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## "Well, in dentistry the dentist is always the boss": A multi-method exploration of which organisational characteristics of dental practices most influence the implementation of evidence-based guidance.

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*"Well, in dentistry the dentist is always the boss":* **A multi-method exploration of which organisational characteristics of dental practices most influence the implementation of evidence-based guidance.**

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## ABSTRACT

**Objective:** To investigate which organisational characteristics of primary care dental practices are influential on the implementation of evidence-based guidance.

**Design:** A multi-method study, set within primary care dentistry in Scotland comprising: (1) Semi-structured interviews with dental teams to inform the development of a self-report questionnaire to explore the translation of guidance in primary care dentistry; (2) A questionnaire-based survey and case studies exploring which organisational characteristics are most influential on knowledge translation in primary care dental practices.

**Results:** The interview data identified three themes: leadership, communication and context. Our survey revealed compliance with recommendations from three topics of dental guidance to be variable, with only 41% (Emergency Dental Care), 19% (Oral Health Assessment and Review) and 4% (Drug Prescribing) of respondents reporting full compliance with the guidance recommendations. Analysis revealed no significant relationship between practice characteristics and compliance with Emergency Dental Care or Drug Prescribing recommendations. Positive associations were observed between compliance with Oral Health Assessment and Review recommendations and having a practice manager, as well as with whether a practice was fully NHS, fully private or offered a mixture of treatments. Case study data identified leadership and context as key drivers of guidance uptake.

**Conclusions** Evidence-based dental recommendations are not routinely translated into practice, with variable leadership and differing practice contexts being central to poor uptake. Guidelines should aim to tailor recommendations and implementation strategies to reflect the complexities and varying contexts that exist in primary care dentistry, thus facilitating the implementation of evidence-based guidance.

### Strengths and Limitations of the Study (5 Bullet points)

- A key strength of this study was the multi-method approach adopted, which provides a more holistic contextual portrayal of the phenomenon being studied.
- The use of the Receptive Healthcare Contexts for Change framework throughout the study provided consistency in theoretical approach.
- Although practices were self-selecting, our use of practice visits and observations served to check the accuracy of self-reported data.
- Only two case studies were undertaken, and care should be taken regarding the transferability of these findings to other dental and primary care settings.
- Gathering practice level questionnaire data was challenging. Data analysis was conducted at the individual rather than the practice level, with clustering by practice ID to reduce potential bias.

## BACKGROUND

Evidence-based guidance aims to reduce inappropriate variations in practice and promote evidence-based healthcare [1]. It is well documented however, that the translation of research evidence into routine practice is unpredictable [2], and patients do not necessarily receive the care they need or that is in accordance with current evidence [3-5]. Knowledge translation (KT) requires more than the development and dissemination of guidance [6-11], and the availability of evidence alone is not usually sufficient to change behaviour [12]. A systematic review across 11 studies found that only a third of research evidence informing guidelines is routinely implemented [13]. This delay in implementation of evidence into clinical practice is known as the "evidence to practice gap"[10, 11].

In the UK, around 90% of health care encounters occur in primary care [14]. Primary care organisations vary in structure, composition, packages of care offered, remuneration and practice systems. Dental practices are mainly small, privately owned organisations, although in recent years there has been a growth in dental corporate bodies, which currently make up around 10% of the Scottish market. General Dental Practitioners (GDPs) work under a NHS contract, treating children and adults under an item of service fee structure. While some GDPs only undertake NHS work, many undertake a mixture of NHS and private treatments.

In 2004 the Scottish Government established the Scottish Dental Clinical Effectiveness Programme (SDCEP), to develop user-friendly guidance to promote best practice and improve the quality of dental care in Scotland [15]. This initiative embedded a KT research programme within the guidance development process, known as Translation Research in a Dental Setting (TRiaDS) [16]. A number of studies undertaken within the TRiaDS programme have found that guideline recommendations were not being fully translated into routine dental practice [17-19].

The diverse characteristics of dental practices make them particularly challenging for KT initiatives. The objective of this study was to investigate which organisational characteristics of primary dental care practices are most influential on the translation of guidance.

**METHODS**
**Study design**
A multi-method study underpinned by the Receptive Healthcare Contexts for Change (RHCC) framework [20]. This framework explores factors including the content, context, and process of change. The RHCC was selected a priori as an exploratory lens through which to explore the organisational level barriers and facilitators to the translation of guidance.

The study comprised two stages:

(1) Semi-structured interviews with dental teams to inform the development of a self-report questionnaire exploring the translation of guidance in primary care dentistry.
(2) Questionnaire-based survey and dental practice case studies to explore which organisational characteristics are most influential on the translation of guidance in primary care dentistry.

**Setting and Participants**

Dental team members  in General Dental Practices in Scotland.

**Data collection**
*Interviews and questionnaire development*
Semi-structured telephone interviews were conducted with dental team members to inform the development of a self-report questionnaire to explore the translation of guidance in primary care dentistry. Practices were sampled from an ongoing trial evaluating the translation of SDCEP's 'Decontamination' guidance [21].  A random sample of practices, stratified by compliance with decontamination recommendations, was generated. All practices in the sample were sent a study information pack and invited to participate.

A topic guide was informed by the RHCC framework, discussions with key stakeholders and literature review findings [22]. Demographical questions were included to develop a full picture of the practice, its structure and systems. The topic guide was piloted with three dental team members. Interviews were conducted by an experienced qualitative researcher (HC) and digitally recorded with consent. Data collection ceased when data saturation was achieved [23].

Interview data were reviewed to inform the development of the questionnaire. This questionnaire also included questions to determine compliance with three topics of dental guidance: SDCEP's Emergency Dental Care Guidance (EDC) [24], Oral Health Assessment and Review (OHAR) [25] and Drug Prescribing (DP) [26]. These topics were selected based on the differing dental contexts and team members they target.

*Questionnaire-based survey and dental practice case studies*
A random sample of 400 practices was identified using the Practitioner Services Division's Management Information Dental Accounting System database [27]. Practices were randomised at practice level and then by individual dentist. One dentist per practice was randomly allocated as the practice contact and asked to distribute questionnaires to all team members. All practices where at least one dentist and one non-dentist completed the questionnaire were eligible for case study participation. Case studies involved face-to-face or telephone interviews, informal discussions and practice observations.

**Data handling and analysis**
*Interviews and questionnaire development*
Audio recordings were anonymised and securely transferred to a professional transcription service and transcribed verbatim. Data were managed using NVivo 10 software. Thematic analysis was undertaken to organise and classify data according to key issues, concepts and emerging themes [28]. The RHCC framework was used as an initial coding framework. As these interviews were exploratory and aimed to identify organisational barriers and facilitators to the translation of guidance, it was important that analysis allowed for the identification of key issues using the RHCC as well as recognising other emergent themes. The Consolidated Criteria for Reporting Qualitative Research (COREQ) guided reporting of the data [29] **(Checklist 1).**

*Questionnaire-based survey and practice case studies*

Questionnaire data were managed using SPSS version 22. Descriptive statistics were used to explore the data. Internal consistency of instrument measures was tested using Cronbach's alpha. Independent t-tests assessed differences in responses from participants reporting compliance with recommendations when compared with those reporting non-compliance. Chi-square tests assessed any relationships between practice characteristics and compliance. Where appropriate, logistic regression models were used to assess the relationship between instrument items and compliance with the three dental topics. Statistical significance was defined as p-value <0.05 and based on two-sided tests. Case study data were analysed using the thematic analysis. The questionnaire can be found in Supplementary file 1.

**Ethical review and governance**

Ethical review was sought by the East of Scotland Research Ethics Service, which advised that full ethical review was not required and classified the project as service evaluation. All data were anonymised and stored confidentially and securely in accordance with University of Dundee Information Governance procedures and the Data Protection Act, 1998 and latterly the General Data Protection Regulation, 2018.

**Patient Involvement**

Patients were not involved in this study.

**RESULTS**

*Interviews*

Twenty-six practices were sent information packs. Fourteen interviews across four practices were conducted, ranging from 15 minutes to one hour. All practices were independently owned but varied in structure and character. Participants covered a range of roles within the dental team. Supplementary file 2 illustrates the key characteristics and findings by practice.

Analysis of the interview data identified three themes: leadership, communication and context.

**Leadership**

Leadership 'hierarchies' were evident in all practices, albeit manifested differently. All practices had an identifiable leader and in all cases, this was the practice owner and dentist; however, leadership was also provided by other team members, such as dental nurses and practice managers (PMs). Leadership strategies acted as both barriers and enablers to the translation of guidance. Some participants, both dentists and non-dentists, claimed that they were happy to be told what to do, almost relying upon it, with participants referring to *'doing as they were told'* and *'following the rules'*. It was, however, clear that some team members found their lack of involvement in decision-making frustrating.

*"Well in dentistry the dentist is always the boss, they have a very strong opinion, and nobody can overrule them if they're wrong…"* **Participant 10 (Dentist).**

In all practices, dentists appeared to have more knowledge and awareness of guidance, when compared with other team members. As a result, practice dissemination systems, influenced how information was received, if at all, by other team members.

*"if it was felt it was relevant to anyone other than the dentist…then individuals would be…shown what was relevant and what was changed..."* **Participant 3 (Dentist).**

Leadership hierarchies also influenced professional development, with clinicians reporting having time to undertake training but administrative staff highlighting barriers. In some cases, this presented as a lack of interest or motivation. One participant when asked about training said they were *"quite happy just to jog along"*. During the interviews, much reference was made to "the dentists" or "the girls", to refer to the dental nurses, reinforcing a sense of two distinct, and perhaps, unequal groups within the team.

**Communication**

Communication was intrinsically linked to leadership. Only one practice reported having regular meetings, and methods for dissemination of guidance varied. Another practice reported only having meetings when there was a problem. The effects of not having any 'whole team' communication were clear and reinforced by participants reporting *"mixed messages"*.

*"…sadly, the only time there is a meeting of the whole team would be when there is a major issue, and then it could be quite confrontational. That would trigger a full meeting based on whatever the issue was and it would be brought up fait accompli, 'look, this is what's happening, we don't want this, we want this, no questions asked, this is what's happening, we start tomorrow', boom!"* **Participant 5 (Dentist).**

*"…one person says something, the next person says another and we get Chinese whispers before it reaches the last person."* **Participant 14 (Dentist).**

In terms of the dissemination of guidance and recommendations, it was reported that the dentists generally received guidance individually, with limited discussion or dissemination to the rest of the team. On the whole guidance was *"passively received"* rather than actively sought. Non-dentists reported feeling frustrated about not being aware of new guidance and felt uninformed about planned changes. This was particularly evident in relation to decision-making processes around which recommendations were to be implemented.

*"We don't really get access to them, we're only told what they contain, what to carry out, but we don't actually have it in front of us to get, you know have the opportunity to look through it."* **Participant 6 (Dental Surgery Assistant).**

*"…there's no real discussion between everyone as a team, about what sorts of things would be useful, you know nobody really has any input at all."* **Participant 7 (Office Administrator).**

**Context**

Context related to the patient profile, the practice setting and the guidance topic. It was clear that patient expectations differed depending on the patient profile and setting of the practice. One practice, set within a more affluent area, reported that patient expectations were high and this led to greater pressure to allocate emergency appointments and a higher standard of care expected.

*"…they can be very demanding, but I mean we meet most of the demand, I wouldn't say that we don't, no, but they do expect quite a high level of care"* **Participant 9 (Dental Nurse).**

Practice context related to the premises and practice resources. Barriers included, patient access to the premises, working across multiple floors and how this impacted upon communication and storage space. Resources, especially time and money, emerged as barriers in all practices.

The guidance topic also appeared to influence the translation of guidance. All practices referred to SDCEP's Decontamination guidance, as a 'hot topic'. It was evident that this was something they felt they should be following, suggesting that when more focus is placed on a topic there may be more motivation to comply. This links with the concept of prioritising which recommendations to follow. Participants referenced *"dipping in and taking bits out"*, and it not being possible to implement it all with *"common sense having to prevail".* The notion of prioritising guidance recommendations and *'cherry picking'* which to follow was evident across all practices.

### *Questionnaire-based survey*

An initial review of the literature did not identify an obvious instrument to explore all of the salient themes identified from the interview data. However, a mapping exercise identified the Organisational Climate Measure (OCM) instrument [30] which covered most themes and could be adapted. Furthermore, the OCM had previously been used within a UK healthcare setting and was considered appropriate for completion by a range of team members. The modified OCM was incorporated into a questionnaire which also included questions to determine compliance with the three topics of dental guidance. The questionnaire was piloted in four dental practices to test content validity.

Four hundred practices were sent questionnaires (four questionnaires per practice). Six opted out and three packs were returned unopened. In total 349 completed questionnaires were returned from across 96 practices: a practice response of 25%. Most participants reported that their practice was independently owned (88%), the remaining were corporately owned (6%) or part of the salaried service (7%). Most offered a mixture of NHS and private treatment (77%), 22% were fully NHS and <1% were fully private. Over half (56%) reported having a PM.

Participants were considered compliant if they reported always following best practice for the recommendations for each topic. Compliance with recommendations was variable (Table 1).

**Table 1:** Compliance with SDCEP Guidance

| Guidance Topic | Compliant | Non-Compliant |
|---|---|---|
| **Emergency Dental Care (EDC)** | 141 (41%) | 200 (59%) |
| **Oral Health Assessment & Review (OHAR)** | 63 (19%) | 273 (81%) |
| **Drug Prescribing (DP)** | 12 (4%) | 317 (96%) |

Table 2 shows the practice characteristics of individuals who reported being fully compliant. Chi-square tests revealed no significant relationship between practice characteristics and compliance with the EDC or DP recommendations. A positive association was observed

between OHAR compliance and having a PM, (p<0.01) and whether a practice was fully NHS, fully private or a mix, (P<0.01).

