Use of the theoretical domains framework to further understanding of what influences application of fluoride varnish to children's teeth: a national survey of general dental practitioners in Scotland.

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Running head: fluoride varnish application in GDP, Scotland

Abstract

Objectives

Despite recent improvements in the oral health of Scotland's population, the persistence of childhood dental caries underscores a need to reduce the disease burden experienced by children living in Scotland. Application of fluoride varnish (FV) to children's teeth provides an evidence-based approach to achieving this goal. Despite policy, health service targets and professional recommendations supporting application, not all children receive FV in line with guidance. The objective of this study was to use the theoretical domains framework (TDF) to further an understanding of what may influence fluoride varnish application (FVA) in General Dental Practice in Scotland.

Methods

A postal questionnaire assessing current behaviour (frequency of FVA) and theoretical domains (TDs) was sent to all General Dental Practitioners (GDPs) in Scotland. Correlations and linear regression models were used to examine the association between FVA and the TDs.

Results

One thousand and ninety (53.6%) eligible GDPs responded. Respondents reported applying FV more frequently to increased risk and younger children (aged 2 to 5 years). Higher scores in eight TDs (Knowledge, Social/professional role and identity, Beliefs about consequences, Motivation and goals, Environmental context and resources, Social influences, Emotion, and Behavioural regulation) were associated

with greater frequency of FVA. Four beliefs in particular appear to be driving GDPs decision to apply FV (recognising that FVA is a guideline recommended behaviour (Knowledge); that FVA is perceived as an important part of the GDPs professional role (Professional role/identity), that FV is something parents want for their children (Social influences) and that FV is something GDPs really wanted to do (Emotion).

Conclusions

The findings of this study support the use of the TDF as a tool to understand GDPs application of FV, and suggest that a multi-faceted intervention, targeting, dental professionals and families, and more specifically those domains and items associated with FVA may have the greatest likelihood of influencing the evidence-based behaviour.

Keywords

Evidence-based practice; evidence-based dentistry; theoretical domains framework (TDF); theory-based intervention; behaviour change; fluoride varnish; oral health; dental caries; Scotland; Childsmile

Introduction

Although preventable, dental caries is the most common chronic disease of childhood and a costly global public health problem(1, 2). Dental caries can severely impact on children's eating and social behaviour, their general health, well-being, and quality of life (3-5). In Scotland, oral health disorders are the most common reason for elective general anaesthesia for children, with all of its risks, accounting for over 10,000 episodes annually(6).

The extent of the caries problem for children in Scotland has led to successive government administrations viewing the improvement of children's oral health as a priority. In 2005, the Scottish Executive published its 'Action Plan for Improving Oral Health and Modernising Dental Services in Scotland'(7) which launched a national child oral health programme known as 'Childsmile'. Childsmile aims to improve the oral health of Scotland's children through a comprehensive, longitudinal, pathway of care, delivered in clinical and community settings, and is designed to shift practice towards preventive care (8). While there is evidence that investment has resulted in improvement in the oral health of children residing in Scotland, there is scope for further improvement, particularly a reduction in inequalities(9).

This paper focuses on the application of Fluoride Varnish (FV) to children's teeth, a key component of Childsmile's intervention strategy. There is considerable evidence that fluoride varnish application (FVA) can help prevent tooth decay when used in combination with regular brushing with fluoride toothpaste(10-12). The Scottish

Dental Clinical Effectiveness Programme (SDCEP) guidelines state that varnish should be applied at least twice a year to the teeth of all children over two years of age(13) and at the time of study Childsmile practices were remunerated for doing so.

The importance of FVA for children has recently been highlighted by a dedicated Scottish Government Health Improvement, Efficiency, Access to Services and Treatment (HEAT)Target (at least 60% of 3 and 4 year old children in each Scottish Index of Multiple Deprivation (SIMD) quintile to receive at least two applications of FV per year by March 2014)(14).

Despite the weight of evidence and professional guidance advising dental practitioners to deliver FV, there is evidence to suggest that FV is not being applied to children's teeth to the extent advocated in the SDCEP guidelines. Limited delivery of preventive dental care to children registered with an NHS dentist in Scotland under the capitation system has been reported(15), a survey undertaken by the Translational Research in a Dental Setting (TRiaDS) programme has indicated that a significant gap exists between optimal and actual practice for the prevention of child caries with only 10% of GDPs reporting 'always' applying FV to their child patients teeth (16), and Childsmile's national monitoring data showed that during the financial year 2010/2011, while 59% of children attending the 320 Childsmile practices received one FVA, only 8% received two applications(17).

