

The INCENTIVE Study: a mixed methods evaluation of an innovation in commissioning and delivery of primary dental care compared to traditional dental contracting.

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SCIENTIFIC SUMMARY (2395 WORDS)

Background

Commissioning of primary care dentistry in the NHS has seen contract currency evolving from payment for units of dental activity towards incentive-driven or blended contracts that include incentives linked with key performance indicators such as access, quality and improved health outcome. There is limited evidence on the impact of these changes in dental oral health outcomes and patient, commissioner and workforce acceptability.

Objectives

The aim of this study was to evaluate a blended/incentive-driven model of dental service provision. To:

1. Explore stakeholder perspectives of the new service delivery model
2. Assess the effectiveness of the new service delivery model in reducing the risk of and amount of dental disease and enhancing oral health related quality of life in patients
3. Assess cost effectiveness of the new service delivery model

The intervention

In the UK, current dental contracts are based on payment for units of dental activity. The new blended/incentive-driven contract and service delivery model evaluated here is based on contracts incentivising quality and oral health improvement in addition to units of dental activity. Sixty per cent of the contract value is apportioned to delivery of a set number of units of dental activity. The remaining 40% is dependent on the delivery of quality (systems, processes, infrastructure 20% and oral health improvement 20%). The blended/incentive-driven contracts are aimed at: ensuring evidence-based preventive interventions are delivered in line with identified needs for a defined population; increased access to dentistry; that care is provided by the most appropriate team member to encourage skill mix. The new contract was designed to encourage a care pathway approach in which all patients have an Oral Health Assessment on joining the practice and at each subsequent recall. Four sets of information (age group, medical history, social history (self-care, habits/diet) and clinical assessment) are used to inform a traffic-light system for patients with high (red), medium (amber) or low (green) risk of oral disease.

Methods

Using a mixed methods approach the study included three dental practices working under the blended/incentive-driven (INCENTIVE) contract and three working under the units of dental activity (TRADITIONAL) contract. TRADITIONAL practices, included in the study as comparators, were matched with INCENTIVE practices by deprivation index, age profile, size of practice and ethnicity. All practices were based in West Yorkshire.

Qualitative study

Objective 1 uses focus groups and semi-structured interviews, supplemented with observations of dental appointments of the delivery of dental care in the INCENTIVE practices and TRADITIONAL practices. Purposive sampling via a sampling matrix supported recruitment of participants with different experiences of the model. The three stakeholders groups were lay people (patients and individuals without a dentist), dental teams and service commissioners. Interviews and focus groups followed a topic guide, partly informed by Andersen's Behavioural model of access but supplemented with themes that emerged from the observations and previous interviews. Interviews with dental team members took place at the dental surgery, those with patients took place in patients' homes. All were recorded and transcribed verbatim.

Effectiveness study

A non-randomised study design compares effectiveness (Objective 2) and cost effectiveness (Objective 3) of INCENTIVE practices compared with the TRADITIONAL practices. The primary outcome was the percentage of points bleeding on probing (BoP). Secondary outcomes were: percentage of sound surfaces, percentage of extracted and filled teeth and oral health related quality of life (OHIP-14 total score). Exploratory analysis was undertaken of the traffic-light risk assessment system.

Sample size was powered using BoP. We estimated the standard deviation in percentage sites BoP across a UK cohort to be 27.5%, assuming a within-patient correlation in baseline to follow percentage sites BoP of 0.5 and a common variance in practices. We assumed a clinically meaningful mean difference in percentage sites BoP baseline to follow up in INCENTIVE practices of 10%, versus a mean difference in percentage sites BoP baseline to follow up in TRADITIONAL practices of 0%. We fixed a Type I error rate of 0.05 and a power of 0.8. A design effect was included to account for clustering of patients within INCENTIVE and TRADITIONAL practices, assuming an intra-cluster correlation of 0.2.

A two-sided two independent samples t-test identified a total of 550 patients to be recruited (allowing for a 10% loss to follow up).

Multiple linear regression was used to model the primary and secondary outcome measures. Given the reduced sample size due to loss to follow up, to improve power, we use an analysis of covariance approach with follow up measurement as the outcome and baseline measurement as a covariate. We first analyse the matched pairs separately before combining in a single analysis. Due to reduced sample size and staff turnover, we have not been able to include practitioner level variables in our analyses.