**Table 2**: Characteristics of Compliant Practices

|  | Emergency Dental Care (n=141) | Oral Health Assessment & Review (n=63) | Drug Prescribing (n=12) |
|---|---|---|---|
| **Has a Practice Manager** | 80 (57%) | 45 (73%) | 6 (50%) |
| **Independently Owned** | 119 (84%) | 56 (89%) | 12 (100%) |
| **Corporate Practice** | 8 (6%) | 5 (8%) | 0 (0%) |
| **Salaried Service** | 14 (10%) | 2 (3%) | 0 (0%) |
| **Fully NHS** | 32 (23%) | 5 (8%) | 0 (0%) |
| **Fully Private** | 1 (<1%) | 1 (2%) | 0 (0%) |
| **A Mixture of NHS/Private** | 108 (77%) | 57 (90%) | 12 (100%) |

Logistic regression models assessed the relationship between the OCM instrument measures and compliance with the EDC and OHAR recommendations. Full results can be found in supplementary file 3. Only one of the instrument measures, 'integration' was predictive of compliance with the EDC recommendations, suggesting that greater levels of the trust and co-operation between team members, increased the likelihood of compliance. Three of the instrument measures, 'welfare', 'pressure to produce' and 'guidance prioritisation' were predictive of compliance with the OHAR recommendations, with lower scores suggesting a greater probability of full compliance. Results also suggested that fully private practices were more likely, and fully NHS practices were less likely, to comply with the OHAR recommendations when compared to those offering a mixture of treatment (P<0.01).

Only 12 of 349 respondents were fully compliant with the DP recommendations. All 12 worked in independently owned practices offering a mixture of NHS and private treatments. Due to this lack of variation across variables, logistic regression was not appropriate. A comparison of responses across the instrument items revealed a significant difference for 'pressure to produce'. Compliant respondents reported lower pressure to produce scores than those who were not compliant (P=0.04). No other statistically significant differences in responses were observed.

### Case studies
Seventy-seven of the 96 practices who completed the questionnaire were eligible for participation in the case studies. Two practices agreed to participate. Eight interviews were conducted in total.

Practice A was an urban, independently owned practice with one part-time dentist and one nurse. Practice B was a rural, corporately owned practice with two dentists, three nurses, a receptionist and a part-time hygienist and PM. Neither practice was fully compliant with any of the three dental topic areas. Despite differences in practice characteristics, some similar themes emerged from the case study data.

Leadership was a strong theme, albeit affecting the practices in different ways. In Practice A strong leadership was apparent from the principal dentist and owner, and while this appeared

to work well most of the time, there were instances where it appeared as a barrier, particularly when a more formalised approach was needed.

*"We sit down all the time and we call it practice meetings for the protocol.  But you know, it's just as easy to stray on to what we did at the weekend."* **Participant 15 (Dentist).**

Practice B had a very different structure and management system in place, mainly due to being corporately owned. All team members referred to *"following the party line"*, having no leader within the practice and everyone being equal. It was evident however, that the PM did exert some leadership and tried to facilitate adoption in terms of disseminating guidance to the team and developing processes to ensure it was read. Her role, however, was remote from the day-to-day working of the team, and this perhaps added to the power struggle observed between the dental nurses, trying to assume aspects of a leadership role in her absence. One team member commented:

*"Who is the leader, or who tries to be the leader…?"* **Participant 19 (Dental Nurse).**

Context incorporated the patient context, including attitude and lifestyle, as well as practice context, including geographical location, premises, team size and ownership. The context of the case study practices was very different, but in both cases appeared to influence how they prioritised guidance. In Practice A, while good intentions to follow recommendations were clear, processes of implementation were haphazard, combined with a tendency to prioritise and tailor recommendations to fit their practice and patient context.

*"The guidelines are that you take your dirty instruments in a plastic container with a lid on it. These three steps between the surgery and the sit-down area, you know.  And really why would you get gunk on your wee plastic container? …And the thing is that of course in most practices they are bigger, and you can see why these guidelines are in place…  So, these are the kind of things that we have to say we do them in protocols but in reality we don't really do them."*  **Participant 15 (Dentist).**

Practice A also tailored their working systems, such as appointment management, to accommodate the chaotic lifestyles of their patients and a relaxed atmosphere was evident, with considerable time spent over appointments and large gaps between patients. This observation was in keeping with the low 'pressure to produce' score from their questionnaire data. In contrast, Practice B's patient profile represented a close-knit community, which appeared to be a barrier when introducing new policies or methods of working. Finance and other external resources only emerged as a barrier to Practice B which was surprising given it is part of a group of corporate practices, where one might expect greater access to resources than an independently owned single-handed practice. In Practice B, both dentists highlighted challenges relating to antibiotic prescribing, which they attributed to the previous practice owner. They reported that some patients presented with the expectation of being prescribed an antibiotic. These patient expectations were specifically identified as a barrier to following DP recommendations.

*"Old patients go back to history of this practice, they were used for a scale and polish to have antibiotics prescribed…and then…I said 'no, you don't need them', …eh they are so persistent that I have to go, 'this is the paper, read it, you want to fight?'"* **Participant 22 (Dentist).**

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**DISCUSSION**

Numerous studies have attempted to identify the best means of translating health-related research findings into practice yet evidence shows that most KT initiatives only work some of the time and in some circumstances [31]. Our dental team interviews identified organisational level barriers and facilitators appearing to influence KT. These were categorised within the three broad themes of leadership, communication and context. Within these, sub-themes around team working, decision making, collaboration, dissemination and practice systems and learning emerged were evident.

Questionnaire findings identified relatively low levels of compliance with dental guidance– only 41%, 19% and 4% were fully compliant with EDC, OHAR and DP guidance recommendations, respectively, highlighting that evidence-based recommendations are not being routinely translated into practice. Furthermore, compliance levels may have been enhanced due to social desirability bias. Exploratory analysis revealed no significant relationship between practice characteristics and compliance with either the DP or EDC recommendations however, positive associations were observed between OHAR compliance and whether the practice is fully NHS, fully private or a mix; and whether the practice has a PM. Low levels of compliance with DP recommendations is supported by the literature [32] and in Scotland, there is a wide variation in dental prescribing [33].

Case study data identified that 'one size does not fit all', with the themes of leadership and context appearing most influential on the translation of guidance and practices themselves tailoring recommendations to their own ownership structure, geographical context and patient profile.

Synthesis of the data identified two overarching areas salient to the translation of dental guidance: leadership and context. Leadership emerged in differing forms and appeared to affect mechanisms and styles of communication. The impact of having a PM, leadership exerted by a principal dentist or leadership offered by dental nurses all appeared influential. A systematic review conducted by Lau and colleagues exploring the evidence to practice gap in primary care, echoed these findings, with both internal and external leadership, including the role of champions, identified as having a positive impact on adoption [11]. This review also suggested that hierarchical structures, which often exist in dental practices, can act as barriers to KT [11].

Context related to patient profile, including attitude and lifestyle; and practice characteristics, including geographical location, premises, team size and ownership. The role of context on KT is increasingly recognized, with what works in one setting not necessarily being transferrable to another [34, 35]. Context has been described as the underlying systems, culture and circumstances of the environment in which an intervention is being implemented [36] and was the subject of a recent realist review, to better understand it's influence on healthcare quality improvement initiatives [37]. Findings identified that contextual factors are frequently cited as both barriers and facilitators, echoing the findings of this study. Furthermore, recent developments reinforce the significant impact that context may play in KT. These include the updated SQUIRE 2.0 guidelines for quality improvement studies in healthcare, to recognise context as a fundamental reporting item [38] and the Medical Research Council (MRC) guidance for process evaluation of complex interventions,

highlighting the importance of the contextual factors associated with variations in implementation, intervention mechanisms and outcomes [39].

Taking the findings on board, one approach for the future may be to explore ways of tailoring recommendations and implementation strategies. This would allow differences in relationships and structural and procedural processes to be accounted for and may facilitate KT. The results of this study confirm that there is no 'right' quality improvement or KT approach that will be effective in all organisations or contexts [40, 41], and supports previous work highlighting that sustainable organisational change initiatives need to be designed in context to fit the particular set of local circumstances [42]. This approach would complement the Scottish Government's Oral Health Improvement Plan (OHIP) [43], which sets out the future of oral health improvement and NHS dental services in Scotland. The OHIP will introduce a dental preventive care pathway and an Oral Health Risk Assessment promoting personalised patient care, tailored to individual needs. Furthermore, a better understanding of what effective leadership looks like is needed. Relatively little is known about attributes of individuals who successfully lead primary care implementation activities [44], and even less so in primary care dentistry.

## CONCLUSIONS

This study identified two overarching organisational level characteristics which appear most influential on the translation of evidence-based guidance in Scottish primary care dental practices: leadership and context. Data synthesis identified that these characteristics act as both barriers and facilitators to KT. The results highlight the complexities around guidance implementation given the varying contexts that exists in primary healthcare. It may be that new guidance and recommendations should be tailored to incorporate these factors to facilitate KT and improve compliance with best practice recommendations.

## SUPPLEMENTARY FILES

Supplementary file 1: Dental team questionnaire
Supplementary file 2: Interview practices - key characteristics and findings
Supplementary file 3: Questionnaire findings

## CHECKLISTS

COREQ Checklist

## Author Contributions

**HC:** Manuscript production and revisions, led the scientific development, conduct, data collection, analysis and interpretation of the study.
**ST:** Contributed to the scientific development of the study, commented on drafts.
**LM:** Contributed to the scientific development of the study, commented on drafts.
**CR:** Contributed to the scientific development of the study, commented on drafts.
**LY:** Contributed to the scientific development of the study, commented on drafts.
**JC:** Contributed to the scientific development of the study, commented on drafts.

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**Declaration of interests**

The authors have no competing interests.

**Data Sharing Agreement**

All anonymised interview and questionnaire data are available on request from the corresponding author. Heather Cassie h.c.cassie@dundee.ac.uk

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**Supplementary File 1: Dental Team Questionnaire**

# Improving Quality in General Dental Practice

## Dental Team Questionnaire

Thank you for completing this questionnaire. We appreciate that you may work in more than one dental practice but please answer the following questions based on this practice only. Most of the questions require you to tick a box or circle a number. There are also text boxes in the questionnaire, which we hope you will use, where you can comment further on your answers.

**Please be assured that the confidentiality of your data is a prime consideration of this study and all information will be held in the strictest confidence. All data will be managed in accordance with the Data Protection Act, 1998**

If you have any questions or would like additional copies of the questionnaire please contact Heather Cassie, CSO Research Fellow. Tel: (01382) 740954 Email: h.c.cassie@dundee.ac.uk

## Section 1: About you and your practice

**Q1**  How many of the following are there in your practice team? *(Please write the number of people undertaking that role in the  box, including yourself)*

| | | | |
|---|---|---|---|
| ☐ Principal Dentist | ☐ Associate Dentist | ☐ Salaried Dentist | ☐ Vocational Trainee Dentist |
| ☐ Assistant | ☐ Dental Hygienist | ☐ Dental Nurse | ☐ Trainee Dental Nurse |
| ☐ Practice Manager | ☐ Receptionist | ☐ Vocational Trainer | ☐ Extended Duty Dental Nurse |
| ☐ LDU Operator | ☐ Other *(please specify)* | | |

**Q2**  What is your role within this practice? *(Please tick all that apply)*

| | | | |
|---|---|---|---|
| ☐ Principal Dentist | ☐ Associate Dentist | ☐ Salaried Dentist | ☐ Vocational Trainee  Dentist |
| ☐ Assistant | ☐ Dental Hygienist | ☐ Dental Nurse | ☐ Trainee Dental Nurse |
| ☐ Practice Manager | ☐ Receptionist | ☐ Vocational Trainer | ☐ Extended Duty Dental Nurse |
| ☐ LDU Operator | ☐ Practice Owner | ☐ Other *(please specify)* | |

**Q3**  How would you describe the ownership of this practice?

☐ Salaried Service        ☐ Dental Body Corporate        ☐ Independently Owned

**Q4**  Is this practice?

☐ Fully NHS        ☐ Fully Private        ☐ A Mixture

**Q5**  (a) If there is no practice manager, does someone else fill the role??        ☐ Yes        ☐ No

(b) Who (e.g. dental nurse, dentist)?        [                              ]

**Q6**  Does this practice have a computerised patient management system?        ☐ Yes        ☐ No

**Please provide any additional comments in relation to your practice:**

[                                                                                  ]

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For peer review only

**Supplementary File 1: Dental Team Questionnaire**

## Section 2: Your views

**Please score the following statements on a scale of 1-4 circling the number you feel most accurately reflects *your dental team.***

*1 = definitely false; 2 = mostly false; 3 = mostly true; 4 = definitely true*

**Q1    AUTONOMY**

| | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| a. | The principal dentist / clinical lead lets team members make their own decisions | 1 | 2 | 3 | 4 |
| b. | The principal dentist / clinical lead trusts team members to make decisions without getting permission first | 1 | 2 | 3 | 4 |
| c. | Supervisors tightly control the work of those below them | 1 | 2 | 3 | 4 |
| d. | The principal dentist / clinical lead keeps too tight a rein on the way things are done | 1 | 2 | 3 | 4 |
| e. | It is important to check things first with the principal dentist / clinical lead before taking action | 1 | 2 | 3 | 4 |

**Q2    INTEGRATION**

| | | | | | |
|---|---|---|---|---|---|
| a. | Team members are suspicious of those in other professional roles within this dental team | 1 | 2 | 3 | 4 |
| b. | There is very little conflict within this dental team | 1 | 2 | 3 | 4 |
| c. | Those with different professional roles are prepared to share information | 1 | 2 | 3 | 4 |
| d. | Collaboration between those with different professional roles is very effective | 1 | 2 | 3 | 4 |
| e. | There is very little respect within this dental team | 1 | 2 | 3 | 4 |

**Q3    INVOLVEMENT**

| | | | | | |
|---|---|---|---|---|---|
| a. | The principal dentist / clinical lead involves team members when decisions are made that affect them | 1 | 2 | 3 | 4 |
| b. | Changes are made without talking to the team members affected by them | 1 | 2 | 3 | 4 |
| c. | Team members do not have any say in decisions that affect their work | 1 | 2 | 3 | 4 |
| d. | Team members feel that decisions are frequently made over their heads | 1 | 2 | 3 | 4 |
| e. | Information is widely shared | 1 | 2 | 3 | 4 |
| f. | There are often breakdowns in communication | 1 | 2 | 3 | 4 |