The aim of this study is to further understand which factors may influence GDPs in Scotland to apply FV to their child patients' teeth in keeping with current evidence

and professional guidelines. The intention is to inform the development of an intervention to encourage the implementation of this evidence-based behaviour. The theoretical domains framework (TDF) is a method of comprehensively identifying perceived psychological and organisational factors that may influence the implementation of evidence-based behaviour by health professionals(18-21). A growing body of evidence suggests that the TDF is an appropriate way of understanding the behaviour of healthcare professionals (20-22), that its' use may prompt the identification of barriers that would not otherwise be reported(23) and that theory-based interventions are more effective than those based on practitioner or researcher intuition (19, 20). The TDF covers a range of domains known to be relevant to professional behaviour change and so provides a means for more evidence-based selection from the large number of theories of individual and organisational behaviour change that exist (18, 24). Given that little is currently known about the factors that influence FVA, using the TDF as a framework for understanding FVA was considered an appropriate way to achieve the aims of this study.

Materials and Methods

Design and participants

A cross-sectional survey was undertaken with demographics, theoretical domains (TDs) and outcome (FVA) measured via postal questionnaire. All active GDPs (working in the NHS salaried dental service (SDS) and non-salaried General Dental Service (GDS) defined as those who had submitted a payment claim for dental

services to Practitioner Services Division, NHS National Services Scotland (NSS) in the six months prior to survey were eligible to participate (N=2526).

Measures

The questionnaire used to measure all study variables is available (Additional File 1).

Outcome measure (self-reported frequency of FVA):

The frequency of FV application to child patients (≤17 years) by GDPs was measured using a Likert type scale (never, at very few appointments, at some appointments, at most appointments, at every appointment), for clinically relevant age groups: 2-5 years; 6-12 years and 13-17 years, respectively; and for two categories of caries risk delineated in relevant professional guidance: standard and increased.

Theoretical domains:

Nine TDs were assessed: Knowledge, Skills, Social/professional role and identity, Beliefs about consequences, Motivation and goals (intention), Environmental context and resources, Social influences (norms), Emotion and Behavioural regulation. The items comprising each domain are presented in Additional File 2.

Demographics:

Role: measured on a categorical scale (principal, associate, salaried, locum, vocational trainee)

Setting: a categorical measure indicating where the respondent worked (GDS, SDS, Community Dental Service) or a combination of settings.

CS Practice: a dichotomous measure of whether respondents currently worked in a Childsmile Practice or not.

Length of time practicing: an interval measure (in years).

Six additional measures were obtained from the Management Information Dental Accounting System Database (MIDAS), NHS Scotland Information Services Division(ISD) for all eligible GDPs: gender, age(in years), time since qualified (in years), salaried or non-salaried practice, childsmile or non-childsmile practice and national SIMD of Practice (quintile 1 to 5). Age, gender and national SIMD were not available from the questionnaire. The other measures were obtained in order to compare responder and non-responder characteristics.

Procedure

Questionnaire design and development

The TDF protocol suggests that an expert group determine which domains should be assessed for the behaviour being studied. An expert group consisting of health psychologists (including a member of the original TDF development panel) and other behavioural experts, clinicians, dental public health specialists, health services researchers, Childsmile proponents, policy makers and those involved in the development of clinical oral health guidelines, all with expertise in the implementation of evidence-based dental behaviour was convened to develop the survey instrument.

The expert group identified nine domains which may be appropriate to FVA, and a consensus was reached on appropriate questionnaire items assessing those domains, as well as on other items which may influence FVA decision-making (age of child, risk status of the child and whether the practice was a Childsmile Practice) and the behavioural outcome measure (FVA). The questionnaire was piloted by a convenience sample of eight GDPs. Minor modifications ensured clarity of wording, and appropriate structure and length.

Survey administration

Information Services Division, NSS (ISD) provided a list of eligible dental practitioners and their contact details. Practitioners undertaking only orthodontic, or emergency work, along with those practitioners whose list numbers were classified as temporary or locum were excluded.

Questionnaires for the first sweep of this survey were sent out on 2nd August 2011. This was followed by two subsequent postal follow-ups for non-responders (both including new questionnaires in the mailing). Practices with non-responders were contacted by telephone between mailings 2 and 3 to confirm contact details and encourage participation. Nearly all completed questionnaires were received by 31st October 2011 (11 were received after this date).

