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A Realist Evaluation of In-Practice Prevention Care Pathway

Sandom, Fiona

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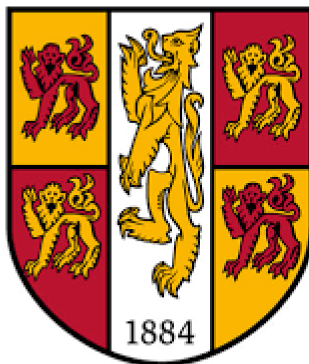

A Realist Evaluation of In-Practice Prevention Care Pathway

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Prifysgol Bangor / Bangor University

Thesis submitted to Bangor University for the degree of

Doctor of Philosophy

January 2023

AUTHOR'S DECLARATION AND CONSENT

'Yr wyf drwy hyn yn datgan mai canlyniad fy ymchwil fy hun yw'r thesis hwn, ac eithrio lle nodir yn wahanol. Caiff ffynonellau eraill eu cydnabod gan droednodiadau yn rhoi cyfeiriadau eglur. Nid yw sylwedd y gwaith hwn wedi cael ei dderbyn o'r blaen ar gyfer unrhyw radd, ac nid yw'n cael ei gyflwyno ar yr un pryd mewn ymgeisiaeth am unrhyw radd oni bai ei fod, fel y cytunwyd gan y Brifysgol, am gymwysterau deuol cymeradwy.'

Rwy'n cadarnhau fy mod yn cyflwyno'r gwaith gyda chytundeb fy Ngrichwyliwr (Goruchwylwyr)'

'I hereby declare that this thesis is the results of my own investigations, except where otherwise stated. All other sources are acknowledged by bibliographic references. This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree unless, as agreed by the University, for approved dual awards.'

I confirm that I am submitting the work with the agreement of my Supervisor(s)'

Signed:

Fiona Sandom

Date: January 2023

Abstract

Introduction

The In Practice Prevention (IPP) Programme was an Oral Health Prevention initiative developed by the North Yorkshire & Humber Local Dental Network. The programme was developed by the Local Dental Network (LDN) in partnership with Public Health England (PHE). IPP was targeted at children with dental caries in areas with higher-than-average dental disease rates. It was developed in response to the Yorkshire and the Humber Oral Health Needs Assessment of 2015 which identified high levels of dental disease in parts of the North Yorkshire and Humber Area

Aim

The aim was to undertake a realist evaluation of a preventive programme undertaken within NHS dental practices in Yorkshire and the Humber, an area with high levels of dental caries and significant health inequalities. By utilising realist methods, the findings from this programme were compared to a further prevention programme to test whether the programme theory generated was applicable to other programmes undertaken in the NHS.

Design

Using realist methodology which is explanatory in nature to endeavour to understand the factors that appear to influence the success (or not) of an intervention, rather than demonstration causality.

Methods and Results

The study sought to generate, test, and refine hypotheses through rounds of data collection and mining. Following Pawson's (2004) steps for a synthesis, the first step was concept mining, which is described as the extraction of a theory of theories, in this study from existing literature.

The study consisted of four phases, phase one involved the setting up of the study including ethical and IRAS approval. Phase two consisted of preparing documentation, stakeholder engagement, including telephone interview, practice visits, development of the initial programme theories, and realist synthesis. Phase three involved testing and refining the programme theories and testing the final theories. Phase four was to disseminate and for knowledge mobilisation.

Informed by the concept mining stage to conceptualising the IPP programme using soft systems, two workshops were held, where key stakeholders were engaged to develop an initial set of programme theories. This took account of the analysis of the CATWOE and 'rich-pictures' and the process of prioritising the broad theory areas, which was confirmed by the LDN. Reflecting the realist approach, the search strategy was deliberately kept as broad as possible and combined a primary search and purposive searches in order to capture the most relevant evidence to build, support and/or refute the IPTs that were being developed (Pawson, 2006). Bespoke data collection tools were developed for the extraction and synthesis of the data. Given the large number of papers identified, each area abstract was reviewed, considering their fidelity, trustworthiness, credibility value, relevance, rigour and relevance Rycroft-Malone (2012) to the IPP project. This reduced the number of relevant papers to 1) Institution logic 2) Clinical leadership 3) Financial incentives in the NHS dental contract 4) Behaviour change; and 5) 'Skill-mix' (n=11).

The initial programme theories were then tested in the field by multiple interviews held iteratively with key stakeholders including dental commissioners, members of the Local Dental Network, general dental practitioners, and dental care professionals.

The programme theory emerged from the IPP evaluation to determine whether it applied to a further NHS prevention programme, called Starting Well Thirteen (SW).

Conclusion

The use of realist methodologies allowed the study to pick apart the programme and produce the reason for doing the intervention. For IPP, an explanation of the programme, developed locally in partnership with dentists in the area, PHE and NHS E commissioners that had the insight and drive to deliver prevention and make a change to the oral health of children in this socially deprived area teasing out what works for whom, in what respects, to what extent, in what contexts, and how?". It also explored the drive of clinical leaders that were passionate about prevention, which drove the intervention forward. Using stakeholder involvement for developing and testing programme theories, final Programme theories were developed and further testing of the FPTs was carried out in Starting Well Thirteen, to provide reassurance that the FPTs were valid.

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GLOSSARY

ADHS	Adult Dental Health Survey
ACV	Annual Contract Value
CDHS	Child Dental Health Survey
CMO	Context – Mechanism – Outcome
CMOC	Context – Mechanism – Outcome Configurations
COHIB	Children’s Oral Health Improvement Board
DCP	Dental Care Professional
GA	General Anaesthetic
GDC	General Dental Council
GDP	General Dental Practitioner
DH	Dental Hygienist
DN	Dental Nurse
DNA	Did Not Attend
DT	Dental Therapist
FTA	Failed to Attend
FV	Fluoride Varnish
IPP	In Practice Prevention
IPP-PCP	In Practice Prevention Patient Care Pathway
IPT	Initial Programme Theories
IRAS	Integrated Research Application System
LDC	Local Dental Committee
LDN	Local Dental Network
MPT	Modified Programme Theories
MRT	Mid-Range Theories
NDIP	National Dental Inspection Programme
NHS	National Health Service
NHS BSA	National Health Service Business Service Authority

NHSE	National Health Service England
NICE	National Institute for Health and Care Excellence
OHNS	Oral Health Needs Assessment
PCR	Patient Charge Revenue
PGD	Patient Group Directive
POM	Prescription Only Medicine
PSD	Patient Specific Direction
PHE	Public Health England
RCT	Randomised Controlled Trials
SSM	Soft System Methodology
SW	Starting Well Thirteen
UDA	Unit of Dental Activity
UK	United Kingdom

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Finally, I would like to thank my partner Paul, who has supported me through the ups and downs of this journey, and my son John for his encouraging words when I needed them.

FOREWORD

This account summarises my personal background and insights that underpinned my approach reflexively to the thesis and work undertaken (Yin, 2014).

The conceptual frame of the reflexive account is based upon the premises of the positioning theory (Davies & Harre, 1990; Harre & Van Langenhoven, 1999), which views the social world as the place of an interactive discourse between the various actors (individuals, groups, social institutions and cultural practices), whose implicit and explicit patterns of reasoning and actions are realised by means of their 'positioning' in relation to each other (Allen & Wiles, 2013; Harre et al, 2009), therefore I would like to express my positioning through a process of researcher reflexivity. It aims to summarise my personal insights on the thesis research undertaken with Dental Policy makers, Dental Commissioners, Dental Practitioners, and their teams.

My research is an evaluation preventive programme undertaken within NHS dental practices in Yorkshire and the Humber, an area with high levels of dental caries and significant health inequalities. The approach of this research is a realist evaluation to understand the underlying context and mechanisms that enable an intervention to work. Once this has been established, I will test the context, mechanisms and outcomes with a similar dental prevention intervention called Starting Well Thirteen.

At the time of writing, I am a clinical dental registrant working in NHS and private practice in North Wales, and a Lead Dental Educator with various roles within Health Education and Improvement Wales and The All-Wales Faculty for Dental Care Professionals. I am also the current Chair for the British Association for Dental Therapists.

In this introductory section I would like to use the positioning theory as the framework for reconstructing and making sense of my autobiographical journey. To begin with, I would like to describe my professional journey or my position at this time. The second part will describe my professional position. These positions represent my backgrounds and my interest in dentistry. The second part will describe my professional experience prior to commencement of the research, as a dental therapist that has worked in many areas of dentistry within varying roles and has been fortunate to utilise the skills escalator model within dentistry. I also have a long-standing interest in role substitution.

Skill Escalation

My career in dentistry began as a dental nurse. Following qualification, I was encouraged to train to be a dental hygienist and, on qualification, returned to Anglesey to practice. The influence of the principle of that practice has helped form my dental career. Outside of clinical dentistry, his role as a Dental Practice Advisor meant that he was instrumental in setting up a dental nurse course in a local college, which resulted in me delivering some teaching to the students. From this introduction to education, I developed myself by attending and completing an adult education teaching certificate and mentored student dental nurses in the practices I worked in.

Six years after qualifying as a dental hygienist, I began to study to become a dental therapist at the University of Liverpool, again with support from the dental practice principle. Following qualification and the change in regulations allowing dental therapists to work in all areas of dentistry instead of being limited to the Community, Hospital and Prison Services, I was among the first dental therapists to work in general dental practice.

Whilst a student at Liverpool, I become an examiner for the National Examining Board for Dental Nurses and, following graduation, I applied for a part time lecturer post at Liverpool University, where I delivered education content and supervised students on clinic.

In 2004 I secured a post in the North Wales Dental Postgraduate Department as Dental Hygiene and Therapy Tutor, later the Department became part of Cardiff University, and this give rise to the opportunity for me to study for a master's degree in medical education.

Professional Position

Throughout my career as a dental therapist, and since qualification in 1999, I have been heavily involved with British Association of Dental Therapists. I am currently the Chair of the Association, and I proudly became the President in 2014, in this role it became evident to me that the potential of dental care professionals was not being fully utilised by the dental profession. Through my career I have discovered that there are many barriers to prevent the use of Dental Care Professionals to deliver dental prevention and treatment and that, even though the General Dental Council have removed the restriction that patients are unable to access a dental hygienist or dental therapist without first seeing a dentist, there are still barriers in place to prevent this, including NHS Rules and Regulations, Performer List Regulations, and The Human Medicine Regulations Act 2012.

I am enthusiastic about widening access to dental care, in particular to those that come from socio-economically deprived areas, who it is evidenced have more disease and poorer access to dental care (Steel, 2009).

Career History

In my 30-year career I have spent 18 years working with the Community Dental Service in North Wales on a part-time basis, as well as working in both NHS and Independent Dental Practices, in a variety of settings, and in different fields of dentistry, including Dental Schools and Universities, each with varying financial and organisation models as well a variety of cultures. This has undoubtedly had an influence over my own unconscious assumptions regarding culture; to an extent I am viewing many of the social and cultural systems described from the inside.

In presenting my autobiographical reflexive account I have reviewed my past significant experiences in terms of positioning in accordance with the principles of positioning theory. I feel that conveying my story is the best way to introduce my personalities that reflect the dilemmas encountered and hopefully resolved along the way.

CHAPTER ONE:

INTRODUCTION

1.1. Introduction

This thesis has sought to undertake a realist evaluation of a preventive programme undertaken within NHS dental practices in Yorkshire and the Humber, an area with high levels of dental caries and significant health inequalities. By utilising realist methods, the findings from this programme were compared to a further prevention programme to test whether the programme theory generated was applicable to other programmes undertaken in the NHS.

The In Practice Prevention (IPP) Programme was an Oral Health Prevention initiative developed by the North Yorkshire & Humber Local Dental Network. The programme was developed by the Local Dental Network (LDN) in partnership with Public Health England (PHE). IPP was targeted at children with dental caries in areas of higher-than-average dental disease rates. It was developed in response to the Yorkshire and the Humber Oral Health Needs Assessment of 2015 which identified high levels of dental disease in parts of the North Yorkshire and Humber Area.

The IPP Programme required General Dental Practitioners (GDPs) to signpost children identified as having decay or requiring a General Anaesthetic (GA) extraction at between 3- and 16-year-olds to Dental Care Professional (DCP) led prevention clinics, where evidence-based prevention was delivered over a defined number of appointments with prescribed evidence-based interventions and messages. DCPs are qualified to practice certain aspects of dental care. The term DCP covers a number of titles that are eligible for registration with the General Dental Council (GDC). Each title has its own qualifications and scope of practice. Titles included under the umbrella term are dental nurse, dental technician, dental therapist, dental

hygienist, orthodontic therapists, and clinical dental technician (GDC 2022). In this way comprehensive, consistent advice and interventions were delivered, targeted at children with disease in areas where disease rates are highest. The IPP pathways were delivered in parallel with the restorative work undertaken by the signposting GDP and the GA extractions provided by the Community Dental Services. Further detail of the IPP programme is given in Section 1.4.

The thesis also sought to test the programme theory that emerged from the IPP evaluation to determine whether it applied to a further NHS prevention programme, called Starting Well Thirteen (SW). SW was an initiative launched by NHS England, a programme of dental practice-based initiatives aimed to reduce oral health inequalities and improve oral health in children under the age of five years. SW was available to all children, with a focus on those not currently visiting the dentist. The aim was to ensure that evidence-based preventive advice about reducing sugar intake and increasing the exposure to fluoride on teeth was given to parents of these children. There were patient and practice level interventions alongside work to strengthen relationships between local communities and practices. The programme intended to complement existing local NHS England and Local Authority led initiatives and the work of the Children's Oral Health Improvement Programme Board and dental contract reform. SW sat as part of a range of interventions that local health and social care economies responsible for children's oral health have to put in place. Guidance from Public Health England (PHE) and the National Institute for Health and Care Excellence (NICE) describe evidence based population level interventions to improve oral health, such as water fluoridation, that complement this practice based initiative. Further detail of the SW programme is given in Section 1.5.

Population health needs are changing across the United Kingdom (UK). Overall, there has been a general improvement in oral health, with most young adults (90%) expected to have more than twenty-one teeth in ten years' time (ADHS, 2009). This contrasts with the level of dental caries that is still seen in young children, despite being totally preventable (CDHS,

2013). However, whilst there have been improvements in children's dental health those that do experience dental caries experience high levels of the disease, this also ties in with social deprivation where those that experience high levels of dental caries are generally in the poorer areas of the country. Research briefing in Wales (Bowers 2016) "in the mid-1980s, the level of dental caries in five-year-old children remained constant at 47%." Since 2008 there has been a steady reduction in levels of decay and the latest survey carried out in 2015 shows that 35% of five-year-olds in Wales had dental decay.

1.2. Child Dental Health

The Child Dental Health Survey (CDHS) in 2013 set within England highlighted that "nearly a third (31%) of five-year olds and nearly half (46%) of all eight-year-olds had obvious decay experience in their primary teeth" (CDHS, 2013). The CDH Survey in 2013 was commissioned by the Health and Social Care Information Centre and is the fifth in a series of national children's dental health surveys that have been carried out every ten years since 1973. CDHSs provide statistical estimates on the dental health of five, eight, twelve and fifteen-year-old children in England, Wales, and Northern Ireland, using data collected during dental examinations conducted in schools on a random sample of children by NHS dentists and dental nurses. The survey measures changes in oral health since the last CDHS in 2003 and provides information on the distribution and severity of oral diseases and conditions.

Across the UK, the CDH survey in 2013 found that untreated decay into dentine in primary teeth was evident in 28% of five-year olds and 39% of eight-year-olds. This pattern of disease also follows a social gradient "a fifth (21%) of the five-year olds who were eligible for free school meals had severe or extensive tooth decay, compared to 11% of five-year olds who were not eligible for free school meals" (CDHS, 2013). Free school meals were used as a proxy for deprivation in the survey.

In England, just over half (52%) of five-year olds in England had good oral health (defined as the absence of obvious decay experience, tooth surface loss into dentine and calculus). Obvious dental decay experience in primary teeth was present in 31% of five-year-olds. In permanent teeth, obvious decay experience was found in 32% of 12-year-olds and 44% of 15-year-olds. The proportion of older children with obvious decay experience in permanent teeth in England reduced between 2003 and 2013. However, toothache was reported by 19% of 12-year-olds and 15% of 15-year-olds and was more common amongst children from relatively deprived families (CDHS, 2013). The comparative toothache data in the CDS 2003 is not available.

Significantly, these figures representing point estimates and improvements at a population level can mask significant health inequalities, where those from the poorest backgrounds suffer the highest levels of dental caries. One such area is Yorkshire and the Humber. In 2015, the Yorkshire and the Humber Oral Health Needs Assessment (2015) identified high levels of dental disease amongst young children across deprived communities in the region. The prevalence of tooth decay in five-year-old children in North Yorkshire and Hull was significantly higher than the England average (43.8% and 43.4% versus 27.9% respectively). Equally, the severity of tooth decay in five-year-old children in Hull was the third worst in England (3.78 versus 3.38 respectively).

In this context, young children presenting with pain and sepsis resulting from dental caries are difficult patients to manage in high street NHS dental practices (Tickle *et al*., 2002). It is also costly. Approximately one fifth of the NHS dental budget is spent on managing the dental caries and its sequelae (HSCIC, 2015). Tooth extraction is commonplace. This is distressing for the child and their families and further increases costs for the NHS (Ghanei *et al*., 2012). Poor dental experiences at an early age can also lead to life-long dental anxiety and poor patterns of attendance, with further health and cost consequences (Locker *et al*., 1999).