**Q4**     **TRAINING**

| | | | | |
|---|---|---|---|---|
| a. Team members are not properly trained when there is new guidance | 1 | 2 | 3 | 4 |
| b. Team members receive enough training when there is new guidance | 1 | 2 | 3 | 4 |
| c. This practice only gives team members the minimum amount of training they need to do their job | 1 | 2 | 3 | 4 |
| d. Team members are strongly encouraged to develop their skills | 1 | 2 | 3 | 4 |

**Q5**     **SUPERVISORY SUPPORT**

| | | | | |
|---|---|---|---|---|
| a. Senior team members are good at understanding team member's problems | 1 | 2 | 3 | 4 |
| b. Senior team members show that they have confidence in those they manage | 1 | 2 | 3 | 4 |
| c. Senior team members are friendly and easy to approach | 1 | 2 | 3 | 4 |
| d. Senior team members can be relied upon to give guidance to team members | 1 | 2 | 3 | 4 |
| e. Senior team members show an understanding of the people who work for them | 1 | 2 | 3 | 4 |

**Q6**     **WELFARE**

| | | | | |
|---|---|---|---|---|
| a. This practice pays little attention to the welfare of the employees | 1 | 2 | 3 | 4 |
| b. This practice tries to look after its employees | 1 | 2 | 3 | 4 |
| c. This practice cares about its employees | 1 | 2 | 3 | 4 |
| d. This practices tries to be fair in its actions towards employees | 1 | 2 | 3 | 4 |

**Q7**     **EFFICIENCY**

| | | | | |
|---|---|---|---|---|
| a. In this practice, time and money could be saved if work was better organised | 1 | 2 | 3 | 4 |
| b. Things could be done much more efficiently, if people stopped to think | 1 | 2 | 3 | 4 |
| c. Poor scheduling and planning is often an issue for delivery of care | 1 | 2 | 3 | 4 |
| d. Productivity could be improved if jobs were organised and planned better | 1 | 2 | 3 | 4 |

*1 = definitely false; 2 = mostly false; 3 = mostly true; 4 = definitely true*

**Q8**   **TRADITION**

| | | | | |
|---|---|---|---|---|
| a.  The principal dentist / clinical lead likes to keep to established, traditional ways of doing things | 1 | 2 | 3 | 4 |
| b.  The way this practice does things has seldom changed | 1 | 2 | 3 | 4 |
| c.  The principal dentist / clinical lead is not interested in trying out new ideas | 1 | 2 | 3 | 4 |
| d.  Changes in the way things are done happen very slowly | 1 | 2 | 3 | 4 |

**Q9**   **QUALITY**

| | | | | |
|---|---|---|---|---|
| a.  This practice is always looking to achieve the highest quality of care | 1 | 2 | 3 | 4 |
| b.  Quality of care is taken very seriously | 1 | 2 | 3 | 4 |
| c.  Team members believe that this practice's success depends on high quality care | 1 | 2 | 3 | 4 |
| d.  This practice does not have much of a reputation for high quality care | 1 | 2 | 3 | 4 |

**Q10**   **FORMALISATION**

| | | | | |
|---|---|---|---|---|
| a.  It is considered extremely important to follow procedures/practice policies | 1 | 2 | 3 | 4 |
| b.  Team members can ignore formal procedures and practice policies if it helps get the job done | 1 | 2 | 3 | 4 |
| c.  Everything has to be done by the book | 1 | 2 | 3 | 4 |
| d.  It is not necessary to follow procedures/practice policies to the letter | 1 | 2 | 3 | 4 |
| e.  Nobody gets too upset if team members break the rules | 1 | 2 | 3 | 4 |

**Q11**   **INNOVATION & FLEXIBILITY**

| | | | | |
|---|---|---|---|---|
| a.  In this practice, new ideas are readily accepted | 1 | 2 | 3 | 4 |
| b.  This practice is quick to respond when changes need to be made | 1 | 2 | 3 | 4 |
| c.  Senior team members here are quick to spot the need to do things differently | 1 | 2 | 3 | 4 |
| d.  This practice is very flexible; it can quickly change procedures to follow new guidance or recommendations | 1 | 2 | 3 | 4 |
| e.  Assistance in developing new ideas is readily available | 1 | 2 | 3 | 4 |
| f.  Team members are always searching for new ways of looking at problems | 1 | 2 | 3 | 4 |

*1 = definitely false; 2 = mostly false; 3 = mostly true; 4 = definitely true*

**Q12    OUTWARD FOCUS**

| | | | | | |
|---|---|---|---|---|---|
| a. | This practice is quite inward looking; it does not concern itself with what is happening elsewhere | 1 | 2 | 3 | 4 |
| b. | Ways of improving patients' satisfaction are not given much thought | 1 | 2 | 3 | 4 |
| c. | Patients are not considered the top priority | 1 | 2 | 3 | 4 |
| d. | This practice is slow to respond to the needs of patients | 1 | 2 | 3 | 4 |
| e. | This practice is continually looking for new opportunities | 1 | 2 | 3 | 4 |

**Q13    LEARNING & REFLECTION**

| | | | | | |
|---|---|---|---|---|---|
| a. | The way team members work together is readily changed in order to improve performance | 1 | 2 | 3 | 4 |
| b. | The methods used by the practice to get the job done are often discussed | 1 | 2 | 3 | 4 |
| c. | There are regular discussions as to whether team members are working effectively together | 1 | 2 | 3 | 4 |
| d. | Plans are modified in light of changing circumstances | 1 | 2 | 3 | 4 |
| e. | Time is taken to review the practice goals | 1 | 2 | 3 | 4 |

**Q14    CLARITY OF PRACTICE GOALS**

| | | | | | |
|---|---|---|---|---|---|
| a. | Team members have a good understanding of what this practice is trying to do | 1 | 2 | 3 | 4 |
| b. | The future direction of this practice is clearly communicated to everyone | 1 | 2 | 3 | 4 |
| c. | Team members are not clear about the goals of this practice | 1 | 2 | 3 | 4 |
| d. | Everyone who works here is well aware of the long-term goals and direction of the practice | 1 | 2 | 3 | 4 |
| e. | There is a strong sense of where the practice is going | 1 | 2 | 3 | 4 |

**Q15    EFFORT**

| | | | | | |
|---|---|---|---|---|---|
| a. | Team members always want to perform to the best of their ability | 1 | 2 | 3 | 4 |
| b. | Team members are enthusiastic about their work | 1 | 2 | 3 | 4 |
| c. | Team members get by with doing as little as possible | 1 | 2 | 3 | 4 |
| d. | Team members are prepared to make a special effort to do a good job | 1 | 2 | 3 | 4 |
| e. | Team members do not put more effort into their work than they have to | 1 | 2 | 3 | 4 |

**Q16**    **PERFORMANCE FEEDBACK**

| | | | | | |
|---|---|---|---|---|---|
| a. | Team members receive feedback on the quality of their work | 1 | 2 | 3 | 4 |
| b. | Team members have no idea how well they are doing their job | 1 | 2 | 3 | 4 |
| c. | In general, it is hard for someone to measure the quality of their own performance | 1 | 2 | 3 | 4 |
| d. | Team member's performance is measured on a regular basis | 1 | 2 | 3 | 4 |
| e. | The way team members do their job is rarely assessed | 1 | 2 | 3 | 4 |

**Q17**    **PRESSURE TO PRODUCE**

| | | | | | |
|---|---|---|---|---|---|
| a. | Team members are expected to do too much in a day | 1 | 2 | 3 | 4 |
| b. | In general, workloads are not particularly demanding | 1 | 2 | 3 | 4 |
| c. | Senior team members require team members to work extremely hard | 1 | 2 | 3 | 4 |
| d. | Team members are under pressure to meet targets | 1 | 2 | 3 | 4 |
| e. | The pace of work is really relaxed | 1 | 2 | 3 | 4 |

**Q18**    **GUIDANCE DISSEMINATION**

| | | | | | |
|---|---|---|---|---|---|
| a. | In this practice, team members are up-to-date with new guidance and recommendations | 1 | 2 | 3 | 4 |
| b. | In this practice, senior team members make other team members aware of new guidance | 1 | 2 | 3 | 4 |
| c. | In this practice, there are regular meetings to discuss new guidance and recommendations | 1 | 2 | 3 | 4 |

**Q19**    **GUIDANCE PRIORITISATION**

| | | | | | |
|---|---|---|---|---|---|
| a. | Senior team members decide what guidance this practice follows | 1 | 2 | 3 | 4 |
| b. | Individual team members are free to decide what guidance they follow | 1 | 2 | 3 | 4 |
| c. | The ease of complying with guidance influences whether this practice follows it | 1 | 2 | 3 | 4 |
| d. | The guidance topic influences whether this practice follows it | 1 | 2 | 3 | 4 |
| e. | In this practice, there are regular meetings to discuss how to prioritise new guidance | 1 | 2 | 3 | 4 |

## Section 3: Use of Guidance in Your Practice

**Q1    Emergency Dental Care**

*If a patient contacts the practice…*

a.   with a dental problem asking for emergency or unscheduled attention, there is a procedure that is followed        ☐ Always  ☐ Sometimes  ☐ Never  ☐ Don't Know  ☐ n/a

b.   when it is closed there are arrangements in place for them to obtain care        ☐ Always  ☐ Sometimes  ☐ Never  ☐ Don't Know  ☐ n/a

c.   complaining of dental trauma, a clinician will contact with the patient, either face to face or by telephone within 60 minutes        ☐ Always  ☐ Sometimes  ☐ Never  ☐ Don't Know  ☐ n/a

d.   complaining of facial swelling a clinician will contact with the patient, either face to face or by telephone within 60 minutes        ☐ Always  ☐ Sometimes  ☐ Never  ☐ Don't Know  ☐ n/a

**Q2    Oral Health Assessment & Review**

*As part of a routine examination in this practice…*

a.   a head and neck assessment is recorded for all **new** patients        ☐ Always  ☐ Sometimes  ☐ Never  ☐ Don't Know  ☐ n/a

b.   caries and restorations are recorded for all **new** patients        ☐ Always  ☐ Sometimes  ☐ Never  ☐ Don't Know  ☐ n/a

c.   a risk-based recall interval is assigned for **all** patients        ☐ Always  ☐ Sometimes  ☐ Never  ☐ Don't Know  ☐ n/a

d.   a long term personal care plan is written for **all** patients        ☐ Always  ☐ Sometimes  ☐ Never  ☐ Don't Know  ☐ n/a

**Q3    Drug Prescribing**

*If a patient presents with a dental abscess, with no obvious signs of spreading infection, in the first instance …*

a.   the patient is treated with local measures        ☐ Always  ☐ Sometimes  ☐ Never  ☐ Don't Know  ☐ n/a

b.   the patient is prescribed a first line antibiotic *(e.g. amoxicillin, metronidazole, phenoxymethylpenicillin , erythromycin)*        ☐ Always  ☐ Sometimes  ☐ Never  ☐ Don't Know  ☐ n/a

c.   the patient is prescribed a second line antibiotic *(e.g. clindamycin, co-amoxiclav, clarithroymicin)*        ☐ Always  ☐ Sometimes  ☐ Never  ☐ Don't Know  ☐ n/a

d.   What would the antibiotic of choice and dosage be?        [                    ]  ☐ Don't Know  ☐ n/a

## Section 4: Additional Comments

**Please provide any additional comments in relation to any other aspects of this questionnaire:**

**Thank you for completing this questionnaire!**

## Supplementary File 2: Key Characteristics and Findings by Practice

### ARCHIBALD DENTAL PRACTICE

#### Demographics/Characteristics:

- Mixture of NHS and Private treatment.
- 3 Dentists, 5 Dental Nurses, 2 Hygienists, 1 Receptionist.
- Computerised patient record system.
- Urban Area.
- Traditional practice, owned by principal dentist and his wife.

#### Views and Awareness of Guidance:

- General awareness of SDCEP and other forms of guidance.
- View guidance as something to cherry pick information from.
- Prefer guidance documents in a hard copy format.

#### Barriers/ Facilitators to the translation of guidance:

- Communication (lack of team meetings, challenges of getting whole team together).
- Hierarchical decision-making in relation to the implementation of guidance.
- Resources (time and finance).
- Clear leadership.
- Training and links with external organisations.

### BLACK'S DENTAL PRACTICE

#### Demographics/Characteristics:

- Mixture of NHS & Private, specialising in orthodontics.
- 4 Dentists, 5 Dental Nurses, 1 Administrator, 1 Practice Manager.
- Computerised system, Website & Facebook Page.
- Urban Area.
- Traditional independently owned practice in the middle of a takeover by an associate collaboration.

#### Views and Awareness of Guidance:

- Very aware of SDCEP and other forms of guidance.
- Challenges exist around the dissemination of guidance within the practice.
- Prefer guidance documents in a hard copy format.

#### Barriers/ Facilitators to the translation of guidance:

- Leadership (lack of clarity over leadership, changing situation).
- Communication (no formal communication mechanisms).
- Teamwork (lack of team involvement, no team decision making, no clear roles/ responsibilities).
- Limited training and performance feedback.
- Resources (staff shortages).

**CAMPBELL DENTAL**

**Demographics/Characteristics:**

- Fully Private.
- 2 Dentists, 4 Dental Nurses, 2 Hygienists, 2 Receptionists, 1 Practice Manager.
- Computerised system, Website, Facebook and Twitter.
- Rural Area.
- Independently owned, progressive practice.

**Views and Awareness of Guidance:**

- Very aware of SDCEP and other forms of guidance.
- Very positive about guidance.
- Very proactive about receiving and disseminating guidance within the practice.
- An awareness and appreciation of other guidance formats, such as web based apps.

**Barriers/ Facilitators to the translation of guidance:**

- Patient expectations.
- Unrealistic/Inflexible/Unclear recommendations.
- Impact of external organisations.
- Communication (hierarchical, whole team involvement, regular feedback).
- Leadership (hierarchical, strong involvement from Practice Manager, strong systems in place).
- Resources (financial, premises space).
- Teamwork (clear roles/responsibilities, motivated).
- Use of innovations.

