



Prevention and Management of Dental Caries in Children

Findings from pre- and post- publication questionnaires: a summary report

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STUDY PERSONNEL

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Introduction

The [Scottish Dental Clinical Effectiveness Programme](#) published their updated guidance on the [Prevention and Management of Dental Caries in Children](#) (PMDCC) in June 2018. To coincide with its publication, pre- and post-publication questionnaires were developed to assess changes in practitioners' beliefs, attitudes and working practices before and after the publication of the updated guidance.

Method

Sample and recruitment

1020 dentists were contacted by email, inviting them to take part in the study: 510 were sent pre-publication questionnaire A, and 510 were sent pre-publication questionnaire B. Only participants who completed the pre-publication questionnaires were invited to take part in the post-publication questionnaire.

Data collection

Pre-publication questionnaires were sent to participants in May 2018, asking about their current practice, beliefs and attitudes towards specific aspects of the PMDCC guidance. Post-publication questionnaires, asking the same questions, were distributed six months later, in November 2018, to participants who had completed the pre-publication questionnaires.

Questionnaire Content

Two [questionnaires](#) were developed: A asked participants about delivering healthy diet advice, preventive fissure sealant placement and assessing caries risk. B asked participants about fluoride varnish application, delivering personalised oral health promotion advice and bitewing radiographs. Both A and B asked about demographic information and current practice, including which practitioners were responsible for each element.

Data analysis

The quantitative data were analysed using IBM SPSS v24. Descriptive statistics were used to calculate frequencies and means for each section. Wilcoxon Signed Rank Tests were used to compare participants' responses at pre- and post-publication to determine any significant differences. The a priori criterion for significance was set at $p < 0.05$.

The qualitative data gathered from the free-text boxes in the questionnaire were analysed using thematic analysis. Thematic analysis is a method for identifying and analysing themes that emerge from qualitative data and has six stages: familiarisation with the data; generating initial coding; searching for themes; reviewing themes; defining and naming themes; and producing the report (Braun and Clarke, 2006; Nowell et al., 2017).

Results

Thirty-nine participants completed pre-publication questionnaire A, and 52 completed pre-publication questionnaire B, representing a 7% and 10% response rate, respectively. From the pre-questionnaire sample, three participants declined to be contacted at the post-publication stage. Therefore, 88 participants were invited to complete the post-publication questionnaire: 37 for A,

and 51 for B. At the end of the data collection period, 21 participants had completed post-publication questionnaire A and 24 had completed post-publication questionnaire B, representing a response rate of 57% and 47% respectively (4% and 5% of the original 510 targeted for recruitment at the start of the study).

Key findings from each section of the questionnaires will now be presented. The pre-publication questionnaire is referred to as “baseline” and the post-publication questionnaire as “follow-up”.

Fluoride Varnish

Fluoride varnish application	<ul style="list-style-type: none"> • At both baseline and follow-up, the majority of participants reported that they knew how to and have the skills to apply fluoride varnish. • More than half of participants at baseline and follow-up reported that sodium fluoride varnish is applied at least twice a year for children over 2 years of age as current practice. • An improvement of 5% between baseline (87%) and follow-up (92%) was observed in participants agreeing that they have a clear plan of when, how, and who will apply fluoride varnish.
Remuneration	<ul style="list-style-type: none"> • Fifty-four percent of participants disagreed at baseline that remuneration was sufficient, and 45% disagreed at follow-up.
Dental professionals' attitude towards fluoride varnish	<ul style="list-style-type: none"> • There was a 13% decrease in participants who disagreed that fluoride application was an efficient use of time between baseline (34%) and follow-up (21%). • Twenty percent more participants agreed at follow-up (75%) that they feel they are making a difference with fluoride application. • Fluoride varnish application was advocated by some because they believed it “builds rapport” with patients, is “easy to apply quickly” and “acclimatizes patients well”.
Patients'/parents' attitude	<ul style="list-style-type: none"> • An increase was observed in participants agreeing that child patients (and/or their parents/carers) wanted fluoride varnish to be applied from 44% at baseline to 61% at follow-up.