The experience of dental caries in young children has an effect on body weight, growth, and their quality of life, such that comprehensive treatment "makes a very significant difference to the psychological and social aspects of the child's life" (Sheiham, 2006). It also affects young children's attendance at school (Jackson *et al*., 2011; Blumenshine *et al*., 2008) and their educational achievement (Seirawan *et al*., 2012). In addition, once the disease is expressed in young children, further dental caries is highly likely (Milsom *et al*., 2008). Prevention is paramount (Milsom *et al*., 2008). Therefore, the prevention of dental disease has a profound impact on the quality of life, academic achievement, and the lifelong burden of disease for those that suffer from it.

Poor oral health has a significant impact not only in children, but also on the service provision of dental services, caries is a preventable disease, and the Steel Report (1999) supported an emphasis on prevention and evidence-based treatment to support better oral healthcare, with the emphasis on prevention and reward for prevention within the system.

1.3. NHS Dental Service Provision in England

In Practice Prevention and Starting Well Thirteen programmes are preventative programmes that are delivered in NHS General Dental Practices. One key element to managing dental caries amongst children is the provision of dental care in dental practices, by GDPs and DCPs as mentioned in 1.1. Dental practices are run as small businesses and differ from many other healthcare professionals in that they take all the financial risk for service provision (Tickle *et al*., 2011). As a result, dental practices operating within the NHS are acutely sensitive to the incentives within any given remuneration system (Brocklehurst *et al.,* 2020; McDonald *et al*., 2012; Tickle *et al*., 2011). In turn, this can influence the institutional logic of the dental practice (the culture within an organisation that shapes the collective behaviour and actions of those who work there) (Harris & Holt, 2013; Harris *et al*., 2015). Retrospective payment systems like Fee-For-Service (where a GDP submits a claim for every single item of completed treatment), have

been shown to lead to over-treatment in order to maximise profit (Birch, 1988; Chalkley & Tilley, 2006). In these systems, the incentive for practices is to increase the volume of clinical activity delivered, which may not always promote prevention or the greater use of Dental Care Professionals (DCPs) to provide care. In contrast, per-capita remuneration systems pay practices a fixed level of funding based on the number of registered patients. This breaks the link between treatment activity and practice income, giving practices greater autonomy on what to focus on (Grytten, 2005). This may lead some practices to place greater emphasis on prevention, which would favour greater use of the whole dental team. However, per capita systems can lead to under-treatment and patient selection; a preference for low-risk patients or those with low levels of disease, given that funding for these practices is capped and unrelated to clinical activity (Grytten, 2005).

Goodwin *et al*. (2018) argue that institutional logics at any given NHS practice not only include dentistry as a business, but also professional ethics and contextual factors, based on where the practice is embedded. As highlighted by Watt *et al*. (2004), the most important factors influencing change in dentistry include: concerns about financial risk, progressive practice environment, supportive organisational structure, supportive professional networks, and opportunity for training. As such, the drive to maintain (and maximise) the viability of an NHS practice can also be tempered by a practice owner's view about their sense of duty to their patients and their ideas about how best to deliver care for their patients and community.

Dental services have been part of the NHS since its inception in 1948. Prior to 2006, GDPs working within the NHS were paid on a fee-for-service basis. This meant that GDPs claimed for every item of clinical activity that they undertook. As highlighted above, these payment mechanisms can have a tendency to incentivise over-treatment, as GDPs' income is directly linked to the level of clinical activity undertaken on each patient. In 2006, a new General Dental Services (GDS) NHS contract was introduced in England and Wales (GDS, 2005). This contract collated NHS dental activity items into

three broad bands in an attempt to lessen the number of individual items of treatment that GDPs would claim for on each patient:

1. Band One: examination, radiographs and a simple scale and polish.
2. Band Two: restorations, extractions, and root canal treatments; and
3. Band Three: crowns, bridges, and dentures.

These bands of treatment attracted one, three and twelve Units of Dental Activity (UDA) respectively (GDS, 2005). The value of a UDA varied across NHS dental practices and was based on clinical activity and payments in a 'reference year' that were 'earned' under the previous fee-for-service NHS dental contract in 2005. Another "key feature of the 2006 contract was cost-containment, specifically 'Providers' annual activity and revenue were capped at an agreed number of UDAs per year for an agreed price, known as an Annual Contract Value (ACV). NHS GDPs were then paid a "twelfth" of their ACV on a monthly basis. As a result, NHS GDPs' outputs under the new contract in England were constrained and they were penalized if they under-performed (<96% of their ACV) or over-performed (>102% of their ACV).

The 2006 NHS dental contract in England proved to be unpopular and led to a series of contract reform programmes. GDPs argued that one form of 'treadmill' had simply been replaced by another. The effect of the 2006 NHS contract change in England was evaluated by Tickle *et al*. (2011) and McDonald *et al*. (2012). They found large and abrupt changes in the provision of a number of treatments coincided with the introduction of the 2006 contract. The number of complex treatments provided (root canal treatments, crown, and bridges), fell dramatically whilst the number of extractions rose just as dramatically. No increase in prevention was observed. As a result, an independent review was undertaken in 2008/9 in England, which recommended the greater use of preventive care and a standardised approach to patient assessment leading to patient care pathways (Steele, 2009). This led to the development of a pilot programme in England in 2010, which was based predominantly on capitation (DH, 2014). However, the pilots in England were beset with a number of informatics

problems and based on concerns about the capitation payment system, were relaunched in 2015 as ‘prototypes’ (DH, 2015). ‘Prototype’ practices were paid on the basis of a blended funded system, drawing on features of the 2006 contract (a retrospective payment mechanism based on clinical activity) with capitation. An evaluation of the first year of prototyping was published in 2018 (DH, 2018), but no change to date has been made to the 2006 contract, which remains the legal basis for NHS service provision to date.

Therefore, as previously mentioned, dental practices are run like small businesses and those dental practices operating within the NHS are acutely sensitive to the incentives within any given remuneration system (Brocklehurst *et al.,* 2020; McDonald *et al*., 2012; Tickle *et al*., 2011), the current NHS contract only pays for treatment and there is no model to pay dental practitioners and their teams to deliver preventive interventions.

An independent review of NHS dental Services in England (Steel, 2009) recommended that commissioner of dental services should find ways to support dentists to make the best and most cost-effective use of the available dental workforce. The next section explores role substitution within NHS dentistry.

1.4. Role-Substitution in NHS Dentistry

Role substitution is commonly termed skill mix within dentistry and issued to describe a model of dental care provision in which the whole of the clinical team is utilized in delivering service activity and prevention (Gallagher & Wilson, 2009). This has been suggested to be an important step forward in addressing the current and future population oral health need (Brocklehurst & Macey, 2015).

In 1956, the newly formed regulator for dentistry, known as the General Dental Council (GDC) developed the regulated title of DH following the training developed in the late 1940’s by The Royal Air Force, with formal registration in 1961 and DT who were first introduced in 1960. Initially Dental

Therapists were titled Dental Auxiliaries, this was amended to Dental Therapists in 1979. The duties of the former related to the provision of preventive and periodontal treatment, whilst the latter role was permitted to provide a range of direct restorative procedures and extract deciduous teeth. In 2002, the Dentists Act was amended and allowed DTs to practise in NHS dental practices for the first time. Before this time, the DTs' role had been limited to the provision of care in NHS Community Dental Service settings only, a role that had been restricted to GDPs since 1948. In 2008, Dental Nurses (DNs) were also required to register with the GDC, to ensure regulatory oversight of the whole of the dental team. These members of the dental team are collectively referred to as Dental Care Professionals (DCPs) and unlike many GDPs, have a strong preventive ethos in both their training and practice.

Therefore, policymakers have been interested in DCPs and the potential of 'skill-mix' in NHS dentistry for some time. In 1993, the Nuffield report argued that the role of DCPs could be expanded (Nuffield, 1993). Subsequently, increasing attention has been paid to how 'skill-mix' can deliver the level of care that is required to meet population health need. This is now explicitly recognised in a number of policy documents that underpin NHS care (Prudent Healthcare, 2019; LTP, 2020). Johnson (2009) argued for a paradigm shift "from treatment to prevention, wellness and self-care".

DCP utilisation by NHS dental practices appears to be heavily influenced by the financial incentives inherent in the NHS contract (Brocklehurst *et al*., 2021; Brocklehurst *et al*., 2016). As highlighted in the previous section, NHS GDPs run their practices as businesses to offset the cost of the capital risk of the premises and the equipment that they own, whilst ensuring liquidity to cover their overheads. In medicine, transaction costs can be offset by economies of scale, which enable a broader range of services to be made available (Adams *et al*., 2000). In a recent realist evaluation investigating the potential of increasing 'skill-mix' in NHS dental practices, contractual limitations within the existing 2006 NHS dental contract were found to be the main barrier (Brocklehurst *et al*., 2021).

IPP and SW programmes both promote the use of skill mix and provide a method within current limitations to implement skill mix and the greater use of DCPs to contribute to the delivery of prevention to children in areas of high dental caries and social deprivation.

1.5. In-Practice Prevention Programme

The Yorkshire and the Humber Oral Health Needs Assessment (2015) identified high levels of dental disease amongst young children across deprived communities in the region. The prevalence of tooth decay in five-year-old children in North Yorkshire and Hull was significantly higher than the England average (43.8% and 43.4% versus 27.9% respectively). Equally, the severity of tooth decay in five-year-old children in Hull was the third worst in England (3.78 versus 3.38 respectively). In response to this, the LDN developed IPP, which required NHS practices with NHS contracts to identify children (aged between three and 16 years of age) with experience of dental caries (at least one lesion) or those children that required a General Anaesthetic. These children were then referred to DCP-led prevention clinics within NHS dental practices, where evidence-based prevention was delivered over a defined number of appointments, with prescribed evidence-based interventions and oral-health messages. The care-pathways were associated with a payment (£36 for three prevention appointments), and this was offset against the target number of UDAs within the ACV (see Section 1.2). This UDA offset was approximately 3% on average, meaning that the prevention activity was resourced within the existing financial envelope. In this way, the programme aimed to take a flexible approach to local commissioning and provide an incentivised and comprehensive programme to deliver consistent oral-health advice and interventions that were targeted at children with the highest levels of disease.

The IPP programme is delivered by teams of trained DNs within each NHS practice. The DNs had all undergone training from Health Education England in both oral health education and fluoride varnish application. Equally, the

DNs and Practice Managers and participating GDPs had also attended dedicated IPP training sessions.

As previously discussed, there is a tension in the GDS between financial incentives and institutional logistics of NHS dental practices i.e., the professional culture, codes and norms that are established in each practice (Goodwin *et al*., 2018). It is well documented in the literature that different factors can influence these values and behaviours in NHS dental practices (Brocklehurst *et al*., 2021; Brocklehurst *et al*., 2016; Goodwin *et al*., 2018; Harris *et al*., 2015; Harris *et al*., 2013; Watt *et al*., 2004). In the GDS, there are multiple logics that are associated with clinical professionalism and the viability of the practice. Harris *et al.* (2015; 2013) established that NHS dental practices are heavily influenced by financial incentives, their peers (clinicians, managers, patients, politicians, commissioning bodies and professional bodies), by institutional factors including practice culture, public policy, health and safety procedures and norms, for example professionalism and affordability. The IPP programme attempted to draw on these influences to incentivise and promote a prevention care pathway for children who experience dental caries.

1.6. Starting Well Thirteen

In 2016, NHS England and the Office of the Chief Dental Officer England launched the Starting Well Thirteen programme (SW). SW was developed by the Children's Oral Health Improvement Programme Board (COHIB) and NHSE with the aim to reduce oral health inequalities and improve oral health in children under five years old. SW was the response to a ministerial commitment for NHSE to pilot more creative ways of using their commission expenditure to improve children's oral health. The programme ran from 2017 until April 2020. The programme was targeted at 13 priority areas which were chosen on the basis of decay experience at a local authority level, existing oral health improvement plans and trends in oral health. These areas were identified as a having high levels of deprivation, dental caries and based on data trends, likely to maintain or increase disease levels.

An associated initiative Starting Well Thirteen Core began in 2018, this programme was also designed to improve access to dental care for young children and promote prevention. In order to enable the difference between the two programmes, the programme is referred to as Starting Well Thirteen 13.

The programme had two modes of delivery:

- Starting Well Thirteen Preventive Practice - the implementation of systems and processes within practices to facilitate a more preventative focus.

- Advanced Starting Well Thirteen Preventive Practice - the same as above, but practices were required to engage with other local health providers to promote oral health messages and encourage "dental check by one" and provide access to a dental examination before their first birthday.

The programme was available to all children, with a focus on those who are not currently visiting the dentist and under 1-year olds, for evidence-based preventive advice about reducing sugar intake and increasing the exposure to fluoride on teeth. The expectation was that there would be patient and practice level interventions alongside work to strengthen relationships with local communities. The expected time commitment of the interventions for a SW practice and an Advanced Starting Well preventive practice was calculated, and funding depended on the size of the practice. The SW Champion led the work in the practice; however, all members of the dental team were expected to be involved in delivering elements of the programme.

SW incentivised dentists to identify a Practice Prevention Champion within the practice and additional time to hold meetings relating to prevention and audit. It was heavily dentist focused and top down in its development, however unlike IPP it did not provide funded time to deliver prevention.

1.7. Realist Approaches to Evaluation

Realist approaches are a form of theory-driven evaluation developed to strengthen the explanatory power of evaluation studies and contribute to evidence-based policy and practice (Pawson, 2013). It is a generic approach that can be applied to many fields of research, including health and social care. Pawson & Tilley (1997) developed the first realist evaluation approach, although other interpretations have been developed since. They argued that in order to be useful for decision makers, evaluations need to identify 'what works in which circumstances and for whom?', rather than merely 'does it work?' but, recognising that all interventions only ever work for certain people in certain circumstances, by asking instead 'what works for whom in what circumstances'?

By applying the realist lens to this evaluation these issues around child dental health, NHS dental care provision, and role substitution in NHS dentistry, facilitated the unpacking and exploration of the intervention in order to understand the programme theory that underpinned IPP, and then use the SW programme to test the final programme theories.

The use of realist approaches is becoming increasingly popular in health services research as it recognises the need to show how and why interventions work, as opposed to merely evaluating whether they work or not (Rycroft-Malone *et al.,* 2012). Both IPP and SW programmes are complex interventions with different mechanisms that operate in a NHS context, that has its own complexity. A realist evaluation design is well suited to assess how interventions in complex situations might work because it allows the evaluator to deconstruct the causal web of conditions underlying such interventions (Wong *et al.,* 2013). The realist approach yields information that indicates how the intervention works, the generative mechanisms, the conditions that are needed for a particular mechanism to work and the influence of context. As a result, it can be useful to policymakers and is an attractive form of evaluation. In realist approaches, "stakeholders are regarded as key sources for eliciting programme theory

and providing data on how the programme works" (Pawson & Tilley, 2004) and their involvement throughout the study is paramount.

Realist programme theory extracts what mechanisms will generate the outcomes and what features of the context will affect whether or not those mechanisms function. The complete realist question is: "What works, for whom, in what respects, to what extent, in what contexts, and how?" (Pawson and Tilly, 1997). In this way, realist evaluations generally involve four steps:

1. Construct Initial Programme Theories (IPTs) by drawing on stakeholder consultation and analysis of the available extant literature.

2. Test the IPTs by collecting evidence in the field.

3. Amend the IPTs to form Modified Programme Theories (MPTs), based on Step Two and expressed as Context-Mechanism-Outcome (CMO) configurations; and

4. Finalise the MPTs using a stakeholder group.

Realist methodology is eclectic and provides the tools for researchers to study complex social systems within their contexts, it is a valuable tool for health service research to develop theory, evaluate programmes and develop interventions. Applying the realist lens to this evaluation will enable a greater understanding of children's dental health, NHS dental provision, the business of dentistry and role substitution in North Yorkshire & Humber, and the implementation of IPP and, by testing the programme theories with the Starting Well Thirteen programme, will add another level of testing to the programme theories of IPP.

1.8. Aims, Objectives and Research Questions

The aim of this study was to undertake a realist evaluation to evaluate the IPP programme, in order to understand "what works, for whom and under

what circumstances Pawson (2006). It sought to identify potentially causal and contingent explanations and underlying attributes that underpin what works (i. e. the successful implementation of the IPP) in the form of CMO configurations (CMOCs). The emergent programme theory from the IPP programme was then applied to the SW programme to identify key similarities and differences and determine how explanatory the IPP programme theory was for SW, another key preventive programme undertaken in the North-East of England.

The objectives of the study were to undertake the following:

1. Use realist synthesis methods to develop IPTs to understand "what works, for whom, in what respects, to what extent, in what contexts, and how" for the IPP programme.

2. Test the candidate IPTs with semi-structured interviews to develop a set of MPTs, expressed as CMOCs.

3. Finalise and prioritise the MPTs with a stakeholder group; and

4. Use further semi-structured interviews to determine whether the explanatory programme theories from IPP were applicable to the SW programme.

The study had the following research questions:

- What works in which circumstances and for whom in the IPP programme?

- Do incentives in the GDS promote preventive orientated NHS practices?

- Does IPP better utilise role-substitutive models in general dental practice. And if so, how.

- Is IPP influenced by the institutional logics in NHS dental practices.