**DAVIDSON'S DENTAL CARE**

**Demographics/Characteristics:**

- Fully NHS.
- 6 Dentists, 6 Dental Nurses, 1 Hygienist, 1 Receptionist.
- Paper patient record system.
- Rural Area.
- Traditional practice owned by principal dentist, not advanced.

**Views and Awareness of Guidance:**

- General awareness of SDCEP and other guidance.
- Mixed views about guidance and its importance.
- Guidance disseminated in a 'top down' manner
- Prefer guidance in a hard copy format, however there was an appreciation of electronic formats.

**Barriers/ Facilitators to the translation of guidance:**

- Leadership (approachable, hierarchical, dental nurse leadership, divisions by professional role).
- Communication (no formal communication mechanisms, team members reluctant to engage).
- Teamwork (no clear roles/responsibilities, lack of motivation).
- Lack of innovation.
- Resources (financial, premises, space).
- Limited training and performance feedback.
- Unclear, constantly changing recommendations.
- Support from external organisations.

**Supplementary file 3:** Dental Practice Organisation Measure (DPOM) Instrument Responses by Compliance

| | Emergency Dental Care | | | Oral Health Assessment & Review | | | Drug Prescribing | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value |
| **Autonomy** | | | | | | | | | |
| Compliant | 2.67 (0.60) | -1.18 | 0.24 | 2.63 (0.50) | -1.33 | 0.18 | 2.67 (0.43) | 0.38 | 0.70 |
| Non-Compliant | 2.74 (0.52) | | | 2.74 (0.56) | | | 2.70 (0.56) | | |
| **Integration** | | | | | | | | | |
| Compliant | 3.56 (0.46) | 4.70 | <0.01** | 3.50 (0.51) | 1.75 | 0.08 | 3.43 (0.45) | -0.32 | 0.75 |
| Non-Compliant | 3.28 (0.59) | | | 3.37 (0.56) | | | 3.49 (0.56) | | |
| **Involvement** | | | | | | | | | |
| Compliant | 3.33 (0.60) | 3.08 | <0.01** | 3.11 (0.67) | 0.38 | 0.70 | 3.23 (0.69) | 0.85 | 0.40 |
| Non-Compliant | 3.00 (0.68) | | | 3.07 (0.64) | | | 3.17 (0.66) | | |
| **Training** | | | | | | | | | |
| Compliant | 3.29 (0.65) | 3.43 | <0.01** | 3.32 (0.60) | 2.53 | 0.01** | 3.25 (0.29) | 1.16 | 0.25 |
| Non-Compliant | 3.05 (0.63) | | | 3.09 (0.66) | | | 3.13 (0.66) | | |
| **Supervisor Support** | | | | | | | | | |
| Compliant | 3.44 (0.56) | 4.03 | <0.01** | 3.34 (0.60) | 0.75 | 0.46 | 3.35 (0.54) | 0.20 | 0.85 |
| Non-Complaint | 3.19 (0.53) | | | 3.28 (0.56) | | | 3.38 (0.57) | | |
| **Welfare** | | | | | | | | | |
| Compliant | 3.55 (0.62) | 3.06 | <0.01** | 3.40 (0.63) | -0.24 | 0.81 | 3.35 (0.45) | 1.76 | 0.08 |
| Non-Compliant | 3.32 (0.71) | | | 3.42 (0.70) | | | 3.19 (0.57) | | |
| **Efficiency** | | | | | | | | | |
| Compliant | 2.84 (0.77) | 3.31 | <0.01** | 2.72 (0.76) | 0.58 | 0.56 | 2.72 (0.68) | -0.65 | 0.52 |
| Non-Compliant | 2.56 (0.77) | | | 2.66 (0.78) | | | 2.77 (0.79) | | |
| **Tradition** | | | | | | | | | |
| Compliant | 2.18 (0.58) | -1.65 | 0.10 | 2.09 (0.62) | -2.47 | 0.01** | 2.23 (0.54) | 0.43 | 0.67 |
| Non-Compliant | 2.29 (0.62) | | | 2.30 (0.60) | | | 2.26 (0.62) | | |

| | Emergency Dental Care | | | Oral Health Assessment & Review | | | Drug Prescribing | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value |
| **Quality** | | | | | | | | | |
| Compliant | 3.78 (0.39) | 2.71 | <0.01** | 3.82 (0.30) | 2.38 | 0.02* | 3.35 (0.32) | 1.26 | 0.21 |
| Non-Compliant | 3.66 (0.44) | | | 3.68 (0.45) | | | 3.29 (0.44) | | |
| **Formalisation** | | | | | | | | | |
| Compliant | 3.78 (0.39) | 3.32 | <0.01** | 3.58 (0.45) | 3.08 | <0.01** | 3.37 (0.39) | 0.45 | 0.66 |
| Non-Compliant | 3.66 (0.44) | | | 3.36 (0.53) | | | 3.40 (0.53) | | |
| **Innovation & Flexibility** | | | | | | | | | |
| Compliant | 3.20 (0.59) | 4.55 | <0.01** | 3.20 (0.54) | 2.86 | <0.01** | 2.92 (0.43) | -0.72 | 0.47 |
| Non-Compliant | 2.93 (0.53) | | | 2.98 (0.57) | | | 3.04 (0.58) | | |
| **Outward Focus** | | | | | | | | | |
| Compliant | 3.42 (0.44) | 2.46 | <0.01** | 3.52 (0.36) | 3.34 | <0.01** | 3.35 (0.51) | 0.12 | 0.91 |
| Non-Compliant | 3.29 (0.51) | | | 3.30 (0.51) | | | 3.33 (0.50) | | |
| **Learning & Reflection** | | | | | | | | | |
| Compliant | 3.04 (0.62) | 4.53 | <0.01** | 3.05 (0.56) | 2.91 | <0.01** | 2.37 (0.49) | -0.07 | 0.95 |
| Non-Compliant | 2.75 (0.53) | | | 2.82 (0.58) | | | 2.38 (0.60) | | |
| **Clarity of Practice Goals** | | | | | | | | | |
| Compliant | 3.09 (0.72) | 4.26 | <0.01** | 3.11 (0.76) | 2.85 | <0.01** | 2.25 (0.54) | -1.26 | 0.21 |
| Non-Compliant | 2.76 (0.69) | | | 2.83 (0.70) | | | 2.41 (0.72) | | |
| **Effort** | | | | | | | | | |
| Compliant | 3.42 (0.60) | 2.97 | <0.01** | 3.52 (0.52) | 3.39 | <0.01** | 3.42 (0.43) | -1.12 | 0.26 |
| Non-Compliant | 3.23 (0.54) | | | 3.25 (0.57) | | | 3.51 (0.59) | | |
| **Performance Feedback** | | | | | | | | | |
| Compliant | 2.74 (0.74) | 3.19 | <0.01** | 2.70 (0.80) | 1.49 | 0.14 | 2.48 (0.79) | -0.50 | 0.62 |
| Non-Compliant | 2.49 (0.67) | | | 2.55 (0.69) | | | 2.59 (0.72) | | |
| **Pressure to Produce** | | | | | | | | | |
| Compliant | 2.23 (0.50) | -0.75 | 0.46 | 2.20 (0.48) | -0.94 | 0.35 | 1.97 (0.39) | -2.02 | 0.04* |
| Non-Compliant | 2.27 (0.53) | | | 2.27 (0.53) | | | 2.27 (0.52) | | |

| | Emergency Dental Care | | | Oral Health Assessment & Review | | | Drug Prescribing | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value |
| **Guidance Dissemination** | | | | | | | | | |
| Compliant | 3.24 (0.69) | 2.83 | <0.01** | 3.27 (0.64) | 2.16 | 0.03* | 3.?2 (0.67) | 0.52 | 0.60 |
| Non-Compliant | 3.04 (0.59) | | | 3.08 (0.64) | | | 3.?2 (0.65) | | |
| **Guidance Prioritisation** | | | | | | | | | |
| Compliant | 2.41 (0.43) | 0.64 | 0.52 | 2.37 (0.46) | -0.39 | 0.70 | 2.?8 (0.62) | -0.91 | 0.37 |
| Non-Compliant | 2.38 (0.43) | | | 2.39 (0.43) | | | 2.?0 (0.44) | | |

**Significant at the 0.01 level
*Significant at the 0.05 level

**Checkist 1: Consolidated Criteria for Reporting Qualitative Research (COREQ): 32 Item Checklist**

*Adapted from:*

*Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. International Journal for Quality in Health Care. 2007. Volume 19, Number 6: pp. 349 – 357*

|  | GUIDE QUESTION/DESCRIPTION | REPORTED ON PAGE # |
|---|---|---|
| **DOMAIN 1: Research team and Reflexivity** | | |
| **Personal characteristics** | | |
| 1. Interviewer | Which authors conducted the interviews? | Page 4 |
| 2. Credentials | What were the researcher's credentials? | Page 1 |
| 3. Occupation | What was their occupation? | Page 1 |
| 4. Gender | Was the researcher male or female? | Female |
| 5. Experience and Training | What training or experience did the researcher have? | Page 4 |
| **Relationship with participants** | | |
| 6. Relationship established | Was a relationship established prior to study commencement? | No |
| 7. Participant knowledge of interviewer | What did the participants know about the researcher? | Brief introduction provided at start of interview (name/ role/ purpose of research) |
| 8. Interviewer characteristics | What characteristics were reported about the interviewer? | As above. Page 4 |
| **DOMAIN 2: Study Design** | | |
| **Theoretical framework** | | |
| 9. Methodological orientation and theory | What methodological orientation was stated to underpin the study | Page 3 |
| **Participant selection** | | |
| 10. Sampling | How were participants selected? | Page 4 |
| 11. Method of approach | How were participants approached? | Page 4 |
| 12. Sample size | How many participants were in the study? | Page 5 |
| 13. Non-participation | How many people refused to participate/ dropped out? Reasons? | Pages 5&7 |
| **Setting** | | |
| 14. Setting of data collection | Where was the data collected? | Telephone interviews and in dental practices |
| 15. Presence of non-participants | Was anyone else present besides the participants and researchers? | No |
| 16. Description of sample | What are the important characteristics of the sample? | Supplementary file 2 |
| **Data collection** | | |
| 17. Interview guide | Were questions, prompts, guides provided by the author? Was it pilot tested? | Page 4 |
| 18. Repeat interviews | Were repeat interviews carried out? | No |

| 19. Audio/visual recording | Did the researcher use audio or visual recording equipment? | Yes Page 4 |
| 20. Field notes | Were field notes made during and/or after the interviews? | No |
| 21. Duration | What was the duration of the interviews? | Page 5 |
| 22. Data saturation | Was data saturation discussed? | page 4 |
| 23. Transcripts returned | Were transcripts returned to participants for comment and/or correction | No |
| **DOMAIN 3: Analysis and Findings** | | |
| **Data analysis** | | |
| 24. Number of data coders | How many data coders coded the data? | 1 |
| 25. Description of the coding tree | Did authors provide a description of the coding tree? | <u>Nvivo database available on request</u> |
| 26. Derivation of themes | Were themes identified in advance or derived from the data? | Page 5 |
| 27. Software | What software was used to manage the data? | Nvivo 10 |
| 28. Participant checking | Did participants provide feedback on the findings | No |
| **Reporting** | | |
| 29. Quotations presented | Were participant quotations presented to illustrate the themes/findings? Was each participant identified? | Yes, practice and participant pseudonyms used |
| 30. Data and findings consistent | Was there consistency between the data presented and the findings? | Yes |
| 31. Clarity of major themes | Were major themes clearly presented in the findings? | Page 15 |
| 32. Clarity of minor themes | Is there a description of diverse cases or discussion of minor themes | Page 15 onwards |

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# BMJ Open

## "Well, in dentistry the dentist is always the boss": A multi-method exploration of which organisational characteristics of dental practices most influence the implementation of evidence-based guidance.

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*"Well, in dentistry the dentist is always the boss":* **A multi-method exploration of which organisational characteristics of dental practices most influence the implementation of evidence-based guidance.**

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**Keywords:**
Knowledge translation; Dental care; Dental practice; Health care research; Professional behaviour.

1
2 1 **ABSTRACT**
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4 2
5 3 **Objective:** To investigate which organisational characteristics of primary care dental practices
6 4 influence the implementation of evidence-based guidance.
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8 5
9 6 **Design:** A multi-method study, set within primary care dentistry in Scotland comprising: (1)
10 7 Semi-structured interviews with dental teams to inform development of a self-report
11 8 questionnaire exploring the translation of guidance in primary care dentistry; (2) A
12 9 questionnaire-based survey and case studies exploring which organisational characteristics
13
14 10 influence knowledge translation.
15 11
16 12 **Results:** Interview data identified three themes: leadership, communication and context.
17 13 Survey data revealed compliance with recommendations from three topics of dental guidance
18
19 14 to be variable, with only 41% (Emergency Dental Care), 19% (Oral Health Assessment and
20 15 Review) and 4% (Drug Prescribing) of respondents reporting full compliance. Analysis
21 16 revealed no significant relationship between practice characteristics and compliance with
22 17 Emergency Dental Care or Drug Prescribing recommendations. Positive associations were
23
24 18 observed between compliance with Oral Health Assessment and Review recommendations
25 19 and having a practice manager, as well as with the type of treatment offered, with fully private
26 20 practices more likely, and fully NHS practices less likely to comply, when compared to those
27 21 offering a mixture of treatment. Synthesis of the data identified leadership and context as key
28
29 22 drivers of guidance uptake.
30 23
31 24 **Conclusions** Evidence-based dental recommendations are not routinely translated into
32 25 practice, with variable leadership and differing practice contexts being central to poor uptake.
33
34 26 Guidelines should aim to tailor recommendations and implementation strategies to reflect
35 27 the complexities and varying contexts that exist in primary care dentistry, thus facilitating the
36 28 implementation of evidence-based guidance.
37
38 29
39 30 **Strengths and Limitations of the Study (5 Bullet points)**
40 31 • A key strength of this study was the multi-method approach adopted, which provides a
41 32 more holistic contextual portrayal of the phenomenon being studied.
42 33 • The use of the Receptive Healthcare Contexts for Change framework throughout the
43
44 34 study provided consistency in theoretical approach.
45 35 • Although practices were self-selecting, our use of practice visits and observations served
46 36 to check the accuracy of self-reported data.
47 37 • Gathering practice level questionnaire data was challenging. Data analysis was conducted
48
49 38 at the individual rather than the practice level, with clustering by practice ID to reduce
50 39 potential bias.
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1 **BACKGROUND**

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3 Evidence-based guidance aims to reduce inappropriate variations in practice and promote
4 evidence-based healthcare [1]. It is well documented however, that the translation of
5 research evidence into routine practice is unpredictable [2], and patients do not necessarily
6 receive the care they need or that is in accordance with current evidence [3-5]. Knowledge
7 translation (KT) requires more than the development and dissemination of guidance [6-11],
8 and the availability of evidence alone is not usually sufficient to change behaviour [12]. A
9 systematic review across 11 studies found that only a third of research evidence informing
10 guidelines is routinely implemented [13]. This delay in implementation of evidence into
11 clinical practice is known as the "evidence to practice gap"[10, 11].

