



Training dental nurses with additional skills in oral health education and application of fluoride varnish: activity impact and challenges

J.I. Csikar, D. Seymour and J. Godson

Public Health England, UK

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Public health competencies being illustrated

- Oral health surveillance
- Oral health improvement
- Developing and monitoring quality dental services
- Dental Public Health intelligence

Initial impetus for action

The Department of Health in England have issued key policy and guidance documents aiming to support evidence-based oral health improvement through the delivery of high quality, accessible and appropriate dental services:

- Choosing better oral health: An oral health action plan for England (DH, 2005)
- Healthy Lives, Healthy People: Our strategy for public health in England (DH, 2010b)
- Equity and excellence: Liberating the NHS (DH, 2010a)
- The NHS Outcomes Framework 2014/15 (DH, 2013a)
- The Public Health Outcomes Framework 2013/16 (DH, 2013b)
- Improving oral health and dental outcomes: Developing the dental public health workforce in England (DH, 2010c)
- Delivering Better Oral Health: An evidence-based toolkit for prevention (BASCD, 2009 and PHE, 2014a)
- Local authorities improving oral health: commissioning better oral health for children and young people: An evidence-informed toolkit for local authorities (PHE, 2014b)
- The use of fluoride varnish by dental nurses to control caries (PCC, 2009).

The NHS White Paper, Equity and excellence: Liberating the NHS (DH, 2010a) restated the importance of improving the oral health of school children. It proposed the introduction of a new dental contract that will focus on three elements; improving quality, capitation and registration. More recently the functions to improve oral health of local populations that were bestowed on

Primary Care Trusts since 2006 have now transferred to local authorities (DH, 2012).

This paper will focus on data gathered within Bradford and Airedale (Yorkshire and Humber region, England), a health district that has an estimated population of 506,800 people. It is one of the few metropolitan districts that are experiencing population growth. The district has a rich mix of ethnic groups and cultures, with 74% of the population classified as white, 21% Asian, the remaining 5% being mixed race, black and other ethnic groups. Almost one-third (31%) of Bradford lower super output areas fall within the 10% most deprived in England and Wales.

Considering the population structure and deprivation experienced within Bradford and Airedale, it is not surprising that dental disease is a significant issue, especially for children. The 2009 national dental epidemiological survey of five-year-olds revealed that the mean dmft in Bradford and Airedale was 2.42. This was significantly higher than that of Yorkshire and the Humber (1.51) and of England as a whole (1.11). The proportion of children with experience of caries, was significantly higher at 52% than the regional (39%) and national (31%) figures (NDEP, 2011).

There are no local clinical data available for the adult population at a Bradford and Airedale level so the Adult Dental Health Survey (HSCIC, 2009) has been used to give an illustration of coronal caries levels for adults in Yorkshire and the Humber. According to this survey, 28% of adults in Yorkshire and the Humber had current, obvious caries, compared with 23% in England as a whole.

Within Bradford and Airedale district an oral health strategy was developed to tackle the poor oral health of the population and outlined key areas where programmes could be targeted. These key aspirations were then translated into the Oral Health Action Plan which delivered an evidence based, life course approach with children passing through each element of the “Bradford and Airedale Building Brighter Smiles”. The programmes combined a targeted and universal approach to improve children’s oral health with additional targeting of children and families in greatest need.

These interventions are based on evidence of what works, utilising skill mix and involving key stakeholders through engagement and consultation. The use of topical fluorides has demonstrable effects in the reduction of caries at an individual and community level (BASCD/DH 2009). Evidence-based guidelines recommend the application of fluoride varnish (FV) at least two times per year for all children aged 3 years and older and twice yearly for younger children and adults at risk of dental caries. Evidence suggests that six monthly applications will reduce the mean caries increment by 37% in primary dentition and 43% in the permanent dentition (Marinho *et al.*, 2007).

Solutions suggested

Fluoride varnish has to be applied by a professional and the General Dental Council has advised that within the scope of practice this can be carried out by a trained and competent dental nurse (GDC, 2009). In FV programmes, dental nurses can apply varnish under the directions of a Consultant or Specialist in Dental Public Health in community settings, and to individual patients in a dental practice under the directions of a dentist. NHS Bradford and Airedale, in conjunction with the Yorkshire and Humber Post Graduate Deanery, began running a course with the University of Central Lancashire and VSM Health 'The certificate in oral health and application of fluoride varnish'. The course was developed by the university in conjunction with the North West Postgraduate Dental Deanery and Colgate. The range of expertise in the planning, co-ordination and delivery (in conjunction with the course providers) ensured a high satisfaction rating of those who went on the course and also the high success rate in completing the course.

