shows that each of the trials was able to recruit dental practices from each decile of multiple deprivation. Comparison across the deciles showed that the highest percentage of practices in all three trials within one decile of deprivation was in decile 3, followed by decile 1, the most deprived. The lowest percentage of recruited practices to a decile was 16% in decile 9, followed by 18% in decile 7.

For each study, the greatest number of practices recruited was from the five most deprived deciles, 73% (45 of 62 practices) for FICTION, 56% (28 of 50 practices) for INTERVAL and 56% for IQuaD (35 of 63 practices).

The greatest numbers of practices recruited to FICTION was 21% (13 of 62 practices) in both deciles 1 and 3, INTERVAL 16% (8 of 50 practices) in decile 3 and IQuaD in decile 5, 20% (12 of 63).

These results are reflective only of dental practices. It was not possible to confirm that registered patients live within the same decile of deprivation in which their dental practice is located.

Discussion

Achieving targets to time for recruiting sites and patient participants can pose a great challenge to clinical trials. The strategies for trial enrolment and participation study (STEPS) found only 31% of randomised controlled trials (RCTs) recruited to time and target and a review found recruiting to medical studies was a significant concern for trial managers. Challenges of recruiting to the three trials have been previously discussed. Despite this, the trials were able to recruit across 175 primary care practice sites across the United Kingdom, across the breadth of deprivation. A percentage of practices was involved in two or more trials.

Successful recruitment and retention of
primary dental care practices to research requires commitment from the dental practice staff along with ongoing support from the clinical trial office staff. Research in the primary care setting provides an opportunity for dental practice staff to get involved. A 2011 study found that 50% of UK dental hygienists would like to be involved in research, and a recent paper highlighted opportunities for dental care professionals, including dental nurses in practice based research.

It may be that practices located in areas of higher deprivation were more likely to be involved with the studies, especially for the FiCTION trial, as higher levels of dental caries is experienced by the most deprived children. Although caries prevalence in children is reducing in the UK, there is still a requirement for primary care practitioners to provide the best evidenced treatments. In 2016 in Scotland, 55% of primary one children with the highest deprivation had no obvious caries experience, compared with 82% of the least deprived. In England in 2016, 66% of the most deprived five year olds had no experience of decay, compared with 86% of the least deprived. Similarly in Wales, the most socially deprived have lower levels of no caries experience at 57%, compared with 77% of the least socially deprived.

There has also been an increase in the population registered with a dentist. In Scotland, lifetime registration for patients was introduced in April 2010. Between 2007 and 2017 there has been an increase in dental registrations from 45.3% to 92.2% for adults, with 67.45% of those having seen a dentist within the past two years.

In the year 2016 to 2017, 4.1 million NHS courses of dental treatment were claimed in Scotland: 31% (3,078,424) of those are for an examination or provision of a care and treatment summary report. The outcomes of the INTERVAL dental recalls trial will add to the evidence of the effectiveness of six-month check ups compared with risk based recalls and twenty-four month check up intervals.

Likewise, a sizeable proportion of the NHS dental budget is claimed against routine scale and polish. In Scotland in the year 2014 to 2015, there were 2.2 million claims for simple scaling and polishing. Within the same time frame an estimated 12.9 million courses of treatment, including scale and polish, were claimed in NHS England. A 2013 Cochrane review reported: “insufficient evidence to determine the effects of routine scale and polish treatments”. The results of the IQuaD trial will add to the evidence of the effectiveness of different dental treatments.

Conclusion
The FiCTION, INTERVAL and IQuaD multi-site randomised controlled trials were able to recruit a variety of primary care dental practices to participate in the trials over a number of years. The results show distribution of dental practices with differing degrees of multiple deprivation across the United Kingdom. It is desirable to include dental practices from a range of socio-economically varied areas to demonstrate a representative sample and to inform the translation of results into practice.

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The research teams would like to thank the practice teams for their continuing support for the success of the trials.

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Exploring oral health-related knowledge and confidence among Australian community mental health professionals: A cross-sectional web-based survey

R. McGrath¹, J. Satur², R. Marino³

Learning outcomes:
- To understand community mental health support workers’ level of oral health knowledge
- To understand the barriers to people living with severe mental illness (PLWSMI) accessing dental services, as perceived by community mental health support workers
- To understand the need to build capacity to promote oral health in community mental health settings

Aligned with GDC development outcomes: C, D

Key words: Oral health promotion, mental illness, capacity building

ABSTRACT

Aims: The purpose of this study was to explore the oral health-related knowledge and confidence of Community Rehabilitation and Support Workers (CRSWs) at Neami National, an Australian community mental health service. It also sought to determine if participation in oral health training, provided by Bachelor of Oral Health students (equivalent to a UK combined degree in dental hygiene and dental therapy) from the University of Melbourne, was associated with better knowledge and confidence in promoting oral health for people living with severe mental illness (PLWSMI).

Methods: An anonymous cross sectional web-based survey of Neami CRSWs was conducted between November 2015 and March 2016. All CRSWs (n = 471) were invited via email to complete the questionnaire on Survey Gizmo. Univariate and bivariate data analysis was performed using SPSS version 23.0.

Results: 141 (RR 30%) surveys were included in the analysis. Results suggest that community mental health professionals have good knowledge about dental caries prevention but are less certain how to prevent periodontal disease. Participants also identified important oral health risk-factors, such as diet, smoking and excess alcohol consumption. Respondents who had participated in oral health training were found to have significantly higher oral health knowledge (p = 0.039) and to rate their understanding and confidence in promoting oral health significantly higher (p<0.0001) than those who did not have training.

Conclusion: The findings from this study support the development of workforce training programmes to build capacity of community mental health professionals to provide oral health advice and support to PLWSMI.
Study background

Good mental health is important for general health and wellbeing. People living with severe mental illness experience more physical health conditions than the general population. Chronic medical conditions such as cardiovascular disease, respiratory and infectious diseases, diabetes and hypertension, contribute to a reduced life expectancy of 10-25 years.1-3 In addition to poorer physical health outcomes, people living with severe mental illness (PLWSMI) are also at increased risk of poor oral health and face significant challenges in accessing appropriate oral health care.4-10 There is a need to improve health promotion, including oral health promotion, for PLWSMI.

People living with mental illness are recognised as a population group requiring targeted oral health support and care.11-12 Non-dental professionals (e.g. ‘aged-care’ professionals, nurses, midwives) have been used successfully to promote oral health in vulnerable and high-risk population groups.13-15 To date, this approach has been limited in community mental health settings.

The Smile for Health (SFH) programme is a partnership between the Melbourne Dental School at the University of Melbourne and Neami National, an Australian community mental health service which supports people living with severe mental illness.16 The goal of the programme is to increase capacity to provide oral health support for PLWSMI. As part of the SFH programme, second year Bachelor of Oral Health (BOH) students from the University of Melbourne delivered short (30 minutes) face-to-face oral health training sessions at twelve Neami sites in Victoria, in October 2015. These training sessions formed one component of the broader SFH capacity building programme.

The purpose of this present study was twofold: to explore oral health-related knowledge, attitudes and professional practices of Neami Community Rehabilitation and Support Workers who provide support to Neami consumers, at a national level; and to determine if those who had participated in oral health training had better oral health knowledge than those who did not. This paper presents the findings related to Community Rehabilitation and Support Workers’ (CRSWs) oral health-related knowledge and self-confidence in promoting oral health.

Materials and methods

An anonymous cross sectional web-based survey of Neami CRSWs was conducted between November 2015 and March 2016. Ethics approval was granted by the Human Research Ethics Committee at the University of Melbourne (ethics ID 1544795) and by the Research and Evaluation Committee at Neami National.

The questionnaire was purpose-designed for this study. Knowledge questions were adapted from validated survey tools used in other studies conducted through the Melbourne Dental School and in consultation with oral health experts.21,22 The survey was piloted on a small sample of Neami staff members, who were not part of the study pool, to test validity and reliability before necessary revisions were made. The survey was conducted using Survey Gizmo, an online survey software tool.19

Potential participants were all CRSWs (n = 471) currently providing support services to Neami consumers. According to Neami, internal survey response rates were generally between 35-50%. In order to maximise the number of respondents, all CRSWs were invited to participate in the survey. Therefore, the estimated sample size was 165-236 CRSWs. A sample of 128 was deemed large enough to detect a medium effect size of 0.5 at a significance level of 5% and 80% power (G* Power © Version 3.1.9.2.).

CRSWs were invited to participate via an email, which included a link to the online survey. The plain language statement was on Survey Gizmo web-based survey platform and the respondents indicated their consent to participate by choosing to complete the questionnaire. In efforts to maximise response rates, the survey steps outlined by Dillman were followed (e.g. notifying potential participants prior to the invitation email being sent and sending a reminder email one week after the invitation).20

Data analysis

Firstly, univariate statistics were used to describe the respondents’ characteristics (e.g. location, years worked at Neami and participation in oral health training in the previous twelve months) and responses to each of the survey questions. Bivariate analysis (comparing those who were/ were not located in Victoria, those who had/ had not worked at Neami for more than two years, and those who had/had not had oral health training in the last twelve months) of nominal and ordinal variables was performed using Chi-squared and Fisher’s Exact tests. For continuous variables, Mann-Whitney U tests were conducted. As this was an exploratory study, all p-values <0.05 were considered significant. Data manipulation and analysis was performed using SPSS version 23.0. (IBM)

Results

A total of 141 surveys (RR 30%) were included in the analysis. Although lower than anticipated, this sample was large enough to conduct the required statistical analysis. Almost half of respondents were from Victoria (n = 69, 48.93%) (Table 1). More than 60 per cent of respondents in each state had worked at Neami for less than two years: almost three-quarters (n = 104, 73.76%) of all respondents had commenced working with Neami within the previous 24 months. Two-fifths (n = 55, 39%) had oral health training in the preceding year, the vast majority of whom were located in Victoria (n = 49, 89%).

Generally, CRSWs had good understanding of behaviours that can reduce the risk of dental caries (Table 2). The vast majority believed that brushing teeth (n = 140, 99.3%), flossing (n = 128, 90.8%) and visiting a dental practitioner regularly (n = 132, 93.6%) were ‘very important’ or ‘important’ in preventing dental caries. Most (>80%) also knew that cutting down on sugary foods and drinks was important to reduce the risk of tooth decay. Respondents were less certain about the prevention of periodontal disease, with most (>88%) failing to recognise that fluoride in toothpaste and in water is ‘not at all important’ in relation to gum disease.

When asked about the association between a range of risk behaviours and oral health (Table 4), the majority correctly identified poor diet and nutrition (n = 123, 87.2%), smoking (n = 120, 85.1%), and excessive alcohol consumption (n = 96, 68.1%) as ‘very important’. However, over half of participants did not know that excessive sun exposure (n = 74, 52.5%) or unprotected sexual activity (n = 72, 51%) were oral health risk factors, demonstrating a lack of knowledge about the link between sun exposure and cancer of the lip and the potential for transmission of sexually transmissible infections (STIs) through unprotected oral sex.

CRSWs were asked to indicate whether a number of statements about oral health (n = 11) were true or false (Table 5). Almost all respondents knew that PLWSMI experience more oral health issues than the general population (n = 135, 95.7%), that people with no natural teeth should see an oral health professional regularly (n = 130, 92.2%) and that increasing sugar consumption will increase tooth decay (n = 132, 93.6%). Almost nine-tenths (n = 125, 88.7%) also knew that medications could increase the
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risk of oral diseases. Although the majority of CRSWs knew that bleeding was not a sign of brushing teeth too hard, one-in-five (n = 31, 22%) believed that it was. The majority of respondents (n = 113, 80.1%) did not know that the bacteria that cause tooth decay could be transmitted from one person to another (e.g. from mother to child). In addition, close to a third (n = 44, 30.5%) did not know that tooth loss was not a normal part of getting older.

Respondents' knowledge scores were calculated out of a maximum of eleven. The mean knowledge score for all CRSWs was 7.04 (SE 0.13), with a maximum of 10 and minimum of 4 scored. There were no significant differences in knowledge scores dependent upon being located in Victoria or working at Neami for longer than two years (Table 6). However, oral health training was associated with significantly higher mean knowledge scores (7.38 versus 6.83, U = 1,885.5, z = -2.068, p = 0.039).

Participants were asked to select what they believe to be the five most important barriers to accessing dental services from a list of fifteen possible barriers. Despite the fact that the majority of Neami consumers would have a healthcare card or pension card and therefore be eligible for free or low-cost public dental care in all Australian states, cost (n = 24, 87.9%) was the most frequently selected barrier. Fear, coping with anxiety, lack of motivation and lack of oral health knowledge were the other four most frequently selected barriers (Figure 1).

CRSWS were asked to rate their level of oral health knowledge and confidence.