12

13 In the United Kingdom (UK), around 90% of health care encounters occur in primary care [14].
14 Primary care organisations vary in structure, composition, packages of care offered,
15 remuneration and practice systems. Dental practices are mainly small, privately owned
16 organisations, although in recent years there has been a growth in dental corporate bodies,
17 which currently make up around 10% of the Scottish market. General Dental Practitioners
18 (GDPs) work under a National Health Service (NHS) contract, treating children and adults
19 under an item of service fee structure. While some GDPs only undertake NHS work, many
20 undertake a mixture of NHS and private treatments.

21

22 In 2004 the Scottish Government established the Scottish Dental Clinical Effectiveness
23 Programme (SDCEP), to develop user-friendly guidance to promote best practice and improve
24 the quality of dental care in Scotland [15]. This initiative embedded a KT research programme
25 within the guidance development process, known as Translation Research in a Dental Setting
26 (TRiaDS) [16]. A number of studies undertaken within the TRiaDS programme have found that
27 guideline recommendations were not being fully translated into routine dental practice [17-
28 19].

29

30 The diverse characteristics of dental practices make them particularly challenging for KT
31 initiatives. The objective of this study was to investigate which organisational characteristics
32 of primary dental care practices are most influential on the translation of guidance and
33 explore whether these characteristics are predictors of guideline compliance.

34

35 **METHODS**
36 **Study design**
37 A multi-method study underpinned by the Receptive Healthcare Contexts for Change (RHCC)
38 framework [20]. This framework explores factors including the content, context, and process
39 of change. The RHCC was selected a priori as an exploratory lens through which to explore
40 the organisational level barriers and facilitators to the translation of guidance.

41

42 The study comprised two stages:

43

44 (1) Semi-structured interviews with dental teams to inform the development of a self-report
45 questionnaire exploring the translation of guidance in primary care dentistry.
46 (2) Questionnaire-based survey and dental practice case studies to explore which
47 organisational characteristics are most influential on the translation of guidance in
48 primary care dentistry.

**Setting and Participants**

Dental team members  in General Dental Practices in Scotland.

**Data collection**

*Interviews and questionnaire development*

Semi-structured telephone interviews were conducted with dental team members to inform the development of a self-report questionnaire to explore the translation of guidance in primary care dentistry. Practices (n=26) were sampled from an ongoing trial evaluating the translation of SDCEP's 'Decontamination' guidance [21]. Self-reported compliance data relating to decontamination recommendations, from 131 dental practices in Scotland allowed practices to be ranked by compliance. The top 10% (N=13) and the bottom 10% (N=13) were selected, in order to recruit four practices in total: two of higher and two of lower compliance. All practices in the sample were sent a study information pack and invited to participate.

A topic guide was informed by the RHCC framework, discussions with key stakeholders and literature review findings [22]. Demographical questions were included to develop a full picture of the practice, its structure and systems. The topic guide was piloted with three dental team members. Interviews were conducted by an experienced qualitative researcher (HC) and digitally recorded with consent. Data collection ceased when data saturation was achieved [23].

Interview data were reviewed to inform the development of the questionnaire. This questionnaire also included questions to determine compliance with three topics of dental guidance: SDCEP's Emergency Dental Care Guidance [24], Oral Health Assessment and Review [25] and Drug Prescribing [26]. These topics were selected based on the differing dental contexts and team members they target.

*Questionnaire-based survey and dental practice case studies*

A random sample of 400 practices was identified using the Practitioner Services Division's Management Information Dental Accounting System database [27]. Practices were randomised at practice level and then by individual dentist. One dentist per practice was randomly allocated as the practice contact and asked to distribute questionnaires to all team members. All practices where at least one dentist and one non-dentist completed the questionnaire were eligible for case study participation. Case studies involved face-to-face or telephone interviews, informal discussions and practice observations.

An initial review of the literature did not identify an obvious instrument to explore all of the salient themes identified from the interview data. However, a mapping exercise identified the Organisational Climate Measure (OCM) instrument [28] which covered most themes and could be adapted. Furthermore, the OCM had previously been used within a UK healthcare setting and was considered appropriate for completion by a range of team members. The modified OCM was incorporated into a questionnaire which also included questions to determine compliance with the three topics of dental guidance. Participants were considered compliant if they reported 'always' following best practice for the recommendations for each topic.  Compliance with recommendations was variable. The questionnaire was piloted in four dental practices to test content validity.

1  **Data handling and analysis**

2  *Interviews and questionnaire development*

3  Audio recordings were anonymised and securely transferred to a professional transcription

4  service and transcribed verbatim. Data were managed using NVivo 10 software. Thematic

5  analysis was undertaken to organise and classify data according to key issues, concepts and

6  emerging themes [29]. The RHCC framework was used as an initial coding framework. As

7  these interviews were exploratory and aimed to identify organisational barriers and

8  facilitators to the translation of guidance, it was important that analysis allowed for the

9  identification of key issues using the RHCC as well as recognising other emergent themes. The

10  Consolidated Criteria for Reporting Qualitative Research (COREQ) guided reporting of the

11  data [30] **(Checklist 1).**

12

13  *Questionnaire-based survey and practice case studies*

14  Questionnaire data were managed using SPSS version 22. Descriptive statistics were used to

15  explore the data. Internal consistency of instrument measures was tested using Cronbach's

16  alpha. Independent t-tests assessed differences in responses from participants reporting

17  compliance with recommendations when compared with those reporting non-compliance.

18  Chi-square tests (or Fishers exact for low frequency observations) assessed any relationships

19  between practice characteristics and compliance. Where appropriate, logistic regression

20  models were used to assess the relationship between instrument items and compliance with

21  the three dental topics. Data was clustered by the practice ID variable, to control for any

22  practice level characteristics that might influence the result. Statistical significance was

23  defined as p-value <0.05 and based on two-sided tests. Case study data were analysed using

24  the thematic analysis. The questionnaire can be found in Supplementary file 1.

25

26  **Ethical review and governance**

27  Ethical review was sought by the East of Scotland Research Ethics Service, which advised that

28  full ethical review was not required and classified the project as service evaluation. All data

29  were anonymised and stored confidentially and securely in accordance with University of

30  Dundee Information Governance procedures and the Data Protection Act, 1998 and latterly

31  the General Data Protection Regulation, 2018.

32

33  **Patient Involvement**

34  Patients were not involved in this study.

35

36  **RESULTS**

37

38  *Interviews*

39  Twenty-six practices were sent information packs, including participant information sheets.

40  Six practices were contacted by telephone before the target four were recruited. Non-

41  participating practices cited time constraints. Fourteen interviews across the four practices

42  were conducted, ranging from 15 minutes to one hour. Practices have been given

43  pseudonyms for the purpose of presenting this data.

44

45  All four practices were independently owned, two practices (Archibald's and Black's) offered

46  a mixture of NHS and private treatment, one (Campbell's) was fully private and the other

47  (Davidson's) was fully NHS. Team members interviewed comprised: six dentists, three dental

nurses, one Practice Manager, two receptionists, one dental surgery assistant and one office administrator. Table 1 presents the structure and character of participating practices.

**Table 1: Practice Structures and Characteristics**

| ARCHIBALD DENTAL PRACTICE | CAMPBELL DENTAL |
|---|---|
| **Demographics/Characteristics:** <br>• Mixture of NHS and Private treatment. <br>• 3 Dentists, 5 Dental Nurses, 2 Hygienists, 1 Receptionist. <br>• Computerised patient record system. <br>• Urban Area. <br>• Traditional practice, owned by principal dentist and his wife. | **Demographics/Characteristics:** <br>• Fully Private. <br>• 2 Dentists, 4 Dental Nurses, 2 Hygienists, 2 Receptionists, 1 Practice Manager. <br>• Computerised system, Website, Facebook and Twitter. <br>• Rural Area. <br>• Independently owned, progressive practice. |
| BLACK'S DENTAL PRACTICE | DAVIDSON'S DENTAL CARE |
| **Demographics/Characteristics:** <br>• Mixture of NHS & Private <br>• 4 Dentists, 5 Dental Nurses, 1 Administrator, 1 Practice Manager. <br>• Computerised system, Website & Facebook Page. <br>• Urban Area. <br>• Traditional independently owned practice in the middle of a takeover by an associate collaboration. | **Demographics/Characteristics:** <br>• Fully NHS. <br>• 6 Dentists, 6 Dental Nurses, 1 Hygienist, 1 Receptionist. <br>• Paper patient record system. <br>• Rural Area. <br>• Traditional practice owned by principal dentist, not advanced. |

Supplementary file 2 presents the key findings by practice. Analysis of the interview data identified three themes: leadership, communication and context.

**Leadership**

Leadership 'hierarchies' were evident in all practices, albeit manifested differently. All practices had an identifiable leader and in all cases, this was the practice owner and dentist; however, leadership was also provided by other team members, such as dental nurses and practice managers (PMs). Leadership strategies acted as both barriers and enablers to the translation of guidance. Some participants, both dentists and non-dentists, claimed that they were happy to be told what to do, almost relying upon it, with participants referring to *'doing as they were told'* and *'following the rules'*. It was, however, clear that some team members found their lack of involvement in decision-making frustrating.

*"Well in dentistry the dentist is always the boss, they have a very strong opinion, and nobody can overrule them if they're wrong…"* **Participant 10 (Dentist).**

In all practices, dentists appeared to have more knowledge and awareness of guidance, when compared with other team members. As a result, practice dissemination systems, influenced how information was received, if at all, by other team members.

*"if it was felt it was relevant to anyone other than the dentist…then individuals would be…shown what was relevant and what was changed..."* **Participant 3 (Dentist).**

Leadership hierarchies also influenced professional development, with clinicians reporting having time to undertake training but administrative staff highlighting barriers. In some cases, this presented as a lack of interest or motivation. One participant when asked about training said they were *"quite happy just to jog along"*. During the interviews, much reference was made to "the dentists" or "the girls", to refer to the dental nurses, reinforcing a sense of two distinct, and perhaps, unequal groups within the team.

**Communication**

Communication was intrinsically linked to leadership. Only one practice reported having regular meetings, and methods for dissemination of guidance varied. Another practice reported only having meetings when there was a problem. The effects of not having any 'whole team' communication were clear and reinforced by participants reporting *"mixed messages"*.

*"…sadly, the only time there is a meeting of the whole team would be when there is a major issue, and then it could be quite confrontational. That would trigger a full meeting based on whatever the issue was and it would be brought up fait accompli, 'look, this is what's happening, we don't want this, we want this, no questions asked, this is what's happening, we start tomorrow', boom!"* **Participant 5 (Dentist).**

*"…one person says something, the next person says another and we get Chinese whispers before it reaches the last person."* **Participant 14 (Dentist).**

In terms of the dissemination of guidance and recommendations, it was reported that the dentists generally received guidance individually, with limited discussion or dissemination to the rest of the team. On the whole guidance was *"passively received"* rather than actively sought. Non-dentists reported feeling frustrated about not being aware of new guidance and felt uninformed about planned changes. This was particularly evident in relation to decision-making processes around which recommendations were to be implemented.

*"We don't really get access to them, we're only told what they contain, what to carry out, but we don't actually have it in front of us to get, you know have the opportunity to look through it."* **Participant 6 (Dental Surgery Assistant).**

*"…there's no real discussion between everyone as a team, about what sorts of things would be useful, you know nobody really has any input at all."* **Participant 7 (Office Administrator).**

**Context**

Context related to the patient profile, the practice setting and the guidance topic. It was clear that patient expectations differed depending on the patient profile and setting of the practice. One practice, set within a more affluent area, reported that patient expectations were high and this led to greater pressure to allocate emergency appointments and a higher standard of care expected.

*"…they can be very demanding, but I mean we meet most of the demand, I wouldn't say that we don't, no, but they do expect quite a high level of care"* **Participant 9 (Dental Nurse).**

1 Practice context related to the premises and practice resources. Barriers included patient
2 access to the premises, working across multiple floors and how this impacted upon
3 communication and storage space. Resources, especially time and money, emerged as
4 barriers in all practices.

6 The guidance topic also appeared to influence the translation of guidance. All practices
7 referred to SDCEP's Decontamination guidance, as a 'hot topic'. It was evident that this was
8 something they felt they should be following, suggesting that when more focus is placed on
9 a topic there may be more motivation to comply. This links with the concept of prioritising
10 which recommendations to follow. Participants referenced "*dipping in and taking bits out*",
11 and it not being possible to implement it all with *"common sense having to prevail".* The
12 notion of prioritising guidance recommendations and *'cherry picking'* which to follow was
13 evident across all practices.

15 ***Questionnaire-based survey***
16 Four hundred practices were sent questionnaires (four questionnaires per practice). Six opted
17 out and three packs were returned unopened. In total 349 completed questionnaires were
18 returned from across 96 practices: a practice response of 25%. Most participants reported
19 that their practice was independently owned (88%), the remaining were corporately owned
20 (6%) or part of the salaried service (7%).  Most offered a mixture of NHS and private treatment
21 (77%), 22% were fully NHS and <1% were fully private. Over half (56%) reported having a PM.
22 Table 2 presents compliance with each of the three SDCEP guidance documents.