Statistical analyses

A 10% random sample was double entered to identify any systematic data entry errors. All statistical analyses were carried out in Stata IC (StataCorp, V10). Descriptive summaries (means and standard deviations (medians and Q1 and Q3 if

skewed) and proportions of the outcome variables, demographic characteristics and TDs were produced. Chi-squares and independent t-tests were used to examine differences between responders and non-responders. Items comprising each domain were scored positively, summed and an average 'domain score' calculated for each respondent. An estimate of internal consistency (Cronbach's alpha) was calculated for each domain.

Univariable linear regression models were used to examine the association between FVA and the nine TDs, using the **cluster** command in Stata, which adjusted the standard error of the estimates for the clustering of dentists' responses (3 age groups and 2 risk categories). In order to identify those domains that were most strongly and independently associated with FVA, multivariable linear regression models were then run. In a final step, individual items that made up the domains independently associated with FVA were included in a multivariable linear regression model. Regressions were run using a stepwise variable selection method with a strict $p<0.001$ for model entry. *A priori*, age of the child, child's caries risk and whether the practitioner was working in a Childsmile practice or not were included in all multivariable models to account for the potential mediating effect of these variables on the relationship between the TDs and FVA.

Ethical review

The West of Scotland Research Ethics Service advised that under the terms of the governance arrangements for research ethics committees in the United Kingdom NHS ethical review was not required. Glasgow University Medical Faculty Ethics

committee approved the evaluation of Childsmile of which this study comprises one component. NHS clinical governance approval was obtained.

Results

The study population

Of the 2526 surveys sent out to the generated list of GDPs, 491 were subsequently identified as being ineligible (64 letters were returned unopened in the mail, 41 practitioners did not treat children, 16 practitioners were on maternity leave, 11 had retired and 8 were oral surgeons). Eight GDPs refused to take part and 937 surveys were unreturned. This resulted in a total of 1090 respondents (53.6% response rate). The majority of responders worked in the GDS (89.5%). Over half (51.7%) described themselves as associate dentists, and 38.6% principal dentists. There was an almost even split between those who worked in a CS practice and those who did not. Over half the sample (53%) was male, with a median age of 39 years and median length of time practicing of 15 years. Almost half (48.4%) of respondents worked in a practice within one of the two most deprived SIMD quintiles. Respondent characteristics are presented in Table 1.

There was a higher response from salaried practices (95.4% compared to 51.2% GDS: X^2=81.09, df=1, p<0.001); Childsmile practices (57.6% compared to 51.1% in non-Childsmile practices: X^2=8.278,df=1, p<0.001); females (60.9% compared to 48.2% of males: X^2=31.010, df=1 p<0.001). Younger dentists [Mean=39.91 (SD=8.78) years for responders compared to Mean=41.5 (SD=9.81) years for non-responders: t=-3.361, df=1978, p<0.001] and those who had qualified more recently

[Mean=8.38 (SD=8.78) years since qualifying for responders and Mean=9.81 (SD=9.81) years since qualifying for non-responders: t=-3.522, df=1978, p<0.001] were also significantly more likely to respond although group means did not differ greatly.

Behavioural outcome (FVA)

The frequency with which GDPs applied FV to their child patients is shown in Figure 1, according to age group and caries risk. Overall, a higher percentage of GDPs applied FV to children considered to be at increased risk of caries at all ages than those considered to be at standard risk. For both categories of caries risk, younger children were more likely to have FV applied at *most* or *every* appointment.

Theoretical domains associated with behavioural outcome (FVA)

Table 2 shows the internal consistency and descriptive statistics for each domain. Cronbach's alphas ranged from 0.71 to 0.92, indicating high internal reliability of the measures. Controlling for age of child, caries risk status of child and whether respondents worked in a Childsmile practice, the TDs univariably associated with frequency of FVA were: Knowledge, Social/professional role and identity, Beliefs about consequences, Motivation and goals, Environmental context and resources, Social Influences, Emotion and Behavioural regulation (Table 2). Increased scores on all TDs were associated with increased frequency of FVA, independent of age, caries risk category or Childsmile practice status.