Mixed responses were gathered from participants' perceptions regarding the efficiency and benefits of fluoride varnish application in comparison to diet and toothbrushing instruction. Participants who did not find fluoride varnish application effective believed that toothbrushing instruction was more effective:

“I remain unconvinced that application of fluoride varnish will have a significant effect on caries incidence, particularly in the face of regular and frequent exposure to high-sugar food and drink.”

“Toothbrushing in nurseries and schools makes more difference”

Fees are provided for providing fluoride varnish for children up to 6 years old, whereas it has been recommended from guidelines that fluoride varnish are to be applied for children up to 18 years old. The lack of remuneration for fluoride varnish for children between 6 to 18 years old appeared to serve as a lack of motivation for GDPs to advocate this.

Fissure Sealants

<p>Application of fissure sealants</p>	<ul style="list-style-type: none"> • At both baseline and follow-up, 100% of participants knew how to place fissure sealants and had the skills to do so. • A significant increase was observed between baseline (52%) and follow-up (63%) regarding participants' confidence that they can place fissure sealants even when there is little time ($p=0.04$). • Five percent of participants at follow-up disagreed with remembering to place fissure sealants on lower permanent molars as soon after eruption, compared to 10% at baseline.
<p>Remuneration</p>	<ul style="list-style-type: none"> • Thirty-eight percent of participants at baseline felt that remuneration for fissure sealants was insufficient, which reduced to 33% at follow-up.
<p>Dental professionals' attitude towards fissure sealants</p>	<ul style="list-style-type: none"> • Positive change was observed from baseline (71%) to follow-up (85%) as more participants agreed that fissure sealants on permanent molars as soon as possible after eruption will help prevent caries. • There was an increase from 70% at baseline to 81% at follow-up regarding participants' optimism that placing fissure sealants will reduce a child's risk of caries. • A significant difference was observed between baseline (34%) and follow-up (48%) regarding participants' view that fissure sealant placement took priority over all the other competing tasks ($p=0.02$).
<p>Fissure sealants in relation to patient's caries risk</p>	<ul style="list-style-type: none"> • Qualitative data indicated there were mixed feelings regarding placement of fissure sealants for high risk versus low risk patients, with the underlying consensus that managing patient expectations & parents' wishes are determining factors in treatment provided. • Many participants commented that fissure sealants "<i>may do more harm than good</i>" if they are poorly placed because they can act as a plaque trap.

Many participants were in favour of the use of fissure sealants, but some felt that no fissure sealant was better than a poorly placed one.

"I disapprove of poorly executed fissure sealants with leakage... I would rather place no fissure sealant than a poor one."

Many felt that the remuneration for fissure sealants was insufficient because fissure sealants will require topping up over time which are not included in the Statement of Dental Remuneration (SDR). Many participants also felt frustrated in placing fissure sealants both at baseline and follow-up, mainly as a result of poor cooperation and poor moisture control:

“I wish the SDR allowed for the replacement of worn fissure sealants or indeed [glass ionomer cement] sealants when partially erupted or due to difficult moisture control and co-operation then allow for resin to be placed later.”

Bitewings

Taking bitewings	<ul style="list-style-type: none"> At baseline, 8% disagreed with having a clear plan of when, how, and who will take bitewing radiographs. A slight improvement was observed during follow-up with a decrease to 4%.
Remuneration	<ul style="list-style-type: none"> All participants (100%) disagreed at baseline that there was sufficient remuneration within the SDR for bitewing radiographs to be taken. However, 13% of participants agreed at follow-up that there was sufficient remuneration, which was a significant difference (p=0.03).
Dental professionals’ attitude towards bitewings	<ul style="list-style-type: none"> At baseline, 12% of participants disagreed that bitewing radiographs were important which decreased to 0% at follow-up. Participants have agreed that radiographs are not routinely conducted for patients under 10 years old because of “<i>lack of cooperation</i>” from the child patient, “<i>parents are not keen</i>” and concern regarding “<i>unnecessary radiation</i>” exposure. At baseline 66% of participants felt they made a difference when taking bitewing radiographs. This increased to 84% at follow-up, which was a significant difference. (p=0.02)

Participants had mixed responses regarding the benefits of bitewing radiographs to children’s oral health at baseline (12% disagreed) and follow-up (8% disagreed). This trend was supported in the qualitative feedback as many dentists concluded that the lack of cooperation in young children, parents’ attitude towards radiation exposure and radiation risks that outweigh benefits made this a less routine procedure.