24 **Table 2:** Compliance with SDCEP Guidance

| Guidance Topic | Compliant | Non-Compliant |
|---|---|---|
| **Emergency Dental Care** | 141 (41%) | 200 (59%) |
| **Oral Health Assessment & Review** | 63 (19%) | 273 (81%) |
| **Drug Prescribing** | 12 (4%) | 317 (96%) |

26 Table 3 shows the practice characteristics of individuals who reported being fully compliant.
27 Chi-square tests revealed no significant relationship between practice characteristics and
28 compliance with the Emergency Dental Care guidance or Drug Prescribing recommendations.
29 A positive association was observed between Oral Health Assessment and Review compliance
30 and having a PM, (p<0.01) and whether a practice was fully NHS, fully private or a mix,
31 (P<0.01).

1    **Table 3**: Characteristics of Compliant Practices

| Practice Characteristics | Emergency Dental Care (n=141) | Oral Health Assessment & Review (n=63) | Drug Prescribing (n=12) |
|---|---|---|---|
| **Has a Practice Manager** | 80 (57%) | 45 (73%) | 6 (50%) |
| **Independently Owned** | 119 (84%) | 56 (89%) | 12 (100%) |
| **Corporate Practice** | 8 (6%) | 5 (8%) | 0 (0%) |
| **Salaried Service** | 14 (10%) | 2 (3%) | 0 (0%) |
| **Fully NHS** | 32 (23%) | 5 (8%) | 0 (0%) |
| **Fully Private** | 1 (<1%) | 1 (2%) | 0 (0%) |
| **A Mixture of NHS/Private** | 108 (77%) | 57 (90%) | 12 (100%) |

Logistic regression models assessed the relationship between the OCM instrument measures and compliance with the Emergency Dental Care guidance and Oral Health Assessment and Review recommendations. Full results can be found in supplementary file 3. Only one of the instrument measures, 'integration' was predictive of compliance with the Emergency Dental Care recommendations, suggesting that greater levels of the trust and co-operation between team members, increased the likelihood of compliance. Three of the instrument measures, 'welfare', 'pressure to produce' and 'guidance prioritisation' were predictive of compliance with the Oral Health Assessment and Review recommendations, with lower scores suggesting a greater probability of full compliance. Results also suggested that fully private practices were more likely, and fully NHS practices were less likely, to comply with the Oral Health Assessment and Review recommendations when compared to those offering a mixture of treatment (P<0.01).

Only 12 of 349 respondents were fully compliant with the Drug Prescribing recommendations. All 12 worked in independently owned practices offering a mixture of NHS and private treatments. Due to this lack of variation across variables, logistic regression was not appropriate. A comparison of responses across the instrument items revealed a significant difference for 'pressure to produce'. Compliant respondents reported lower pressure to produce scores than those who were not compliant (P=0.04). No other statistically significant differences in responses were observed.

### Case studies

Seventy-seven of the 96 practices who completed the questionnaire were eligible for participation in the case studies. Two practices agreed to participate. Eight interviews were conducted in total.

Practice A was an urban, independently owned practice with one part-time dentist and one nurse. Practice B was a rural, corporately owned practice with two dentists, three nurses, a receptionist and a part-time hygienist and PM. Neither practice was fully compliant with any of the three dental topic areas. Despite differences in practice characteristics, some similar themes emerged from the case study data.

Leadership was a strong theme, albeit affecting the practices in different ways. In Practice A strong leadership was apparent from the principal dentist and owner, and while this appeared

to work well most of the time, there were instances where it appeared as a barrier, particularly when a more formalised approach was needed.

*"We sit down all the time and we call it practice meetings for the protocol. But you know, it's just as easy to stray on to what we did at the weekend."* **Participant 15 (Dentist).**

Practice B had a very different structure and management system in place, mainly due to being corporately owned. All team members referred to *"following the party line"*, having no leader within the practice and everyone being equal. It was evident however, that the PM did exert some leadership and tried to facilitate adoption in terms of disseminating guidance to the team and developing processes to ensure it was read. Her role, however, was remote from the day-to-day working of the team, and this perhaps added to the power struggle observed between the dental nurses, trying to assume aspects of a leadership role in her absence. One team member commented:

*"Who is the leader, or who tries to be the leader…?"* **Participant 19 (Dental Nurse).**

Context incorporated the patient context, including attitude and lifestyle, as well as practice context, including geographical location, premises, team size and ownership. The context of the case study practices was very different, but in both cases appeared to influence how they prioritised guidance. In Practice A, while good intentions to follow recommendations were clear, processes of implementation were haphazard, combined with a tendency to prioritise and tailor recommendations to fit their practice and patient context.

*"The guidelines are that you take your dirty instruments in a plastic container with a lid on it. These three steps between the surgery and the sit-down area, you know. And really why would you get gunk on your wee plastic container? …And the thing is that of course in most practices they are bigger, and you can see why these guidelines are in place… So, these are the kind of things that we have to say we do them in protocols but in reality we don't really do them."* **Participant 15 (Dentist).**

Practice A also tailored their working systems, such as appointment management, to accommodate the chaotic lifestyles of their patients and a relaxed atmosphere was evident, with considerable time spent over appointments and large gaps between patients. This observation was in keeping with the low 'pressure to produce' score from their questionnaire data. In contrast, Practice B's patient profile represented a close-knit community, which appeared to be a barrier when introducing new policies or methods of working. Finance and other external resources only emerged as a barrier to Practice B which was surprising given it is part of a group of corporate practices, where one might expect greater access to resources than an independently owned single-handed practice. In Practice B, both dentists highlighted challenges relating to antibiotic prescribing, which they attributed to the previous practice owner. They reported that some patients presented with the expectation of being prescribed an antibiotic. These patient expectations were specifically identified as a barrier to following Drug Prescribing recommendations.

*"Old patients go back to history of this practice, they were used for a scale and polish to have antibiotics prescribed…and then…I said 'no, you don't need them', …eh they are so persistent that I have to go, 'this is the paper, read it, you want to fight?'"* **Participant 22 (Dentist).**

## DISCUSSION

Numerous studies have attempted to identify the best means of translating health-related research findings into practice yet evidence shows that most KT initiatives only work some of the time and in some circumstances [31]. Our dental team interviews identified organisational level barriers and facilitators appearing to influence KT. These were categorised within the three broad themes of leadership, communication and context. Within these, sub-themes around team working, decision making, collaboration, dissemination and practice systems and learning were evident.

Questionnaire findings identified relatively low levels of compliance with dental guidance – only 41%, 19% and 4% were fully compliant with the Emergency Dental Care, Oral Health Assessment and Review and Drug Prescribing recommendations, respectively, highlighting that evidence-based recommendations are not being routinely translated into practice. Furthermore, compliance levels may have been enhanced due to social desirability bias. Exploratory analysis revealed no significant relationship between practice characteristics and compliance with either the Drug Prescribing or Emergency Dental Care recommendations however, positive associations were observed between Oral Health Assessment and Review compliance and whether the practice is fully NHS, fully private or a mix; and whether the practice has a PM. Low levels of compliance with Drug Prescribing recommendations is supported by the literature [32] and in Scotland, there is a wide variation in dental prescribing [33].

Case study data identified that leadership and context appear most influential on the translation of guidance with practices themselves tailoring recommendations to their own ownership structure, geographical context and patient profile.

Synthesis of the data identified two overarching areas salient to the translation of dental guidance: leadership and context. Leadership emerged in differing forms and appeared to affect mechanisms and styles of communication. The impact of having a PM, leadership exerted by a principal dentist or leadership offered by dental nurses all appeared influential. A systematic review conducted by Lau and colleagues exploring the evidence to practice gap in primary care, echoed these findings, with both internal and external leadership, including the role of champions, identified as having a positive impact on adoption [11]. This review also suggested that hierarchical structures, which often exist in dental practices, can act as barriers to KT [11].

Context related to patient profile, including attitude and lifestyle; and practice characteristics, including geographical location, premises, team size and ownership. The role of context on KT is increasingly recognized, with what works in one setting not necessarily being transferrable to another [34, 35]. Context has been described as the underlying systems, culture and circumstances of the environment in which an intervention is being implemented [36] and was the subject of a recent realist review, to better understand it's influence on healthcare quality improvement initiatives [37]. Findings identified that contextual factors are frequently cited as both barriers and facilitators, echoing the findings of this study. Furthermore, recent developments reinforce the significant impact that context may play in KT. These include the updated SQUIRE 2.0 guidelines for quality improvement studies in healthcare, to recognise context as a fundamental reporting item [38] and the Medical Research Council (MRC) guidance for process evaluation of complex interventions,

1
2  1    highlighting the importance of  the contextual factors associated with variations in
3     2    implementation, intervention mechanisms and outcomes [39].
4
5     3
6     4    This study benefits from a number of strengths. Firstly, the multi-method approach adopted.
7     5    The use of multiple methods, can enhance research findings, allowing the strengths of each
8     6    approach to reinforce the overall study design [40], producing a more holistic contextual
9     7    portrayal of the phenomenon being studied [41]. It is argued that, as was the case with this
10    8    study, when exploring organisational level factors, multiple viewpoints achieved through the
11    9    use of both qualitative and quantitative methods, can improve the accuracy of any
12    10   judgements concerning the data.
13
14    11
15    12   The use of the RHCC framework to underpin the study design, data collection and analysis
16    13   was novel and provided consistency. The RHCC was originally developed from case studies
17    14   carried out in large-scale organisations [20]. It provided an exploratory lens through which to
18    15   explore the translation of guidance, however given this work was undertaken within small
19    16   primary care organisations, the focus of some aspects of the framework differed to that
20    17   developed in the original model. Future work could test modifications to the framework in
21    18   dental and other primary care research settings.
22
23    19
24    20   Caution should however be taken when interpreting these findings. Firstly, it could be argued
25    21   that participating practices may represent the more motivated dental teams, albeit this is the
26    22   case for all research studies where participation is voluntary. The questionnaire response rate
27    23   was also lower than anticipated and gathering practice level data was challenging. Low levels
28    24   of compliance and lack of variability may explain why not all themes that emerged from the
29    25   interviews were identified by the survey findings. Due to the low practice level response,
30    26   analysis was conducted at the individual rather than the practice level.  For the regression
31    27   analysis however, data was clustered by the practice ID variable, to control for any practice
32    28   level characteristics that might influence the result. Furthermore, only two case studies were
33    29   undertaken. In these practices, the dental teams were working within very specific patient
34    30   and organisational contexts. Therefore, consideration should be taken in relation to the
35    31   transferability of these findings to other dental and primary care settings. That said, the case
36    32   study approach is not intended to be generalizable and case studies, because they detail
37    33   specific experiences in specific contexts, provide an insight into the relationships between
38    34   organisational processes and the context [42].
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40    35
41    36   One approach for the future may be to explore ways of tailoring guidance implementation
42    37   strategies. This would allow differences in relationships and structural and procedural
43    38   processes to be accounted for and may facilitate KT. Tailoring healthcare and implementation
44    39   strategies is an emerging field especially within behavioural science.[43] The importance role
45    40   of context and understanding the when, where, why, and how implementation strategies can
46    41   improve implementation effectiveness and subsequent health outcomes warrants further
47    42   attention[44].
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49    43
50    44   The results of this study confirm that there is no 'right' quality improvement or KT approach
51    45   that will be effective in all organisations or contexts [45, 46], and supports previous work
52    46   highlighting that sustainable organisational change initiatives need to be designed in context
53    47   to fit the particular set of local circumstances [47]. This approach would complement the
54    48   Scottish Government's Oral Health Improvement Plan (OHIP) [48], which sets out the future
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of oral health improvement and NHS dental services in Scotland. The OHIP will introduce a dental preventive care pathway and an Oral Health Risk Assessment promoting personalised patient care, designed to individual needs. Furthermore, a better understanding of what effective leadership looks like is needed. Relatively little is known about attributes of individuals who successfully lead primary care implementation activities [49], and even less so in primary care dentistry.

**CONCLUSIONS**

This study identified low compliance with dental guidance. Two overarching organisational level characteristics appeared most influential on the translation of evidence-based guidance in Scottish primary care dental practices: leadership and context. Data synthesis identified that these characteristics act as both barriers and facilitators to KT. The results highlight the complexities around guidance implementation given the varying contexts that exists in primary healthcare. It may be that guidance implementation strategies should be tailored to incorporate these factors to facilitate KT and improve compliance with best practice recommendations.

**SUPPLEMENTARY FILES**

Supplementary file 1: Dental team questionnaire

Supplementary file 2: Interview practices - key findings

Supplementary file 3: Questionnaire findings

**CHECKLISTS**

COREQ Checklist

**Author Contributions**

**HC:** Manuscript production and revisions, led the scientific development, conduct, data collection, analysis and interpretation of the study.

**ST:** Contributed to the scientific development of the study, commented on drafts.

**LM:** Contributed to the scientific development of the study, commented on drafts.

**CR:** Contributed to the scientific development of the study, commented on drafts.

**LY:** Contributed to the scientific development of the study, commented on drafts.

**JC:** Contributed to the scientific development of the study, commented on drafts.

**Declaration of interests**

The authors have no competing interests.

**Data Sharing Agreement**

All anonymised interview and questionnaire data are available on request from the corresponding author. Heather Cassie h.c.cassie@dundee.ac.uk

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16

**Supplementary File 1: Dental Team Questionnaire**

# Improving Quality in General Dental Practice

## Dental Team Questionnaire

Thank you for completing this questionnaire. We appreciate that you may work in more than one dental practice but please answer the following questions based on this practice only. Most of the questions require you to tick a box or circle a number. There are also text boxes in the questionnaire, which we hope you will use, where you can comment further on your answers.