### Table 1. Profile of survey respondents, by state (n = 141)

<table>
<thead>
<tr>
<th>Location</th>
<th>NSW</th>
<th>%</th>
<th>QLD</th>
<th>%</th>
<th>SA</th>
<th>%</th>
<th>VIC</th>
<th>%</th>
<th>WA</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
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<td>16.3</td>
<td>9</td>
<td>6.4</td>
<td>26</td>
<td>18.4</td>
<td>69</td>
<td>48.9</td>
<td>14</td>
<td>9.9</td>
<td>141</td>
<td>100.0</td>
</tr>
<tr>
<td>Years worked at Neami</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1</td>
<td>12</td>
<td>55.2</td>
<td>5</td>
<td>55.6</td>
<td>30.8</td>
<td>25</td>
<td>36.2</td>
<td>7</td>
<td>50.0</td>
<td>57</td>
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<td></td>
</tr>
<tr>
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<td>17.4</td>
<td>1</td>
<td>11.1</td>
<td>8</td>
<td>50.8</td>
<td>30</td>
<td>43.5</td>
<td>4</td>
<td>28.6</td>
<td>47</td>
<td>33.3</td>
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<tr>
<td>2-3</td>
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<td>2</td>
<td>22.2</td>
<td>4</td>
<td>15.4</td>
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<td>10.1</td>
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<td>7.1</td>
<td>18</td>
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<td>11.1</td>
<td>5</td>
<td>19.2</td>
<td>3</td>
<td>4.3</td>
<td>1</td>
<td>7.1</td>
<td>12</td>
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</tr>
<tr>
<td>&gt;4</td>
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<td>-</td>
<td>-</td>
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<td>3.8</td>
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<td>5.8</td>
<td>1</td>
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<td>7</td>
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<tr>
<td>OH training</td>
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<td>2</td>
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<td>49</td>
<td>7.1</td>
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<td>-</td>
<td>55</td>
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<tr>
<td>No</td>
<td>22</td>
<td>95.7</td>
<td>7</td>
<td>77.8</td>
<td>23</td>
<td>88.5</td>
<td>20</td>
<td>29.0</td>
<td>14</td>
<td>100</td>
<td>86</td>
<td>61.0</td>
</tr>
<tr>
<td>Aware of OH programme</td>
<td>Yes</td>
<td>13</td>
<td>56.5</td>
<td>5</td>
<td>55.6</td>
<td>11</td>
<td>42.3</td>
<td>57</td>
<td>82.6</td>
<td>5</td>
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<td>91</td>
</tr>
<tr>
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<td>10</td>
<td>43.5</td>
<td>4</td>
<td>44.4</td>
<td>15</td>
<td>57.3</td>
<td>12</td>
<td>17.4</td>
<td>9</td>
<td>64.3</td>
<td>50</td>
<td>35.5</td>
</tr>
</tbody>
</table>

Chi-square tests

NSW = New South Wales, QLD = Queensland, SA = South Australia, VIC = Victoria, WA = Western Australia

** Significant differences at the alpha level p<0.01

*** Significant differences at the alpha level p<0.001

### Table 2. CRSWs opinions on the importance of behaviours in preventing dental caries

<table>
<thead>
<tr>
<th></th>
<th>Not at all important</th>
<th>Somewhat important</th>
<th>Important</th>
<th>Very important</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Brushing</td>
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<td>--</td>
<td>12</td>
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<tr>
<td>Flossing</td>
<td>1</td>
<td>.7</td>
<td>12</td>
<td>8.5</td>
<td>29</td>
</tr>
<tr>
<td>F water</td>
<td>21</td>
<td>14.9</td>
<td>49</td>
<td>34.8</td>
<td>39</td>
</tr>
<tr>
<td>F toothpaste</td>
<td>9</td>
<td>6.4</td>
<td>33</td>
<td>23.4</td>
<td>38</td>
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<tr>
<td>Reduce sugary foods</td>
<td>-</td>
<td>-</td>
<td>7</td>
<td>5.0</td>
<td>22</td>
</tr>
<tr>
<td>Reduce sugary drinks</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>2.8</td>
<td>17</td>
</tr>
<tr>
<td>Sugar free gum</td>
<td>31</td>
<td>22.0</td>
<td>44</td>
<td>31.2</td>
<td>35</td>
</tr>
<tr>
<td>Regular dental visits</td>
<td>1</td>
<td>.7</td>
<td>6</td>
<td>4.3</td>
<td>23</td>
</tr>
</tbody>
</table>

### Table 3. CRSWs opinions on the importance of behaviours in preventing periodontal disease

<table>
<thead>
<tr>
<th></th>
<th>Not at all important</th>
<th>Somewhat important</th>
<th>Important</th>
<th>Very important</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Brushing</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Flossing</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>12</td>
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<tr>
<td>F water</td>
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<td>9.2</td>
<td>30</td>
<td>21.3</td>
<td>40</td>
</tr>
<tr>
<td>F toothpaste</td>
<td>16</td>
<td>11.3</td>
<td>39</td>
<td>27.7</td>
<td>31</td>
</tr>
<tr>
<td>Reduce sugary foods</td>
<td>13</td>
<td>9.2</td>
<td>28</td>
<td>19.9</td>
<td>33</td>
</tr>
<tr>
<td>Reduce sugary drinks</td>
<td>1</td>
<td>.7</td>
<td>14</td>
<td>9.9</td>
<td>35</td>
</tr>
<tr>
<td>Sugar free gum</td>
<td>27</td>
<td>19.1</td>
<td>40</td>
<td>28.4</td>
<td>31</td>
</tr>
<tr>
<td>Regular dental visits</td>
<td>1</td>
<td>.7</td>
<td>3</td>
<td>2.1</td>
<td>20</td>
</tr>
</tbody>
</table>
The majority of respondents from Victoria rated their understanding of the links between oral health and mental health as ‘above average’ or ‘excellent’ (52.2%), compared to only 35 per cent of those outside Victoria ($\chi^2 (2) = 7.786$, $p = 0.020$). Those who had OH training rated themselves significantly higher compared to those who had not training for: understanding oral health risk factors (FET, $p = 0.009$), understanding the links between oral health and mental health (FET, $p = 0.005$), and being confident when using the Neami oral health resources (FET, $p < 0.0001$).

The results from all seven items were combined to calculate mean self-rated understanding and confidence scores (Table 8). Mean scores were significantly higher for CRSWs in Victoria compared to those outside Victoria ($U = 3,332$, $z = 3.511$, $p < 0.0001$). Self-rated understanding and confidence were also significantly higher for those who had participated in oral health training ($U = 1,497.5$, $z = -3.680$, $p < 0.0001$). A significant positive correlation was found between knowledge scores and understanding and confidence scores ($r_s = 0.304$, $p < 0.0001$, $n = 141$), suggesting those with better knowledge also felt more confident providing oral health advice and support.

### Discussion

This cross-sectional survey found that oral health training is associated with better oral health-related knowledge and higher levels of confidence in providing oral health support to PLWSMI. Therefore, the implementation of professional development activities is advocated to increase capacity to promote oral health in community mental health settings.

The majority of participants were from Victoria or New South Wales, which reflects the geographic distribution of Neami services and staff. Most of the CRSWs who had participated in oral health training were located at sites in Victoria where the BOH students had delivered training. This result was also anticipated, as it was believed that there had been little focus on oral health training in other states.

While CRSWs generally had good knowledge about dental caries prevention, they were less certain about how to prevent periodontal disease. Other studies have also found health professionals to have poor knowledge about periodontal disease.25-26 Key oral health messages about fluoride use and sugar consumption are often generic and do not always state whether they relate to dental caries or periodontal disease prevention.
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(e.g. brush teeth twice a day with fluoride toothpaste, limit consumption of sugar-sweetened foods and drinks). This may contribute to confusion among non-dental professionals and the general public regarding the prevention of specific dental diseases. Nevertheless, it would seem more important to know that particular behaviours can reduce the risk of dental diseases rather than the specific disease in question.

It was interesting to find that the majority of respondents incorrectly believed that ‘lack of physical activity’ was an oral health risk factor. While physical activity can help maintain a healthy weight, and reduce the likelihood of chronic health conditions associated with periodontal disease (e.g. obesity and type 2 diabetes),25-31 ‘lack of physical activity’ is not a recognised oral health risk factor. On the other hand, there is evidence that unprotected oral sex and excessive sun exposure are linked to oral diseases. However, half of respondents were not aware of these associations indicating a lack of knowledge about sun exposure as a risk factor for oral cancer of the lip and of the potential spread of STIs through unprotected oral sex (e.g. Syphilis, Human Papillomaviruses and Herpes Simplex Viruses).32-37 This lack of knowledge about behavioural risk factors associated with oral health should be considered in the development of future oral health training sessions for community mental health professionals.

The transmission of oncogenic Human Papillomaviruses (HPV) through unprotected oral sex is particularly important, due to the association between HPV and oropharyngeal cancer.33,34,38 In Australia, HPV vaccines are routinely provided to all adolescent girls and boys as part of a school-based national immunisation programme.39 In July 2018, the UK Government announced that from autumn 2019 the HPV vaccination programme in England would be extended to include adolescent boys as well as girls.40 (In April 2018, the HPV vaccination scheme was also offered to men who have sex with men.)

This survey found that CRSWs who had oral health training had significantly better knowledge than those who had no training (p = 0.026). There is good evidence that education interventions can significantly increase oral health knowledge.14,41,42 The results of this study support the implementation of oral health training in other community mental health settings.

When asked their opinions on potential ‘barriers’ facing PLW/SMI accessing dental services, the most frequently mentioned barrier

<table>
<thead>
<tr>
<th>Self-rated understanding</th>
<th>Poor</th>
<th>Below average</th>
<th>Average</th>
<th>Above average</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk factors associated with poor oral health</td>
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<td>5</td>
<td>75</td>
<td>53.2</td>
<td>73</td>
</tr>
<tr>
<td>Links between mental health and oral health</td>
<td>1</td>
<td>11</td>
<td>7.8</td>
<td>68</td>
<td>53.2</td>
</tr>
<tr>
<td>Links between oral health and general health and wellbeing</td>
<td>1</td>
<td>5</td>
<td>3.5</td>
<td>75</td>
<td>53.2</td>
</tr>
<tr>
<td>Self-rated confidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discussing oral health with consumers</td>
<td>1</td>
<td>7</td>
<td>7.8</td>
<td>73</td>
<td>51.8</td>
</tr>
<tr>
<td>Using Neami oral health resources</td>
<td>7</td>
<td>5.0</td>
<td>25</td>
<td>17.7</td>
<td>57</td>
</tr>
<tr>
<td>Supporting consumers with their oral health needs</td>
<td>3</td>
<td>2.1</td>
<td>9</td>
<td>6.4</td>
<td>61</td>
</tr>
<tr>
<td>Referring consumers to oral health services</td>
<td>1</td>
<td>7</td>
<td>9.9</td>
<td>51</td>
<td>36.2</td>
</tr>
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</table>

Table 7. CRSWs self-rated oral health-related understanding and confidence

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>SE</th>
<th>Sig.</th>
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</thead>
<tbody>
<tr>
<td>VIC</td>
<td>69</td>
<td>3.56</td>
<td>.062</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Non-VIC</td>
<td>72</td>
<td>3.24</td>
<td>.066</td>
<td></td>
</tr>
<tr>
<td>&gt;2 years</td>
<td>37</td>
<td>3.44</td>
<td>.082</td>
<td>.547</td>
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<tr>
<td>&lt;2 years</td>
<td>104</td>
<td>3.38</td>
<td>.057</td>
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</tr>
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<td>OH training</td>
<td>55</td>
<td>3.62</td>
<td>.071</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>No OH training</td>
<td>86</td>
<td>3.26</td>
<td>.057</td>
<td></td>
</tr>
<tr>
<td>All CRSWs</td>
<td>141</td>
<td>3.40</td>
<td>.047</td>
<td></td>
</tr>
</tbody>
</table>

Table 8. Comparing mean self-rated understanding and confidence scores
was cost. This is in keeping with the results of a national survey in Australia investigating the reasons why people avoid or delay dental visits, which identified cost of dental services as the primary barrier.43 Over 8-in-10 (84%) Australians report that their last dental visit was to a private dental practice.44 However, it is believed that the majority of Neami consumers have a concession card (healthcare card or pension card) and are therefore eligible for free public dental care.2* The fact that cost was the most frequently selected barrier to accessing oral health care calls into question CRSWs knowledge of the eligibility criteria for accessing public dental services. This information is particularly pertinent in Victoria, where mental health clients get priority access to public dental care, meaning they will not be placed on a waiting list and will be given the next available appointment (DHSV). Despite public dental services being free or low cost, the indirect costs associated with dental visits (e.g. travel expenses and time off work) may mean that ‘cost’ remains a barrier46 and should be considered in efforts to enhance dental services accessibility for PLWSMI.