- Are there any substantive barriers and enablers to IPP?
- Are there any unintended consequences for participating NHS practices?
- Does the IPP programme offer an attractive and effective strategy for NHS policymakers that could be rolled out beyond Hull & The Humber

1.9. Structure of Thesis

This thesis is arranged in Chapters as follows:

Chapter One: Began with the background to the thesis by describing the current status of child dental oral health across the UK, an overview of NHS funding in England, the role of 'skill-mix', the two preventive programmes undertaken in Yorkshire and the Humber (IPP and SW), and realist approaches to evaluation. Chapter One concluded with an overview of the aims, objectives and research questions of the approach taken and provided the overarching structure of the thesis.

Chapter Two: This Chapter explores the underlying principles of the evidence-based paradigm and determine how applicable this approach is, when evaluating complex interventions within complex health systems. It then discusses the philosophical, epistemological, and ontological position of this study, realist evaluation and the realist approach to evidence synthesis, before moving on to describe the study design and the aims and objectives.

Chapter Three: This Chapter will report and discuss the findings from the Realist Synthesis. It will deliberate the scoping of the literature, the use of Soft Systems Methodology (SSM) which guided the stakeholder workshops and describe the literature search and the bespoke data collection tools developed and used. The Chapter concludes with Initial Programmes Theories (IPT) framed as IF-THEN statements.

Chapter Four: The Chapter begins by explaining briefly the methodology used for teaching back sessions, and then reports upon how each of the five initial programme theories were refined to form the basis of the final programme theories to be presented fully in Chapter Five. The Chapter discusses the approach to the testing theory phase of the study, but primarily reports upon the testing and the narrative from the testing theory phase, and refinement of the Initial Programme Theories developed throughout Chapter Three.

Chapter Five: Describes the refinement of the IPTs stakeholder engagement, describing the process and discussions from the interviews which facilitated creating MPTs and the finalisation and prioritisation of the different elements of the programme theory.

Chapter Six: The explanatory power of programme theories from Chapter Five are tested on a further preventive programme for young children in the Yorkshire and Hull area, Starting Well Thirteen. This programme was introduced some 12 months after IPP in the region. It details the methods used for this “teach back” session and the rational for stakeholders invited to test the programme theories from IPP and test if they transfer to SW. The Chapter moves on to discuss the results of the semi structured interviews and discussed each programme theory in turn and concludes with a summary of the findings.

Chapter Seven: In this Chapter, the results of the thesis, strengths and weaknesses and implications for future research will be discussed. The results of the realist evaluation of the In-Practice Prevention (IPP) programme will be first explored, before summarising how explanatory these programme theories were for the Starting Well Thirteen (SW) programme. The strengths and weaknesses of undertaking a realist evaluation will then be considered, before describing potential avenues for future research.

1.10. Summary

In this introductory Chapter, I have explored the current status of child dental oral health across the UK before providing an overview of NHS funding in England, the role of 'skill-mix', details of the two preventive programmes that will form the case study, the In Practice Prevention (IPP) and Starting Well Thirteen (SW) programmes. In addition to the Realist theory driven approach and to reinforce the realist synthesis, we will introduce the case study approach to inform the qualitative study methodology.

The Chapter concludes with an overview of the aims, objectives and research questions of the approach taken and provides the overarching structure of the thesis.

This Chapter has introduced the two preventive programmes to be evaluated and provided a background into the status of children's dental health in the UK and in North Yorkshire & Humber, where these interventions have been delivered. It also described the provision of NHS Dental Services in England and the use of role substitution in dentistry.

The next chapter will explore the philosophical, epistemological, and ontological position of realist evaluation and the context positioning of the researcher and study design.

CHAPTER TWO:

METHODOLOGY AND STUDY DESIGN

2.1. Introduction

This Chapter explores the underlying principles of the evidence-based paradigm and determines how applicable this approach is, when evaluating complex interventions within complex health systems. It then discusses the philosophical, epistemological, and ontological position of this study, realist evaluation and the realist approach to evidence synthesis, before moving on to describe the study design and the aims and objectives.

As highlighted in Chapter One, realist approaches are a form of theory-driven evaluation developed to strengthen the explanatory power of evaluation studies and contribute to evidence-based policy and practice. Realist approaches are appropriate for evaluating complex interventions, programmes with wider learning potential. They are particularly useful for evaluating programmes that produce mixed outcomes to better understand how and why differential outcomes occur. However, a realist approach is not appropriate when how, why, and where programmes work is already understood, the programme is simple, versatile, or only the net effect of the intervention is of interest. (Public Health England 2001). It is however appropriate in complex interventions. When participants take part in a complex intervention, they make choices about what actions to undertake and the actions give the researcher the outcomes. But they do not have an infinite range of choices as these choices are limited and determined by the context that that participant is in. There are various mechanisms that lie behind these choices.

Applying the realist lens to this evaluation will enable a greater understanding of children’s dental health, NHS dental provision of prevention, the business of dentistry and role substitution in North Yorkshire

& Humber, and the implementation of IPP and testing of the program theories In with Starting Well Thirteen.

In this Chapter, the evidence-base paradigm will be explored, including the use of Randomised Controlled Trails (RCTs) in healthcare and systematic reviews of RCTs. In addition, the methodology issues with this form of experimental approach in the evaluation of complex interventions will be critiqued, before discussing the philosophical, epistemological, and ontological position of this study.

2.2. Traditional evidence-based approaches to evaluation

The process of generating robust research evidence for health professionals and policymakers has traditionally relied on Randomised Controlled Trials (RCTs) and systematic reviews of RCTs to empirically evaluate interventions (Sackett *et al*., 1996). Within this paradigm, "any observed effect is pooled statistically, and the evidence is then synthesized to create evidence-based policies" (Innes et al, 2016). Research evidence is then either pushed from the research community (in guidelines or evidence summaries) or pulled by clinicians who are seeking evidence-based approaches in order to "introduce new, or modify existing, patterns of collective action in health care or some other formal organisational setting" (Campbell et al, 2016). The underlying philosophical basis for experimental research of this nature is based on positivism and empiricism i.e., the assumption that it is possible to observe the entirety of the phenomena under investigation and measure the changes that occur as a result of the introduction of the intervention to one group and not the other.

Despite the significant increase in the adoption of the evidence-based paradigm, there are a number of methodological issues when this form of experimental design is used to evaluate complex interventions within complex health systems. Brocklehurst *et al*. 2019 argue that the first problem with this model is that the quality of many trials remains poor, with many having high levels of bias (Glasziou *et al*., 2014; Yordanov *et al*., 2015).

Equally, trialists commonly ignore issues around uncertainty in complex health systems (Lewis, 2016) and often frame effectiveness using effect sizes based on a single primary outcome measure (Barratt *et al*., 2016). As Grant *et al*. (2016) highlight, there is often “not enough contextual information provided to transfer the results from the trial setting into other settings”. Systematic reviews are then used to collate this empirical information. However, as multiple trials are required for one systematic review, they are highly resource intensive (Lehoux *et al*., 2004). They also rely on the timely release of both positive and negative results for any given intervention. This can be problematic, as trials with positive results are much more likely to be published in a shorter timeframe compared to those with negative results, and this often contrasts with rapidly evolving policy context (Hopewell *et al*., 2007). As Gannan *et al*. (2010) highlight, “emerging issues require access to high-quality evidence in a timely manner to inform system and policy response”. Systematic reviews can also strip out the policy and organisational context as they are primarily focused on undertaking a meta-analysis on one or multiple point estimates of effectiveness. Such insights highlight the value of shifting from the traditionally used binary question of effectiveness within toward a more sophisticated explanation that accounts for contextual information (Bate *et al*., 2014). As highlighted by Moore, “effect sizes do not provide policy makers with information on how an intervention might be replicated in their specific context, or whether trial outcomes will be reproduced” (Moore G.F *et al*., 2015). People and systems don’t always behave according to the design of the intervention in a “rarefied” trial.

2.3. Positivism, constructivism, and realism

Realism lies somewhere between experimental and participatory research methods; between methods that accept a position of independence and those that involve the researchers own position in that research. Positivism describes reality as fixed, reliable, and measurable, where the nature of observing this reality is neutral and / or value free (Graham & McAleer 2018). In this sense, positivism positions the world to be external to the researcher. A positivist would describe science as “the methodological observation of

phenomena which enable the observer to identify the causal relationships that exist between those phenomena" (Porter, 2001). The epistemology is based on the belief that causality is directly related to the effect. Positivists argue one reality exists and that the purpose of research is to provide measurable accounts of this reality (Oltmann & Boughey, 2011). For a positivist, scientific knowledge provides the answers to questions around behavioural science, however, closed systems, or one reality, allow constant combinations of events, which can be described as the human version of causation.

For Bhaskar, positivism commits the epistemic misconception of trying to fit ontological questions around the nature of reality to epistemological questions around the knowing of what reality is (Cruickshank, 2011).

On the other end of the virtual continuum of knowledge paradigms, philosophers have endeavoured to find different ways of exploring phenomena as they occur within the social world. Constructivism can be described as a way of viewing reality as being in the mind, with language, narrative and discourse offering different perspectives of this reality (Kazi, 2003). A constructivist approach to research focuses on the stakeholder perspective and instead of reality being considered in the singular, embraces the idea of multiple perceptions and multiple worlds. Constructivists reject the idea that knowledge of the human and social world can be explained by positivist approaches (Bhaskar, 1979). However, critics of constructivism argue that this approach lacks the depth of understanding in comparison to other approaches "constraining and enabling social structures and mechanisms" (Wainwright, 1997). There are, nevertheless, other forms of constructivism that edge to the positivist position on the virtual continuum. Stake (1995) believes that the majority of researchers adopt a pragmatic "rationalist-constructivist" view of the world, because to do otherwise would be to believe in a reality based on illusion (McCormack & McCance, 2006). The rationalist-constructivist stance does not sit well for the positivist seeking the absolute "truth" (Whall, Sinclair & Parahoo, 2006) therefore a number of researchers have pursued a middle ground. From a post-positivist approach,

it is more meaningful to be able to describe the phenomena in an understandable way rather than seeking the “absolute truth” (Wilson & McCormack, 2006).

2.4. Philosophical, epistemological, and ontological position of evaluation with a realist lens

As previously discussed, realist methodology assumes that the same intervention will not work everywhere for everyone (Wong 2016). The key questions within realist methodology are causation (the act of causing something to happen) and attribution (who or what makes this happen). Pawson and Tilley first used the term “realist evaluation” and argued that in order for an evaluation to be valuable for decision makers, they need to be able to recognise ‘what works in which circumstance and for whom’. Realist evaluation is grounded within a school of philosophy called ‘realism’ which emphasises that both the material and the social worlds are ‘real’ and can have real effects and that, by recognising this, it is possible to work towards gaining a closer recognition of what it is within a programme that causes change to happen.

All evaluation methodologies are based on philosophical assumptions and realist evaluation is based on realism, a philosophical perspective in which the social world is viewed as real. Therefore, non-observable processes and objects such as culture and economic influences, (which are commonly ignored by empirical approaches) are seen to have a real impact on how or if a programme works. Examples of social systems are family, schools, and economic systems and they have dynamic boundaries in the terms of the flow of people, resources, and information. These social systems interact with each other, so system boundaries will need to be defined for the evaluation even though these boundaries do not necessarily exist in reality. Programmes themselves are open and dynamic systems (PHE 2001). These can interact with other social systems, and so causation is not a simple linear process. They can be the result of changes in, and interactions between, different social systems (Pawson 2013) .

Realist approaches are considered appropriate for evaluating complex interventions and can offer a wider learning potential (PHE 2001). They are theory driven and seek to identify both the seen and unseen elements of a programme (the mechanisms) that lead to its success or failure (Rycroft-Malone *et al*., 2016). They are particularly useful for evaluating programmes that produce mixed results to better understand how and why differential outcomes occur.

2.5. Realist Evaluation

In contrast to experimental designs, realist evaluations are theory driven and seek to identify both the seen and unseen elements of a programme (the mechanisms) that lead to its success or failure (Rycroft-Malone *et al*., 2016) i. e. they are not focused on only one intervention or one primary outcome measure. Contingent relationships are expressed as (CMO)s, to show how particular 'Contexts' act on different 'Mechanisms' to generate 'Outcomes'. In the realist paradigm, mechanisms are 'the pathway from resource to reasoning and response' and resources can be described as those that are 'material, cognitive, social or emotional' (Pawson, 2003; Hewitt & Harris, 2012). Attention is also paid to the multiple perspectives that can influence the nature of the intervention, unlike systematic reviews, which only account for a change in the point estimate (and variance) associated with the primary outcome measure (Westhorp, 2011). This is important in health service interventions, given the complexity of the context in social programmes and their "theories incarnate" (Westhorp, 2011). In this sense, programme theories 'describes the theory built into every programme' (Pawson, 2013). Different sources of evidence are used to construct programme theories, but they emerge from a systematic process that includes stakeholder engagement, an overview of relevant extant theory, and scrutiny of primary research (Pawson, 2013; Pawson, 2006).

Given the complex nature of both the intervention and the context in the IPP as defined above and SW [multiple (CMO)s], it was deemed appropriate to use this approach to understand the 'theories incarnate' and how the

intervention worked (or not) across the different contexts in the geographical region that it was implemented within. Essentially, a more meaningful exploration was required to show how different intermediaries can be successful to promote the successful implementation of IPP. Stakeholders are central to realist evaluations and the evaluation follows a number of stages as part of the process, but unlike traditional stages of a systematic review, the process of realist evaluation is iterative, the review is both theory and stakeholder driven. This is because it is a process of theory development and stakeholder consultation, and it is this theory development that guides the search for evidence.

Evaluating a programme through a realist lens starts with the formulation of a theory of the of the programme's development, implementation, and its potential evaluation, then tests those theories. This means collecting data, about how the programme impacts, the processes of programme implementation, and crucially about the specific aspects of programme context that might impact upon outcomes plus specific mechanisms that might be triggered (or not) so that change happens.

The next section will describe the approach to the synthesis, detailing the realist cycle and the approach to evidence synthesis.

A Realist Synthesis is the synthesis of a wide range of evidence that seeks to identify underlying causal mechanisms and explore how they work under what conditions. In this context, realist evaluations seek to explore "What works, for whom, in what respects, to what extent, in what contexts, and how?". The process for undertaking realist evaluations tend to follow four distinct stages, in what is often referred to as the 'realist cycle' (Figure 2.1).

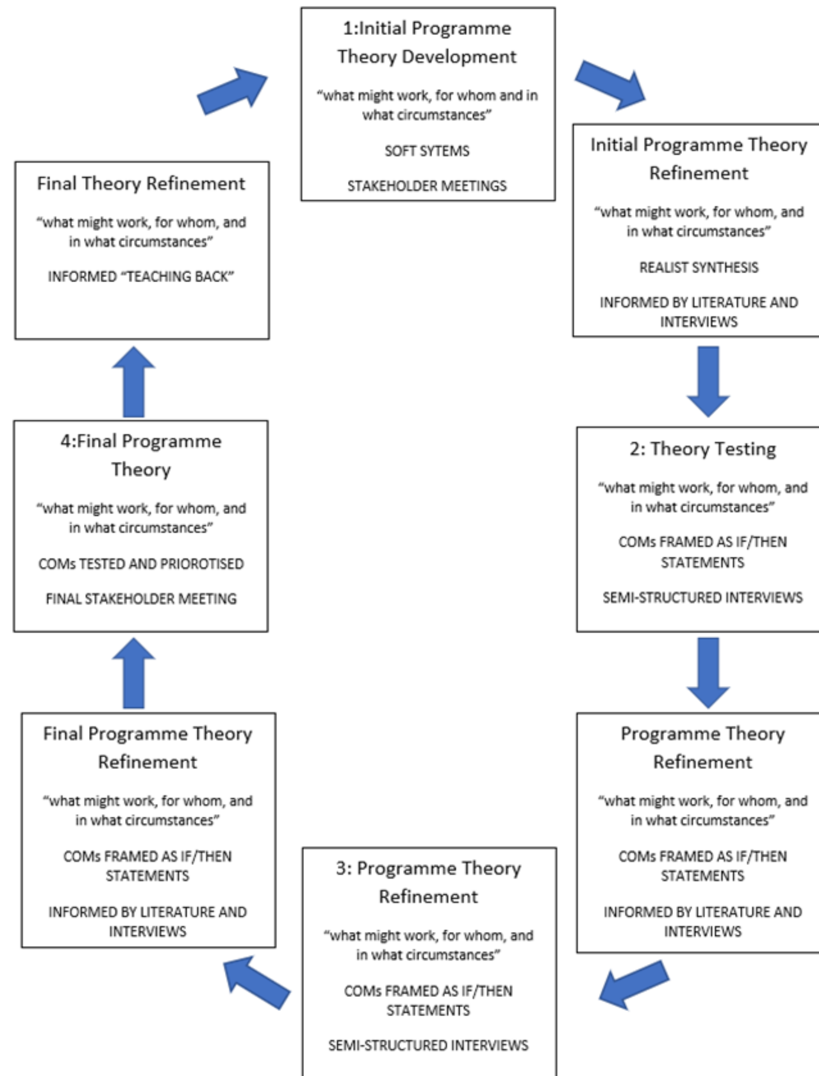

Figure 2.1: Realist cycle

As a 'theory driven' approach, realist evaluations start by determining potential candidate Initial Programme Theories (IPTs) *a priori* before iteratively developing these theories using a systematic pattern of enquiry (Wong *et al*., 2013) (Fig 2.1). Stage One starts by determining a number of Initial Programme Theories (IPT) that bring together the different contexts (C) and mechanisms (M) that produce the outcomes (O) of the intervention under evaluation. These are then refined over time, drawing on evidence from the literature and interviews with key stakeholders (Stage Two), prior to

refining the programme theory (Stage Three) and 'teaching back' the findings to the key stakeholders involved (Stage Four).