**Please be assured that the confidentiality of your data is a prime consideration of this study and all information will be held in the strictest confidence. All data will be managed in accordance with the Data Protection Act, 1998**

If you have any questions or would like additional copies of the questionnaire please contact Heather Cassie, CSO Research Fellow. Tel: (01382) 740954 Email: h.c.cassie@dundee.ac.uk

## Section 1: About you and your practice

**Q1**  How many of the following are there in your practice team? *(Please write the number of people undertaking that role in the  box, including yourself)*

| | | | |
|---|---|---|---|
| ☐ Principal Dentist | ☐ Associate Dentist | ☐ Salaried Dentist | ☐ Vocational Trainee Dentist |
| ☐ Assistant | ☐ Dental Hygienist | ☐ Dental Nurse | ☐ Trainee Dental Nurse |
| ☐ Practice Manager | ☐ Receptionist | ☐ Vocational Trainer | ☐ Extended Duty Dental Nurse |
| ☐ LDU Operator | ☐ Other *(please specify)* | | |

**Q2**  What is your role within this practice? *(Please tick all that apply)*

| | | | |
|---|---|---|---|
| ☐ Principal Dentist | ☐ Associate Dentist | ☐ Salaried Dentist | ☐ Vocational Trainee  Dentist |
| ☐ Assistant | ☐ Dental Hygienist | ☐ Dental Nurse | ☐ Trainee Dental Nurse |
| ☐ Practice Manager | ☐ Receptionist | ☐ Vocational Trainer | ☐ Extended Duty Dental Nurse |
| ☐ LDU Operator | ☐ Practice Owner | ☐ Other *(please specify)* | |

**Q3**  How would you describe the ownership of this practice?

☐ Salaried Service     ☐ Dental Body Corporate     ☐ Independently Owned

**Q4**  Is this practice?

☐ Fully NHS     ☐ Fully Private     ☐ A Mixture

**Q5**  (a) If there is no practice manager, does someone else fill the role??     ☐ Yes     ☐ No

(b) Who (e.g. dental nurse, dentist)?     [                    ]

**Q6**  Does this practice have a computerised patient management system?     ☐ Yes     ☐ No

**Please provide any additional comments in relation to your practice:**

[                                                                    ]

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## Supplementary File 1: Dental Team Questionnaire

### Section 2: Your views

**Please score the following statements on a scale of 1-4 circling the number you feel most accurately reflects _your dental team._**

*1 = definitely false; 2 = mostly false; 3 = mostly true; 4 = definitely true*

**Q1      AUTONOMY**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| a.   The principal dentist / clinical lead lets team members make their own decisions | 1 | 2 | 3 | 4 |
| b.   The principal dentist / clinical lead trusts team members to make decisions without getting permission first | 1 | 2 | 3 | 4 |
| c.   Supervisors tightly control the work of those below them | 1 | 2 | 3 | 4 |
| d.   The principal dentist / clinical lead keeps too tight a rein on the way things are done | 1 | 2 | 3 | 4 |
| e.   It is important to check things first with the principal dentist / clinical lead before taking action | 1 | 2 | 3 | 4 |

**Q2      INTEGRATION**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| a.   Team members are suspicious of those in other professional roles within this dental team | 1 | 2 | 3 | 4 |
| b.   There is very little conflict within this dental team | 1 | 2 | 3 | 4 |
| c.   Those with different professional roles are prepared to share information | 1 | 2 | 3 | 4 |
| d.   Collaboration between those with different professional roles is very effective | 1 | 2 | 3 | 4 |
| e.   There is very little respect within this dental team | 1 | 2 | 3 | 4 |

**Q3      INVOLVEMENT**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| a.   The principal dentist / clinical lead involves team members when decisions are made that affect them | 1 | 2 | 3 | 4 |
| b.   Changes are made without talking to the team members affected by them | 1 | 2 | 3 | 4 |
| c.   Team members do not have any say in decisions that affect their work | 1 | 2 | 3 | 4 |
| d.   Team members feel that decisions are frequently made over their heads | 1 | 2 | 3 | 4 |
| e.   Information is widely shared | 1 | 2 | 3 | 4 |
| f.   There are often breakdowns in communication | 1 | 2 | 3 | 4 |

*1 = definitely false; 2 = mostly false; 3 = mostly true; 4 = definitely true*

**Q4**    **TRAINING**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| a.  Team members are not properly trained when there is new guidance | 1 | 2 | 3 | 4 |
| b.  Team members receive enough training when there is new guidance | 1 | 2 | 3 | 4 |
| c.  This practice only gives team members the minimum amount of training they need to do their job | 1 | 2 | 3 | 4 |
| d.  Team members are strongly encouraged to develop their skills | 1 | 2 | 3 | 4 |

**Q5**    **SUPERVISORY SUPPORT**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| a.  Senior team members are good at understanding team member's problems | 1 | 2 | 3 | 4 |
| b.  Senior team members show that they have confidence in those they manage | 1 | 2 | 3 | 4 |
| c.  Senior team members are friendly and easy to approach | 1 | 2 | 3 | 4 |
| d.  Senior team members can be relied upon to give guidance to team members | 1 | 2 | 3 | 4 |
| e.  Senior team members show an understanding of the people who work for them | 1 | 2 | 3 | 4 |

**Q6**    **WELFARE**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| a.  This practice pays little attention to the welfare of the employees | 1 | 2 | 3 | 4 |
| b.  This practice tries to look after its employees | 1 | 2 | 3 | 4 |
| c.  This practice cares about its employees | 1 | 2 | 3 | 4 |
| d.  This practices tries to be fair in its actions towards employees | 1 | 2 | 3 | 4 |

**Q7**    **EFFICIENCY**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| a.  In this practice, time and money could be saved if work was better organised | 1 | 2 | 3 | 4 |
| b.  Things could be done much more efficiently, if people stopped to think | 1 | 2 | 3 | 4 |
| c.  Poor scheduling and planning is often an issue for delivery of care | 1 | 2 | 3 | 4 |
| d.  Productivity could be improved if jobs were organised and planned better | 1 | 2 | 3 | 4 |

*1 = definitely false; 2 = mostly false; 3 = mostly true; 4 = definitely true*

**Q8   TRADITION**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| a. The principal dentist / clinical lead likes to keep to established, traditional ways of doing things | 1 | 2 | 3 | 4 |
| b. The way this practice does things has seldom changed | 1 | 2 | 3 | 4 |
| c. The principal dentist / clinical lead is not interested in trying out new ideas | 1 | 2 | 3 | 4 |
| d. Changes in the way things are done happen very slowly | 1 | 2 | 3 | 4 |

**Q9   QUALITY**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| a. This practice is always looking to achieve the highest quality of care | 1 | 2 | 3 | 4 |
| b. Quality of care is taken very seriously | 1 | 2 | 3 | 4 |
| c. Team members believe that this practice's success depends on high quality care | 1 | 2 | 3 | 4 |
| d. This practice does not have much of a reputation for high quality care | 1 | 2 | 3 | 4 |

**Q10   FORMALISATION**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| a. It is considered extremely important to follow procedures/practice policies | 1 | 2 | 3 | 4 |
| b. Team members can ignore formal procedures and practice policies if it helps get the job done | 1 | 2 | 3 | 4 |
| c. Everything has to be done by the book | 1 | 2 | 3 | 4 |
| d. It is not necessary to follow procedures/practice policies to the letter | 1 | 2 | 3 | 4 |
| e. Nobody gets too upset if team members break the rules | 1 | 2 | 3 | 4 |

**Q11   INNOVATION & FLEXIBILITY**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| a. In this practice, new ideas are readily accepted | 1 | 2 | 3 | 4 |
| b. This practice is quick to respond when changes need to be made | 1 | 2 | 3 | 4 |
| c. Senior team members here are quick to spot the need to do things differently | 1 | 2 | 3 | 4 |
| d. This practice is very flexible; it can quickly change procedures to follow new guidance or recommendations | 1 | 2 | 3 | 4 |
| e. Assistance in developing new ideas is readily available | 1 | 2 | 3 | 4 |
| f. Team members are always searching for new ways of looking at problems | 1 | 2 | 3 | 4 |

**Q12   OUTWARD FOCUS**

| | | | | | |
|---|---|---|---|---|---|
| a. | This practice is quite inward looking; it does not concern itself with what is happening elsewhere | 1 | 2 | 3 | 4 |
| b. | Ways of improving patients' satisfaction are not given much thought | 1 | 2 | 3 | 4 |
| c. | Patients are not considered the top priority | 1 | 2 | 3 | 4 |
| d. | This practice is slow to respond to the needs of patients | 1 | 2 | 3 | 4 |
| e. | This practice is continually looking for new opportunities | 1 | 2 | 3 | 4 |

**Q13   LEARNING & REFLECTION**

| | | | | | |
|---|---|---|---|---|---|
| a. | The way team members work together is readily changed in order to improve performance | 1 | 2 | 3 | 4 |
| b. | The methods used by the practice to get the job done are often discussed | 1 | 2 | 3 | 4 |
| c. | There are regular discussions as to whether team members are working effectively together | 1 | 2 | 3 | 4 |
| d. | Plans are modified in light of changing circumstances | 1 | 2 | 3 | 4 |
| e. | Time is taken to review the practice goals | 1 | 2 | 3 | 4 |

**Q14   CLARITY OF PRACTICE GOALS**

| | | | | | |
|---|---|---|---|---|---|
| a. | Team members have a good understanding of what this practice is trying to do | 1 | 2 | 3 | 4 |
| b. | The future direction of this practice is clearly communicated to everyone | 1 | 2 | 3 | 4 |
| c. | Team members are not clear about the goals of this practice | 1 | 2 | 3 | 4 |
| d. | Everyone who works here is well aware of the long-term goals and direction of the practice | 1 | 2 | 3 | 4 |
| e. | There is a strong sense of where the practice is going | 1 | 2 | 3 | 4 |

**Q15   EFFORT**

| | | | | | |
|---|---|---|---|---|---|
| a. | Team members always want to perform to the best of their ability | 1 | 2 | 3 | 4 |
| b. | Team members are enthusiastic about their work | 1 | 2 | 3 | 4 |
| c. | Team members get by with doing as little as possible | 1 | 2 | 3 | 4 |
| d. | Team members are prepared to make a special effort to do a good job | 1 | 2 | 3 | 4 |
| e. | Team members do not put more effort into their work than they have to | 1 | 2 | 3 | 4 |

**Q16    PERFORMANCE FEEDBACK**

|  |  | | | |
|---|---|---|---|---|
| a. Team members receive feedback on the quality of their work | 1 | 2 | 3 | 4 |
| b. Team members have no idea how well they are doing their job | 1 | 2 | 3 | 4 |
| c. In general, it is hard for someone to measure the quality of their own performance | 1 | 2 | 3 | 4 |
| d. Team member's performance is measured on a regular basis | 1 | 2 | 3 | 4 |
| e. The way team members do their job is rarely assessed | 1 | 2 | 3 | 4 |

**Q17    PRESSURE TO PRODUCE**

|  |  | | | |
|---|---|---|---|---|
| a. Team members are expected to do too much in a day | 1 | 2 | 3 | 4 |
| b. In general, workloads are not particularly demanding | 1 | 2 | 3 | 4 |
| c. Senior team members require team members to work extremely hard | 1 | 2 | 3 | 4 |
| d. Team members are under pressure to meet targets | 1 | 2 | 3 | 4 |
| e. The pace of work is really relaxed | 1 | 2 | 3 | 4 |

**Q18    GUIDANCE DISSEMINATION**

|  |  | | | |
|---|---|---|---|---|
| a. In this practice, team members are up-to-date with new guidance and recommendations | 1 | 2 | 3 | 4 |
| b. In this practice, senior team members make other team members aware of new guidance | 1 | 2 | 3 | 4 |
| c. In this practice, there are regular meetings to discuss new guidance and recommendations | 1 | 2 | 3 | 4 |

**Q19    GUIDANCE PRIORITISATION**

|  |  | | | |
|---|---|---|---|---|
| a. Senior team members decide what guidance this practice follows | 1 | 2 | 3 | 4 |
| b. Individual team members are free to decide what guidance they follow | 1 | 2 | 3 | 4 |
| c. The ease of complying with guidance influences whether this practice follows it | 1 | 2 | 3 | 4 |
| d. The guidance topic influences whether this practice follows it | 1 | 2 | 3 | 4 |
| e. In this practice, there are regular meetings to discuss how to prioritise new guidance | 1 | 2 | 3 | 4 |

## Section 3: Use of Guidance in Your Practice

**Q1    Emergency Dental Care**

*If a patient contacts the practice…*

a.   with a dental problem asking for emergency or unscheduled attention, there is a procedure that is followed
☐ Always   ☐ Sometimes   ☐ Never   ☐ Don't Know   ☐ n/a

b.   when it is closed there are arrangements in place for them to obtain care
☐ Always   ☐ Sometimes   ☐ Never   ☐ Don't Know   ☐ n/a

c.   complaining of dental trauma, a clinician will contact with the patient, either face to face or by telephone within 60 minutes
☐ Always   ☐ Sometimes   ☐ Never   ☐ Don't Know   ☐ n/a

d.   complaining of facial swelling a clinician will contact with the patient, either face to face or by telephone within 60 minutes
☐ Always   ☐ Sometimes   ☐ Never   ☐ Don't Know   ☐ n/a

**Q2    Oral Health Assessment & Review**

*As part of a routine examination in this practice…*

a.   a head and neck assessment is recorded for all **new** patients
☐ Always   ☐ Sometimes   ☐ Never   ☐ Don't Know   ☐ n/a

b.   caries and restorations are recorded for all **new** patients
☐ Always   ☐ Sometimes   ☐ Never   ☐ Don't Know   ☐ n/a

c.   a risk-based recall interval is assigned for **all** patients
☐ Always   ☐ Sometimes   ☐ Never   ☐ Don't Know   ☐ n/a

d.   a long term personal care plan is written for **all** patients
☐ Always   ☐ Sometimes   ☐ Never   ☐ Don't Know   ☐ n/a

**Q3    Drug Prescribing**

*If a patient presents with a dental abscess, with no obvious signs of spreading infection, in the first instance …*

a.   the patient is treated with local measures
☐ Always   ☐ Sometimes   ☐ Never   ☐ Don't Know   ☐ n/a

b.   the patient is prescribed a first line antibiotic *(e.g. amoxicillin, metronidazole, phenoxymethylpenicillin , erythromycin)*
☐ Always   ☐ Sometimes   ☐ Never   ☐ Don't Know   ☐ n/a

c.   the patient is prescribed a second line antibiotic *(e.g. clindamycin, co-amoxiclav, clarithroymicin)*
☐ Always   ☐ Sometimes   ☐ Never   ☐ Don't Know   ☐ n/a

d.   What would the antibiotic of choice and dosage be?
☐————————————   ☐ Don't Know   ☐ n/a

## Section 4: Additional Comments

**Please provide any additional comments in relation to any other aspects of this questionnaire:**

**Thank you for completing this questionnaire!**

**Supplementary File 2: Key Findings by Practice**

**ARCHIBALD DENTAL PRACTICE**

**Views and Awareness of Guidance:**
- General awareness of SDCEP and other forms of guidance.
- View guidance as something to cherry pick information from.
- Prefer guidance documents in a hard copy format.