After cost, the top barriers to dental services reported were fear, anxiety and lack of motivation. These barriers have been cited in numerous studies investigating dental visit avoidance behaviours in the general population and, more specifically, in mental health populations.46-51 Research conducted with consumers of Neami services also highlighted fear and anxiety as barriers they experienced in accessing oral health care.52 The results of this present study demonstrate that community mental health workers have good knowledge of the reasons why people living with mental illness may avoid or delay visiting a dental practitioner. Overall, CRSWs rated their oral health understanding and confidence as ‘average’ or ‘above average’. This is in line with the findings of Johnson et al. (2017)17 who reported that eating disorder professionals rated their knowledge of oral disease, preventive oral care and oral health risks as ‘average’ or ‘above average’. As would be expected, CRSWs with better oral health knowledge rated their understanding and confidence higher (p < 0.0001). Oral health training was also associated with significantly better self-rated understanding and confidence, which was unsurprising given the evidence that oral education interventions for non-dental professionals can be effective in building confidence.144,45 Oral health professionals (OHPs) have an essential role to play in educating non-dental professionals about oral health. This requires OHPs to be competent in delivering health promotion interventions.54

In interpreting the results of this study, certain limitations must be acknowledged. Although within the acceptable range for a web-based survey,55 the response rate for this study was lower than expected. However, the sample was representative of the Neami CRSW population (geographic distribution and years worked at Neami) and was large enough to conduct the required statistical analysis. It is also important to remember that this survey was conducted within a single organisation, which limits the generalisability of the findings. To date, little is known about oral health knowledge, attitudes and professional practices in other community mental health settings. Therefore, this exploratory study provides important new information and highlights the need for future research into oral health knowledge and oral health promotion practices of community mental health professionals.

Conclusion

This cross-sectional survey found that Neami CRSWs oral health knowledge levels varied, particularly their understanding of dental caries and periodontal disease. However, those who had oral health training generally had better knowledge than those who had not. In addition, oral health training was associated with significantly higher confidence levels in providing oral health support to people living with severe mental illness. These results suggest that professional development is effective in building oral health knowledge and self-confidence in community mental health professionals. This exploratory study was part of the Neami SFH programme, and subsequently contributed to the design of workforce development activities to increase capacity to promote oral health for PLWSMI. The persistently poor oral health of PLWSMI, and the lack of targeted oral health promotion, highlights the need for more action. This study provides initial evidence for use in the design of oral health training programmes for use in other community mental health services.

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Author contributions

The study was one component of a PhD project. All research activities for this study were conducted by the first author under the supervision of the co-authors. The first author also had the major contribution to the writing of this manuscript.

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Dental Hygiene and Therapy students’ perception of reflective tools used within their undergraduate education

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Learning outcomes:
- Understand dental hygiene and therapy students’ perceptions of the usefulness of reflective tools embedded within their undergraduate programme
- Understand whether reflective tools facilitate the development of internal awareness and meaningful reflection
- Appreciate the need for further research into the use of reflective tools to improve patient care

Aligned with GDC development outcomes: B,C,D

Key words: Reflection, Dental Hygiene and Therapy students, Undergraduate education

ABSTRACT

Aims: To explore students’ perceptions of the reflective tools embedded within the Dental Hygiene and Therapy undergraduate programme at the University of Portsmouth Dental Academy (UPDA) and to examine whether the reflective tools (RT) facilitate the development of internal awareness and meaningful reflection.

Methodology: Two semi-structured focus groups were conducted with ten Dental Hygiene and Therapy students (DHTS) from Years 2 and 3 at UPDA during November 2017. Discussions explored the importance, effectiveness, contribution and barriers of the reflective tools used by DHTS. The data captured were manually transcribed and analysed using Braun and Clarke’s (2006)¹ six phases of thematic analysis.

Results: From the data, six themes and twenty sub-themes emerged. Participants understood the importance of reflection and its potential to improve patient care. However, judgement, time, mood and lack of motivation were identified as the common barriers to effective reflection. Participants preferred to reflect in their own time and use their own methods, which were more likely to inspire change and progress. Students reported on the importance of increasing student-tutor interaction when reflecting on clinical experiences.

Conclusions: Reflective tools need to be meaningful to facilitate reflection. Moreover, guidance and teaching on the subject of reflection is needed in order to develop reflective skills. Further research into reflection in other dental schools is indicated in order to understand the challenges of our colleagues and create a more efficient and user-friendly reflective tool to improve patient care.
Introduction

The General Dental Council (GDC) educational standards require training establishments to demonstrate reflective practice (RP) among students. Research suggests dental schools are not aware of how to best facilitate student reflection and development. Moreover, with the introduction of Enhanced Continuing Professional Development (ECPD) it is timely to investigate the current efficacy and validity of the current RT used in undergraduate education.

Reflection now and the GDC’s role

Historically the GDC referred to reflection as a process of self-auditing. However, within healthcare, the majority of the literature around reflection is found within nursing education. This suggests a research and knowledge gap within the dental educational system with regard to strategies used to positively implement RP among students. Nurses require a high standard of clinical, professional and emotional intelligence, since they care for patients with life threatening conditions. These challenges can impact one’s clinical confidence, and the demanding emotional requirement may be one of the reasons why reflection is heavily encouraged within nursing and midwifery.

The lack of research in the dental educational system is suggestive of a knowledge gap with regard to strategies used to positively implement.

The GDC document, Standards for Education and Preparing for Practice, outlines the requirements for educational providers and trainers within the United Kingdom (UK). It states the requisite for reflection and its assessment in order to improve student performance and the methods in which these can be implemented. Reflection can be achieved through student portfolios; training in reflection; feedback; evidence of reflection and evidence of mentoring sessions. Each institution decides how reflection and feedback is embedded within the course.

The GDC has recently introduced the Enhanced Continuing Professional Development (ECPD) scheme, which has been devised to support learning through Continuing Professional Development (CPD). ECPD encourages RP through the requirement for registrants to reflect on how CPD enables them to maintain and develop their skills, and its positive contribution to the wider context of patient care.

Reflection at UPDA

DHTs are required to reflect using group tutorials, reflective logs, reflective report writing, one-on-one tutorials, LiftUpp™ and peer reviews. LiftUpp™ is an online grading system, which “enables students to receive regular, tracked and meaningful feedback for improved learning.” It is populated with observations and feedback by both tutors and students at the end of each clinical activity. Reflective logs and LiftUpp™ form part of the clinical practice modules and log books. Students are required to reflect upon their weaknesses during clinical sessions, for example, if they may have failed to draw upon relevant theoretical knowledge to justify treatment. Furthermore, individual and group tutorials are held termly, allowing students to voice their thoughts and feelings regarding their academic experiences.

Methodology

Ethical approval was acquired and approved by UPDA’s Ethics Committee. To accommodate participant availability, two semi-structured focus groups were conducted with 10 participants in November 2017. Volunteers were recruited using convenient sampling. The first ten students to respond to the recruitment email were selected, (20% of the combined 2nd and 3rd year population).

A focussed discussion is an effective way to gather and share information on perceptions, feelings and thinking of users in relation to issues, products, services or opportunities. Nine open-ended questions and one closed were used to evoke conversations requiring explanations, descriptions or illustrations. Questions were designed to gain insight into participants’ thoughts and feelings. For example, participants were asked “How do you feel these reflective tools consistently contribute to your professional development and learning?” All participants received copies of the current RT to view and converse upon when prompted with a question.

Data were collected using a Dictaphone which was then uploaded onto an encrypted storage device and manually transcribed by the author. Manual transcription is considered a way to gather and share information on perceptions, feelings and thinking of users in relation to issues, products, services or opportunities. The data were then transcribed and manually transcribed by the author. Manual transcription is considered an effective way to gather and share information on perceptions, feelings and thinking of users in relation to issues, products, services or opportunities.

Themes Subthemes

| Theme 1: Importance | a. Areas for improvement  
| c. Demonstration of progress  
| d. Gaining perspective after the incident  
| Theme 2: Engagement | a. Usefulness  
| b. Preferred tools  
| c. Tools are impersonal  
| d. Reflection is involuntary  
| e. Minimal tutor interest  
| f. Minimal guidance/feedback on reflection  
| Theme 3: Personal growth | a. Natural reflection with oneself  
| b. Increased awareness of reflection  
| c. LiftUpp™  
| Theme 4: Barriers | a. Time  
| b. Emotion  
| c. How to reflect  
| Theme 5: Shared reflections | a. Benefits of sharing  
| b. Negatives of sharing  
| Theme 6: Recommendations | a. Increase shared reflection  
| b. Online access  

Table 2: Themes and subthemes developed from the data
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1. Familiarising oneself with the data
2. Generating initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the report

Results

Table 2 shows six themes and 20 subthemes developed from the data.

Analysis and discussion

Analysis suggested that students felt reflection does contribute to professional development. However, the way reflection is evidenced requires modification in order to gain meaningful insight. Participants of the first focus group were appointed numbers 1 to 4 and those in the second group, 5 to 10.

Theme 1: Importance

In theme 1 - ‘importance’ - students recognised the importance of reflection and its ability to inform positive change. Within the data the following subthemes emerged: areas for improvement, recognising achievements and demonstration of progress emerged. Students acknowledged that reflection highlights achievements and demonstrates progress. Participants (P) 9 stated: “It lets you look back and if you’ve done something well then you can continue to do that but also you can learn from your mistakes and alter them for the future”. This coincides with Schon’s belief that reflection is a necessary practice for professionals of various disciplines.6 In the fourth subtheme - ‘gaining perspective after the incident’ - P3 felt that reflecting sometime after the incident facilitates better insight, as you are no longer clouded by emotion: “It gives you a chance, if you had a bad day to calm down, you see things from a different point of view that you might not have done in the moment.” Schon (1983) mentions reflection on action allows us to discover how our knowing in action may have contributed to an unforeseen outcome.

Theme 2: Engagement

In sub theme 2A – ‘usefulness’ - students stated which RT they found most useful out of a total of 9, as summarised by Table 3.

Self-assessment of practical skills (SAPS) and Reflective logs (RL) were deemed the most useful tools. In sub theme 2B – ‘preferred tools’ - students were fond of the SAPS and RL because of their user-friendly structure. These allowed students to determine their level of confidence and capability, whilst encouraging thought for areas in need of improvement. Participants also enjoyed referring back to SAPS to compare and see how far they had progressed.

In sub themes 2C – ‘tools are impersonal’ and 2D – ‘reflection is involuntary’ - participants found reflection an involuntary and impersonal activity. P3 stated, “I don’t find it very engaging. It seems more like work than something I would voluntarily like to do. I know the process is useful but the way it has to be done is almost forced”. This is in line with the findings of Boud (2006)13 who suggested that if the reflection is imposed and not voluntary, it becomes a checklist practice, as it is perceived to be involuntary, which devalues its purpose, leaving professionals reluctant to reflect.

Brindley (2018) suggested that sharing reflections gives us the opportunity to gain insight and a different perspective into our routine practice.14 Under sub theme 2E – ‘minimal tutor feedback’ – the majority of students expressed that once they had completed their reflections, they would have liked more, and felt they would have benefited from additional tutor feedback.

In sub theme 2F – ‘minimal guidance/feedback on reflection’ - participants expressed their need for further guidance on reflection to gain understanding, reduce stress and avoidance. P9 stated, “I think we are not really shown how to reflect, we are just told to reflect and left to it. I have never had to reflect before so when it comes to doing reflection, I really struggle to know how to do it.” When questioned on their level of engagement, P9 responded, “it looks quite daunting to me. If I was looking at these forms thinking I’ve got to reflect not really knowing how to do it. I’ll probably just put it off and try and avoid it until I absolutely had to do it. I then get stressed because I have left it and I don’t know what I’m doing and don’t have long left to do it”. Brockbank and McGill (2007)15 suggest that tutors can play a crucial role in providing their mentees with the correct information to reflect meaningfully, by actively listening, providing information, feedback, facilitating reflective skills, questioning and empathising.

Theme 3: Personal growth

Some participants viewed the RT as forced mandatory activities, limiting constructive and meaningful insight. The tools were described as: “too broad” and a “blank canvas”. P4 stated, “I use my internal reflection to progress, not the tools”. This is in line with Boud (2006), who suggested that reflection has lost its true purpose, by distorting the way in which it is implemented. Under sub theme 3A – ‘natural reflection with oneself’ - both focus groups agreed that reflection occurs naturally, and that writing about your mistakes can sometimes make the student feel worse. P2 stated, “If I had done something to a patient, I would be reflecting on it. I wouldn’t need to write it down. I know I have done something wrong. I would go away and feel awful about it for a couple of days. Reflection can be good, if you did something really well and you do a reflection it’s great! You think I did that really well. You boost your morale. In terms of negative things, it makes a situation worse”. Bolton (2014)16 recognised people often face emotional challenges when reflecting. To overcome this barrier Bolton (2014)16 highlighted the importance of empathy and the perspectives of others to facilitate learning. This role could be adopted by a tutor.

Under sub theme 3B – ‘increased awareness’ - students felt that the tools had increased the number of times they reflected alongside their awareness of when it takes place: “I definitely do it a lot more. I can’t decide if I do it because of this course or was always doing it and wasn’t really aware of it, but I am definitely aware of it now” (P6). However, P2 and P9 mentioned they have previously never reflected, “I never really used to” (P2), “I don’t
think I did any reflection before starting and now I am forced to” (P9).

In sub theme 3C – ‘LiftuppTM’ - all participants found LiftuppTM to be a great learning tool. P1 stated, “We all interact with Liftupp and I think it is quite useful, because they have started introducing 360 which is quite reflective. Something more Liftupp based would be more useful especially because everybody is quite technology-based now”.

**Theme 4: Barriers**

Under sub theme 4A – ‘time’ - all participants perceived time to be a major barrier. Students felt pressured to fill out RL and have them signed by tutors at the end of each clinical session. However, students found that there was not enough time on clinic to reflect in between seeing patients. P6 stated, “It is the last thing on my mind when I’m up on clinic having a busy morning or afternoon, I rarely do it on clinic. I feel like it’s not easy to quickly grab them and do it between patients”. Adequate time is a major barrier to reflection.4 Time is needed to contemplate and consider possibilities for change.