Using a stepwise regression model, controlling for age, caries risk category and Childsmile practice status, the TDs that emerged as being independently associated

with frequency of FVA were: Knowledge, Social/professional role and identity, Social influences and Emotion (Table 3). Thirty-two percent of the variation in the outcome variable was explained by these four TDs.

The four salient domains for the multivariable analysis were then deconstructed back into items, and the scores on the individual items offered to a multivariable regression model with age group, caries risk category and Childsmile practice status, in order to identify key domain drivers. Table 4 presents the results of the item-based analysis. Four items (each from a different domain) were independently associated with FVA (in order of significance): Applying fluoride at least twice yearly to my child patients is: an important part of my professional role (Social/professional role and identity); what parents want for their children (Social influences); is something I really want to do (Emotion) and is advocated in current guidelines (Knowledge).

Discussion

The aim of this study was to further an understanding of the factors which influence GDPs decision to apply FV to patients aged 17 years and under in Scotland. The results provided evidence that GDPs are not applying FVA as often as guidance advocates. Dentists were statistically more likely to report applying FV more frequently to the teeth of younger children (2 to 5 year olds) and for increased risk children in all age groups. While guidance recommends additional FVAs for increased risk children, the findings suggest that FV may be being under-applied particularly for children who are older and those at standard risk. This fits with a

recent ISD report covering the period from 1st April 2011 to 31st March 2012 which indicated that only 25% of 3 year olds and 36% of 4 year olds residing in the most deprived SIMD quintile received two or more FVAs during this period, reducing to just 6% of both 3 and 4 year olds in the most affluent SIMD quintile and that GDPs more often apply varnish to patients deemed to be at increased risk (25).

The results of this study suggest that the TDF could be successfully applied to identifying factors that may influence FVA. Eight of nine measured domains were positively associated with frequency of FVA. The likelihood of a decision in favour of application of FV increased with: awareness of relevant clinical guidelines, belief that applying varnish was part of their role, belief that it would have positive (and not negative) consequences (for themselves/their practice and patients), motivation to perform the behaviour, a non-prohibitive practice environment, parents' and professionals' support of FVA, positive emotional reinforcement and having a prior action plan to apply varnish. The only domain not independently associated with FVA was 'skills'. This intuitively makes sense since applying FVA is not a highly skilled or difficult procedure for GDPs.

While the statistically significant associations between individual domains and the behavioural outcome were 'moderate' to 'weak', identifying the direction in which domains were associated with FVA, affords the potential for developing a tailored, theory-based intervention (26). The analyses revealed that the main domains driving GDPs' decision to apply varnish were Knowledge, Social/professional role and identity, Social influences and Emotion. Within these domains four items drove FVA. These were FVA being perceived as: advocated in current guidelines; an important

part of the GDPs professional role; something parents want for their children and something GDPs really wanted to do. In combination these domains explained over a third of the variance in GDPs application of FV.

The results suggest that increasing awareness of the guidance may encourage dentists to comply in terms of FVA. This is in keeping with the reality that implementation of any evidence-based practice commonly entails various methods of increasing knowledge(27). However, it is in contrast to a number of recent studies exploring similar evidence-based preventative behaviours advocated in guidance for GDPs, including the placement of fissure sealants(27) and taking intra-oral radiographs(28) where knowledge of relevant guidelines did not predict behaviour. Nonetheless, it is well documented that a substantive gap exists between what is known about how to improve health and what is actually done to improve health(29). Evidence shows that the passive distribution of guidance alone is unlikely to result in uptake of desired behaviours by health professionals (30).

That more frequent FVA was associated with GDPs' perception that this was an important part of their professional role suggests the need to support a cultural shift from reactive management to preventative treatment for GDPs. This may suggest an important role for undergraduate and postgraduate dental education and continuing professional development. Whether a behaviour is viewed as part of a professional's role or identity has been found to be an influential domain in several studies that have employed the TDF (23, 31, 32).

The strong influence of GDP's perceptions of whether parents' want their children to receive FV suggests that influencing this clinical behaviour may require interventions aimed at both parents (increasing knowledge, positive attitude toward FV) and/or dental professionals. It may be that raising parental expectations that FVA should be a part of routine care for their child is sufficient to influence GDPs behaviour. That decisions to deliver care are influenced by team members and patients relatives' views has been demonstrated for a range of professional behaviours (23, 31-34).