“Bitewing radiographs are not appropriate for children where deciduous buccal segment persists, in my view... I consider irradiation of young heads to be irresponsible”

The lack of remuneration for radiographs for patients below 18 years old also does not serve as an incentive for dentists to take bitewing radiographs. Many have suggested alternatives to substitute radiation exposure, which may be helpful to address the concerns expressed by participants:

“I prefer to check interdentially with a strong caries detection light”

“I feel an observant dentist carrying out an exam in good lighting and with transillumination should be able to decide when x rays are required and when they are not.”

It may be possible to speculate whether the frequency of bitewing radiographs may increase if it was remunerated substantially within the SDR, despite consensus that there is no obvious benefit for bitewing radiographs to be taken for young children at low caries risk. There seem to also be a mixed response amongst participants of when bitewing radiographs are taken, whether every year or 2 years.

Personalised Oral Health Promotion (POHP) Advice

Delivering POHP advice	<ul style="list-style-type: none"> • All the participants (100%) at baseline and follow-up indicated that they encourage and support children (and/or parents/carers) to brush their teeth, or have their teeth brushed for them, at least twice a day using fluoride toothpaste. • All the participants (100%) agreed at follow-up that they have sufficient knowledge (96% baseline), skills (96% baseline) to deliver POHP advice, and they felt confident (93% baseline) to deliver PHOP advice. • Twenty-five percent more participants agreed at follow-up (92%) that they have a clear plan of when, how and who will deliver POHP advice, which was significant (p=0.03). • A significant difference was observed between baseline (56%) and follow-up (79%) in participants who agreed that the appointment time is long enough to deliver POHP advice (p=0.01).
Remuneration	<ul style="list-style-type: none"> • Eight-seven percent of participants disagreed that there was sufficient remuneration for delivering POHP advice being sufficient; this was reduced to 75% at follow-up.
Patients’ and/or parents’/carers’ attitude	<ul style="list-style-type: none"> • Eighty-four percent of child patients (and/or parents/carers) at follow-up want to receive POHP advice. This is a significant improvement from 59% at baseline (p=0.04).

For some dentists, brushing advice, alongside diet advice have been preferred methods of prevention over active caries treatment:

“I prioritise OHI and dietary advice over active treatment of carious deciduous teeth which are symptomless.”

More participants agreed at follow-up that the length of appointment time was sufficient for POHP advice. However, many participants suggested that POHP could be delivered by other members of the dental team, allowing the dentist more time for other treatments:

“If I had a therapist or Childsmile-trained nurse, I would delegate the delivery of toothbrushing instruction to them”

“I have DCPS in the practice to cover oral health promotion to free up my time and provide a more in-depth consultation to reinforce what I have already mentioned”

Diet Advice

Delivering diet advice	<ul style="list-style-type: none"> • All participants (100%) agreed on the importance of delivering diet advice tailored to the needs of the child, with 95% knowing how to deliver diet advice at both baseline and follow-up. • There was an increase from 62% to 86% in participants who agreed that delivering diet advice is an efficient use of their time. • There was an increase from 48% at baseline to 62% at follow-up in participants reporting that delivering diet advice takes priority over other competing tasks. • Improvements were observed between baseline and follow-up with more participants agreeing that they have the skills and clear plan on how, when and who would deliver diet advice. <ul style="list-style-type: none"> ○ Skills to deliver diet advice: 85% at baseline, 96% at follow-up. ○ Clear plan on delivering diet advice: 72% at baseline, 91% at follow-up. This was a significant difference (p=0.03) • More than half (65% baseline, 62% follow-up) of participants agreed that there is insufficient appointment time to deliver diet advice. • An increase was observed regarding participants reporting that there were up-to-date materials in their dental practice for patients regarding diet advice, from 46% at baseline to 61% at follow-up, which was a significant difference (p=0.00)
Remuneration	<ul style="list-style-type: none"> • There was a reduction in the number of participants who agreed there was insufficient remuneration in delivering diet advice, from 81% at baseline to 71% at follow-up.