In sub theme 4B – ‘emotion’ - participants recognised their mood often affected their perceptions. For example, P4 said, “It is mood dependent. If you have done something that is negatively affecting you, you would write down everything negative and not look for anything positive”. If a person develops a greater awareness of their emotions, and the messages they convey, then our mood no longer poses a barrier, which would greatly enhance the process and impact of critical reflection.20

In sub theme 4C – ‘how to reflect’ - the majority of the participants felt they required taught sessions on how to reflect; its benefits and reasons to reflect, to help them develop. P10 stated, “More guidance on it from tutors, and for them to explain more about the benefits to prompt us and to make us see really why we are doing it in the long term”. Tutors were perceived to assume that the students were capable of meaningful reflection, however Bolton (2014) suggested that supervisors and mentors play a key role in facilitating the learning journey of a student. Moreover, it is the mentor’s responsibility to work with their mentee to ensure they are able to meet their objectives.18

**Theme 5: Shared reflections**

In sub theme 5A – ‘benefits of sharing’ - students mentioned that this increases confidence, facilitates learning and provides validation. P7 describes a meeting following their first clinical session: ‘A tutor said to us does anybody have any interesting cases, or want to talk about anything and we did, we had a really good in-depth discussion about everybody which was really beneficial. You had a really troubling one once (refers to P8) and you discussed it, got it out and felt a lot more confident.” Furthermore, P7 stated, “It will benefit all of us because we have had similar situations.” This was followed by P8 who said, “We all learn from each other”. P3 also stated, “Having a conversation with somebody is a lot more useful than writing it down.” Sharing also provides validation for some participants: “I sometimes need the validation, so I need the horrible deepest reflections put on to someone else so they can reassure me back” (P3). Bolton (2014) described sharing reflections as ‘standing in front of the mirror’. Mentors are able to help students ‘step outside of the box’ to view familiar thoughts from a different perspective.18 Therefore, discussing one’s experiences with another enables us to explore deeper, through questions one does not, or cannot ask oneself, whilst reinforcing confidence.

In sub theme 5B – ‘negatives of sharing’ - participants described anxiety and fear of judgement as the challenges of sharing reflections. P4 stated, “Verbal reflections can sometimes be detrimental because someone might reinforce your anxiety on something you are reflecting on.” Generally, students felt more comfortable to share reflections with each other as opposed to their tutors: “In front of tutors it is a bit more difficult” (P10). All participants agreed that voicing their experiences also depended upon the gravity of the negative incident: “It depends on how big the problem is as well, whether people would judge you” (P5). P10 mentioned, “If I was in a situation where something had gone drastically wrong and I was having a meltdown the last thing I want to do is sit in a group and tell everyone my problems.” Sharing reflections can be challenging and demanding, therefore it is important for all parties to employ a cooperative and collaborative approach.21 In addition, an element of fear can be associated with reflection, especially since reflections are currently being judged and used in litigation against practitioners.22 This subsequently undermines the reflective process and makes reflectors reluctant to share them among peers, tutors and mentors.

**Theme 6: Recommendations**

In sub theme 6A – ‘increased shared reflection’ - participants agreed that sharing reflections following self-reflection would prove more beneficial: “Would you not be able to have something like this (refers to RL), but verbally with someone that you can trust to be positively feeding back, it is more constructive and still documented?” (P3). Strong evidence suggests it is vital to share experiences with a mentor or someone trustworthy in order to develop.16-18

In sub theme 6B – ‘online access’ - increased usage of LiftuppTM was also discussed, because of ease of use and lack of time restrictions: “We all interact with Liftupp quite a bit I think that would be quite useful…” (P4), “…to get any benefit from clinic you do need to have interaction with your tutor. Maybe use something that was online rather than written on paper where it is easier to communicate, you can have a two-way conversation about something. If it was online it is easier to access and more user friendly so we would be more inclined to do it” (P10). It was mentioned by (P6) that this is currently undertaken only when a critical incident takes place.

**Conclusion**

This research adds to the current insight into the efficacy of reflection delivery. Participants recognised the barriers to reflection, alongside its importance and potential, however they struggled to utilise the RT to fully enhance their development, due to its linear presentation. Positive recognition was given to the RL and SAPS, as they were deemed the most useful tools that contributed to professional development.

As professionals, the evidence which informs our practice continually changes and consequently our need to also grasp new methods and skills to improve patient care. Therefore, the ability to reflect and draw positive change must become an inherent part of our professional life. As part of the new ECPD scheme, it is imperative for DHTS to grasp the fundamentals of the reflective process in preparation for ECPD post qualification.

The findings illustrate the need for further guidance on the reflective process, an increase in student-tutor interaction and a more user-friendly RT. Undergraduate students would benefit from further research being carried out in other dental schools, to comparatively draw a conclusive understanding in generating a more effective, meaningful and optimal set of RT.

**Limitations**

This small study has been confined to the students at UPDA. Including other dental
schools and programmes would lead to a greater pool of data and provide a broader insight into the delivery of reflection and students’ perceptions.

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Author contributions

1. Nida Malik - designed and constructed the proposal, carried out the research, and wrote up the study.
2. Claire Chambers - supervised the construction and design of the research proposal for submission to ethics.
3. Marina Harris supervised the write-up of the study.

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Provision of dietary education by oral health care professionals as part of preventive oral health care

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Learning outcomes:
- To acknowledge the importance of dietary education for all dental patients as part of preventive oral health care.
- To understand the significance of professional development in the area of diet and nutrition for the provision of contemporary patient education.
- To recognise the significance of patient-centred strategies to provide appropriate dietary messages at every patient life stage.

eCPD aligned with GDC development outcomes: A,C,D

Key words: Oral health practitioners, diet education, preventive oral health care

Abstract

Objective: Change in the dietary habits of communities worldwide is posing increased risks to oral and general health. Despite poor dietary habits linked to increased dental disease, literature reveals the provision of dietary education for patients is not well implemented as part of preventive oral health care.

A group of oral health care professionals in Australia - oral health therapists, dental therapists and dental hygienists - are uniquely placed to provide diet education. The purpose of this study was to survey Australian oral health therapists, dental hygienists and dental therapists to gain an insight into their provision of dietary education to their patients.

Methods: Subjective sampling selected participants in the three practice groups to complete an electronic survey. Questions were asked about demographics, education, location and the provision of dietary education and information.

Results: A sample size of 262 completed the survey. Of these, 256 (97.9%) strongly agreed/agreed that dietary education was able to reduce the risk of poor oral health and positively influence general health. The majority of respondents, 239 (91.2%), strongly agreed/agreed this information should be provided for all patients. Of the respondents, 188 (72%) were confident in their diet knowledge and 123 (47%) reported that postgraduate education was insufficient. Whilst national and international dietary guidelines were recommended to patients, specific national oral health messages were not so widely promoted.

Conclusion: Practitioners should be supported in an educational approach which should include: patient-centred motivational strategies, promotion of dietary messages and a focus on appropriate dietary strategies throughout the patient’s life journey.
Introduction

The changing pattern of nutrition, dietary habits and food and beverage consumption has changed in the last two decades.1 Fast foods, consisting of fermentable carbohydrates, free sugars and salt, are readily available and easy no cook solutions have had an impact on the dental health and general health and wellbeing of our communities. Increased advertising and the hard sell by large multinational food companies with poor nutritional offerings continue to proliferate. The change in dietary habits is never more evident than in the increased availability and consumption of sweetened carbonated beverages, posing an increased risk of damage to the oral environment and to general health. Sweetened beverages, particularly soft drinks, have been associated with rising obesity and diabetes2 and, alarmingly, the increase in obesity related cancers.2 Obesity related health issues have implications for oral health clinicians. For example, recent reviews show that diabetes and periodontal disease have a bidirectional relationship with a proliferation of additional oral health complications.3 This evidence necessitates oral health practitioners to provide not only clinical care, but introduce and support dietary changes that improve the oral health of patients with potentially better general health outcomes, such as improved glycaemic control. Oral health clinicians need to develop proficiency in discussing poor dietary habits, deliver a dietary strategy which is adaptable to a patient’s daily routines and, importantly, recognise, refer and work collaboratively with those who need specialised dietetic services. In providing appropriate dietary education in clinical practice, Moynihan (2002) argues that dietary messages for optimum oral health are one and the same for general health and wellbeing.4 Dietary messages that promote a reduction in sweetened food and beverages must also include advice to increase fruits and vegetables, and drink fluoridated tap water in conjunction with other oral health prevention measures. Dietary guidelines around the world advocate similar messages, available as contemporary resources in the public domain. In Australia two key guidelines provide direction on dietary messages for oral health: The National Oral Health Plan 2015-20245 - guiding principles that underpin Australia’s oral health system - provides national strategic direction, containing key oral health messages for all patients, not just those considered at risk; and the Australian Dietary Guidelines that give advice on eating for health and wellbeing based on the latest scientific evidence.6 The other key international guideline is the World Health Organisation’s guidelines on sugar consumption for adults and children.7 Despite diet being an integral component of oral disease, dental clinicians generally overlook dietary advice as part of their preventive oral health care.8 Dietary advice varies considerably in content, currency and structure. With inconsistencies, the perception of the importance and the actual provision of dietary education varies within dental practices.9,10 In the study conducted by Yokoyama and colleagues (2013), of the dental clinicians who rated diet as ‘more important’, only 48% gave dietary counselling to more than 20% of their patients.10 DiMaria-Ghalili et al (2014) cite that, when surveyed, dental practitioners acknowledge the importance of nutrition however feel inadequately trained and uncomfortable in providing nutrition interventions.11 This illustrates that preventive oral health care that addresses the diet and nutrition of patients is often neglected and only given a cursory mention, should appointment time allow. Patient beliefs and attitudes in the value of diet and nutrition as part of dental care is often seen as a barrier to providing diet and nutrition education, with practitioners reluctant to open a dialogue if they perceive it will be received negatively. In a recent study that looked at the use of diet diaries in general dental practice in England, Arheiam and colleagues (2016) reported that 40% of general dental practitioners refer patients to other dental care professionals, such as dental hygienists (DH) or dental therapists, (DT) for dietary advice.12 Dental care professionals, particularly dental hygienists and dental therapists, place a strong emphasis on prevention. In Australia, oral health therapists (OHT) is the most recent category of dental care providers combining dental therapy and dental hygiene skills gained during a three-year undergraduate degree. Australia currently has eight universities that deliver oral health therapy programmes, training dual skilled oral health clinicians. With the preventive remit in their undergraduate education, and a historical legacy of providing preventive oral health care within the community, these practitioners are uniquely positioned to provide dietary information to their patients, address oral health disease risk and potentially influence general health.13 Currently however there is a paucity of literature on their preventive practices. The purpose of this study was to survey Australian oral health therapists, dental hygienists and dental therapists to gain an insight into their provision of dietary education to their patients.

Methods

An electronic survey recruited participants across all states and territories of Australia. The survey was distributed via professional associations, employer groups, and a closed social media discussion group. An electronic survey was the preferred method of delivery to reach the target population, with its wide geographical reach1 it was able to access rural and remote practitioners. This method was preferred over a postal questionnaire to reduce costs, resources and time. Inclusion in the study required the participants to be employed in clinical practice in either a part-time or full-time capacity. The University of Newcastle Australia granted ethics approval (HREC Approval No H-2015-0409). The survey was pre-tested for ease of use including layout, ambiguity and readability by an independent member of the university oral health staff. The modified survey was then distributed to a pilot group consisting of DH, DT and OHT. The survey collected data over a period of 14 weeks during the latter half of 2017. Demographic data was collected as well as geographic location, year of graduation, professional practice category and any additional qualifications or education. Likert scale style questions were pre-coded from 1 to 5 with positive answers being 5 and negative answers being 1. In addition, participants selected a response from: ‘strongly disagree,’ ‘disagree,’ ‘uncertain,’ ‘agree’ and ‘strongly agree.’ These questions were grouped thematically into five subsets that had been informed by a series of focus groups with OHT, DT and DH. Figure 1 shows the thematically grouped subsets.

Fig 1. Thematically grouped questions subsets

1. Provision of dietary advice
2. Perceived confidence in delivering dietary education
3. Organisational constraints to providing dietary education
4. Professional development
5. Actual dietary knowledge

A subjective sampling strategy was used to...
select participants from the three practice categories. The collected survey data was analysed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). Chi-square test, and independent samples t-test were used in data analysis.

**Results**

In total, 325 respondents undertook the electronic survey and of those 63 failed to finish the survey by exiting before completing all the questions. The final sample size was 262 (n=262). This represents 6.5% of the 3972 total combined 2017 national registrants in the DH, DT and OHT practice divisions.