Additionally, 'whether dentists wanted to apply FV' was independently associated with frequency of FVA independently of other domains hypothesised to drive the behaviour. This suggests that whether dentists have a positive emotional response to FVA influences frequency of FVA. Further research would be required to facilitate understanding of how emotion is driving the decision to apply FV.

Finally, in light of several studies highlighting the importance of the domain 'Beliefs about consequences'(31-34) in influencing professional behaviour and more specifically, studies which have demonstrated the influence of remuneration on dentists' behaviour(35-37), it is perhaps surprising that anticipated outcomes (including financial reward) was not independently associated with frequency of FVA in this study.

This study has a number of strengths, not least that a national census of GDPs comprised the population for this study, and the resultant sample size. The response rate obtained was favourable when compared with several contemporary

behavioural surveys of GDPs which achieved returns ranging from 29% to 45%(16, 27, 38) and use of the TDF as a self-completion questionnaire is novel.

However, notwithstanding these strengths a number of potential limitations merit consideration. Despite a relatively good response rate, our sample may have favoured those dentists who were more likely to apply FV, for example those incentivised through Childsmile payments or working in the SDS. Nonetheless, the relatively low reported rates of FVA among those who responded suggests that our sample was not restricted to enthusiastic dentists who ‘always’ apply FV to the teeth of their child patients in line with current guidelines.

Another potential limitation is in the self-reported nature of the behavioural measure comprising the main study outcome (FVA). At the time of study, it was not possible to obtain an objective measure of FVA for all GDPs through national dental accounting systems as FVA came under a general capitation fee for all but Childsmile dentists. However, the majority of TDF studies have been based on self-reported measures of behaviour.

Additionally, although the internal consistency of domain scales was high, the allocation of items to individual domains may elicit theoretical debate reflecting the consensual and heterogeneous nature of the TDF. This has been discussed elsewhere (22). With cautious interpretation the descriptive and integrative nature of domains does not detract from the utility of the approach. However, there may be benefit to undertaking further qualitative work to further explicate the influence of domains found in this study and the interactions between them in particular contexts

arising in dental practice. This work could usefully gather the view of families in addition to dental professionals.

Nonetheless, the effectiveness of an evidence-based intervention developed in a theoretical way using the results from this study, could be tested through a randomised controlled trial. This approach is in keeping with influential guidance on the development and evaluation of complex interventions which clearly advocates the use of theory in intervention development (39).

Conclusion

This study has added to a growing body of literature which supports the use of the TDF in understanding clinical behaviour, and explored an evidence-based behaviour which, to date, has received limited investigation with regard to the factors that influence its delivery. The results underscore the need to further intervene to increase the frequency with which dental professionals practicing in Scotland apply FV in line with clinical guidelines and provide the basis for an evidenced way forward in terms of planning a theoretically guided intervention to improve patient's access to appropriate preventative care. Results suggest that a multi-faceted intervention which specifically targets GDPs knowledge of the guidance, along with their beliefs that FVA is something they have a responsibility to provide and which raises parental

expectations with regard to their child's receipt of varnish is likely to have the greatest influence on GDPs compliance with recommendations.

List of abbreviations used.

FV	Fluoride varnish
FVA(s)	Fluoride varnish application (s)
SDCEP	Scottish Dental Clinical Effectiveness Programme
SIMD	Scottish Index of Multiple Deprivation
GDP(s)	General dental practitioner(s)
TDF	Theoretical Domains Framework
TD(s)	Theoretical Domains(s)
GDS	General Dental Service
SDS	Salaried Dental Service
MIDAS	Management Information Dental Accounting System Database
ISD	Information Services Division. National Services Scotland

Competing interests

The authors have no competing interests to declare.

Authors' contributions

LM and DC conceived of the study. All authors contributed to study design. DB and WG developed the survey instruments. SS and WG administered the survey. AS conducted the statistical analysis. DB and WG interpreted the results. WG and AS drafted the manuscript and all authors discussed content, commented on drafts and approved the final version.

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All authors except DB are based at the Community Oral Health Section at the University of Glasgow's Dental School. WG is a research fellow in Dental Public Health and Evaluation, AS is a senior lecturer in Statistics, SS is a research associate, DC is a clinical senior lecturer in Dental Public Health and LM is a professor of Dental Public Health. All authors based at Glasgow University are members of a larger evaluation team funded to undertake a comprehensive evaluation of Childsmile. DB is a senior research fellow in the Dental Health Services Research Unit at the University of Dundee.