Four cohorts of dental nurses (DNs) had completed the course at the time of analysis; 28 from general dental practices (GDP) and 12 from the Salaried Dental Service (SDS) from 20 settings (19 GDP and one SDS). On successful completion of the course dental nurses are able to give preventive advice and carry out application of FV in general dental practice and as part of a community programme. This course gave the DN's the required additional skills (DNAS).

This evaluation assessed the impact of training DN's to apply FV in practice. A two-phase, complementary assessment of the impact within Bradford and Airedale

was undertaken. Phase one consisted of an analysis of data from the Business Service Authority (BSA). This agency collates information from claims sent in by dentists who provide clinical care under contract with the NHS. The BSA provided data that identified for each practice, the total number of claims and the number of these that included claims for FV application between 2009 and 2012. The data were assigned at a practice level and thus identified where a DNAS was operating and those where there were no DNASs employed. Phase two comprised a semi-structured, self-completed questionnaire that was sent by e-mail to all DNASs between August and November 2012. The questionnaire was developed and piloted with dental nurses in one general dental practice in Bradford and Airedale. We discussed with those nurses the impact of the training and any barriers to undertaking FV applications. The suggestions from the piloting phase were incorporated in the final questionnaire (Figure 1). There were three mailings to boost the response rate and a follow-up telephone call to practices.

Actual outcome

Phase one: BSA data analysis

In Bradford and Airedale there were 65 practices that had submitted claims to the BSA between 2009 and 2012 included within this analysis (Total 1,633,621 claims, claims for those age 18 and over 1,139,131, claims for those under 18 494,490). The total number of claims including FV for this period was 85,769 (mean claims per practice 191) this equates to 5.3% of the total claims submitted for this period. When these figures are broken down further, there were 66,674 claims for FV child applications (mean by practice 299, n=223, range 0-3,865, sd 612) and 19,095 adult applications (mean by practice 84, n=227, range 0-2,006, sd 213).

Table 1 shows the FV applications for practices where DNAS were employed (there were 41 DNASs in 20 practices within Bradford and Airedale) versus 49 practices where no DNASs were employed. The analysis revealed that overall 62,912 FV applications overall were carried out in practices where DNASs were employed (child: 47,350, adult: 15,562) and the mean number of claims for FV were significantly higher (in child, adult and total claims). The total FP17 submission for FV applications by practice ranged from zero to 3,865 with a mean number of submissions of 425.

1. Does your practice apply FV to patient's teeth?
2. Are you personally applying FV to patient's teeth in the dental practice?
Is anyone else applying FV to patient's teeth in the dental practice?
3. If you are personally applying FV, can you state how often? (Please tick one)
How many patients each week are you personally applying FV to?
4. Can you monitor how many FV applications your patients receive?
5. If yes, please tell us what percentage of your patients return for their second FV application within 12 months?
If no, please estimate what percentage of your patients return for their second FV application within 12 months?
6. Are there any difficulties or issues that has prevented or reduced the FV applications that you undertake?
7. Please tell us about the difficulties or issues (e.g. no sessions free from nursing, surgery space limited, referrals limited, staffing, time, financial constraints).

Figure 1. *The questionnaire*

Table 1. Fluoride varnish application by practices with and without DNASs (2009-2012)

<i>DNASs operating in the practice?</i>	<i>Patient's age category</i>	<i>Number of FP17s (all dental activity†)</i>	<i>Range (applications)</i>	<i>Total FP17s FV applications only (% of all FP17s)</i>	<i>Mean</i>	<i>sd</i>	<i>*p value</i>
Yes	Adult	96,076	0-2,006	15,562 (16.2%)	207	327	0.001
No		590,627	0- 692	3,376 (0.6%)	23	65	
Yes	Child	234,681	0-3,865	47,350 (20.2%)	6,493	882	0.001
No		712,237	0-1,818	19,481 (2.7%)	129	305	

*Mann-Whitney U test; † including FV applications

Table 2. Numbers and percentages of patients returning for their second FV application within 12 months for practices which can and cannot monitor applications

<i>Percentage of patients</i>	<i>Can monitor</i>		<i>Cannot monitor</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
<50	0	0	2	25
50	1	6	1	12½
60	2	11	1	12½
70	5	28	1	12½
80	6	33	1	12½
90	3	17	2	25
100	1	6	0	0
Total	18	100	8	100

Phase two: Questionnaire results

There were 41 questionnaires distributed and 26 (64%) responses were received from DNASs from 14 practices. All nurses responded that FV was applied to patients within their practice. When asked if they personally applied varnish, 23 (89%) of those who responded said 'yes' and reported they applied FV most frequently on a daily basis (52%), followed by weekly (35%) and less than monthly (13%).

The questionnaire enquired as to 'who else applies FV within the practice?'; the greatest proportion of responses were 'dentist' (n=22, 45%) followed by therapist (n=13, 27%), other DNAS (n=10, 20%) and hygienist (n=4, 8%).