The demographic data revealed that 244 (93.13%) participants were female and 18 (6.87%) were male, with the majority of those participants, 136 (52.2%), from New South Wales, Australia’s largest state by population. More than half - 155 (59.16%) - of all respondents fell into the OHT practice category. DH were represented by 68 (25.95%) respondents while DT made up the remaining 39 (14.89%) respondents. This is commensurate with numbers of registered practitioners in each practice category in Australia, with OHT as the largest registered group, followed by DH and DT respectively. Most respondents were in the 25-34 age group - 95 (36.26%) - with only one in the 65+ age category. Table 1 shows characteristics of the sample group studied.

The employment status of the respondents indicated 134 (51.15%) worked part-time and full-time workers numbered 128 (48.85%). Most respondents - 140 (53.44%) - worked in private practices with public sector dental services being the next biggest employer. Of the OHT practice group, 53 (34.4%) worked in public sector services, however 37 (94.8%) DT were public sector employees. Other employment types reported were corporate practices, Aboriginal medical services, defence forces, aged care facilities, specialist dental practices and self-employed.

Practice location was predominately in a city or large regional centres, with 74 (21.37%) City/Large regional centre. Practice Type was predominately in private practice, followed by corporate practice. Other Practice Type was represented by 9 (3.44) Other. Practice location was predominantly in a city or large regional centres, with 74 (21.37%) City/Large regional centre. Practice Type was predominately in private practice, followed by corporate practice. Other Practice Type was represented by 9 (3.44) Other.

Practice Type:
- Corporate practice (25.95%)
- Public sector services (31.30%)
- Private practice (53.44%)
- Other (9.54%)

Practice location:
- City/Large regional centre (74.43)
- Rural (21.37)
- Remote (0.76)
- Other (3.44)

Other qualifications held:
- Yes (32.21)
- No (66.79)

Age group:
- 18-24 (9.92)
- 25-34 (36.26)
- 35-44 (19.85)
- 45-54 (19.85)
- 55-64 (13.74)
- 65+ (0.38)

Table 1. Study Sample Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Subset</th>
<th>% of participants</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
<td>(6.87)</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>(93.13)</td>
<td>244</td>
</tr>
<tr>
<td>Practice category</td>
<td>OHT</td>
<td>(59.16)</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>DH</td>
<td>(25.95)</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>DT</td>
<td>(14.89)</td>
<td>39</td>
</tr>
<tr>
<td>Employment status</td>
<td>Full time</td>
<td>(48.85)</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Part time</td>
<td>(51.15)</td>
<td>134</td>
</tr>
<tr>
<td>Practice Type</td>
<td>Private practice</td>
<td>(53.44)</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>Public sector services</td>
<td>(31.30)</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>Corporate practice</td>
<td>(5.73)</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>(9.54)</td>
<td>25</td>
</tr>
<tr>
<td>Practice location</td>
<td>City/Large regional centre</td>
<td>(74.43)</td>
<td>195</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>(21.37)</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Remote</td>
<td>(0.76)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>(3.44)</td>
<td>9</td>
</tr>
<tr>
<td>Other qualifications held</td>
<td>Yes</td>
<td>(32.21)</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>(66.79)</td>
<td>175</td>
</tr>
<tr>
<td>Age group</td>
<td>18-24</td>
<td>(9.92)</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>25-34</td>
<td>(36.26)</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>35-44</td>
<td>(19.85)</td>
<td>52</td>
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<td></td>
<td>45-54</td>
<td>(19.85)</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>55-64</td>
<td>(13.74)</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>65+</td>
<td>(0.38)</td>
<td>1</td>
</tr>
</tbody>
</table>

They are common in the health sector to service indigenous communities and outstations.

In the survey questions about postgraduate qualifications 87 (33.2%) respondents cited that they held other qualifications. These additional qualifications ranged from master’s degrees to vocational certificates. There was no significant correlation in respondents having a postgraduate qualification at any level and an increased provision of patient education as part of preventive oral health care (p=0.74). No respondents reported having postgraduate qualifications in nutrition or dietetics.

When asked about the provision of diet and nutrition education, significantly, 256 (97.9%) of all respondents, across all practice groups, strongly agreed/agreed that diet and nutrition education was able to reduce the risk of poor oral health and positively influence general health. A further 227 (86.6%) strongly agreed/agreed that information in the form of take home pamphlets or written information on appropriate products was also an important educational tool.

When asked about when patients should receive diet and nutrition education 239 (91.2%) strongly agreed/agreed that patients should be provided with this information routinely, not just at the start of a course of care, or with increased risk factors for oral disease. Most respondents, 239 (91.7%), strongly agreed/agreed that patients should be monitored for changes in dietary behaviours. When asked about their role, 256 (97.9%) respondents across all practice types strongly agreed/agreed that part of their role was to motivate patients to address poor dietary habits as an important part of oral and general health care.

Questions asked all respondents about their confidence in understanding the theories behind behaviour change to help patients improve their dietary habits: 69 (26.2%) agreed they were not they confident, with another 55 (21.1%) responding as neutral. Of the respondents, 189 (72%) answered that they were confident in their knowledge of diet and nutrition. Those respondents working in private practice were statistically more confident with their actual dietary knowledge: private practice (M=10.4, SD=3.2) public sector (M=9.1, SD=2.6; t
(172) = 2.8, p = 0.02). Statistically overall, all respondents working in public sector dental services were more likely to provide dietary education and information: private practice (M=8.2, SD 1.8) public sector (M=8.1, SD 1.4; t(174) = -2.8, p = 0.005, two tailed). Those employed in the public sector reported that when it came to providing dietary education they were bound more by constraints imposed by the organisation than those who worked in other practice types (P=0.002). There was a statistical difference in the provision of dietary education and information, with those who identified as DH reporting to provide more diet education in the private sector than OHT and DT practice categories (p = 0.047).

Whilst 252 (96.3%) respondents indicated it was important to keep up to date with current dietary guidelines to provide accurate information to their patients, 123 (47%) strongly agreed/agreed there was insufficient appropriate postgraduate education/professional development to increase skills delivering diet and nutrition education. Table 2 illustrates the responses regarding the provision of diet and nutrition education.

<table>
<thead>
<tr>
<th>Question</th>
<th>% of respondents strongly agree/agree</th>
<th>% of respondents neutral</th>
<th>% of respondents strongly disagree/disagree</th>
<th>n=</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet and nutrition education reduces risks to oral health and positively influences general health</td>
<td>97.9%</td>
<td>2.1%</td>
<td>0</td>
<td>256</td>
</tr>
<tr>
<td>Providing diet and nutrition information i.e pamphlets, tip sheets, written product information is important and improves oral health</td>
<td>86.6%</td>
<td>11.7%</td>
<td>1.7%</td>
<td>227</td>
</tr>
<tr>
<td>Patients should receive diet and nutrition education routinely not just when beginning of a course of care</td>
<td>91.2%</td>
<td>7.1%</td>
<td>1.7%</td>
<td>239</td>
</tr>
<tr>
<td>Patients should be monitored after receiving diet and nutrition information and education, during a course of care for dietary behaviour change</td>
<td>91.7%</td>
<td>7.6%</td>
<td>0.7%</td>
<td>239</td>
</tr>
<tr>
<td>I see my role to motivate patients to address poor dietary habits as an important part of oral and general health care</td>
<td>97.9%</td>
<td>2.1%</td>
<td>0%</td>
<td>256</td>
</tr>
<tr>
<td>I am confident my current knowledge is sufficient to provide correct diet and nutrition education to my patients</td>
<td>72%</td>
<td>19%</td>
<td>9%</td>
<td>189</td>
</tr>
</tbody>
</table>

Table 2. Responses regarding the provision of diet and nutrition education.

Discussion

Despite the diverse methods used to distribute the survey, reminders and distribution through professional associations, the response rate of completed surveys was low. Literature cited that survey researchers are experiencing a declining response rate in health professionals completing similar surveys."14-15 Whilst it is acknowledged that a small sample size is not an indicator of the quality of the collected data16-18 it does however, raise the question of non-response bias. To address this, Vink (2004) suggests contacting potential non-responders.19 Considering the anonymity of this electronic survey, it would not have been possible to contact non-responders.

One suggested method for handling non-response bias is the comparison of early and late responders.19-20 This was the method employed to determine the non-response bias in this study with consideration to time, cost and ethical considerations in re-sampling. This result showed that both early and late responders answered similarly across the grouped question subsets.

Encouragingly, the oral health clinicians surveyed acknowledged that providing dietary education and information to patients...
routine was not just aimed at those patients with increased oral health risk factors. However they were unsure of underpinning theories of behaviour change that influence actual dietary changes. This may indicate that the concept of what constitutes patient motivation is unknown and may require additional strategies to assist patients to make effective dietary improvements. Providing professional development on motivational interviewing techniques and the underpinning theories of behaviour change may support practitioners in developing their confidence when initiating conversations about diet with patients. The study established that those who worked in public sector oral health services provided more dietary advice, regardless of the geographical location. Public sector services provide care for those communities that often have a greater burden of disease. Public sector respondents reported being more constrained by the structure of the organisation in providing dietary education and information. This may be attributed to demand outweighing available clinical services. Major drivers, such as maximising treatment for the allocated patient appointment and clinical out-put, are barriers to preventive care. Preventive oral health care often takes second place to a restorative approach, with more value being placed on measurable restorative benchmarks. Individuals should be encouraged to reorient the care they provide to a preventive focus rather than a wholly curative approach, with OHT, DT and DH uniquely positioned to drive this change.

Dietary messages from Australia’s National Oral Health Plan were not well promoted. Further research to investigate the content of dietary messages and develop more widely promoted oral health strategies that align with key guidelines and national policy is suggested. Professional development of skills to deliver appropriate dietary education should be a lifelong learning process and oral health clinicians must keep abreast of current dietary recommendations. Providing appropriate dietary advice that is contemporary is like any other area of dental practice, a lifelong learning process. Sheiham and James (2015) describe dental caries as a chronic cumulative lifelong disease.21 This being the case, a contemporary preventive oral health practitioner needs to follow patients through the continuum of care providing appropriate dietary messages at each life stage, both to individuals and at a community level. This study suggests the reported lack of appropriate postgraduate diet and nutrition educational offerings should be addressed.

Conclusion

Oral health therapists, dental therapists and dental hygienists in their role as preventive practitioners are key to providing dietary education to their patients. However, they need to be supported to enable them to promote current national oral health messages and raise awareness in their daily practice. Development of a supportive educational approach for practitioners should include: teaching patient-centred strategies to influence dietary behaviours; initiating change for improved oral and general health; the promotion of appropriate dietary messages throughout the life journey of all patients; and focused preventive strategies combined with restorative care to place value on prevention rather than cure.

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Author contributions:

Kay Franks designed the study, analysed the data and took the lead in writing the manuscript as part of her PhD. All other authors, Jane Taylor, Surinder Baines, and Janet Wallace, her supervisors, provided critical feedback.

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References

Screening for alcohol misuse and alcohol brief interventions in primary dental care settings: A literature review

D. Rochford

Learning outcomes:

- Identify the three alcohol drinking categories defined by Public Health England
- Implement the use of an appropriate alcohol screening tool at patients’ dental visits
- Justify the need for undertaking a training programme to carry out alcohol screening and brief interventions with confidence.

Key words: Alcohol misuse, alcohol screening, alcohol brief intervention, dental patient, dental setting

ABSTRACT

Aim: To determine why screening for alcohol misuse and the delivery of brief alcohol interventions are not consistently carried out for patients in a primary dental care setting.

Method: A literature review was undertaken. Key words were used to establish search terms. A hierarchy of evidence and inclusion and exclusion criteria provided structure for the search of six electronic databases. Following initial exclusions, eleven papers were critically appraised and seven excluded. Four studies were deemed relevant to answer the review question.

Results: The studies found a culture of negativity among dentists in contrast to patients’ perceptions, which were positive. Dentists reflected a lack of confidence, knowledge and motivation, no perceived need or relevance, combined with embarrassment and discomfort when discussing alcohol related matters with patients. Perceived barriers by dentists were cited as: time constraints, disruption to the patient-clinician relationship, provision of screening tools, effectiveness of the intervention and the need for referrals.

Conclusion: Two recent studies have indicated successful outcomes, firstly for training dentists and, secondly, for dentists providing screening for alcohol misuse and delivering Alcohol Brief Interventions (ABI). The authors of these studies both recognise the need for further research to assess the effectiveness and cost effectiveness of dentists delivering the intervention. Completing evidence-based training specific to the dental team, importantly, to include dental hygienists and dental therapists, fulfils the General Dental Council’s (GDC) expectations of a commitment to continually develop knowledge and skills throughout our working life, whilst delivering a holistic approach to patient care.
SCREENING FOR ALCOHOL MISUSE IN PRIMARY DENTAL CARE SETTINGS

Introduction

Alcohol is widely consumed and socially acceptable in the UK, with 85% of men and 80% of women reported to drink alcohol. Described by The World Health Organisation (WHO) as ‘a psychoactive substance with dependence-producing properties,’ harmful use can significantly impact on a person’s physical and mental health. The Chief Medical Officer’s alcohol guidelines review, published in January 2016, highlights that the risk of developing mouth, throat and breast cancers increases with any amount drunk on a regular basis.

Public Health England defines three alcohol drinking categories:

- **Hazardous drinking**: the level or pattern of drinking that, if continued, increases the risk of harm;
- **Harmful drinking**: a pattern of drinking that causes mental and/or physical damage;
- **Alcohol dependence**: behavioural, cognitive and physiological factors that lead to a person’s desire to continue to drink, despite the negative impacts on their physical and/or mental health.