2.6. Realist approaches to evidence synthesis

The aim of realist syntheses is "to articulate underlying programme theories and then to interrogate the existing evidence to find out whether and where these theories are pertinent and productive. Primary research is examined for its contribution to the developing theory" (Rycroft-Malone *et al*., 2012). Rycroft-Malone *et al*. (2012) note five differences to a systematic review as:

1. The focus of the synthesis is derived from a negotiation between stakeholders and reviewers and therefore the extent of the stakeholder involvement throughout the evaluation is high.

2. The search and appraisal of evidence is purposive and theoretically driven with the aim of refining theory.

3. Multiple types of information and evidence can be included.

4. The process is iterative; and

5. The findings from the synthesis focus on explaining why (or not) the intervention works and in what ways, to enable informed choices about further use and/ research.

In similarity to a systematic review, a realist synthesis involves a number of set stages, but these are not necessarily followed in a fixed sequential pattern. Unlike a systematic review, the realist paradigm allows the researcher to move backwards and forwards between each stage iteratively. As a 'theory driven' approach, the review starts by determining potential candidate programme theories *a priori* before exploring the literature. However, it is possible that the literature provides a number of other potential programme theories which are worthy of consideration. As a result, the researcher seeks to iteratively develop these theories using a systematic

pattern of enquiry to determine “what works for whom in what circumstances” (Brocklehurst 2021).

Guidelines on conducting a realist synthesis review have been produced by Wong *et al*. (2013). The Rameses guidelines argue that “the results of the review and synthesis combine both theoretical thinking and empirical evidence and are focused on explaining how the intervention under scrutiny works in its own particular context*”* (Wong *et al*. (2013)*.* The initial scope of the synthesis often involves a negotiation with different stakeholders in order to ‘unpick’ the potential candidate programme theories (‘theories incarnate’). This builds on the explicit and implicit assumption that the ‘same’ intervention is never implemented identically and never has the same impact, because of differences in the context, setting, process, stakeholders, and outcomes. As a result, there is a strong focus on stakeholder engagement in all stages of the synthesis, which reflects the participatory nature of the approach taken.

The difference between evidence syntheses based on an experimental and realist paradigm is articulated by Greenhalgh *et al.* (2007). Greenhalgh *et al.* (2007) undertook a realist review in parallel with a traditional Cochrane systematic review to evaluate school feeding programmes. The Cochrane review provided evidence that feeding programmes do work, but it did not offer explanations on how they work and in what contexts. The included trials “had many different designs and were implemented in varying social contexts and educational systems; by staff with different backgrounds, skills, and cultural beliefs; and with huge variation in the prevailing social, economic, and political context”. The findings of the realist review were far more useful from a policy perspective, as they provided more valuable contextual information. As highlighted by Greenhalgh *et al*. (2007), “simply knowing that feeding programmes work is not enough for policymakers to decide on the type of intervention that should be implemented”.

2.7. Study Design

The study consisted of four phases, phase one involved the setting up of the study including ethical and IRAS approval. Ethical considerations that were made to guide the design and the principals included voluntary participation, informed consent, anonymity, confidentiality, potential for harm and results communication.

According to Bryman and Bell (2007) there are ten points that represent the most important principles related to ethical considerations.

1. Research participants should not be subjected to harm in any ways whatsoever.
2. Respect for the dignity of research participants should be prioritised.
3. Full consent should be obtained from the participants prior to the study.
4. The protection of the privacy of research participants has to be ensured.
5. Adequate level of confidentiality of the research data should be ensured.
6. Anonymity of individuals and organisations participating in the research has to be ensured.
7. Any deception or exaggeration about the aims and objectives of the research must be avoided.
8. Affiliations in any forms, sources of funding, as well as any possible conflicts of interests have to be declared.
9. Any type of communication in relation to the research should be done with honesty and transparency.
10. Any type of misleading information, as well as representation of primary data findings in a biased way must be avoided.

All participants were identified by their role in IPP and the majority of participants are anonymous, however one key participant, the LDN Chair played a significant role in the interviews and focus groups that they became easily identifiable. This was discussed with the participant and acknowledged that they were happy with this.

Phase two consisted of preparing documentation, stakeholder engagement, including telephone interview, practice visits, development of the initial programme theories, and realist synthesis. Phase three involved testing and refining the programme theories and testing the final theories. Phase four was to disseminate and for knowledge mobilisation.

2.7.1 Aims and Objectives of the study

The aim of this study is to undertake a realist evaluation to evaluate the IPP programme, in order to understand “what works, for whom and under what circumstances”. This will involve identifying potentially causal and contingent explanations and underlying attributes that underpin what works (i.e., the successful implementation of the IPP) in the form of Context, Mechanism and Outcome configurations (CMOs). The objectives of the thesis were to undertake the following:

- Use a series of stakeholder groups to develop Initial Programme Theories (IPTs) of CMOs.
- Undertake a realist synthesis to further develop these IPTs and ground them in the literature.
- Create a series of IF-THEN propositions from the IPTs to facilitate testing.
- Test the candidate IPTs with semi-structured interviews to develop a set of Modified Programme Theories; and
- Refine and prioritise the MPTs with a stakeholder group.

The research project has the following research questions:

- What works in which circumstances and for whom in the IPP programme?

- Do incentives in the GDS promote preventive orientated NHS practices?
- Does IPP better utilise role-substitutive models in general dental practice. And if so, how.
- Is IPP influenced by the institutional logics in NHS dental practices.
- Are there any substantive barriers and enablers to IPP?
- Are there any unintended consequences for participating NHS practices?
- Does the IPP programme offer an attractive and effective strategy for NHS policymakers that could be rolled out beyond Hull & The Humber

Work with the National Health Service Business Service Authority was carried out to develop a data collection tool to record IPP appointments delivered to develop a bespoke IPP report that included relevant FP17 (FP17 form is sent to the NHS electronically as part every NHS claim) data collection streams such as:

- Access
- Fluoride varnish application
- Treatment band distribution
- Patient Charge Revenue

The data collection tool recording IPP appointments will record observations of IPP appointment delivery:

- To critically analyse and synthesise the evidence base regarding the requirements of dental preventative programmes and those in other health care settings

2.8 Summary

This Chapter has explored the underlying principles of the evidence-based paradigm and determine how applicable this approach is, when evaluating complex interventions within complex health systems. It has discussed the philosophical, epistemological, and ontological position of this study, realist evaluation and the realist approach to evidence synthesis, before moving on to describe the study design and the aims and objectives.

Chapter Three will report and discuss the findings from the Realist Synthesis and deliberate the scoping of the literature, and the use of Soft Systems Methodology (SSM) that guided the stakeholder workshops. It will describe the literature search and the bespoke data collection tools developed and used and will conclude with Initial Programmes Theories (IPT) framed as IF-THEN statements.

CHAPTER THREE:

REALIST SYNTHESIS

3.1. Introduction

In this Chapter I will report and discuss the findings from the Realist Synthesis. I will deliberate the scoping of the literature, and the use of Soft Systems Methodology (SSM) which guided the stakeholder workshops. I will describe the literature search and the bespoke data collection tools developed and used. The Chapter concludes with Initial Programmes Theories (IPT) framed as IF-THEN statements.

Chapter Two argued that realist evaluations are theory driven from the outset and seek to identify both the seen and unseen elements of a programme (the mechanisms) that lead to its success or failure (Rycroft-Malone *et al*., 2016). Contingent relationships are expressed to show how particular 'Contexts' act on different 'Mechanisms' to generate 'Outcomes'. In the realist paradigm, mechanisms are described as 'the pathways from resource to reasoning and response' (Hewitt *et al*., 2012).

As mentioned in Chapter Two, realist evaluations start by determining potential candidate Initial Programme Theories (IPTs) and develop theories iteratively using a systematic pattern of enquiry (Wong et al., 2013). To facilitate this, the following process was followed for realist synthesis for the In-Practice Prevention (IPP) programme:

1. Scoping the literature.

    a. Concept mining.
    b. Conceptualising the IPP programme using soft systems.
    c. Identification of theory areas.

2. Literature search.
3. Selection and appraisal of documents; and
4. Data extraction, analysis, and synthesis.

3.2. Scoping the literature

The study sought to generate, test, and refine hypotheses through rounds of data collection and mining. Following Pawson's (2004) steps for a synthesis, the first step was concept mining, which is described as the extraction of a theory of theories, in this study from existing literature. Concept mining was undertaken to map evidence about the IPP programme. This involved a process of searching through different bodies for information that could help build potential candidate theories. This started with a detailed analysis of the policy documentation of the IPP programme. Particular attention was paid to the policy objectives, the nature of evidence-based prevention in general dental practice, incentives within the NHS contract, role-substitution, institutional logics at the level of the practice, and child-based prevention programmes.

To guide the development of the programme theories, an initial search of the extant literature was conducted to understand how evidence-based preventive programmes might be effective and the challenges to their implementation in primary dental care. The following work was explored their applicability to the IPP programme:

1. Delivering Better Oral Health (2017).

2. Healthy Gums Do Matter (Moore *et al.,* 2016).

3. What is clinical leadership and why it might be important (Brocklehurst *et al*., 2013).

4. Institutional logics at the dental chairside (Harris & Holt, 2013).

5. Paying for the wrong kind of performance (Tickle *et al*., 2011); and

6. Extending dental nurses' duties: Scotland's child oral health improvement programme (Childsmile) (Gnich *et al*., 2014).

Informed by the concept mining stage to conceptualising the IPP programme using soft systems, two workshops were held, where key stakeholders were engaged to develop an initial set of programme theories (Table 3.1). The first workshop was held in Health Education England premises in Leeds and was attended by a Consultant in Dental Public Health England, Two Commissioners, and North Yorkshire and Humber Local Dental Network Representative. Th second workshop was held at a Dental Practice in Hull, where there were 3 dental nurses, one practice manager and three dentists in attendance.

Table 3.1: Key stakeholders involved in the Initial Programme Theory development

Stakeholder type	Justification
Public Health England (PHE)	Responsible for the prevention of dental disease in children in England and the endorsement of the In-Practice Prevention programme
NHS Commissioners for North Yorkshire and The Humber (NHSE)	Responsible for funding the In-Practice Prevention programme
North Yorkshire and The Humber Local Dental Network (LDN)	Responsible for developing the In-Practice Prevention programme
General Dental Practitioners (GDPs)	Responsible for referring patients to the In- Practice Prevention programme
Dental Nurses, Practice Mangers, and Receptionists	Responsible for implementation and delivery of the In-Practice Prevention programme

The structure of the workshops was guided SSM, a learning approach which offers an interpretive perspective of the complex and adaptive nature of human systems within the ‘real world’ (Lane & Oliva, 1998; Williams, 2005). In this instance, it would be how the dental nurse saw the IPP in terms of their own perspective, their vision of how it works, and the barriers and enablers that were present. This type of approach complements the realist paradigm as it accounts for multiple perspectives when developing the Initial Programme Theories (IPTs) (Checkland, 1999). Dalkin *et al,.*2018 argue that SSM and realist approaches emphasize the necessity to engage stakeholders, which enables researchers to uncover the complexity as experienced by the stakeholders. Mingers and Rosenhead (2011) believe that using SSM helps to “adopts a systems-theoretic framework to problem situations for which there are different perceptions based on contrasting world views held by stakeholders”.

One of the strengths is claimed to be its practical usability in a wide range of situations and can be used for a wide variety of tasks. Soft systems methodology was developed on the realisation that the real world is complex, primarily because we, as humans, will have different perspectives of the same situation. Soft systems methodology takes the chaotic arguments of the real world caused by the different perspectives of those involved and creates a model for comparison with what is happening in the real world, to make judgements. These models are not models of the real world, but models of what it could be, what good looks like and what it could be like. The model of what good looks like can then be compared to reality.

Within this approach, the focus falls on understanding the relationships among system components (mechanisms) and the interactions of the system with its environment (contexts) to produce a given set of outcomes. Systems are viewed as dynamic and being constantly subject to various forces and feedback mechanisms. Some of those forces and mechanisms are stabilizing and some are reinforcing or de-stabilizing. System dynamics modelling is used in this way to help understand the behaviour of systems over time in order to identify the driving variables so that system behaviour

may be positively affected and predict future preferred results. To facilitate this further, we utilised the CATWOE mnemonic to unpack these relationships within the system for the IPP programme (Checkland, 1981).

1. Customers (C): beneficiaries of the IPP programme.
2. Actors (A): those with a role or function in the IPP programme.
3. Transformations (T): changes and adjustments that have to be undertaken in order for the IPP programme to be implemented.
4. World views (W): underlying contextual culture and the challenges in implementing the IPP programme.
5. Ownership (O): factors that influence the development of the IPP programme; and
6. Environments (E): factors that may constrain or act as barriers to its implementation.

This provides a framework to “make explicit a variety of stakeholder perspectives separately and understand their implications” (Dalkin *et al.*, 2018). In this manner, “particular perspectives are subjected to a structured and rigorous model development process using the mnemonic”, which captures the following elements (Dalkin *et al*., 2018; Checkland & Scholes, 1992):

The CATWOE mnemonic was also utilised to facilitate the initial discussions and structure data collection within the workshops. Both workshops were recorded, and notes were made on a flip chart to capture the views of the stakeholders. The key questions that were asked within each category are detailed in Table 3.2.

Table 3.2: CATWOE questions for the stakeholder group

CATWOE elements	**CATWOE questions**
Customers	What are the roles of those involved with IPP?
Actors	Who do you think should be involved with the future development of the IPP programme development? In what way?

Transformations	What changes were required to implement IPP? Where is the intervention likely to work? Where is the intervention likely to fail?
World views	What are the current challenges facing IPP at the moment? How could these challenges be dealt with? What are other influences in IPP that we need to consider?
Ownership	What and or who can influence success in developing IPP?
Environment	What are the constraints or barriers for IPP?

The recordings were then transcribed and analysed thematically, and key points are provided below (Table 3.3).

Table 3.3: Key elements of the IPP programme organised according to CATWOE

CATWOE category	Justification
C: Beneficiaries of the IPP programme	1-The key beneficiaries of the IPP programme were young children in the region with high levels of dental caries; and 2-The NHS dental practices that worked within the ‘flexible commissioning’ approach.
A: Roles and functions in IPP	1-The LDN was considered to be a key driver for IPP, who were seen as the “movers and shakers” within local professional circles and so had roles as ‘Clinical Leaders’. 2-NHSE were responsible for local commissioning and so were pivotal to the success of the programme and the underpinning ‘flexible commissioning’ approach. 3-PHE leadership was also seen as critical to ensure a dental public health approach was taken to address the problem. 4-The LDN and PHE had developed a business case to take to the NHSE, so multi-agency working was seen as key at a strategic level. 5-The engagement of GDPs and local dental teams was seen as pivotal (and the incentives and leadership skills needed to promote change at a practice level). 6-Given the change to the ‘traditional’ commissioning model, the IPP programme had ‘national eyes’ on the project and so an on-going relationship with the DH was key; and

	7-Members of the dental team (dental practice owners, Dental Care Professionals, dental nurses and dental receptionists) were seen as critical to the delivery of IPP.
T: Changes and adjustments to implement IPP	1-multi-agency and cross-sector working were critical. 2-IPP was seen to be 'over and above' what GDPs were normally commissioned to provide, so clinical leadership, culture and behaviour change was key (e.g., preparedness to change appointment times to facilitate after-school appointments and increase appointment times). 3-Incentives under-pinned the delivery of the programme. 4-GDPs and dental teams needed to understand the problem from a public health perspective (i.e., widen their frame of reference and become more 'community-facing'). 5-The whole practice team had to engage with the programme (and sometimes there was dissonance between practice owners and their teams, who would deliver IPP). 6-Identification of 'movers and shakers' within the professional was important to promote peer-to-peer acceptance of the programme. 7-Addressing NHSE's concern about the impact of the programme on Patient Charge Revenue (PCR) was important. 8-In turn, this meant re-focusing NHSE's priority on promoting access to services. 9-There was a need to focus on evidence-based prevention and health promotion; and

	10-To facilitate the latter, influencing the attitudes of patients and their families was key.
W: Underlying context for IPP	1-IPP to be delivered by dental teams whilst still working to the existing NHS dental contract (which set targets for activity and performance). 2-Availability of suitable appointments for the programme would require a change in the mind-set of the practice and dental receptionists. 3-Given this, a change in practice culture was considered to be key. 4-The LDN were keen to ensure that the programme was delivered to a consistent standard. 5-Given the novelty of the 'flexible commissioning' model, there was a need for the LDN to challenge traditional methods of service provision and challenge national priorities (access/PCR). 6-This required NHSE dental commissioners to allow 'top-slicing' to support IPP. 7-National programmes ('Starting Well Thirteen'; 'Dental Check by One') were also starting to be delivered across England, which could be an alternative to the programme or subsumed into it. 8-PHE were driven by the local needs of the population and the need to reduce dental caries amongst young children; and 9-At a practice level, different members of the dental team held different worldviews about their role.