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Tables

Table 1: Characteristics of responders*

	N=1090
	% (n)
How would you describe yourself?	
Principal dentist	38.6 (421)
Associate dentist	51.7 (564)
Salaried dentist	9.3 (101)
Vocational Trainee	0.2 (2)
Associate and Salaried	0.1 (1)
Missing	0.1 (1)
In which setting do you work?	
GDS	89.5 (976)
CDS	1 (11)
SGSD	7.0 (76)
Other (combination of above)	2.4 (26)
Missing	0.1 (1)
Currently working at a Childsmile practice?	
No	51.1 (557)
Yes	48.1 (524)
Missing	0.9 (9)
Length of time practicing (years)	
Median [Q1, Q3]	15 [6, 25]
Range	1 to 46
Mean (SD)	16.4 (10.6)
Missing	17
Gender	
Male	52.8 (559)
Female	47.2 (500)
Missing	31
Age (years)	
Median [Q1, Q3]	39 [30,49]
Range	23 to 67
Mean (SD)	39.9(10.6)
Missing	31
SIMD of practice (national)	
1 (Most deprived quintile)	21.4 (226)

2	27.0 (285)
3	20.2 (214)
4	15.0 (159)
5 (Least deprived quintile)	16.4 (173)
Missing	33

*Variables are self-reported from the study survey with the exception of gender, age and SIMD of practice which were extracted from the Management Information Dental Accounting System Database (MIDAS), Information Services Division, National Services Scotland (ISD) at the end of March 2011.

Table 2: Descriptive statistics for theoretical domains and correlation coefficients for frequency of fluoride varnish application.

Theoretical domain*	Alpha	Range	Mean (SD)	Pearson's r	p
Knowledge	na	1 to 7	5.33 (1.51)	0.29	<0.001
Skills	na	1 to 7	5.08 (1.91)	-0.04	0.001
Social/professional role and identity	0.895	1 to 7	4.86 (1.34)	0.41	<0.001
Beliefs about consequences	0.920	1.66 to 7	5.01 (0.91)	0.40	<0.001
Motivation	na	1 to 7	5.07 (1.79)	0.28	<0.001
Environmental context and resources	0.911	1 to 7	4.74 (1.79)	0.21	<0.001
Social influences	0.862	1 to 7	4.19 (1.20)	0.35	<0.001
Emotion	na	1 to 7	4.79 (1.78)	0.37	<0.001
Behavioural regulation	na	1 to 7	4.86 (1.79)	0.23	<0.001

Table 3: Results of the explorative stepwise regression analyses including all domains associated with fluoride varnish application*.

Outcome: frequency of fluoride varnish application		Adjusted β [95% CI]	Adj R^2	df	F	p
Knowledge, Skills, Social/professional role and identity, Beliefs about consequences, Motivation, Environmental context and resources, Social influences, Emotion, Behavioural regulation	Knowledge	0.08 [0.03 to 0.12]				
	Social/ Professional role	0.13 [0.07 to 0.18]				
	Social Influences	0.12 [0.07 to 0.18]				
	Emotion	0.10 [0.06 to 0.15]				
			0.32	8, 874	295.33	<0.0001

*Adjusted for age of child, risk status of child and whether a CS Practice –based on p<0.001 for inclusion.

Table 4: Results of regression analyses including all individual items from domains independently associated with fluoride varnish application.

Outcome: Frequency of fluoride varnish application		Adjusted β [95% CI]	Adj R^2	df	F	p
Social/professional role and identity: Important part of my professional role; Important part of professional role of other members of team; Is my responsibility to ensure is provided	Important part of my professional role	0.17 [0.13 to 0.21]				
Social influences: Is not supported by colleagues in practice; Is something that children I see want; Is something that parents I see want for their children	What parents want for their children	0.08 [0.05 to 0.11]				
Emotion: Is something I really want to do	I really want to do	0.07 [0.03 to 0.10]				
Knowledge: Is advocated within current clinical guidelines	Advocated in current guidelines	0.08 [0.04 to 0.12]				
			0.34	8,1025	341.2	<0.001

*Adjusted for age of child, risk status of child and whether a CS Practice –based on p<0.001 for inclusion.

Figures (.pdf)

Figure 1: Frequency of Fluoride Varnish Application by age of child and caries risk status

Additional files (.pdf)

Additional File 1: Survey questionnaire

Additional File 2: Item composition of theoretical domain scales