Alcohol can potentially cause damage to every system in the body. Dental professionals should employ a holistic approach to patient care and consider the patient’s oral and systemic health, psychological and social needs. Alcohol misuse in a patient can be easily missed, due to the time constraints of short appointments, where a patient’s oral health concerns are generally the main focus.

Alcohol dependent patients often present with a variety of symptoms including: periodontal disease, dental caries, dental erosion, a burning or inflamed tongue and recurrent aphthous ulceration. The risk of oral and pharyngeal cancer is significantly increased, reinforcing the need for a thorough soft tissue evaluation at every appointment.

Roked et al. (2014) carried out a clinical audit to determine how effective the question, ‘How many units of alcohol do you drink each week?’ (on a medical history form, or asked by a clinician), is in helping identify patients’ drinking patterns. The audit demonstrated limited compliance as a quarter of the patients’ alcohol consumption levels could not be identified from the answers they gave. Screening tools, however, identify levels of alcohol misuse effectively and efficiently. In a second clinical audit by Roked and his co-workers the team assessed the efficiency of the Modified-Single Alcohol Screening Question (M-SASQ) (Fig. 1). The group found that 98% of patients interviewed were able to complete the screening question, of which 25% were identified as hazardous drinkers.

Research carried out in Scotland using the Alcohol Use Disorders Identification Test (AUDIT) (Fig. 2) recorded 31% of dental patients drinking at hazardous and harmful levels. The AUDIT, ten-item questionnaire and scoring system provides guidance for the appropriate level of advice or referral.

Alcohol Brief Interventions (ABI) provide an evidence-based approach. Non-confrontational, short, structured conversations provide motivation and support behaviour change, to reduce the risk
A recent Cochrane review reported significant reductions in drinking at a one-year follow-up.11

Whilst smoking cessation programmes in primary dental care settings are widely accepted and routinely implemented by dental professionals, there appears to be limited screening for alcohol misuse and delivery of ABI. The aim of this literature review is to assess why screening for alcohol misuse and the delivery of alcohol brief interventions is not consistently carried out for patients in a primary dental care setting.

Methodology

A literature review was undertaken. PICO (Population, Intervention, Context, Outcomes) enabled key words and phrases to be identified for use in the systematic search of published literature. These included: alcohol misuse, alcohol abuse, heavy drinking, alcohol screening, alcohol screening tool, alcohol brief intervention, alcohol brief advice, dental patient, dental setting and dental practice.

The primary focus of the literature review was to identify attitudes, opinions and perceptions of dental professionals and patients. Qualitative primary research was deemed the most applicable, in the form of cross-sectional studies. Questionnaires and surveys demonstrate the views at a point in time of a specific population.

Six databases retrieved a wide range of studies. Dental and Oral Sciences, Embase (Ovid), Medline (full text) and ProQuest, all provide access to evidence-based resources from a range of healthcare journals, with selective coverage of dentistry. CINAHL Complete is a dependable resource for healthcare professionals, with limited dental research experience. The Cochrane Library is considered the ‘gold standard’ of evidence based systematic reviews, providing high quality evidence for all areas of medicine and dentistry. Consistent use of the search terms, limitations and Boolean operators throughout each database search ensured a systematic approach. However, truncation was used for ProQuest searches as the search terms used produced high volumes of studies (Table 1).

The CASP tool and a list of ten questions presented by Greenhalgh (2014)12 were the most appropriate way to assess the quality of cross-sectional studies, in the form of questionnaires and surveys. A data extraction table presented the developing themes from four papers critically appraised: Shepherd et al. (2010)13, Shepherd et al. (2011)14, Neff et al. (2013)15, Miller et al. (2006)16.

Ethical approval was sought from the University of Central Lancashire on behalf of the study. As it was a review of published...
Results

The initial search across the six databases produced one hundred and ninety-nine papers. Duplicate papers were eliminated, followed by papers that did not fit the hierarchy of evidence, while further papers were excluded according to the identified inclusion and exclusion criteria (Table 2).

Eleven papers were read in full and the final four selected (Table 3). Exclusions were made if the papers were: not primary research; had no clear aim, objectives or methodology; presented a clinical audit which focused on the efficacy of screening tools; an abstract of a soon to be published randomised control trial; or a paper detailing the methodology for a large-scale randomised control trial, which although was relevant to the review question, presented no findings.

The final four papers selected include: two cross-sectional studies in the form of questionnaires, presenting the results as quantitative research; one study using a mixed methodology, undertaking both quantitative and qualitative research methods; and one qualitative study of a phenomenological nature. The papers are different in terms of study design, the context in which they are set and their perspectives. However, they are all relevant to answering the review question.

Discussion

The four papers primarily identify the attitudes and perceived barriers of dentists, however one paper includes dental hygienists, whilst another reflects the patients’ views: Shepherd et al. (2010)\textsuperscript{13}, Shepherd et al. (2011)\textsuperscript{14}, Neff et al. (2013)\textsuperscript{15}, Miller et al. (2006)\textsuperscript{16}. Strategies for implementation are also discussed throughout. The context of all four papers related to the negative impact on systemic health and the increased risk of oral and pharyngeal cancers, with alcohol as the risk factor, thus emphasising the need for clinicians to routinely screen patients.

Attitudes

In both studies by Shepherd et al. (2010, 2011)\textsuperscript{13,14} the research teams identified a culture of negativity among dentists. The
teams found respondents to be lacking in knowledge, confidence, motivation and the conviction for successful outcomes. Dentists felt no pressure for implementation, considered ABI ineffective, difficult to integrate and of little relevance to clinical practice. However, in contrast, Neff et al. (2013) reflected a positive attitude from dental hygienists. Similarly, Miller et al. (2006) determined a positive attitude from patients towards receiving ABI.

Lack of knowledge and confidence

A recent BBC documentary ‘The truth about…alcohol,’ informing the general public of the potentially negative impacts of alcohol, is an example of media involvement for increasing awareness. The dentists who confessed to ‘a lack knowledge’ is a worrying concept, when information and guidance is freely available. Publications, such as ‘Delivering Better Oral Health,’ provide clear guidance for dental teams about their role in supporting patients who drink alcohol. Interestingly, significant parallels can be drawn from the successful integration of smoking cessation programmes into primary dental care settings. Rosseel et al. (2010) also identified a lack of knowledge, confidence and difficulties initiating conversations with patients about smoking.

Conviction

There is limited evidence specifically related to dentistry for the successful outcomes of screening and delivery of ABI, justifying the dentists’ lack of conviction. However, two randomised controlled trials have determined the feasibility of screening for alcohol misuse and providing ABI in primary dental care settings. Ntouva et al. (2015) explore both dental professionals’ and patients’ views on the importance of screening, developing and evaluating an ABI specific to NHS general dental practice. In comparison, Roked et al. (2015) carried out their study with a dentist and dental hygienist providing ABI in response to positive scores on M-SASQ screening tool. Their results revealed that 43% scored positively, with seven patients’ scores changing from positive to negative following the ABI, clearly demonstrating the need for a new approach towards the screening and intervention.

Relevance

Links between alcohol and oral cancer were first identified in papers published more than 50 years ago. Stronger evidence has emerged over time associating harmful and hazardous drinking with an increasing risk of oral cancer; approximately 75% of oral cancers arise in association with alcohol (and tobacco) use.

Perceived barriers

Time constraints are key barriers, described by both Neff’s group and Shepherd’s teams. Unease in the patient-clinician relationship and embarrassment when asking questions with potential financial implications are also considered barriers. Dentists appear to be unaware of valid screening tools to enable the dissemination of credible information, with the opportunity to offer appropriate referrals.

Time

Lack of time is a major barrier described by dentists and by dental hygienists. Rosseel et al. (2010) explain that experience gained and following advice protocols diminished this key barrier. Similarly, this same barrier featured heavily during the integration of smoking cessation programmes in primary dental care settings. The teams led by Neff and Stacey invited dental hygienists to participate and utilise their skills as oral health educators. A team approach for a time efficient smoking cessation programme was then established, led by dentists with dental hygienists and dental nurses providing the intervention, creating a complete and structured intervention. The team approach ethos is in line with recommendations by the National Institute for Clinical Excellence (NICE), the General Dental Council (GDC) and the British Dental Association’s (BDA) Inequalities of Oral Health Policy.

Patient - clinician relationship

Miller et al. (2006) identified a positive attitude from patients towards screening and the delivery of ABI by dentists, especially if the patient’s drinking patterns were having a negative impact on their oral health. In contrast, Shepherd et al. (2010) found that the dentists expressed embarrassment and unease in their relationship with the patients, which is often built on trust. In a study by Beich et al. (2002) a group of general practitioners (GP), experienced negative reactions from a minority of patients to alcohol screening and ABI. However, the majority of their patients displayed positive reactions as they felt reassured that the GP was concerned about their holistic health and well-being. Clinicians should be perceptive to the positive attitudes of patients as increased acceptance and success builds trust in the patient – clinician relationship.

Screening tools

There is a wealth of evidence indicating that the use of appropriate screening tools, which necessitate treatment recommendations, are effective. However, a formally recognised tool specifically for use in primary dental care settings is not yet available. The AUDIT tool, developed by WHO is highly reliable, valid and accurate, often described as the ‘gold standard.’ The M-SASQ, which was used in a randomised controlled trial to determine the feasibility of a suitable screening tool for alcohol misuse in a dental setting, also had some success. To encourage behaviour change, techniques such as motivational interviewing provide workable strategies for delivering ABI.

Strategies for implementation

Training and education should help to offset feelings of embarrassment, lack of knowledge and confidence. Encouraging the adoption of best practice will ensure the effectiveness of the intervention.
as identified by the dentists and dental hygienists.\textsuperscript{13-14}

In one study, although smoking cessation is considered to be part of their role by 89% of dentists interviewed, only 69.5% felt the same about delivering ABI.\textsuperscript{20} Dentists’ knowledge, attitudes, practice environment, patient influences and demands are likely to prevent changes to their clinical practice.\textsuperscript{23} Funding, is also a contributory factor. Motivation, such as peer pressure, the ease with which the intervention can be carried out and reflection on past positive experiences, can influence behavioural change. Training and education, focussing on evidence-based research, motivational theory and improving communication skills to increase confidence, has been found to change attitudes and reduce the perceived barriers.\textsuperscript{27}

Limitations

The search strategy carried out in this work, using a wide range of key words, retrieved two good quality studies.\textsuperscript{11,14} The first study was carried out with a small group of dentists in the Scottish Highlands, the results of which may not be reflective of other communities in or outside of Scotland.\textsuperscript{13} Furthermore, the same authors used the findings of their initial study to inform the design of a larger second study, limiting the empirical evidence available.\textsuperscript{14}

Conclusion

Recommendations that both men and women, should not regularly exceed 14 units of alcohol per week,\textsuperscript{4} (Fig.3) are potentially linked to the general trend that in 2016 adults and young people in Great Britain were drinking less.\textsuperscript{28} Additionally, a systematic analysis of 694 data sources and 592 prospective and retrospective studies from 195 countries and territories between 1990-2016 confirmed that alcohol is a leading risk factor for global disease specifically cancer. The collaboration goes on to clearly state that the level of alcohol consumption to minimise health loss is zero.\textsuperscript{29}

Implications for clinical practice

Ntouva, et al. (2015)\textsuperscript{15} and Roked, et al. (2015)\textsuperscript{19} address the themes identified and provide the fundamental evidence required for change. Whilst Roked et al.\textsuperscript{19} reported findings related to the successful implementation of screening for alcohol misuse and delivery of ABI in a primary dental care setting, Ntouva et al. (2018)\textsuperscript{10} evaluated a ‘novel brief alcohol advice training programme’ specifically designed for NHS dentists: two, four-hour, highly interactive training sessions were undertaken by fifteen NHS dentists in North London. Their knowledge, attitudes and confidence scores were assessed before and after the training sessions. The results showed positive changes. Overall knowledge improved by 23%, positive attitudes towards carrying out the screening and intervention increased by 40%, furthermore, confidence levels increased by 80%. The authors concluded that NHS dentists can be successfully trained to carry out screening and deliver ABI. Both authors discuss the need for continued research, increasing the sample size, widening the location and extending the duration of the studies, since they both used small groups of participants in a single location for a limited period of time.\textsuperscript{19,10}

The study by Neff et al. (2013)\textsuperscript{13} was the only one in this review that interviewed dental hygienists, valuing their role as oral health educators. The inclusion of dental hygienists and dental therapists should be considered in future studies, similar to the role they play in delivering smoking cessation programmes. NICE guidance states that all appropriate members of the dental team should be trained to deliver alcohol related advice.\textsuperscript{23} Evidence-base, the standard by which the approach to treatment and clinical care is measured, ensures good quality patient care.\textsuperscript{23} Ntouva’s team concluded that further research will need to assess the effectiveness and cost effectiveness of dentists delivering the intervention.\textsuperscript{10}

Professional responsibilities

Health Education England provides an online platform consisting of four sessions of evidence-based tailored education specific to dental teams, an example of training that is becoming more available. The BDA identified a need to advise patients on sensible drinking, in their ‘Inequalities of Oral Health Policy.’\textsuperscript{21}