O: Factors that influence the ownership of IPP	Elements that determined the success of the programme were identified in the Transformations section, but the two key factors that were considered to be critical was the top-level ‘buy-in’ amongst the different agencies and the clinical leadership to deliver the programme, through the LDN and the local dental teams in the region.
E: Contextual barriers	1-Supportive dental practice owners were needed in order to change current working practices. 2-DCPs were to run the programme, who had a different ‘world view’ to their practice owners. 3-Education of the DCPs was fundamental to the implementation of IPP and the consistency of its delivery (this included training of dental nurses in the application of fluoride). 4-A number of specific practice-level barriers were articulated (e.g., physical surgery space, capacity within the workforce, willingness to problem solve and the headspace to do this, given the confines of the existing NHS dental contract). 5-Funding of training was not guaranteed (achieved initially through the 'claw-back' mechanism following annual reviews of dental contracts). 6-Practice re-organisation was required to promote role-substitution and role-supplementation (greater use of 'skill-mix' in the programme). 7-Changes to internal pay structures within the practice to deliver the programme (and the problems caused if other members of the team on the same pay structures were not involved). 8-Geographical location of practices also posed a potential barrier to the training of dental nurses (who also required time away from the practice or their 'own-time'); and

	9-National priorities on improving access and reducing changes to PCR.

The use of the CATWOE soft systems approach generated a substantial amount of information from the discussions. These were recorded and transcribed verbatim and notes were made on a flipchart at the time, under the CATWOE headings Figure 3.1, further pictures of the data collected via CATWOE can be viewed in Appendix 7.

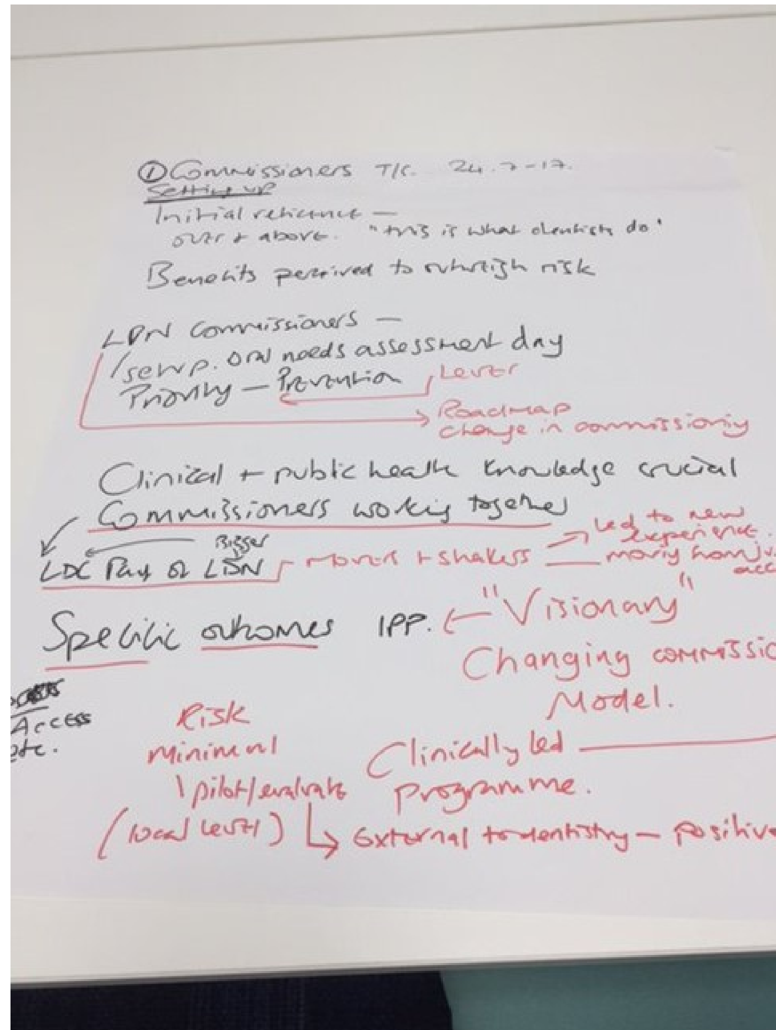

Figure 3.1 Example of Flip Chart from CATWOE

In the second workshop, the CATWOE approach was augmented with ‘rich pictures’ to capture how IPP works from the different perspectives of the stakeholders (particularly those responsible for the delivery of the programme) (Dalkin *et al*., 2018). A ‘rich picture’ is a way to explore, acknowledge and define a situation and express it through diagrams to create a preliminary mental model. This helps to open discussion and come

to a broad, shared understanding of a situation across the different stakeholders. Its potential for use within a realist context was articulated by Dalkin *et al*. (2018), who argue that this method within a SSM “can provide a useful tool to a) map programme complexity and, b) develop and refine stakeholders programme theories, thus increasing the transparency, reliability, validity, and accuracy of the theory building and refining process in realist approaches”. An example of a ‘rich picture’ from the workshop is detailed in Figure 3.2., further examples are shown in Appendix 6, and facilitated the identification of key theory areas. From the rich pictures the process of IPP from the perspective of the Dentist referring a child to IPP, the role of the receptionist and DCP delivering the intervention were explored. The rich pictures also recognised the administration processes and data collection and audit that formed part of IPP.

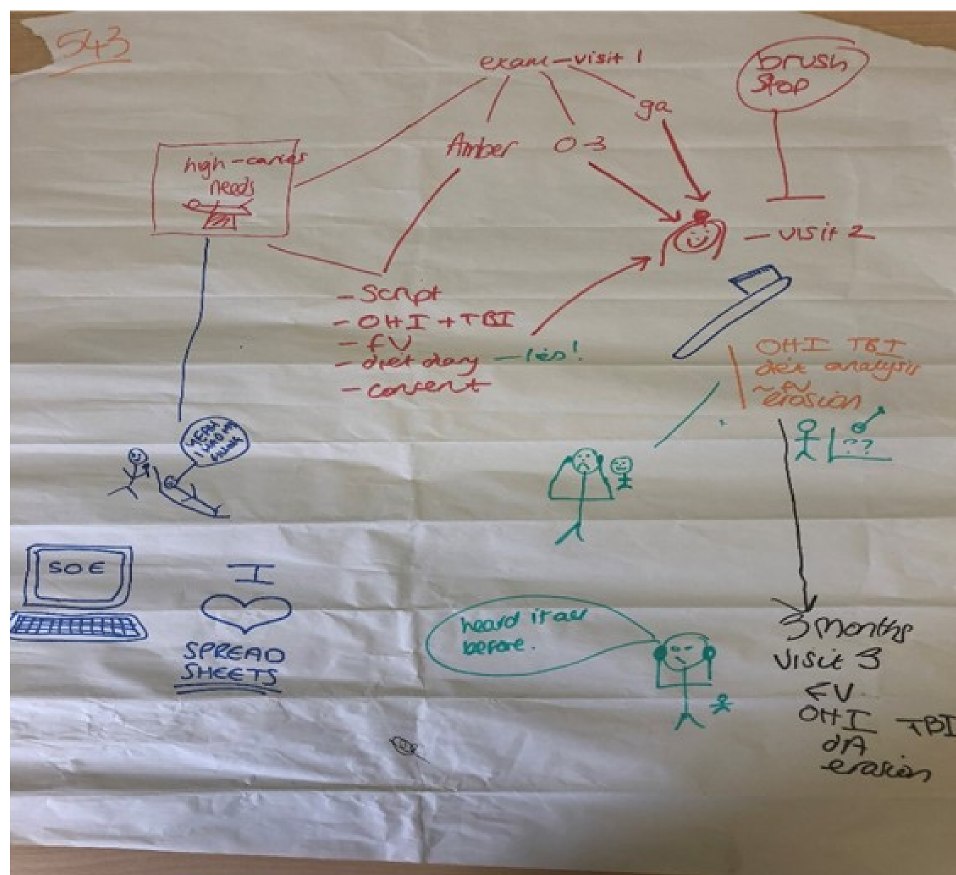

Figure 3.2 Example of Rich Pictures

Following the stakeholder meeting all the data was collated and notes made, and transcriptions explored. All the data was then placed in a working document in order to uncover the broad theory areas, the working document can be viewed in Appendix 1. This process highlighted the importance of five broad theory areas, which were used to focus the realist synthesis:

1. Institution logic (i. e. practice culture).
2. Clinical leadership.
3. Financial incentives in the NHS dental contract.
4. Behaviour change; and
5. ‘Skill-mix’.

In addition to the soft system methods described, a series of observation practice visits were carried out during this phase at practices that delivered IPP in order to gain an inside perspective of how the intervention was being delivered and was or was not working in practices.

Observation can be used alongside realist evaluation to enable the IPTs to be “guided and informed by incidents arising from the observation” (Manzano 2016). Consequently, our evaluation drew from the observations that were made.

A working document was created to structure the visits to ensure consistent data was gathered at each practice. Table 3.4 and Appendix 4

At each practice the “space” where the observation was carried out was considered, this included the infrastructure of the practice, number of surgeries, reception area, area for meetings, and the room where IPP is delivered. The “actors” within the intervention, who is involved in IPP and what are their “roles”, were noted and the activities of those delivering IPP, in particular noting what the appointment for IPP is about, and what are the main “activities” of the participants in terms of contribution, listening and responding. Also noted were the “objects” used in IPP delivery for example motivational interviewing techniques or mouth models to help with

demonstration and acted as a resource that helped to provide a fuller explanation of the IPP appointment.

“Time” was noted for the intervention as well as time set aside for the discussion of IPP at practice meetings. “Events” relating to IPP implementation including special events that promoted IPP including the actions taken in practice meetings or by the receptionists to promote IPP were noted. Goals were discussed to establish the ambition of the practice of the people involved with IPP. And finally, the “feelings” expressed by the individuals.

In total seven visits were arranged over a period of 3 days via email, and a timetable drawn up for the visit to be carried out in the region. Unfortunately, one practice was unaware of the arrangement and not prepared for the visit, and in another practice the person responsible for IPP and its delivery was unavailable. However, the remaining five practices were prepared, and this exercise helped to contribute to the formation of the IPTs.

Table 3.4: Observation of IPP at Practice Visits

Practice Visit 1	
Space: *where the observations are taking place, in a practice meeting, staff and reception areas*	*There were no patients booked in for the observation, practice principle not in today. The practice very busy as end of March and UDA targets. Generally use any surgery that is free.*
Actors: *who is involved, what are their roles in the IPP-PCP?*	*Ann the receptionist is involved in IPP and looks after the paperwork. EEDN1 and EEDN 2 deliver the IPP PCP*
Activities: *what the appointment is about and what are the main activities of the participants – listening, contributing, and so on*	*No patient booked in for me to observe*
Objects: *IPP-PCP,*	*There are 6 dentists, 1 hygienist and 1 therapist in the practice along with the 2 EDDNs that deliver IPPP-PCP*
Acts: *providing fuller explanation about specific involvement in the IPP-PCP providing feedback or facilitating a discussion or action*	*IPP-PCP first appointments is delivered at the dental check appointment.* *IPP clinics are booked between 3pm and 5pm term time and in school holidays in an attempt to reduce FTAs*

Time: *for example, when a practice meeting or appointment takes place, how long it lasts and if any of the other dimensions change over time (such as additional people joining or leaving the appointment which might change the dynamic of the meeting)*	*The appointments are 20 mins, but can be longer if there is language issue (based near Army camp which has a lot of Gurkha and Fijian soldiers and their families)*
Events: *for example, specific events that take place during a practice meeting or in staff and reception areas*	*IPP is discussed in practice meetings to remind the dentists that it is there!*
Goals: *what the purpose of the practice or staff meeting was, what goals are achieved during the meeting and what are the goals of those involved*	*N/A*
Feelings*: for example, feelings expressed by an individual at a practice meeting or in the practice*	*"Likes IPP, feels that it has a wider benefit to the family, that the messages reach everyone. I would like to see it incorporated into schools and to other groups, especially the elderly." EDDN 1* *Would also like to see it expand into schools. The practice is part of "Tooth Team"*

Practice Visit 2	
Space: *where the observations are taking place, in a practice meeting, staff and reception areas*	*Patients booked in for the observation but had cancelled, practice principle not in today. Generally use any surgery that is free.* *UDA target not an issue. Works with the FD dentist*
Actors: *who is involved, what are their roles in the IPP-PCP?*	*Only Claire delivers IPP-PCP*
Activities: *what the appointment is about and what are the main activities of the participants – listening, contributing, and so on*	*Reports a problem with attendance, FTAs, and cancellations* *Has been left totally in control, no induction, only delivers 2 appointments, doesn't understand the website, was not aware that there should be 3 appointments, only delivers it if they are "really bad"*
Objects: *IPP-PCP,*	*Multiple dentists and surgeries. Claire is left to IPP. Did not understand the questionnaire and was only giving to GA Pathway children.*
Acts: *providing fuller explanation about specific involvement in the IPP-PCP providing feedback or facilitating a discussion or action*	*IPP-PCP first appointments is delivered at the dental check appointment.* *IPP clinics are booked between 3pm and 5pm term time and in school holidays in an attempt to reduce FTAs*

Time: *for example, when a practice meeting or appointment takes place, how long it lasts and if any of the other dimensions change over time (such as additional people joining or leaving the appointment which might change the dynamic of the meeting)*	*The appointments are 20 mins and books in for 2 appointments and therefore only one fluoride application is delivered, unless the IPP nurse feels they are "really bad". Did not realise that the care pathway was for 2 fluoride applications.* *Does not use the website for further information about IPP*
Events: *for example, specific events that take place during a practice meeting or in staff and reception areas*	*IPP is discussed in practice meetings to remind the dentists that it is there!*
Goals: *what the purpose of the practice or staff meeting was, what goals are achieved during the meeting and what are the goals of those involved*	*Likes how it is running, would like to expand it to other nurses* *Principle likes IPP to be delivered in set clinics and does not want to be done as an ad-hoc*
Feelings*: for example, feelings expressed by an individual at a practice meeting or in the practice*	*Practice is part of "Tooth Team"*
Practice Visit 3	

Space: *where the observations are taking place, in a practice meeting, staff and reception areas*	*In surgery 8 with EEDN3, patient, and parent in attendance.* *1st patient 7-year-old* *2nd patient 2-year-old information regarding IPP appointment and consent gained for IPP*
Actors: *who is involved, what are their roles in the IPP-PCP?*	*EEDN 3, patient, and dad.* *EEDN 3, patient, Mum, and Aunt*
Activities: *what the appointment is about and what are the main activities of the participants – listening, contributing, and so on*	*Asked patient about brushing habits and toothpaste check and shown where the fluoride can be found on packet.* *Explained why diet important in the treatment of decay.* *Examined the mouth to check on oral hygiene status, good rapport with patient, happy with patient oral hygiene, practice tooth brushing with patient on the model "3 laps each time"* *Patient really engaged*
Objects: *IPP-PCP,*	*Mouth model used and toothbrush, child involved with all aspects*

Acts: *providing fuller explanation about specific involvement in the IPP-PCP providing feedback or facilitating a discussion or action*	*Good clear explanations with recall and questioning* *Check diet* *Diet advice and advice given*
Time: *for example, when a takes place, how long it lasts and if any of the other dimensions change over time (such as additional people joining or leaving the appointment which might change the dynamic of the meeting)*	*20-minute appointment only Dad* *If families will book 10 minutes per child, -Tonika in charge of how many IPP appointments* *Mum and one other attended. Mum requested appointment as patient has a tongue and lip tie, good explanations to help with oral hygiene and tooth brushing techniques. Mum has had a lot of treatment and keen to avoid problems. Patient using milk teeth toothpaste and Mum aware of ppm* *Due to ties difficult to use sip cup, can use a straw*

Practice Visit 4	

Space: *where the observations are taking place, in a practice meeting, staff and reception areas*	*543 has 11 dentists working over 3 floor, 3 reception areas with 2 receptionists on each, with an additional reception area with 2 receptionists for when it gets busy! IPP is delivered in a dedicated room, child and oral health friendly. Set up with everything that is needed and a computer to record patients notes and the IPP visits for audit purposes.*
Actors: *who is involved, what are their roles in the IPP-PCP?*	*EEDN 4 delivers IPP 3 days a week and on those days is available to do "extras" if they arise. There are other IPP nurses*
Activities: *what the appointment is about and what are the main activities of the participants – listening, contributing, and so on*	*There is video of EEDN 4 delivering IPP, so observation not necessary*
Objects: *IPP-PCP,*	*See video*
Acts: *providing fuller explanation about specific involvement in the IPP-PCP providing feedback or facilitating a discussion or action*	
Time: *for example, when a practice meeting or appointment takes place, how long it lasts and if any of the other dimensions change over time (such as additional people joining or leaving the*	*15-minute appointments and how many depend on the care pathway. EEDN 4 does all the paperwork for some of the dentists as they find it too much and will not refer. There is no incentive for the dentist to refer the IPP-PCP the IPP payments go to the practice/principle/contract holder.*

appointment which might change the dynamic of the meeting)	
Events: *for example, specific events that take place during a practice meeting or in staff and reception areas*	*The practice is part of "Teeth Team" and has just become part of the "Starting well" programme, EEDN 4 will be moving over from IPP to deliver starting well. She will train one of the other IPP nurses to carry on with the IPP paperwork and submissions*
Goals: *what the purpose of the practice or staff meeting was, what goals are achieved during the meeting and what are the goals of those involved*	
Feelings*: for example, feelings expressed by an individual in the practice*	*This is a much-organised practice and sees the benefit of these programmes. The dental nurse in charge also has a good understanding of the process and is currently helping other IPP practices with the delivery.*

Practice visit 5	

Space: *where the observations are taking place, in a practice meeting, staff and reception areas*	*In surgery when free, usually every day except Thursday. Surgery is very small*
Actors: *who is involved, what are their roles in the IPP-PCP?*	*The team, IPP1 is delivered by dentists at the check-up, consent and risk assessment and diet diary, then sees EDDN for visit 2 and OH and fluoride application, 3rd visit 3 or 6 months*
Activities: *what the appointment is about and what are the main activities of the participants – listening, contributing, and so on*	*Make sure they bring their own toothbrush, so that they can demo tooth brushing*
Objects: *IPP-PCP,*	
Acts: *providing fuller explanation about specific involvement in the IPP-PCP providing feedback or facilitating a discussion or action*	
Time: *for example, when a practice meeting or appointment takes place, how long it lasts and if any of the other dimensions change over time (such as additional people joining or leaving the*	*20 minutes, unable to deliver in less, she finds there is too much information to give in 12-15 minutes* *School holidays are "mental", delivered target in January* *In April '17 delivered 7 February '18 delivered 143*

appointment which might change the dynamic of the meeting)	
Events: *for example, specific events that take place during a practice meeting or in staff and reception areas*	*Nurses' meetings are more useful for IPP than practice meetings and development from there.*
Goals: *what the purpose of the practice or staff meeting was, what goals are achieved during the meeting and what are the goals of those involved*	*To break down the language barriers and ensure that the messages were getting through to people whose first language isn't English*
Feelings*: for example, feelings expressed by an individual at a practice meeting or in the practice*	*Love delivering IPP, would like to see spread out to older generations. 0-3 should be more than one visit if necessary, takes more than once appointment to get a behaviour change.* *Website is very confusing; the different boxes makes it unclear*

3.3. Literature search

As the search for potential candidate IPTs developed, an initial search strategy was developed and refined. This took account of the analysis of the CATWOE and 'rich-pictures' and the process of prioritising the broad theory areas, which were present to and confirmed by the LDN, Reflecting the realist approach, the search strategy was deliberately kept as broad as possible and combined a primary search and purposive searches in order to capture the most relevant evidence to build, support and/or refute the IPTs that were being developed (Pawson, 2006).