Cost effectiveness study

Within Objective 3, primary analyses take the perspective of the commissioners of the service (contractual payments). Secondary analysis takes the perspective of the service provider including the cost of dental practitioners' time and treatment materials. The price year is 2012. A discounting rate of 3.5% was used for costs and outcomes.

The analyses used the incremental cost per unit change in OHIP-14 score and the cost per quality adjusted life year (QALY) (derived from the EQ-5D-3L). Incremental cost effectiveness ratios are presented together with cost-effectiveness plane scatterplots showing the uncertainty surrounding the estimates and cost-effectiveness acceptability curves to illustrate the probability that each treatment would be cost-effective given a range of acceptable threshold values. Sensitivity analyses were further carried out to account for uncertainty in the cost values.

For the quantitative studies missing data for the OHIP-14 was imputed use median imputation if 2 or less OHIP-14 item scores are missing. Participants who had more than 2 components of the OHIP-14 missing or missing EQ-5D-3L at baseline and follow-up are excluded from the analysis.

Inclusion criteria and timing of assessments

The inclusion criteria for the quantitative studies were: patients aged 16 years and over, willing to be followed up for 24 months and give informed consent, a *new* patient to the dental practice and able to complete the patient questionnaires. All new patients attending the practice for the first time were invited to participate. Patients were asked to complete the OHIP-14 and EQ-5D-3L at their first visits and at the follow-up visit 24 months later. The dentist undertook the clinical assessment of teeth and gingivae using the International Caries Detection and Assessment System instrument (ICDAS) and BoP at both visits. Family/social history was taken at the first visit only. The oral health assessment, using the traffic light system was completed at baseline and 24 months by INCENTIVE practices. Appointment and treatment history were collected retrospectively using patients' dental records held at the practices.

Patients were contacted by the dental practice 6-8 weeks prior to their 24 months follow up date to arrange an appointment by way of telephone, SMS and letter in order to optimise follow up. Patients were contacted a minimum of three times to arrange the appointment.

Ethical approval

Ethical approval was received from Bromley REC reference number 12/LO/0205 on 5th April 2012. The study was sponsored by the University of Leeds.

Results

Qualitative study

Observations were made of 30 dental appointments. Eighteen lay people, 15 dental team staff and a member of the commissioning team took part in the interviews and focus groups. Data were collected between August 2012 and February 2014.

We found perceptions that the blended/incentive-driven contract increased access to dental care, with the contract determining dentists' and patients' perceptions of need, their behaviours, evaluated and subjective health outcomes and patient satisfaction. These outcomes were then seen to feed back to shape people's predispositions to visit the dentist.

The data hint at appreciable challenges related to a general refocussing of care and especially to perceptions about preventive dentistry and use of the risk assessments and care pathways. There are also obstacles to overcome to realise any benefits of the greater deployment of skill mix.

The ratings from the oral health assessments were seen to influence patients' perceptions of need, which led to changes in preventive behaviour. There was evidence that dentists' behaviours had responded to the contract in the desired direction with greater emphasis on prevention, use of the ratings in treatment planning, adherence to the pathways and the utilisation of skill-mix. Participants identified increases in the capacity of practices to deliver more care as a result. These changes were seen to improve evaluated and perceived health and patient satisfaction.

Effectiveness study

Within the quantitative studies recruitment started on 1st June 2012 (the first patient entered the study on 14th June 2012). Recruitment finished on 31st January 2013. 550 participants were recruited to the study at baseline. However, only 291 participants attended a follow up appointment at 24 months. Although there are no statistically significant differences in age, gender or ethnicity between those who included in these analyses and those lost to follow up, those who are lost to follow up are generally younger and more likely to be male. Additionally those lost to follow up have worse oral health although this is more variable (a higher mean and standard deviation).