Patients' and/or parents'/carers' attitude	<ul style="list-style-type: none"> • More participants agreed at follow-up (72%) that children (and/or parents/carers) want them to deliver diet advice, compared to 43% at baseline, which was a significant difference (p=0.01). • A small increase was observed in participants who agreed that patients were interested in what they have to say when delivering diet advice from 58% at baseline to 62% at follow-up.
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The qualitative data supported the questionnaire data as many participants believe that “*a better diet is the key to good dental health*”, and “*a cornerstone of achieving caries free teeth*”. However, many participants felt that there was insufficient time, resources and financial remuneration to justify providing diet advice:

“Diet advice should be important but there is insufficient time in practice to deliver this. I have never been able to issue and review a diet diary and fully analyse it for a patient to give well-tailored advice. I cannot justify the time and effort it would take with no remuneration for it.”

Diet had an important role in caries development and there has been greater emphasis on dental professionals to advocate for the prevention of caries by providing diet advice which is reflected in the results. Improvement in the general population’s attitude towards diet advice and oral health are also observed. A consensus from both dental professionals and patients alike in the importance of diet advice in oral health is a positive note.

Caries Risk

Benefits of caries risk assessment	<ul style="list-style-type: none"> • All participants (100%) agree on the importance of assessing caries risk and its benefit for a child’s oral health both at baseline and follow-up. • Significant differences were observed regarding the knowledge of how to accurately assess caries risk (baseline: 80%; follow-up: 95%; p=0.01); the skills required to assess caries risk (baseline: 87%; follow-up: 96%; p=0.04); having a clear plan to assess caries risk (baseline: 81%; follow-up: 95%; p=0.01); and are confident to assess caries risk (baseline: 81%; follow-up: 86%; p=0.03). • A significant difference was observed between baseline (58%) and follow-up (71%) in participants who felt they were making a difference when assessing caries risk (p=0.02). • All participants (100%) reported that they intended to assess caries risk at follow-up. This was a significant difference compared to baseline (95%; p=0.02).
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	<ul style="list-style-type: none"> • Significant differences were also observed regarding participants' intentions to assess caries risk. <ul style="list-style-type: none"> ○ At baseline, 81% of participants agreed that it was easy to remember to assess caries risk, compared to 96% at follow-up (p=0.04). ○ 53% of participants at baseline, and 85% at follow-up, agreed that other dental professionals who are important to them thought that they should be assessing caries risk (p=0.00).
Remuneration	<ul style="list-style-type: none"> • A significant difference was observed between baseline (62%) and follow-up (48%) regarding participants agreeing that there was insufficient remuneration to assess caries risk (p=0.02).

Most participants can assess a patient's caries risk but find that the challenge arises from working with uncooperative and/or unreceptive patients. Assessing caries risk seems to be more beneficial for the practitioner rather than the patients as it depends hugely on their receptiveness on the information, whether they are "open minded", and their willingness to act upon this:

"Everything depends on the parents/carers taking the advice on board. If the parents/carers/children are open minded a positive change is possible."

Participants expressed concern that they "cannot assess caries risk for children properly". Suggestions were given regarding the provision of set of questions or an online programme to determine a patient's caries risk:

"...maybe I should have a series of questions I ask myself or boxes to tick or a program to fill in that does it more scientifically/accurately."

Overall summary and conclusions

Evaluation of the quantitative and qualitative results have shown there is generally a positive change towards participants' responses to the questionnaires between baseline and follow-up in terms of knowledge, attitude and skills in fluoride varnish, fissure sealants, bitewings, oral health promotion advice, diet advice and assessing caries risk. An obvious pattern was observed when remuneration was discussed as many felt that insufficient remuneration is provided for the preventive interventions.

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