The realist synthesis aims to test the theory areas that have been identified against the empirical evidence in the literature to enlighten the research as to why programmes that are based are around them succeed in some situations, for some and not for others.

A realist synthesis, like a conventional systematic review involves a number of stages, but these are not as strict or as undeviating. In a conventional review, each stage is distinct and following in a sequence. In a realist synthesis, the process is much less staged, and the researcher will move backwards and forwards between each stage iteratively.

The synthesis aims to develop a rich and meaningful understanding of the theory underpinning the In Practice Prevention Care Pathway intervention. Conceptual richness is a degree of theoretical and conceptual development that explains how an intervention is expected to work. It also requires enough detail to gather the multi-layered understanding to context, the conceptual thickness. That is, sufficient detail to establish what exactly is going on, in the intervention and the wider context. In addition, enough detail to enable the reader to assume whether findings can be transferred to other people, places, situations, or environments. These demands place a significance on a systemic and informed approach to the search technique.

The search continued until we achieved “theoretical saturation”, in realist terms, this is the point where there are no more mechanisms to uncover in the evidence. However, given the timeframe of the project the process needed to be completed by the end of August 2018 which allowed five months.

3.3.1 Search strategy

One search within dentistry was carried out and then the wider literature was used, as there was an awareness that relevant context, mechanism and outcomes may be identified in the literature outside the scope of this project.

As the aim was to reach theoretical saturation, rather than complete coverage of all the evidence, the emphasis of the search was on specificity (accuracy) rather than on sensitivity (breadth of coverage).

Two related processes were running in parallel, searching and selecting the evidence and appraising the documents.

The searching process was developed to be systematic and transparent.

1. The search was driven by the objectives and the focus of the review. Those being the 5 programme theories that have been established from stakeholder engagement.
2. The search strategy was be piloted and refined to ensure that it is fit for purpose.
3. A wide range of sources was used to identify documents that are likely to identify data for theory development, refining and testing.
4. There was no restriction of the study or document type that was searched.
5. Further searches were undertaken following a greater understanding of the theory areas.

6. The searches were designed to find additional data to enable further development, refinement, and testing of the programme theories.
7. The search design needs to be iterative, as the synthesis progressed, new elements required further information to explain certain findings.
8. The search design deliberately sought out information from outside the programme, where it could be hypothesised that the same mechanisms may be in operation.
9. In line with realist practice, inclusion and exclusion decisions will be based on two criteria (Wong *et al.*, 2013):
    i. Relevance
    ii. Rigour
10. Quality standards for selecting and appraising documents were defined as (Wong *et al.*, 2013);
    i. Selection of a document for inclusion into the review was based on what it can contribute to the process of theory development, refinement and/or testing (i.e., relevance).
    ii. Appraisals of rigour judge the plausibility and coherence of the method used to generate data.
    iii. During the appraisal process limitations of the method used to generate data are identified and taken into consideration during analysis and synthesis.
    iv. Selection and appraisal demonstrate sophisticated judgements of relevance and rigour within the domain. A bespoke “relevant and good enough flow chart was developed to aid this process, (Appendix 12)

3.3.2 Search Method

These search terms were based on the five initial theory areas that were developed following the initial stakeholder meetings and some scoping of the literature has taken place to inform this process.

Systematic searches were conducted in three electronic databases subscribed to by Bangor University: Ovid MEDLINE, CINAHL and PsycInfo. were chosen because of their extensive collection of over 32 million combined citations of medical, nursing, allied health, and life science journals as well as inclusiveness of international publications.

Searches were carried out of databases including material indexed in the major health and related databases (Cochrane Library, Campbell Collaboration, ZETOC, MEDLINE, EMBASE and CINAHL), grey literature and other sources. Techniques such as citation searching and retrieval of "sibling" (different papers relating to the same study) and "kinship" (where papers are theoretically related) studies were used as they offer an additional approach to text word based bibliographic strategies (Appendix 12)

As well as key term searching to help focus the search and to find relevant citations, MeSH (Medical Subject Headings) were utilised.

Criteria for the search process was guided by the following factors:

i. Relevance: whether the literature contributed to theory building and or testing for the IPP programme
ii. Rigour: whether the methods used to generate the relevant data were credible and trustworthy (Wong *et al.*, 2013)
iii. Time-limited: post 2006, given that this was when the NHS Dental Contract was introduced. (The changes in the payment method, which no longer paid the GDPs to deliver preventive dental care).

Results were placed in folders in Mendeley under the following titles

i. Inclusion
    a. Papers that used sample size, data collection techniques, analysis of methods and research claims as well "nuggets" of wisdom

b. As relevant to the initial programme theories and provided relevance to the theory development and refinement of the theory areas.

ii. Exclusion

a. Not meeting the above criteria

iii. Revisit

a. Those that could be relevant and may be revisited

Each of the searches were given a name and date and the scope of all the searches were recorded in a table

3.3.3 Extraction and Synthesis

Data reviewed and considered relevant from the article was recorded on the data extraction form. The data extraction contained questions relating to each theory area and will provide a framework to probe the papers. If the paper did not include information on the question in the data extraction form, “Not Applicable” was noted. Evidence and direct quotations were recorded, along with the page number and copied in the Evidence Table. The data extraction form was piloted for suitability prior to being implemented.

DATA EXTRACTION FORM FOR IN PRACTICE PREVENTION PATIENT CARE PATHWAY

<table>
<tr><td>Document ID/Title</td><td colspan="5">Paying for the wrong kind of performance? Financial incentives and behaviour changes in National Health Service dentistry 1992–2009</td></tr>
<tr><td>Author/s</td><td colspan="5">Tickle M, McDonald R, Franklin J, Aggarwal VR, Milsom K, Reeves D</td></tr>
<tr><td>Date published</td><td colspan="5">2011</td></tr>
<tr><td>Source of paper</td><td colspan="5">Search</td></tr>
<tr><td>Type of study</td><td colspan="5">Comparison</td></tr>
<tr><td>Study's aim</td><td colspan="5">Examine the impact of changes to financial incentive structures on the behaviour of dentists working in the English National Health Service (NHS) as a result of a new national contract.</td></tr>
<tr><td>Sample size</td><td colspan="5"></td></tr>
<tr><td>Setting</td><td colspan="5">NHS dentists in England</td></tr>
<tr><td>Intervention (if applicable)</td><td colspan="5"></td></tr>
<tr><td>Theory area</td><td>Clinically led interventions</td><td>Institutional logic</td><td>Incentive theory of motivation</td><td>Behaviour change theory</td><td>Skill mix</td></tr>
</table>

Figure 3.1: Bespoke data collection tool

For the primary search, a list of search terms was created from the theory development work (concept mining and soft systems), for each of the five key theory areas (Table 3.4).

Table 3.5: Search terms for the theory areas derived from the theory development work

Theory area	
Institution logic (i.e., practice culture)	Institutional logic Practice culture Professional responsibility Practice pattern
Clinical leadership	Locally led Professional empowerment Professional responsibility Local professional networks
Financial incentives in the NHS dental contract	Flexible commissioning Motivation Targets Incentive Motivation Remuneration Contracting Practice payments Capitation
Behaviour change	Behaviour change Preventive care
‘Skill-mix’	Communication Training Training needs Professional practice Decision making – personal skills Autonomy

The use of an Information Specialist at Bangor University was utilised, informed by the main themes that had emerged from the CATWOE process, they developed the search terms further. Searches were carried out in the major health and related databases; grey literature and other sources and titles/abstracts were inspected for search terms. Search term lists were rationalised and checked against Medical Subject Headings (MeSH) when available and checked alongside the developing set of IPTs.

The databases were searched using keywords identified through the search development and database specific 'keywords' adapted for each information source. The primary search was limited to material from 1990 to 2019.This starting date was selected given that the concept of evidence-based practice/evidence-based treatment/evidence-based medicine first gained prominence in the 1990's with the field of implementation science following in response to a growing consciousness of the research to practice gap (Lewis *at al*, 2020). Methodological filters were not used to avoid excluding any potentially relevant papers. The searches took place in June 2018. References were stored in Mendeley database software.

The systematic databases search yielded 5,194 references; 164 of these were duplicates, leaving 5,030 hits included for title screening. The number of records identified in each database are shown in Table 3.6.

Purposive searches were also conducted to explore for potentially useful evidence in the five theory areas. This approach contrasts with the 'Cochrane-style' approach but is considered important in the realist process to yield further sources that could inform the development of the initial programme theories (Westhorp, 2014; Greenhalgh & Peacock, 2005). The Prisma Flow Chart Figure 3.2 visually summarises the screening process.

3.4. Selection and appraisal of documents

Evidence was excluded only if it did not relate to the theory areas. The test for inclusion was if the evidence provided was 'good and relevant enough' to be included (Pawson, 2006). This was carried out using the bespoke "Relevant and Good Enough Flow Chart" (Appendix 12) and drawing on the experience of the supervisors. These were informed by a subset of constructs which were added to the data extraction form. 'Good enough' was deconstructed as the quality of evidence expressed through fidelity, trustworthiness, and value. 'Relevance' related to the contribution of the evidence to the theories. Abstracts were reviewed by FS and checked by the supervisors of the project. The number of identified papers that were included in the review were as follows:

1. Institution logic (n=0).
2. Clinical leadership (n=42).
3. Financial incentives in the NHS dental contract (n=83).
4. Behaviour change (n=58); and
5. 'Skill-mix' (n=82).

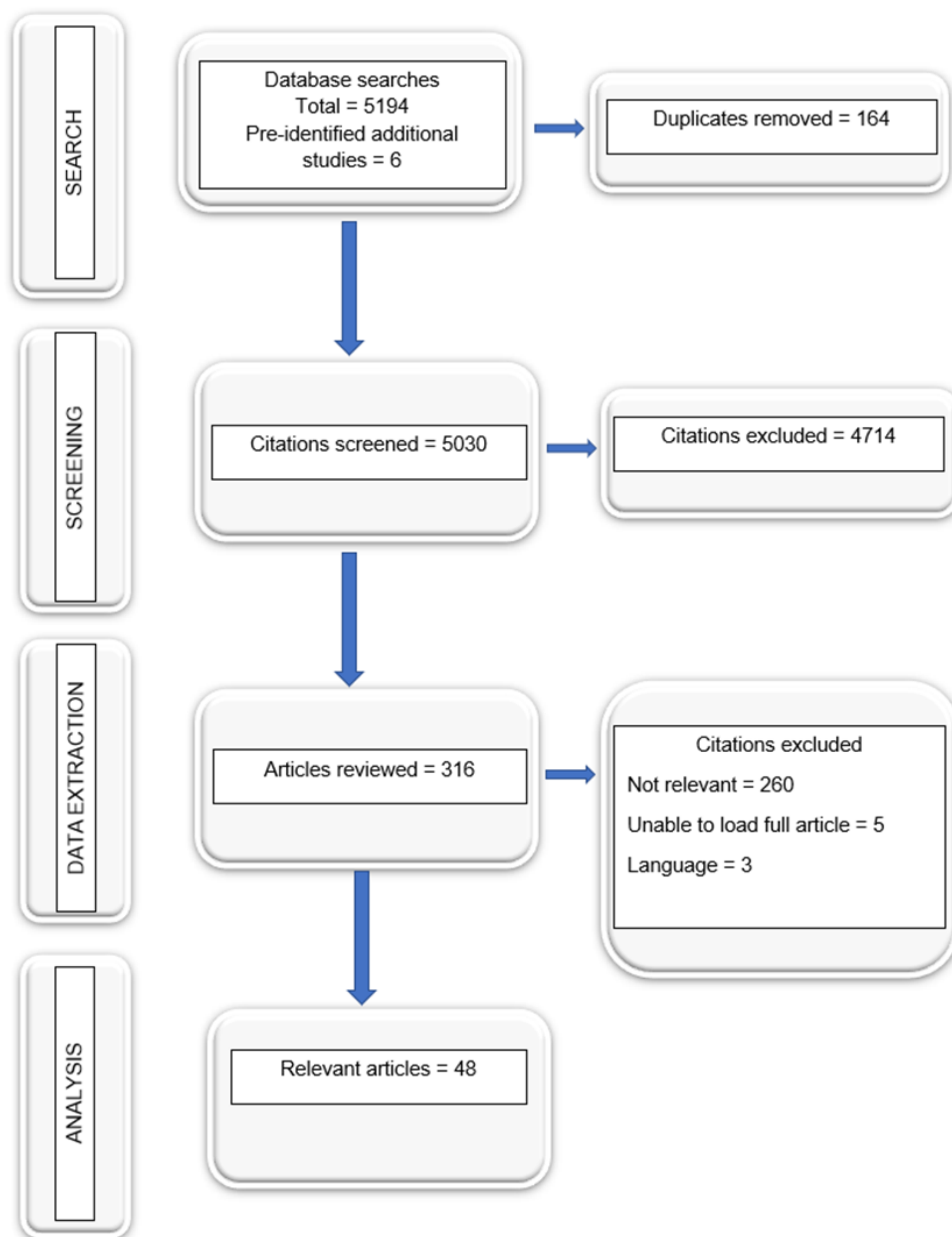

Figure 3.2: Prima Flow Chart

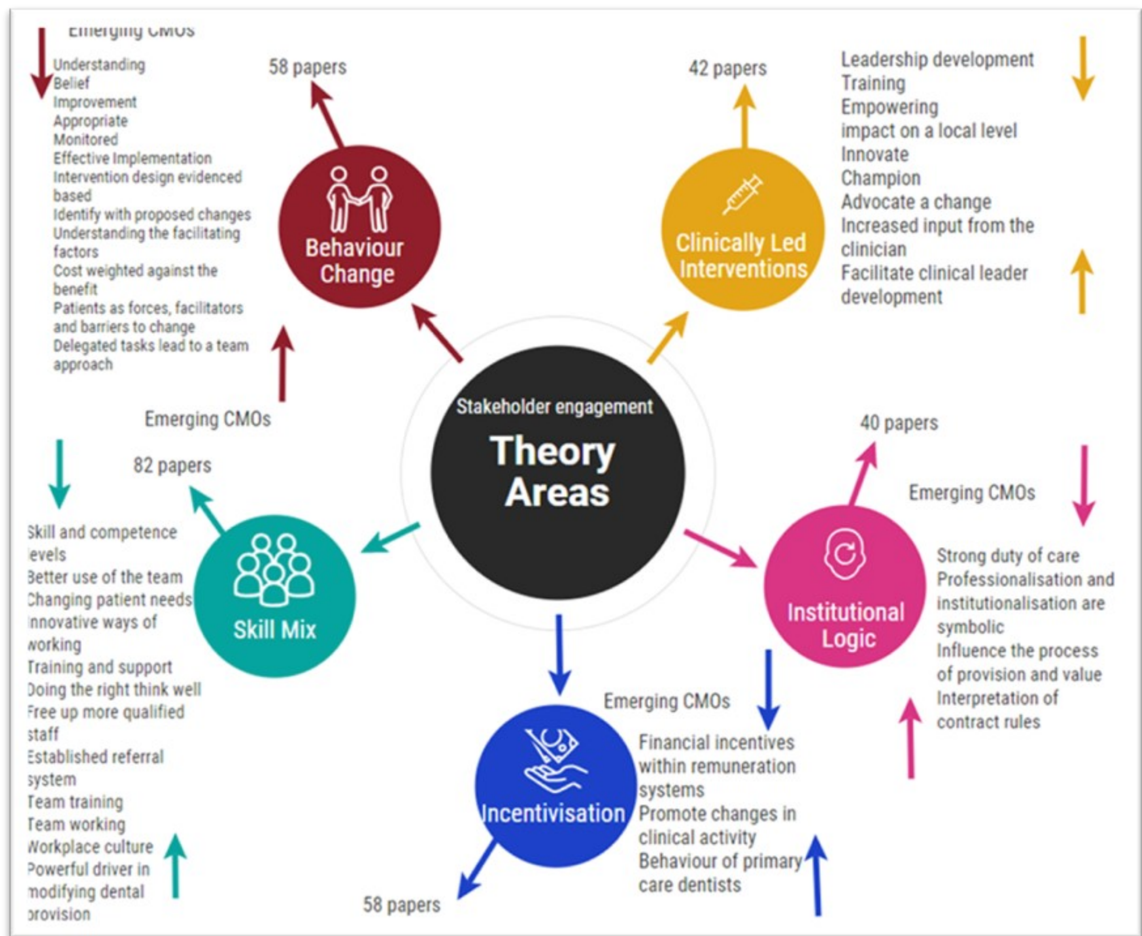

Figure 3.3: Showing the emerging CMOs from each theory area

3.5. Data extraction, analysis, and synthesis processes

Given the large number of papers identified, each area abstract was reviewed, considering their fidelity, trustworthiness, credibility value, relevance, rigour and relevance Rycroft-Malone (2012) to the IPP project. As recommended by Pawson (2004) this study used sample size, data collection techniques, analysis of methods and research claims as well "nuggets" of wisdom and this was recorded on a bespoke data collection tool Figure 3.1.