By undertaking appropriate training we fulfil the GDC’s expectations of dental

<table>
<thead>
<tr>
<th>Dental Professionals</th>
<th>Patient Attitudes</th>
<th>Perceived Barriers</th>
<th>Strategies for implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td>Expect dentists to ask questions</td>
<td>Time constraints</td>
<td>Short ABI (3-5mins)</td>
</tr>
<tr>
<td>Lack of motivation</td>
<td>Not embarrassed by questions</td>
<td>Need for training</td>
<td>Respective roles of dentists and dental hygienist</td>
</tr>
<tr>
<td>Lack of confidence</td>
<td>Accepting of advice</td>
<td>Unaware of the best strategy</td>
<td>Continuing education accreditation.</td>
</tr>
<tr>
<td>Lack of conviction</td>
<td></td>
<td>Ineffective</td>
<td>Media and awareness campaigns</td>
</tr>
<tr>
<td>Low intention for implementation</td>
<td>Disrupt patient-clinician relationship</td>
<td>Financial implications</td>
<td>Training for GDPs</td>
</tr>
<tr>
<td>Difficult to carry out</td>
<td></td>
<td>No perceived need</td>
<td>Published guidelines</td>
</tr>
<tr>
<td>Ineffective</td>
<td></td>
<td>Irrelevant</td>
<td>Support for behaviour change</td>
</tr>
<tr>
<td>No peer pressures</td>
<td></td>
<td>Embarrassing</td>
<td></td>
</tr>
<tr>
<td>Aware of negative impacts</td>
<td></td>
<td>Lack of knowledge</td>
<td></td>
</tr>
<tr>
<td>Appropriate for team members to implement</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Developing themes
teams having a positive attitude, respect, integrity; good communication skills and a commitment to continually develop knowledge and skills throughout our working life, whilst delivering a holistic approach to our patients’ care.7

EXTRACTED REFERENCES:

Is sodium hypochlorite an effective treatment for periodontal disease? A review of the literature

A. Seymour,1 C. Chambers,2 M. Harris3

Learning outcomes:

- To understand the potential uses for sodium hypochlorite in the treatment of periodontal disease.
- To appreciate the strengths and limitations of current evidence for the use of this chemical solution in the treatment of periodontal disease.
- To gain an insight into the growing trend of the use of sodium hypochlorite as an oral rinse by the general public.

eCPD aligned with GDC development outcomes: C,D

Key words: Periodontal disease, sodium hypochlorite

ABSTRACT

Aim: To understand if the efficacy of sodium hypochlorite (NaOCl) could be effective against periodontopathic bacteria and what impact this could have on future periodontal treatment.

Methods: A comprehensive literature review was undertaken, encompassing an analytical approach using a variety of research databases.

Results: From analysing a number of studies, a key theme emerged. This theme identified that nearly all short-term studies using a low concentration received positive findings in the reduction of periodontal bacteria, whilst the long-term studies using a higher concentration found no statistical significance.

Conclusion: The findings suggest a possibility that sodium hypochlorite could be effective as an adjunctive oral rinse when used for a short period of time. However, long-term and extensive clinical trials are still required.

Introduction

Periodontal disease is one of the four most common global oral diseases,1 with severe periodontitis ranking as the 6th most prevalent disease in humankind.2 It is estimated that 45% of the adult population in England, Wales and Northern Ireland have periodontal disease with gingival pocketing exceeding 4 mm in depth.3

Due to the complexity of the disease, periodontitis strongly remains a diagnostic and therapeutic challenge. As there is mounting evidence to suggest a significant relationship between periodontitis and general health, effective treatment for the disease is now more imperative than ever.4 Current treatment options for periodontal disease include either surgical or Non-Surgical Periodontal Therapy (NSPT).

NSPT consists of professional mechanical debridement, effective patient performed oral hygiene, local delivery of antimicrobial agents and occasionally the use of systemic antibiotics.5 Surgical interventions include either pocket reduction, pocket elimination or regenerative procedures.4

In the last twenty years adjunctive antimicrobial regimes have been designed to accompany the mechanical removal
of subgingival plaque. Antimicrobial therapy can be delivered either topically or systemically, with the most common topical antimicrobials including Chlorhexidine Digluconeate (CHX) 0.2%, Hydrogen Peroxide (H₂O₂) 1.5% w/v and Minocycline 2% w/w.

Antimicrobials

CHX is a broad-spectrum bisbiguanide that is effective against fungi, Gram-positive and Gram-negative bacteria, as it binds to and disrupts the cell membrane. CHX has been used in dentistry since 1969 when the chemical was discovered to inhibit plaque formation and, since then, has become one of the most studied agents in dentistry. However, CHX still carries a number of local side-effects such as tenacious extrinsic staining, taste perturbation, oral mucosal erosions and parotitis.

H₂O₂ solution in dilute form has been used as an oral rinse for a number of years. The antimicrobial effects are created by releasing oxygen when in contact with peroxidases and catalases found in saliva and oral tissues. This in turn disturbs the anaerobic bacteria residing at the base of the gingival pocket. It has also been indicated to have an antibacterial effect against Gram-positive as well as Gram-negative microorganisms. Although H₂O₂ is shown to have positive effects for use in periodontal disease, prolonged use may cause hypertrophy of the papillae of the tongue.

Sodium Hypochlorite

Sodium Hypochlorite (NaOCl) is most commonly known as ‘household bleach’, with the content of NaOCl ranging from 5% to 10% with a pH value of approximately eleven. It was first discovered in 1796 when it was manufactured by a French chemist named Claude-Louis Berthollet. This led to the discovery of its effectiveness in controlling wound infections as a result of its antiseptic properties against bacteria, fungi and viruses.

NaOCl has been available in dentistry for a number of years, where it has predominantly been used in endodontics as a root canal irrigant. It is understood that NaOCl occupied a key position in the twentieth century in periodontal therapy and was used as an epithelial-specific solvent, delivered as either an oral rinse or local irrigation. However, therapeutic emphasis changed to mechanical debridement in the 1940s and the interest of antimicrobial therapy declined. This interest was renewed in 1969 with the discovery of CHX as an adjunctive to mechanical debridement. However, there has been no explanation as to why there was such a large gap in the use of NaOCl, or from where the new interest appeared.

NaOCl works by destroying microorganisms through oxidation of proteins, nucleotides and lipids without inhibiting the fibroblastic activity of the skin and mucosa when used in low concentrations. However, the risks associated with the oral use of NaOCl have been discussed, but with limited findings. It is evident that NaOCl as a product has held a century-long safety record and has not been shown to evoke allergic reactions, or identify as a carcinogen, teratogen or mutagen.

Conversely, there have been accounts of accidents associated with the use of NaOCl during endodontic treatment which has caused catastrophic damage to the patient including oedema and diffuse bleeding of the oral epithelial tissues. Nonetheless, no adverse events have been reported when used as a diluted oral rinse. Although the evidence shows little in the way of disadvantages or contraindications of its use in periodontal therapy, NaOCl can act as a bleaching agent of oral hard tissues, which may be seen as an undesirable effect.

Without adequate and up-to-date knowledge, the risks of accidental soft tissue damage remain unknown. Increasing knowledge, patient education and ensuring patient safety, has therefore prompted the need for new literature in this subject area.

Inclusion and exclusion criterion

The inclusion criteria included worldwide research papers written in English with participants aged 16 years or over. The inclusion of literature relevant to NaOCl and periodontal disease that has made a valuable contribution to the gap in knowledge was also included. Research papers that did not contribute to new knowledge were discounted.

Critical appraisal

Methodological quality was measured by using the Crowe’s Critical Appraisal Tool. This framework ensures pertinent data is extracted following an analysis of the quality, which is then converted into a percentage. To populate key findings, a summary of studies table was created to help synthesise all outcomes and uncover gaps in the research (Table 1).
<table>
<thead>
<tr>
<th>Citation</th>
<th>Aims</th>
<th>Methods</th>
<th>Sample Size</th>
<th>Results and Findings</th>
<th>Conclusion</th>
<th>Comments</th>
<th>CCAT Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Espho &amp; Colsombo, (2017)</td>
<td>Test the effect of 0.1% NaOCl MW alongside full-mouth UP debridement.</td>
<td>Randomised, double-blind, placebo-controlled with a 6-month follow-up.</td>
<td>Placebo group- 16 Test group- 16</td>
<td>No additional benefits found</td>
<td>Further clinical investigations required concerning concentration levels and duration of use.</td>
<td>Subjects had to be non-smokers or quit for &gt;5yrs.</td>
<td>89%</td>
</tr>
<tr>
<td>Jurczak et al., (2016)</td>
<td>Assess the antimicrobial activity of a NaOCl gel against periodontopathic bacteria.</td>
<td>In-vitro.</td>
<td>In-vitro study - 3 components</td>
<td>NaOCl gel more effective against Gram (-) than Gram (+). Unsuccessful in inhibiting the multi-species biofilm matrix unlike CHX. Activity of NaOCl gel was more remarkable on a 4-day old biofilm.</td>
<td>Further research and long-term studies still required.</td>
<td>The NaOCl gel holds a worldwide product licence but is not available in the UK, why? Ethical issues may arise from the in-vitro study. Bias exists - funded by the producer of the NaOCl gel.</td>
<td>70%</td>
</tr>
<tr>
<td>Bizzarro, Van der Velden, &amp; Loes, (2016)</td>
<td>Investigate clinical and microbiological effects of local disinfection with 0.5% NaOCl +/- systemic antimicrobials during BPT.</td>
<td>Partial double-blind, parallel designed, RCT.</td>
<td>4 treatment groups (24 participants in each). By 12-month follow-up, 99 participants completed the study.</td>
<td>Local disinfection with 0.5% NaOCl, +/- systemic ABs, did not contribute to any adjunctive effect at the 12-month follow-up for clinical attachment loss.</td>
<td>Long-term use of NaOCl alongside BPT has shown to be insignificant. Further clinical studies required to test short and long-term use.</td>
<td>Patients classed as a smoker if he/she was currently smoking or quit &lt;6 months before baseline.</td>
<td>86%</td>
</tr>
<tr>
<td>Rich &amp; Slott, (2015)</td>
<td>Examine clinical studies that have addressed NaOCl oral rinsing and its potential for promoting periodontal health.</td>
<td>Case-report, literature review.</td>
<td>Reviews 4 clinical studies using a variety of electronic databases.</td>
<td>Suggests a twice weekly oral rinse of 0.25% constitutes a valuable adjunct to current methods of plaque removal.</td>
<td>Whether a NaOCl rinse can partly or fully substitute existing dental care procedures is still under investigation.</td>
<td>Bias and unreliability - author has been involved in all but one of the studies discussed. Case-reports rank low in the hierarchy of evidence pyramid.</td>
<td>65%</td>
</tr>
<tr>
<td>Gonzalez et al., (2015)</td>
<td>The effects of a 0.25% NaOCl MW in reducing BoP in periodontal pockets.</td>
<td>Randomised, single-blinded, clinical trial in parallel groups.</td>
<td>12 participants. Both over 3-months.</td>
<td>BoP in pockets of 4-7mm reduced by 53% in NaOCl group. Twice-weekly NaOCl rinses showed significant reduction to BoP.</td>
<td>Inclusion criteria included smokers. Small sample size. Cannot represent long-term effects of NaOCl as an oral rinse.</td>
<td></td>
<td>71%</td>
</tr>
<tr>
<td>Galen et al., (2014)</td>
<td>Evaluate 0.25% NaOCl twice-weekly oral rinse to plaque and gingivitis in patients with minimally treated periodontitis.</td>
<td>Randomised, controlled, single-blinded, clinical trial in parallel groups.</td>
<td>30 participants with periodontitis. All participants completed baseline and 2-week visits, 12 participants completed 3-month visit.</td>
<td>3-month interval NaOCl group showed significant improvement in plaque reduction and number of teeth without BoP when compared to control group. Controlled studies still required. Studies needed to identify most successful way of introducing NaOCl to the public.</td>
<td>Subjective - visual plaque scores used at baseline recording. Bias - authors of this study are the same as other study.</td>
<td>79%</td>
<td></td>
</tr>
<tr>
<td>De Nardo et al., (2012)</td>
<td>Evaluate effects of 0.05% NaOCl on supragingival biofilm and gingival inflammation.</td>
<td>Randomised, controlled, single-blinded, clinical trial in parallel groups according to the CONSORT criteria.</td>
<td>44 males enrolled 20 participants rinsed with NaOCl (test) 20 rinsed with distilled water (control) All for 21-days without toothbrushing.</td>
<td>Day 0-21, all participants had an increase of plaque and staining. Increased plaque and bleeding scores in control group compared to test group.</td>
<td>0.05% NaOCl constitutes an efficacious MW in periodontal health care. More studies required with larger sample sizes and longer study periods.</td>
<td>Small sample size. Only included male participants. Included smokers. Subjective - Visual plaque scores recorded on day 0. Disclosing agent as was used on day 21.</td>
<td>79%</td>
</tr>
<tr>
<td>Lobene, Soparkar, &amp; Quigley, (1973)</td>
<td>Evaluate effects of antiseptic agents delivered as pressure jets on undisturbed accumulated dental plaque. Two antiseptic agents tested: - 1% H2O2 - 0.5% NaOCl.</td>
<td>Pilot study.</td>
<td>6 college students suspended all OH procedures 2 days prior and 5 days during test period. Each participant rinsed with a 20% sucrose rinse for 1 minute prior to the test to record the plaque pH. UR teeth flushed with active solutions (test). UL teeth flushed with tap water (control).</td>
<td>Both NaOCl and H2O2 were found to minimise drop in plaque pH. The NaOCl effect on plaque pH persisted for 24-hours post last treatment. The evaluation of in depth delivery systems for agents which affect plaque mass and metabolism, requires further investigation.</td>
<td>No clear justification for using H2O2, or NaOCl for testing. Minimal reference list to support study. Could the irrigating device have affected the results?</td>
<td>55%</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Results and Findings.
this study showed no additional clinical or microbiological effects of the local disinfection of NaOCl when compared to BPT alone. Comparing this recent study with a historical study, where 0.5% NaOCl was used within a pulsating irrigating device, shows a clear juxtaposition of results. The use of NaOCl as an oral therapeutic agent in conjunction with a water pressure cleansing device, was shown to reduce plaque pH and accumulation of plaque which also persisted for a further 24-hours post treatment.27 Nevertheless, it is important to consider the use of the irrigating device may have modulated the oral flora from an anaerobic environment to that of an aerobic environment, which is not periodontally pathogenic.