**Barriers/ Facilitators to the translation of guidance:**
- Communication (lack of team meetings, challenges of getting whole team together).
- Hierarchical decision-making in relation to the implementation of guidance.
- Resources (time and finance).
- Clear leadership.
- Training and links with external organisations.

**BLACK'S DENTAL PRACTICE**

**Views and Awareness of Guidance:**
- Very aware of SDCEP and other forms of guidance.
- Challenges exist around the dissemination of guidance within the practice.
- Prefer guidance documents in a hard copy format.

**Barriers/ Facilitators to the translation of guidance:**
- Leadership (lack of clarity over leadership, changing situation).
- Communication (no formal communication mechanisms).
- Teamwork (lack of team involvement, no team decision making, no clear roles/ responsibilities).
- Limited training and performance feedback.
- Resources (staff shortages).

**CAMPBELL DENTAL**

**Views and Awareness of Guidance:**
- Very aware of SDCEP and other forms of guidance.
- Very positive about guidance.
- Very proactive about receiving and disseminating guidance within the practice.
- An awareness and appreciation of other guidance formats, such as web based apps.

**Barriers/ Facilitators to the translation of guidance:**
- Patient expectations.
- Unrealistic/Inflexible/Unclear recommendations.
- Impact of external organisations.
- Communication (hierarchical, whole team involvement, regular feedback).
- Leadership (hierarchical, strong involvement from Practice Manager, strong systems in place).
- Resources (financial, premises space).
- Teamwork (clear roles/responsibilities, motivated).
- Use of innovations.

**DAVIDSON'S DENTAL CARE**

**Views and Awareness of Guidance:**

- General awareness of SDCEP and other guidance.
- Mixed views about guidance and its importance.
- Guidance disseminated in a 'top down' manner
- Prefer guidance in a hard copy format, however there was an appreciation of electronic formats.

**Barriers/ Facilitators to the translation of guidance:**

- Leadership (approachable, hierarchical, dental nurse leadership, divisions by professional role).
- Communication (no formal communication mechanisms, team members reluctant to engage).
- Teamwork (no clear roles/responsibilities, lack of motivation).
- Lack of innovation.
- Resources (financial, premises, space).
- Limited training and performance feedback.
- Unclear, constantly changing recommendations.
- Support from external organisations.

**Supplementary file 3:** Dental Practice Organisation Measure (DPOM) Instrument Responses by Compliance

| Dimension (Cronbach's alpha) | Emergency Dental Care | | | Oral Health Assessment & Review | | | Drug Prescribing | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value |
| **Autonomy (α = 0.7)** | | | | | | | | | |
| Compliant | 2.67 (0.60) | -1.18 | 0.24 | 2.63 (0.50) | -1.33 | 0.18 | 2.67 (0.43) | 0.38 | 0.70 |
| Non-Compliant | 2.74 (0.52) | | | 2.74 (0.56) | | | 2.70 (0.56) | | |
| **Integration (α = 0.8)** | | | | | | | | | |
| Compliant | 3.56 (0.46) | 4.70 | <0.01** | 3.50 (0.51) | 1.75 | 0.08 | 3.33 (0.45) | -0.32 | 0.75 |
| Non-Compliant | 3.28 (0.59) | | | 3.37 (0.56) | | | 3.39 (0.56) | | |
| **Involvement (α = 0.9)** | | | | | | | | | |
| Compliant | 3.33 (0.60) | 3.08 | <0.01** | 3.11 (0.67) | 0.38 | 0.70 | 3.33 (0.69) | 0.85 | 0.40 |
| Non-Compliant | 3.00 (0.68) | | | 3.07 (0.64) | | | 3.27 (0.66) | | |
| **Training (α = 0.8)** | | | | | | | | | |
| Compliant | 3.29 (0.65) | 3.43 | <0.01** | 3.32 (0.60) | 2.53 | 0.01** | 3.05 (0.29) | 1.16 | 0.25 |
| Non-Compliant | 3.05 (0.63) | | | 3.09 (0.66) | | | 3.13 (0.66) | | |
| **Supervisor Support (α = 0.9)** | | | | | | | | | |
| Compliant | 3.44 (0.56) | 4.03 | <0.01** | 3.34 (0.60) | 0.75 | 0.46 | 3.25 (0.54) | 0.20 | 0.85 |
| Non-Complaint | 3.19 (0.53) | | | 3.28 (0.56) | | | 3.28 (0.57) | | |
| **Welfare (α = 0.9)** | | | | | | | | | |
| Compliant | 3.55 (0.62) | 3.06 | <0.01** | 3.40 (0.63) | -0.24 | 0.81 | 3.25 (0.45) | 1.76 | 0.08 |
| Non-Compliant | 3.32 (0.71) | | | 3.42 (0.70) | | | 3.09 (0.57) | | |
| **Efficiency (α = 0.9)** | | | | | | | | | |
| Compliant | 2.84 (0.77) | 3.31 | <0.01** | 2.72 (0.76) | 0.58 | 0.56 | 2.62 (0.68) | -0.65 | 0.52 |
| Non-Compliant | 2.56 (0.77) | | | 2.66 (0.78) | | | 2.67 (0.79) | | |
| **Tradition (α = 0.8)** | | | | | | | | | |
| Compliant | 2.18 (0.58) | -1.65 | 0.10 | 2.09 (0.62) | -2.47 | 0.01** | 2.23 (0.54) | 0.43 | 0.67 |
| Non-Compliant | 2.29 (0.62) | | | 2.30 (0.60) | | | 2.26 (0.62) | | |

| | Emergency Dental Care | | | Oral Health Assessment & Review | | | Drug Prescribing | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value |
| **Quality (α = 0.8)** | | | | | | | | | |
| Compliant | 3.78 (0.39) | 2.71 | <0.01** | 3.82 (0.30) | 2.38 | 0.02* | 3.?5 (0.32) | 1.26 | 0.21 |
| Non-Compliant | 3.66 (0.44) | | | 3.68 (0.45) | | | 3.?9 (0.44) | | |
| **Formalisation (α = 0.8)** | | | | | | | | | |
| Compliant | 3.78 (0.39) | 3.32 | <0.01** | 3.58 (0.45) | 3.08 | <0.01** | 3.?7 (0.39) | 0.45 | 0.66 |
| Non-Compliant | 3.66 (0.44) | | | 3.36 (0.53) | | | 3.?0 (0.53) | | |
| **Innovation & Flexibility (α = 0.9)** | | | | | | | | | |
| Compliant | 3.20 (0.59) | 4.55 | <0.01** | 3.20 (0.54) | 2.86 | <0.01** | 2.?2 (0.43) | -0.72 | 0.47 |
| Non-Compliant | 2.93 (0.53) | | | 2.98 (0.57) | | | 3.?4 (0.58) | | |
| **Outward Focus (α = 0.8)** | | | | | | | | | |
| Compliant | 3.42 (0.44) | 2.46 | <0.01** | 3.52 (0.36) | 3.34 | <0.01** | 3.?5 (0.51) | 0.12 | 0.91 |
| Non-Compliant | 3.29 (0.51) | | | 3.30 (0.51) | | | 3.?3 (0.50) | | |
| **Learning & Reflection (α = 0.8)** | | | | | | | | | |
| Compliant | 3.04 (0.62) | 4.53 | <0.01** | 3.05 (0.56) | 2.91 | <0.01** | 2.?7 (0.49) | -0.07 | 0.95 |
| Non-Compliant | 2.75 (0.53) | | | 2.82 (0.58) | | | 2.?8 (0.60) | | |
| **Clarity of Practice Goals (α = 0.9)** | | | | | | | | | |
| Compliant | 3.09 (0.72) | 4.26 | <0.01** | 3.11 (0.76) | 2.85 | <0.01** | 2.?5 (0.54) | -1.26 | 0.21 |
| Non-Compliant | 2.76 (0.69) | | | 2.83 (0.70) | | | 2.?1 (0.72) | | |
| **Effort (α = 0.9)** | | | | | | | | | |
| Compliant | 3.42 (0.60) | 2.97 | <0.01** | 3.52 (0.52) | 3.39 | <0.01** | 3.?2 (0.43) | -1.12 | 0.26 |
| Non-Compliant | 3.23 (0.54) | | | 3.25 (0.57) | | | 3.?1 (0.59) | | |
| **Performance Feedback (α = 0.9)** | | | | | | | | | |
| Compliant | 2.74 (0.74) | 3.19 | <0.01** | 2.70 (0.80) | 1.49 | 0.14 | 2.?8 (0.79) | -0.50 | 0.62 |
| Non-Compliant | 2.49 (0.67) | | | 2.55 (0.69) | | | 2.?9 (0.72) | | |

| | Emergency Dental Care | | | Oral Health Assessment & Review | | | Drug Prescribing | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value | Mean (SD) | t-value | p-value |
| **Pressure to Produce (α = 0.7)** | | | | | | | | | |
| Compliant | 2.23 (0.50) | -0.75 | 0.46 | 2.20 (0.48) | -0.94 | 0.35 | 1.97 (0.39) | -2.02 | 0.04* |
| Non-Compliant | 2.27 (0.53) | | | 2.27 (0.53) | | | 2.27 (0.52) | | |
| **Guidance Dissemination (α = 0.8)** | | | | | | | | | |
| Compliant | 3.24 (0.69) | 2.83 | <0.01** | 3.27 (0.64) | 2.16 | 0.03* | 3.12 (0.67) | 0.52 | 0.60 |
| Non-Compliant | 3.04 (0.59) | | | 3.08 (0.64) | | | 3.12 (0.65) | | |
| **Guidance Prioritisation (α = 0.6)** | | | | | | | | | |
| Compliant | 2.41 (0.43) | 0.64 | 0.52 | 2.37 (0.46) | -0.39 | 0.70 | 2.28 (0.62) | -0.91 | 0.37 |
| Non-Compliant | 2.38 (0.43) | | | 2.39 (0.43) | | | 2.40 (0.44) | | |

**Significant at the 0.01 level
*Significant at the 0.05 level

**Checkist 1: Consolidated Criteria for Reporting Qualitative Research (COREQ): 32 Item Checklist**

*Adapted from:*

*Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. International Journal for Quality in Health Care. 2007. Volume 19, Number 6: pp. 349 – 357*

|  | GUIDE QUESTION/DESCRIPTION | REPORTED ON PAGE # |
|---|---|---|
| **DOMAIN 1: Research team and Reflexivity** | | |
| **Personal characteristics** | | |
| 1. Interviewer | Which authors conducted the interviews? | Page 4 |
| 2. Credentials | What were the researcher's credentials? | Page 1 |
| 3. Occupation | What was their occupation? | Page 1 |
| 4. Gender | Was the researcher male or female? | Female |
| 5. Experience and Training | What training or experience did the researcher have? | Page 4 |
| **Relationship with participants** | | |
| 6. Relationship established | Was a relationship established prior to study commencement? | No |
| 7. Participant knowledge of interviewer | What did the participants know about the researcher? | Brief introduction provided at start of interview (name/ role/ purpose of research) |
| 8. Interviewer characteristics | What characteristics were reported about the interviewer? | As above. Page 4 |
| **DOMAIN 2: Study Design** | | |
| **Theoretical framework** | | |
| 9. Methodological orientation and theory | What methodological orientation was stated to underpin the study | Page 3 |
| **Participant selection** | | |
| 10. Sampling | How were participants selected? | Page 4 |
| 11. Method of approach | How were participants approached? | Page 4 |
| 12. Sample size | How many participants were in the study? | Page 5 |
| 13. Non-participation | How many people refused to participate/ dropped out? Reasons? | Pages 5&7 |
| **Setting** | | |
| 14. Setting of data collection | Where was the data collected? | Telephone interviews and in dental practices |
| 15. Presence of non-participants | Was anyone else present besides the participants and researchers? | No |
| 16. Description of sample | What are the important characteristics of the sample? | Supplementary file 2 |
| **Data collection** | | |
| 17. Interview guide | Were questions, prompts, guides provided by the author? Was it pilot tested? | Page 4 |
| 18. Repeat interviews | Were repeat interviews carried out? | No |

| 19. Audio/visual recording | Did the researcher use audio or visual recording equipment? | Yes<br>Page 4 |
|---|---|---|
| 20. Field notes | Were field notes made during and/or after the interviews? | No |
| 21. Duration | What was the duration of the interviews? | Page 5 |
| 22. Data saturation | Was data saturation discussed? | page 4 |
| 23. Transcripts returned | Were transcripts returned to participants for comment and/or correction | No |
| **DOMAIN 3: Analysis and Findings** | | |
| **Data analysis** | | |
| 24. Number of data coders | How many data coders coded the data? | 1 |
| 25. Description of the coding tree | Did authors provide a description of the coding tree? | <u>Nvivo database available on request</u> |
| 26. Derivation of themes | Were themes identified in advance or derived from the data? | Page 5 |
| 27. Software | What software was used to manage the data? | Nvivo 10 |
| 28. Participant checking | Did participants provide feedback on the findings | No |
| **Reporting** | | |
| 29. Quotations presented | Were participant quotations presented to illustrate the themes/findings?<br>Was each participant identified? | Yes, practice and participant pseudonyms used |
| 30. Data and findings consistent | Was there consistency between the data presented and the findings? | Yes |
| 31. Clarity of major themes | Were major themes clearly presented in the findings? | Page 15 |
| 32. Clarity of minor themes | Is there a description of diverse cases or discussion of minor themes | Page 15 onwards |