This reduced the number of relevant papers to:

1. Institution logic (n=8).

2. Clinical leadership (n=9).
3. Financial incentives in the NHS dental contract (n=10).
4. Behaviour change (n=9); and
5. 'Skill-mix' (n=11).

As highlighted above, theory development and refinement is an iterative process and was facilitated by creating a bespoke data extraction tool (Figure 3.2) (Pawson, 2006). Data were organised into evidence tables representing the five theory areas. In addition, data were organised into evidence tables representing a continuum ranging from conceptual (awareness, knowledge and understanding) to instrumental (attitudes and perceptions) to direct impact (practice change) (Nutley *et al.,* 2007). This also involved abduction, which is the justifying of the hypotheses with the empirical primary data and retrodictive analysis, which is identifying and exploring using theory to offer a causal explanation, to understand the different IPTs and a process of triangulation to look for emergent demi-regularities, which can be described as frequently reproduced behaviours or patterns that are seen in human activity, in the data (Jagosh *et al*., 2012; Greenhalgh *et al.,* 2014). This process sought to identify a narrow range of factors that could potentially influence adoption, as opposed to grand theories, which aim to "construct all-encompassing meta-narratives that span space and time" (Weick, 1989).

As previously mentioned, and shown in Table 3.4, the search for literature in the five areas produced a large number of papers which were further drawn down and data extraction of the whole pool of evidence were transcribed to the evidence tables (Figure 3.5) to summarise the evidence that had been extracted relevant to each plausible IPT. These evidence tables were then used as the basis for further deliberations about the emerging contingencies seen within and across the extracted data.

The first stage of this process given the large number of papers that the search terms yielded they were categorised by the type of data they yielded.

Papers for “Institutional Logic” were divided into Business Healthcare (n=8). “Clinical Leadership” were divided into papers that were cased on cases (n=9), or policy. Papers for “Financial Incentives” were divided into Determinants of behaviour change(n=10) and pay for Performance and Papers on “Behaviour Change” were divided into Policy (n=11) and Interventions and papers on “Skill Mix were divided into Theories (n=9) and Interventions as shown in Figure 3.2

These papers were read in full and those included were papers that provided data relevant supported the theory areas.

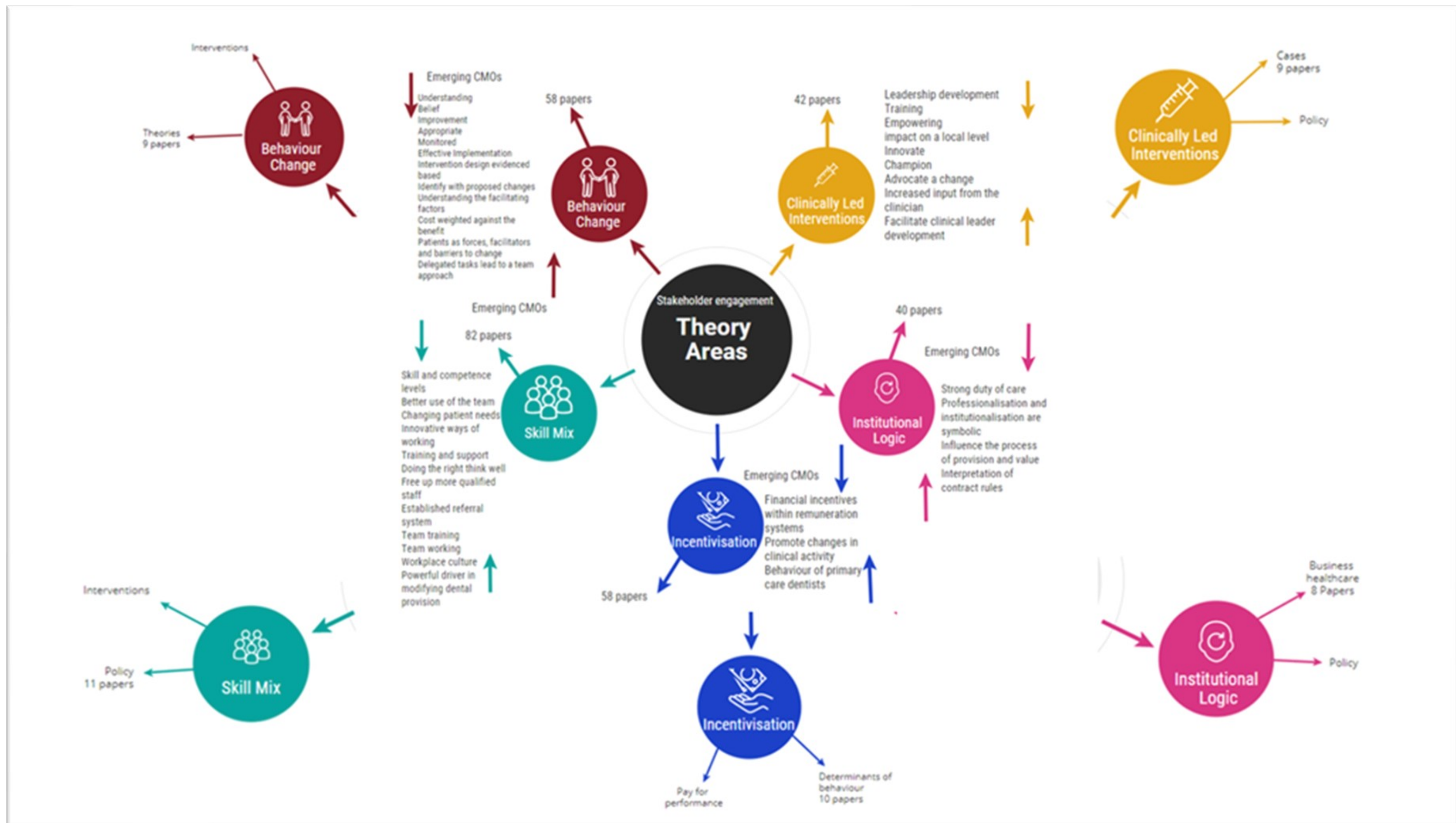

Figure 3.4: Remaining papers after reading the full papers

Following data extraction of the whole pool of evidence, tables had been developed that summarised the evidence that had been extracted relevant to each plausible hypothesis. These evidence tables (Figure 3.4) were then used as the basis for the testing of the Initial Programme Theory areas.

Evidence Source	Theory Area 2 Institutional logic, identifying a range of factors that influence change, attitude, experience, organisational etc.
Do in institutional logics predict interpretation of contract rules at the dental chair-side?	Institutions are defined by prevailing habits (e.g. recur to previously successful formulae for acting); scripts (procedures); heuristics (moral guidance), all of these inform what does and/or should happen in evolving circumstances(Checkland et al., 2012) Commissioning in the English National Health Service: what's the problem J. Soc. Policy 41,533-550. These understandings have been termed in institutional logics:
	Institutional background The current NHS contract details a currency of UDAs, courses of treatment weighted by complexity. Each procedure is classified into a band determining the number of UDAs earned, bands take account of the type of treatment not the number of procedures undertaken. Commissioners stipulate an annual number of UDAs has to be achieved at an agreed value. Since over-achievement is not rewarded at the end of the financial year, under-achievement comes with a financial penalty
Interacting Institutional logics in general dental practice	This study investigates the institutionalization of this joining of professional and commercial "logics", specifically recent developments, from the organizational perspective of providers, the dental practice DiMaggio P and Powell W (1983) the iron cage revisits: institutional isomorphism and collective rationality of organized fields American Sociological Review, 28(2), 14-160 We can identify such institutional settings as an organized "field" governed by prevailing logic, often tacitly expressed, that they are beyond the gift of individuals to change, and which govern what effective care means The paper found through analysis of the archive data that the dental field is governed by 3 related logics: Medical professionalism (care through technical expertise and ethical standards) Businesses like healthcare (efficiency, effectiveness, and transparency)

Figure 3.5: Bespoke Evidence Table

Following data extraction of the whole pool of evidence, tables were developed that summarised the evidence we extracted relevant to each plausible IPT. These evidence tables were then used as the basis for further deliberations about the emerging contingencies seen within and across the extracted data. As highlighted above, realist methodologies commonly present these theories as a function of Contexts (C) and Mechanisms (M) that lead to a particular outcome or set of outcomes (O) (often described as f [C, M, O]). This can necessitate the apportioning of a specific factor to either a Context or Mechanism, which can sometimes become a contorted process (Rycroft-Malone *et al*., 2016; Pearson *et al*., 2015). As a result, this process was simplified by using IF-THEN propositions to capture a combination of (C,

M) that led to any given outcome (Table 3.7) (Rycroft-Malone *et al*., 2016; Pearson *et al*., 2015). This were then tested in the field (Chapter Four).

Table 3.6: IPTs framed as *IF-THEN* propositions

Theory Area	Context, Mechanism, Outcome	
Institution logic	C:The culture in the practice promotes prevention C:Practice principle(owner) believes in the programme M: Employ staff with the knowledge and skills M: Increased 'buy in' M: Clear preventative messages O: Programme delivered consistently O: Programme adopted O: Increased adoption of the programme	1-*IF* the culture within a practice promotes prevention, *THEN* they are more likely to employ staff with the appropriate skills and knowledge and adopt IPP 2-*IF* the culture within a practice was not clear on the messages within IPP *THEN* the programme would not be delivered consistently 3-*IF* the 'buy-in' to IPP wasn't consistent across the practice *THEN* the programme would not be adopted uniformly 4-*IF* the practice principal (practice owner) did not 'own' the programme, *THEN* IPP would not be delivered across the practice

Clinical leadership	C: Clinicians take on leadership role C: Leaders develop programmes in partnership with key stake holders M: Understanding the needs of local dental needs M: 'buy-in' from key stakeholders M: Programme will be better designed and shaped for use in the NHS practice O: become empowered to shape change to improve local oral health through IPP O: they can facilitate the implementation of IPP amongst their peers (peer-to-peer influence)	5-*IF* clinicians are empowered to take on leadership roles, *THEN* they can play a more significant role in how programmes like IPP are developed and delivered 6-*IF* a programme like IPP is developed in partnership with key stakeholders *THEN* IPP will be better designed and shaped for use in the NHS practice 7-*IF* clinicians adopt leadership roles: *THEN* they can become empowered to shape change to improve local oral health through IPP *THEN* they can facilitate the implementation of IPP amongst their peers (peer-to-peer influence)

Financial incentives in the NHS dental contract	C: NHS practices are provided with financial incentives C: NHS practices are offered a reduction in their Annual Contract Value or activity targets M: it can release sufficient resources to deliver IPP O: they are more likely to change working practices to facilitate the implement IPP O: they are more likely to adopt and engage with IPP	8-*IF* NHS practices are provided with financial incentives (or reduction in activity targets): *THEN* they are more likely to adopt and engage with IPP *THEN* they are more likely to change working practices to facilitate the implement IPP 9-*IF* NHS practices are offered a reduction in their Annual Contract Value or activity targets *THEN* it can release sufficient resources to deliver IPP
Behaviour change	C: NHS practices adopt the evidence-based prevention in IPP M: *THEN* young children and their carers are more likely to adopt healthy behaviours	10-*IF* NHS practices adopt the evidence-based prevention in IPP *THEN* young children and their carers are more likely to adopt healthy behaviours *THEN* young children and their careers are more likely to attend more regularly

	M: young children and their careers are more likely to attend more regularly O: young children are more likely to improve their oral health	*THEN* young children are more likely to improve their oral health
‘Skill-mix’	C: NHS practices adopt greater levels of ‘skill-mix’ M: they are more likely to meet future population need (oral health) via programmes like IPP O: they are more likely to meet future population need (oral health) via programmes like IPP O: it can free dentists to undertake more complex cases	11-*IF* NHS practices adopt greater levels of ‘skill-mix’ *THEN* the practice is more likely to promote IPP *THEN* they are more likely to meet future population need (oral health) via programmes like IPP *THEN* it can free dentists to undertake more complex cases (pursuant to their training)

3.6 Summary

This Chapter has reported and discussed the findings from the Realist Synthesis. It has deliberated the scoping of the literature, and the use of Soft Systems Methodology (SSM) which guided the stakeholder workshops. It has described the literature search and the bespoke data collection tools developed and used. The Chapter concluded with Initial Programmes Theories (IPT) framed as IF-THEN statements.

CHAPTER FOUR:

TESTING INITIAL PROGRAMME THEORIES

4.1. Introduction

This Chapter describes the field testing of the Initial Programme Theories (IPTs) previously described in Chapter Three. The Chapter begins by explaining briefly the methodology used for teaching back sessions, and then reports upon how each of the five initial programme theories were refined to form the basis of the final programme theories to be presented fully in Chapter Five. The Chapter discusses the approach to the testing theory phase of the study, but primarily reports upon the testing and the narrative from the testing theory phase, and refinement of the Initial Programme Theories developed throughout Chapter Three.

As Rycroft-Malone *et al*. (2018) articulate, these theories attempt to capture how complex interventions and systems can interact, by combining elements of substantive theory with stakeholders' own theories to identify "the underlying generative mechanisms about how interventions work [or not]". More specifically, it attempts to "understand how context (individual, social, cultural, organisational) interacts with intervention components and underpinning mechanisms to bring about desired outcomes" (Brand *et al*., 2019).

Realist methodology defines these mechanisms as a reaction to "a resource that the intervention provides and the recipients' reasoning about and response to that resource, and the context in which that mechanism will be activated" (Randell *et al.*, 2017). However, as Dalkin *et al.* (2015) articulate, these mechanisms operate across a continuum, interacting within a context to produce a specific outcome. In this Chapter, the testing of the IPTs will be reported, as part of the second stage of the realist cycle. This stage of the realist evaluation concurs with Kislov *et al*.'s (2019) idea that theories should

move from “a relatively isolated, static, reified source” to one that engages in “developing, validating, modifying, and advancing conceptual knowledge in the field”. In this sense, theory testing becomes a process that operationalises and manifests “an ordered set of assertions about a generic behaviour or structure assumed to hold throughout a significantly broad range of specific instances” (Weick, 1989). This stage in the process also ensures that the IPTs developed from the realist synthesis begin to be articulated as Mid-Range Theories (MRT) that promote an understanding of the factors that influence the implementation of the IPP programme (Kislov *et al.*, 2019).

Realist approaches propose the use of ‘teacher-learner cycles’ during this phase (Nanninga & Glebbeek, 2011). Here, the researcher teaches back the theories to the different stakeholders. They then invite them to comment, based on their particular experience and perspective, in order to teach the researcher (Nanninga & Glebbeek, 2011). In similarity to the use of IF-THEN propositions, this type of approach allows for greater circumspection during this stage. As Nanninga & Glebbeek argue, “explication of what was rejected, modified and contextualized can help in the process of theoretical understanding”, facilitating the “insight that is needed to accumulate knowledge in the sense of families of CMO configurations (modified programme theories) that are more or less stable and (re)cognizable”.

4.2. Methods

As highlighted by Randell *et al.* (2017) “theory elicitation can be carried out in a number of ways, such as interviewing stakeholders, reviewing the extant literature on the topic, identifying relevant theories from the literature, or some combination of these approaches”. Following data extraction of the whole pool of evidence, tables had been developed that summarised the evidence that had been extracted relevant to each plausible hypothesis. As described in Chapter Three, evidence tables were then used as the basis for the testing of the Initial Programme Theory areas formed from the emerging contingencies seen within and across the extracted data in five theory areas:

1. *Institutional logic:* factors that influenced the implementation of the IPP programme because of the culture within the dental practice.
2. *Clinical leadership*: the importance of leadership within the dental practice and the local commissioning team.
3. *Financial incentives*: the importance of the financial incentives associated with IPP programme for dental practices.
4. *Behaviour change*: factors that influenced the adoption of the evidence-based oral health messages in the IPP programme, along with behaviour change; and
5. *Skill-mix*: the importance of using non-dentist members of the dental team to the delivery of the IPP programme.