A more recent RCT by De Nardo et al. (2012),28 studied NaOCl as a twice-daily oral rinse at a concentration of 0.05%. This single-blinded clinical trial required forty participants to abstain from toothbrushing for a 21-day period, with only a twice-daily rinse of either 15 ml distilled water or 15 ml of 0.05% fresh NaOCl solution. The results indicated a statistical significance (p = 0.001) from the test group, when compared to that of the control group.

Contrary to these results, the most recent RCT did not compare NaOCl in combination with full-mouth ultrasonic debridement over a six-month period.29 On closer examination, it was noted that De Nardo et al. (2012),28 used a visual plaque score on day 0, but compared that to day 21 when a disclosing agent was used. Visual plaque scores can be subjective, which questions the robustness and quality of this method of recording against the results achieved.

When considering the various uses of NaOCl that have been studied, all have been tested as either an oral rinse or as an irrigating agent. However, in 2016 an in-vitro study was produced by Jurczyk et al. (2016),21 that aimed to assess the antimicrobial activity of a NaOCl gel formulation on the bacteria involved in periodontal disease. This in-vitro study compared a 0.95% NaOCl gel to a 0.1% CHX solution involving 96-well microtiter plates over an incubation period of four days. Interestingly, the results found that CHX acted more effectively in reducing bacterial load when compared to the NaOCl gel. However, when studying which bacteria had been affected, mainly numbers of Gram-positive bacteria were decreased by the CHX. It was understood that the NaOCl gel inhibited more growth on Gram-negative bacteria than Gram-positive. As Gram-negative bacteria is known to be the predominant bacterium involved in periodontal disease, it would suggest that NaOCl could be effective in the treatment of periodontal disease when compared to CHX. Whilst CHX exerts properties that inhibit plaque accumulation, NaOCl gel did not compare.

NaOCl gel is in use within Europe, manufactured since 2013 by RLS Global AB. This Swiss company created the NaOCl gel under the registered trademark name Perisolv.29 Regdent hold a worldwide licence, with sales in this product stretching across Europe, but not the UK.28 Understanding the reason for this is unclear, but may suggest the governing body for the sale and distribution of medicines and healthcare products in the UK may not provide a licence for the product.

### Limitations of a literature review methodology

The critical appraisal uncovered aspects of the studies that would, or could have, affected the results, reliability or validity of the clinical trials and the inclusion and exclusion criteria were variable between studies. For example, two of the studies included smokers as part of their selection criteria, two studies only accepted non-smokers and the remaining four studies did not. Such reasons may suggest the reliability of the findings due to such varying confounding factors.

A second finding revealed varied methodologies between studies, with no clear consistent protocols being followed prior to, during, or after the trials. For example, three studies used subgingival and supragingival debridement either at the start or throughout the trial, whereas three studies only conducted a clinical examination. The baseline recordings differed in how gingival bleeding and plaque levels were measured and the concentration of NaOCl investigated varied from 0.05% to 0.95%, with differing trial periods ranging from four days to twelve months. Concomitantly, the delivery methods were either in-vitro, local irrigation or as an oral rinse.

### Conclusion

Throughout the process of critically analysing and reporting upon the findings, a lack of consistency was identified with the concentration of NaOCl tested as well as the methods used in each trial. Each clinical trial used small sample sizes with differing...
inclusion and exclusion criteria, with all studies being conducted in either America or Europe, but none in the UK. From elucidating these findings, it is difficult to draw a concise conclusion into the efficacy of NaOCl as a way of treating periodontal disease. However, a key trend emerged, in which nearly all short-term studies using a low concentration of NaOCl showed positive findings, while the long-term studies using a higher concentration found no statistical significance. Based on these findings, it would suggest a possibility that NaOCl could be effective in the treatment of periodontal disease and be used as an adjunctive oral rinse for a short period of time, similar to that of CHX.

Recommendations

Despite promising properties, long-term studies are still required and further experimental investigations are needed to better understand this topic. As a future recommendation, the effective concentration of NaOCl must be established as it would help to clarify a greater degree of accuracy on this matter.

To enable the results to be transferable and reliable, all clinical trials must be conducted in a comparable manner following a similar protocol. For this product to be used in the UK, strict legislations would apply with the challenge of it being proven safe for use to the general public by the MHRA.

At present, it has been difficult to find research that has been conducted in the UK regarding periodontal disease and the use of NaOCl. The majority of studies currently available have been produced in the United States of America, which are still limited in quantity. This therefore suggests a generalised gap in knowledge.

As a prerequisite to producing a clinical trial, sufficient funding and possible sponsors from health and medical conglomerates may be required. If funding was available and long-term studies were produced, knowledge in the UK would increase. With increased knowledge of periodontal therapies and the safety surrounding the use of NaOCl, patient and professional education could be changed to incorporate the safe use of NaOCl in the treatment of periodontal disease.

Author contributions

1. Anna Seymour designed research proposal and carried out literature review.
2. Claire Chambers supervised the design of the literature review.
3. Marina Harris supervised the writing up of the literature review.

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References

1. What is an optimum plaque score for patients going into implant surgery?
   A. >50%
   B. <15%
   C. <20%
   D. >30%

2. What is the ideal MINIMUM frequency of implant recall appointments?
   A. Quarterly
   B. Six monthly
   C. Annually
   D. Biannually

3. Which of the following are risk factors for peri-implant disease?
   A. Plaque
   B. Bleeding on probing
   C. Non-attendance at recall
   D. All of the above

4. Tailored Oral Health programmes for implant patients can:
   A. Increase risk of peri-implant disease
   B. Increase risk of inflammation
   C. Decrease risk of peri-implant disease
   D. Increase risk of implant failure
PAPER 2: PRACTICE DEMOGRAPHICS IN THREE RANDOMISED CONTROLLED TRIALS UNDERTAKEN IN DENTAL PRIMARY CARE SETTINGS PP10-14

eCPD aligned with GDC development outcomes: B.C

1. How many primary dental care studies were supported by the NHS NIHR in 2016/17?
   A. 12  
   B. 24  
   C. 46  
   D. 68  

2. Which of the University of Dundee NIHR funded trials aims to determine which of three caries management approaches is most successful for primary teeth?
   A. FICTION  
   B. INTERVAL  
   C. IQuaD  
   D. SiXES  

3. How many practices were recruited across the three trials?
   A. 50  
   B. 62  
   C. 63  
   D. 175  

4. To which deprivation decile were the greatest number of total practices recruited?
   A. One  
   B. Two  
   C. Three  
   D. Four  

PAPER 3: EXPLORING ORAL HEALTH-RELATED KNOWLEDGE AND CONFIDENCE AMONG AUSTRALIAN COMMUNITY MENTAL HEALTH PROFESSIONALS: A CROSS SECTIONAL WEB-BASED SURVEY PP15-21

eCPD aligned with GDC development outcomes: C.D

1. What type of study design was used by the authors?
   A. Semi-structured interviews  
   B. Cross-sectional survey  
   C. Focus groups  
   D. Quasi-experiment  

2. How many CRSWs were invited to participate in the study?
   A. 131  
   B. 171  
   C. 441  
   D. 471  

3. What percentage of participants did not know that the bacteria that cause tooth decay can be transmitted from one person to another?
   A. 80.1%  
   B. 87.9%  
   C. 88.7%  
   D. 89.0%  

4. Which of the following was rated as the least important barrier to PLWSMI accessing dental services?
   A. Fear  
   B. Coping with anxiety  
   C. Lack of motivation  
   D. Lack of oral health knowledge
1. In the study by Arheiam et al., examining the use of diaries in general dental practice in England, what percentage of general dental practitioners refer to a dental therapist and dental hygienist for dietary advice?
   A. 25%
   B. 40%
   C. 70%
   D. 25%

2. What title is given to the oral health practitioner in Australia who undertakes the combined three year degree in dental therapy and dental hygiene?
   A. Oral Auxiliary
   B. Oral hygienist
   C. Hygienist Therapist
   D. Oral Health Therapist

3. How do Sheiham and James describe dental caries?
   A. Mostly occurring in children and adolescents
   B. Not a concern for those aged over 65 years, compared to periodontal disease
   C. A chronic cumulative lifelong disease
   D. A transient disease risk that relates to age changes in some populations

4. Why are students hesitant to share their reflections?
   A. Feel anxious
   B. Fear of being judged
   C. Identification of clinical errors
   D. All of the above
1. When treating patients in general dental practice what are the oral indications of a potentially alcohol dependant person?
   A. Gingivitis, generalised recession, geographic tongue, occasional minor ulcers, erosion
   B. Periodontal disease, caries, erosion, burning and inflamed tongue, recurrent aphthous ulceration
   C. Recession, caries, aphthous ulcers, healthy looking tongue, erosion
   D. Caries, marginal gingivitis, lichen planus, tooth wear due to bruxing, burning and inflamed tongue

2. What is the percentage of mouth cancers associated with alcohol (and tobacco) use?
   A. 25%
   B. 67%
   C. 75%
   D. 98%

3. Which alcohol screening tool is often described as the ‘gold standard’?
   A. AUDIT
   B. FAST
   C. M-SASQ
   D. CAGE

4. In a recent published systematic analysis what is the recommended safe level of alcohol consumption to minimise health loss?
   A. 0 units per week
   B. 5 units per week
   C. 10 units per week
   D. 14 units per week

1. Which one of the following statements is true?
   A. Sodium hypochlorite has not been shown to be a carcinogen, teratogen or mutagen.
   B. Sodium hypochlorite has been shown to carry a number of side effects such as extrinsic staining and taste perturbation.
   C. Sodium hypochlorite has been shown to cause hypertrophy of the papillae of the tongue.
   D. Sodium hypochlorite has been shown to evoke allergic reactions.

2. What is the abbreviation for sodium hypochlorite?
   A. NoACl
   B. NaOlC
   C. NaOCl
   D. NoCAl

3. In the Study by Gonzalez et al., what percentage of sodium hypochlorite was tested?
   A. 0.1%
   B. 0.5%
   C. 0.05%
   D. 0.25%

4. Of the eight studies analysed, how many resulted in positive findings for the effect of sodium hypochlorite on periodontal bacteria?
   A. Three
   B. Four
   C. Five
   D. Six

PAPER 6: SCREENING FOR ALCOHOL MISUSE AND ALCOHOL BRIEF INTERVENTIONS IN PRIMARY DENTAL CARE SETTINGS: A LITERATURE REVIEW PP32-38

1. When treating patients in general dental practice what are the oral indications of a potentially alcohol dependant person?
   A. Gingivitis, generalised recession, geographic tongue, occasional minor ulcers, erosion
   B. Periodontal disease, caries, erosion, burning and inflamed tongue, recurrent aphthous ulceration
   C. Recession, caries, aphthous ulcers, healthy looking tongue, erosion
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   C. 10 units per week
   D. 14 units per week

PAPER 7: IS SODIUM HYPOCHLORITE AN EFFECTIVE TREATMENT FOR PERIODONTAL DISEASE? A REVIEW OF THE LITERATURE. PP39-43

1. Which one of the following statements is true?
   A. Sodium hypochlorite has not been shown to be a carcinogen, teratogen or mutagen.
   B. Sodium hypochlorite has been shown to carry a number of side effects such as extrinsic staining and taste perturbation.
   C. Sodium hypochlorite has been shown to cause hypertrophy of the papillae of the tongue.
   D. Sodium hypochlorite has been shown to evoke allergic reactions.

2. What is the abbreviation for sodium hypochlorite?
   A. NoACl
   B. NaOlC
   C. NaOCl
   D. NoCAl

3. In the Study by Gonzalez et al., what percentage of sodium hypochlorite was tested?
   A. 0.1%
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   C. 0.05%
   D. 0.25%

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   A. Three
   B. Four
   C. Five
   D. Six