There was a great variation in the number of patients each DNAS was seeing for FV application per week. Out of 23 responses the mean number of applications was 106 (range 1-750).

Of the 18 practices (69%) which could monitor FV applications the distribution of percentage of patients returning for a second FV application within 12 months are presented in Table 2. Of the 8 practices which could not monitor FV application, 2 estimated about 90% of patients returned for a second FV application and 2 gave estimates under 50%: 10% and 30%.

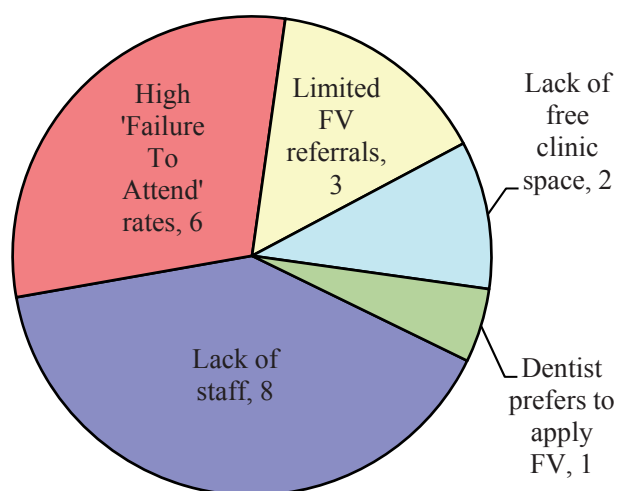
The nurses were asked if that had any difficulties or issues which prevented or reduced the FV applications that they undertake, 18 said 'yes'. The main reasons were staffing which included a lack of staff to cover existing nursing duties and high 'failure to attend' rates (Figure 2).

Challenges addressed

These initial results suggest that training dental nurses to apply FV can increase the number of applications made. However, it should be noted that the overall claims for FV applications on children was low, especially considering the evidence based guidelines which stated (BASCD / DH, 2009): (PHE and BASCD, 2014):

All children over the age of 3: Apply fluoride varnish to teeth twice yearly (2.2% F).

An FV application is an income generating FP17 item which should not damage the revenue flow into dental practices, therefore each patient should be offered such a service as the evidence base indicated that appropriate applications can reduce caries (Marinho *et al.*, 2007). Trained DNASs reported that 55% of other dental care professionals (DCPs) were applying FV in practice, versus 45% of dentists. The variation to which team members applied FV in practice was linked to barriers such as a 'lack of staff', these included a lack of administration and nursing staff. Staffing may always be an issue, especially in small practices. It is to be anticipated that preventive care is present within any dental service, regardless of team size, using the skill mix to its full potential may facilitate FV applications being undertaken.

**Figure 2.** Distribution of responses to the question: Difficulties or issues that have prevented or reduced the number of FV applications you undertake? (multiple responses possible)

High 'failure to attend' rates were also cited as a possible barrier to applying FV. Dental practices, as well as many other healthcare organisations, suffer from patients failing appointments. It is inconvenient for staff and costs the practice valuable time and resources.

Future implications

The reorganisation of the structure of the NHS in England in April 2013 (DH, 2010) meant that training in prevention and the application of FV ceased to be delivered by NHS Bradford and Airedale. DNs can still access a variety of FV and prevention courses, though access to them may be limited. Organisations such as Health Education England or the Primary Care Contracting 'Making Prevention Work in Practice' courses may pick up training needs in future. Currently there is a disparity in training in some areas and this could have implications for the delivery of particular preventive programmes, such as community based FV schemes, in some areas. The gap has been acknowledged by the Public Health England North of England Dental Public Health network, along with the need to ensure robust, evidence-based courses are available that meet the requirements of the oral health improvement programmes, regardless of the setting.

Other implications for providing robust, quality training is the advent of direct access which gives patients the choice to see DCPs who are trained, competent and indemnified, without first seeing a dentist and without a prescription (GDC, 2013). Dental nurses can see patients directly if they are taking part in structured programmes which provide dental public health interventions such as applying FV.

Learning points

Training nurses in prevention and the application of FV can increase applications and therefore may have a positive impact on the prevention of caries. There is a need to review the availability and the content of current and future courses that are available for dental care professionals to ensure that the best quality courses are training dental teams to provide preventive care.

Dental public health practitioners have a role in leadership and supporting partnership working with Health Education England, including the decision making, planning and delivery of local courses. This would include engaging with NHS England, Local Dental Networks, Local Dental Committees and the wider dental community to support re-orientation of practices towards prevention. DPH practitioners and their team have the necessary knowledge, skills and experience to support local training, assessment processes and quality assure courses.

It is hoped that the reformed dental contract will facilitate improvements in preventive care through a business model that incorporates and encourages the delivery of initiatives such as the one outlined in this paper.

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