Of the 550 recruited, 529 had a BoP measure at baseline but only 270 had a BoP at both time periods. Following quality assurance 188 were included in the BoP analysis (n=90 INCENTIVE, n=98 TRADITIONAL practice). For BoP pooled across practices, a 95% CI for the effect size was (3.23%, 17.25%) indicating a positive effect for INCENTIVE but with considerable uncertainty in magnitude. For Sound Surfaces (n=187) (defined as caries-free and initial caries ICDAS codes 1 and 2), TRADITIONAL practices had a higher proportion of Sound Surfaces at follow up (4.68%) – although two of the pairings had a non-significant difference between Sound Surfaces. Overall TRADITIONAL practices had a higher follow up OHIP-14 score (n=176) by 3.5 indicating worse oral health related quality of life. Again for two of the three pairings there was no significant difference. For the oral health assessment (INCENTIVE practices only), for those who attended both baseline and follow up (n=111) there was an improvement with 68% red at baseline and 44% red at follow up.

Cost effectiveness

Two hundred and ten of those patients were included in the analyses. Patients in INCENTIVE practices had more appointments on average than those in TRADITIONAL practices (8.89 vs. 6.63). This is slightly higher than patients who were lost to follow (and for who we had appointment data). For the loss to follow up group the average number of dental appointments per person was 7.97 (SD 5.34; n=152) for the INCENTIVE practices and 4.99 (SD 3.53; n=131) for the TRADITIONAL practices.

The INCENTIVE arm attracted a higher cost for the service commissioner (mean per person cost of £459.77 vs. £281.57). INCENTIVE contracts were financially attractive for the dental provider at the practice level (costs less contractual payments equated to a mean per person cost of £-209.26 vs. £-116.21). The mean OHIP-14 scores were 7.11 vs. 8.00 for the INCENTIVE and TRADITIONAL practices respectively. The incremental cost effectiveness ratio using the OHIP-14 from the commissioner's perspective was £199.22 (indicating a cost of £199.22 for an increase of one in the OHIP-14 score); from the service provider perspective INCENTIVE dominates TRADITIONAL (less costly, better mean outcomes). The incremental cost effectiveness ratios using the QALYs from the commissioner's perspective show INCENTIVE to be dominated (more costly, lower mean QALY) and for the service providers perspective incremental cost effectiveness ratio=£122,089.48 (indicating a cost of £122,089.48 for an increase of 1 QALY).

Patient Public Involvement (PPI)

Patient contributors were integral members of the research team from conception of the research through input in: the research and design questions, the ethics application including patient information sheets and as members of our advisory group. They ensured our research was of relevance to patients and the NHS and would contribute to shape and improve reform of the dental contract to maximise a service designed to address patient needs in terms of improved oral health outcome through a paradigm shift from restorative to preventative oral health care and access to NHS services.

Conclusions

The blended/incentive driven contracts were perceived to increase access to dental care, with the contract determining dentists' and patients' perceptions of need, their behaviours, evaluated and subjective health outcomes and patient satisfaction. Whilst the results of the quantitative analysis were mixed and should be treated with caution given the high loss to follow up, the study findings have implications for both practice and future work in assessing these types of contract.

A large proportion of people in the study who had access to a dentist did not follow up on oral care. These individuals are more likely to be younger males and have poorer oral health. The evidence suggests further work is required to understand how best to promote and encourage appropriate dental service attendance especially amongst those with high level of need to avoid increasing health inequalities; and to consider from a policy perspective the care pathway approach recommended in the Steele Report, which legitimises irregular dental attendance for those who choose it.

For dental practitioners, there are challenges within the blended/incentive driven contracts related to a general refocussing of care around preventative dentistry, risk assessment and a care pathway approach rather than the focus on treatment inherent in the UDA based contract. There are also obstacles to overcome to realise the benefits of the greater deployment of skill mix. Intuitively, the delegation of treatment to staff specialised in only a specific range of treatments could reduce costs and increase access to care but that there may be financial barriers that prevent the profitability and effective use of skill mix. Further work is required to validate the RAG assessment as a risk assessment, communication aid, and contract monitoring tool and as a tool for evaluation; and to further assess the financial impact of the contract and particularly the increase of skill mix on the individual practitioner in order to support the model.

Data quality and dentist data recording, particularly dentition charting, was challenging. This supports the view that there should be a strong driver in the contract for it to be collected accurately and appropriate training and support for practices. Further work is required to explore further the utility of bleeding on probing as a surrogate for other oral health outcomes and both the utility and validity of recording dental caries and treatment experience with an indicator such as ICDAS as a contract outcome.

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