A number of focus groups were planned originally to bring a small group of people in the theory testing phase, of between six and ten participants, for the most reliable results there should but no less than six and no more than ten in the group. The aim is for participants to discuss their opinions and backed up by rigorous methods to provide robust observations. The stakeholders that were invited to participate in the theory testing phase are highlighted in Table 4.1. Given the range, geographic distribution and limited availability of the different stakeholders, the research team could not arrange a single focus group and so undertook semi-structured interviews with representatives from each stakeholder type. As a result of the COVID pandemic, the semi-structured interviews were undertaken using Microsoft Teams, audio recorded and transcribed verbatim.

Table 4.1: Key stakeholders invited to participate in the theory-testing stage

Stakeholder type	Justification
NHS England Dental Commissioner **Consultant in Dental Public Health** **Specialist Registrar in Dental Public Health** **Local Dental Network Chair**	To understand the contextual factors that shaped the implementation of the IPP programme

Dental Practice Owners	To understand the mechanisms that sustained or potentiated the effects, unexpected pathways, and consequences in the implementation of the IPP programme from the perspective of the dental practice owner
Dental Team Member	To understand the mechanisms that sustained or potentiated the effects, unexpected pathways, and consequences in the implementation of the IPP programme from the perspective of the employees at the dental practice

A semi-structured interview schedule based on the IF-THEN statements was utilised (Table 3.6). Open-ended questions were also included to identify any new potential IPTs. Interviews lasted no longer than 60 minutes. During the interviews, each participant was presented with the set of emergent IPTs presented as the IF-THEN propositions that had been developed. They were then asked to reflect on whether or not, and in what ways, the statements captured their views about the IPP programme. This ‘teacher-learner’ approach ensured a focus remained on the key issues at the level of MRT that facilitated (or not) the IPP programme, testing out the stakeholders’ responses to the different IPTs. Thus, the interviews were designed to support both ‘theory gleaning’ and ‘theory refinement’ (Manzano, 2016).

After each interview, the interview topic guide was reviewed and, where necessary, revisions were made to incorporate either new theory areas or refinements to the supplied IF-THEN propositions, in accordance with the ‘teacher-learner’ approach (Nanninga & Glebbeek, 2011). This allowed the opportunity to sense check with participants and explore developing findings in subsequent interviews. An iterative approach was taken to the emerging data and a working document was maintained that recorded the emergent themes. Appendix 4. This working document included codes which were from the words of the participants and also recorded new emerging theory patterns, these are theories that emerge from interviews that reinforce, reject or provide a new theory.

The transcribing of the Microsoft Teams recordings was outsourced to a professional secretarial company. To ensure that the transcribed data was coded and categorised correctly, the supervisory team were consulted, which had knowledge of the study, realist methodology and dentistry.

A deductive approach was taken to the analysis of the interviews, where the IF-THEN propositions required refining. In parallel, an inductive thematic approach was taken to the emergent data, where this provided fresh insight and new candidate IPTs. For the latter approach, this involved the researcher immersing themselves in the data by initially reading and re-reading the transcripts. As data collection continued, new interview transcripts were analysed, and this enabled the research team to make across-stakeholder comparisons and develop a richer understanding and new perspectives on both the context and the mechanisms that led to specific outcomes. Presenting the stakeholder with the initial IF- THEN propositions, allowed the team to explore the broad range of contexts and mechanisms (represented within the 'IF' element of the statement) to outcomes (represented within the 'THEN' element of the statement).

4.3. Results

Overall, eleven semi-structured interviews were held with representatives from the different stakeholder groups. Each IPT within each theory area is presented sequentially, with a description and participant accounts

4.3.1 Institutional Logic

Institutional logics are described as "systems of cultural elements (values, beliefs, and normative expectations) by which people, groups, and organizations make sense of and evaluate their everyday activities and organize those activities in time and space" (Harris & Holt, 2013). In this theory area, there were four related IF-THEN statements, which focused on the culture of the dental practice in relation to the implementation and delivery of the IPP programme.

IPT1-IF the culture within a practice promotes prevention, THEN they are more likely to employ staff with the appropriate skills and knowledge and adopt IPP

The participants interviewed all agreed that this was an important element of the IPP programme.

> *"if you have a preventive culture, you are going to attract the right sort of people who believe in that ethos" [7.13]* [Practice Owner]

There is the proposal that effective clinical leadership leads to innovation and innovation leads to change and that change leads to the successful implementation of IPP. This element can be framed in accordance with the 'Diffusion of Innovation' model and the importance of clinical leadership and delegation (Rogers, 2003). Which seeks to explain how, why and at what rate new ideas spread. Rogers argues that there are five main elements that influence the spread of a new idea. These are the innovation itself, adopters, communication, time, and a social system.

The category of adopters are innovators, early adopters, early majority, late majority, and laggards.

> *"that is definitely true if they are the more preventative ones, but also the blue-sky thinkers, so people who are willing to adopt and try things differently, the innovators really" [3.72]* [Consultant in Dental Public Health]

> *"you need the right culture in the practice, you need clinical leadership and then dissemination of that" [5.53]* [LDN Chair]

> *"the culture in the practice in terms of being willing to adopt it in the first place, there is also a culture, how willing are they to delegate to other members of the team and let them take control" [3.89]* [Consultant in Dental Public Health]

> *"we actually had a designated IPP nurse that had a lot of experience but had never done anything here. And she was chomping at the bit.*

The dentists here were not very good at referring" [6.18] [Practice Manager]

Equally, the broader structural culture of GDS provision was mentioned, where the emphasis appeared to be predominantly treatment orientated. As discussed in Chapter One, dental practices are run as small businesses and differ from many other healthcare professions. As a result, dental practices operating within the NHS are acutely sensitive to the incentives, for some systems, the incentive for practices is to increase the volume of clinical activity delivered, which may not always promote prevention or the greater use of Dental Care Professionals (DCPs) to provide care. In contrast, per-capita remuneration systems pay practices a fixed level of funding based on the number of registered patients and as a result breaks the link between treatment activity and practice and may lead some practices to place greater emphasis on prevention, which would favour greater use of the whole dental team.

> *"the culture has got to be that you are not willing to be a drill and fill factory" [4.111]* [Principal Dentist]

> *"I think the culture thing is interesting because of the culture, probably is driven is either by the philosophy but mainly payment method" [5.21]* [LDN Chair]

IPT2-IF the culture within a practice was not clear on the messages within IPP THEN the programme would not be delivered consistently

Practice culture was also seen as being key to how the dental team delivered the IPP programme in a consistent manner. The culture of the practice played a significant role in the organisation of the implementation of IPP, allowing for the necessary planning and embedding of IPP within the practice. This responsibility mainly lay with the Practice Manager or the DCP responsible for delivering IPP in the practice.

"Because we had peer review meetings, that helped to standardise things" [2.42] [Principal Dentist]

"IPP gives a lot of frameworks, and it allows somebody to be given a framework to follow" [7.45] [Practice Owner]

"I mean, the receptionists were great were great when they were talking to the patients because sometimes, I don't think the patients/parents understood the reasoning behind it" [8.77] [Practice Manager]

"I think you need a consistent approach, clear messages, otherwise things are going to get lost or you are not going to get that consistency of message with the patients" [11.41] [Specialist Registrar in Dental Public Health]

"You need somebody that will lead it as well as the person that's actually delivering it and I think that there has to be consistent and clear guidance with everybody in order for it to work" [6.44] [Practice Manager]

IPT3-IF the 'buy-in' to IPP wasn't consistent across the practice THEN the programme would not be adopted uniformly

The importance of consistency across the multiple roles within an NHS practice was highlighted by many.

"we had six dentists. Two or three were okay with it. They remembered it. But the others, we had to consistently mention it again and again" [1.113] [Practice Manager]

"we found that the buy in was a bit variable between...The dentists all work part time. There's five dentists that work there, and the buy in was different for different dentists, and I had to be a bit persuasive

with some of the dentist in order to get them involved, whereas others just to it on absolutely naturally" [2.71] [Practice Owner]

"you need somebody that will lead it as well as the person that's actually delivering it and I think that there has to be consistent and clear guidance with everybody in order for it to work" [6.44] [Practice Manager]

"if it is going to be challenging environment it is going to be challenging to deliver. If you've got different options or some members of the team less enthusiastic than others it' unlikely to be successful as if you've got a whole team approach" [11.52] [Specialist Registrar in Dental Public Health]

Again, the idea of clinical leadership was considered to be key.

"I think to a certain extent, because that's not going to facilitate the delivery of the programme. But when you have outstanding clinical leadership within the practice, then you can overcome those obstacles." [5.62] [LDN Chair]

The size of the dental team was also mentioned.

"In a larger practice you can have the odd maverick or the person who is engaged to just deal with drilling holes and filling them because that is still needed. So, you don't necessarily need everybody, but if you've got a small practice then it would be easy for the culture to be undermined" [7.56] [Practice Owner]

IPT4-IF the practice principal (practice owner) did not 'own' the programme, THEN IPP would not be delivered across the practice

The potential influence of the practice principal was supported by many of those interviewed and again, this was commonly referred to as 'clinical leadership'.

“hundred percent; if the people in the top don’t buy in...no one else does!” [4.189] [Practice Principle]

“someone has to take the lead, so if it wasn’t us and somebody else had taken it, I would hope that my colleagues are equally competent to do it.” [1.305] [Practice Manager]

“I think it would have fallen by the wayside with part of the team, and it’s not going to work so well if there’s different approaches within the same practice really. So, I felt that it was important to try and draw everybody together. We did that in a number of different ways [2.89] [Practice Owner]

“absolutely there has to be clinical leadership and those aims and objectives and that ethos has to be communicated to the whole team, everyone, otherwise it will fail” [5.39] [LDN Chair]

“anything slightly different it that feels there’s a bit of resistance to it. I had to just really labour the benefits to everyone involved, and that made the difference then. But without that, if I hadn’t have been that keen for that to be the case I don’t think that those ones would have been converted. I think that they would have just carried on the way there were” [2.95]

“I think that to a certain extent, because that’s not going to facilitate the delivery of the programme. But where you have outstanding clinical leadership within the practice, then you can overcome these obstacles, so you’ve got a person who is evangelical about it” [5.62] [Practice Owner]

However, clinical leadership, did not necessarily come from the practice principal or owner. It emerged that Practice Managers and DCPs had a significant influence on the implementation and delivery of IPP taking responsibility for the successful implementation of the programme

“there’s people who own a practice who would be happy for the practice to deliver a programme without them necessarily having a huge buy in as long as it delivered the profit at the end or delivered a return” [7.73] [Practice Owner]

“if you have someone that is really pushing it, then it could still be delivered” [6.67] [Practice manager]

“it was a variety of practices that delivered it, so some of it will have been practice owners, but others they were working corporate bodies and they were maybe just a dentist within the corporate body and I think they just saw it as a way of exploring different ways of working” [3.166] [Dental Public Health Consultant]

4.3.2 Clinical Leadership

The potential of ‘clinical leadership’ has been the subject of a substantive amount of interest in the NHS and the research literature (NHS Leadership Model, 2014). In dentistry, a number of clinically led programmes have been evaluated, which appear to support its importance (Moore D *et al*., 2015; Brocklehurst *et al*., 2013). In IPP, the programme leaders were respected members of their local dental community, who all had experience of practice ownership.

IPT5-IF clinicians are empowered to take on leadership roles THEN they can play a more significant role in how programmes like IPP are developed and delivered

The majority of the participants interviewed all agreed on the importance of having a clinical leader responsible for the development and delivery of the programme.

“people like [LDN Chair] are very good to listen to, because they see it from both sides, I mean [LDN Chair] has got a lot of experience in

> *practice, so he knows what goes no" [10.251]* [Specialist Registrar in Dental Public Health]

> *"somebody with skills, also to network and to champion the cause in terms of promoting it and to find solutions, somebody who's a problem solver as well as an innovator" [3.222]* [Dental Public Health Consultant]

> *"you need somebody who's a can-do person who drives it and you need somebody who's...you need the right sort of person who is a blue-sky thinker but also who can problem solve" [3.212]* [Dental Public Health Consultant]

The importance of clinicians moving beyond their current remit as a practising dentist was also mentioned.

> *"I think [LDN Chair] and [Yorkshire and Humber LDN] are clinicians, they are involved with a lot of things going around with IPP and other tings which are not necessarily a clinician's role or responsibilities" [1.416]* [Practice Manager]

Empowerment and the nature of working within the current financial structure of GDS provision was considered to be key.

> *"empowering clinical leaders within practice and clinicians. So if they feel that they have an interest in the programme, they feel that they can influence how it is delivered, and if they see the benefits with their patient base, then they are going to invest in it personally" [5.99]* [LDN Chair]

> *"clinical leaderships is a big part of the NHS and it is about giving people the opportunity and finding a way to have a renumeration structure which allows it and that's been one of the benefits of flexible*

> *commissioning, which, of course, has come as a result of IPP [7.91]* [Practice Owner]

IPT6-IF a programme like IPP is developed in partnership with key stakeholders THEN IPP will be better designed and shaped for use in the NHS practice

Partnership working appeared to be a key element of the IPP programme.

> *"I have started as part of my IPP flexible commission and mainly due to [LDN Chair] I've started to get involved with other groups and things and I do find that almost...when I came into NHS dentistry, which was back in 2007 there was definitely a dentist verses NHS commissioners, that's how it felt" [1.388]* [Practice Manger]

> *"I think it's largely thanks to [LDN Chair] and his team, I feel that dentists now want to work with the NHS, or the NHS want to work with the dentists so both the agencies are now working. And again, I never realised how much Public Health England was involved." [1.396]* [Practice Manager]

This appeared to lead to a greater sharing of meaningful information across the IPP programme.

> *"because of those various stakeholders being involved I think there was greater information sharing and more guidance for sharing and more guidance for practices that maybe would have felt a bit overwhelmed by a new scheme. I think the involvement of the various different stakeholders made it feel easier to adapt to. [2.25]* [Practice Owner]

> *"We have had a lot of regular input from [LDN Chair] with this. I think that has obviously led to the success of the programme because you have had that contact" [6.93]* [Practice Manager]

However, the importance of an ‘innovator’ was still considered to be a potent element of implementation.

> *“it’s best to have many stakeholders involved as possible, but you do need somebody who will actually drive an agenda and be a dog with a bone, which in our situation was a combination of [LDC Chair] and the [LDN Chair]” ..... so, you do need key people to support it, but you also need commissioners that are prepared to, not tear up the rule book, but look for ways to interpret the rule book [7.114]* [Practice Owner]

Equally, the importance of sustaining this innovation across the development and delivery of the IPP programme was key.

> *“if they’re active from the beginning, active throughout the process with IPP, and then they can see how that kind of programme’s developed then I think that’s going to help in terms of a better understanding of maybe how other programmes would work as well” [11.90]* [Specialist Registrar in Dental Public Health]

IPT7-IF clinicians adopt leadership roles: THEN they can become empowered to shape change to improve local oral health through IPP

There was strong support for this statement from many of the participants.

> *“I think [LDN Chair] has done a fantastic job. I don’t come from a dental background. I come from a corporate background and I obviously evaluate a lot of it to how my work was before I joined dentistry. And I will say, I haven’t seen that kind of leadership and commitment to a preventive cause” [1.379]* [Practice Manager]

> *“if you don’t get somebody to actually take ownership of the agenda then the agenda slips because dentistry is still, going back to my repeated comment, it still is drill a hole and fill it, in its ultimate*

> *manifestation of the UDA, that's what it's recognising. So unless you've got somebody who's going to take ownership then you are not going to get the outcome" [7.129]* [Practice Owner]

One important element of this was the credibility that a background in an NHS practice provides and the empathy that this generates to all those that are involved.

> *"actually having that experience of trying to deliver prevention in a practice makes it a bit more credible when he's talking to people about what's going to work. Whereas somebody that has had no experience of working in practice are basically just talking off backside" [6.109]* [Practice Manager]

> *"with their peers they've recognised that they understand that they've been in practice. So sometimes it's easier for somebody like me that's had a practice background with an LDC, because I understand why it wouldn't work or why it would be difficult. So, it's not just with me but also with any clinical leader in commissioning. I think they have to have empathy and be seen to understand what the challenges are in practice. So there's very much that's important in a peer process....[3.275]* [Dental Public Health Consultant]

> *"it's about developing clinicians to become leaders and then harnessing that and then making sure that any programme or decision-making is responsive to their input, so making sure that if they come up with a solution for something, you put those changes in place or allow them to put those changes in place in their own practice, so they begin to develop ownership, engagement grows, and ownership develops [5.204]* [LDN Chair]

Again, the importance of sustaining the innovation across the development and delivery of the IPP programme was key.

> *“if you start off with something and there’s enthusiasm and it goes well it gives confidence to then try more stuff, and I’ve definitively seen that happening over the last couple of years. There’s been a massive surge really in trying to just develop prevention in practices and find initiatives to broaden it out so that it is involving more practices” [2.42]* [Practice Owner]

THEN they can facilitate the implementation of IPP amongst their peers (peer-to-peer influence)

As highlighted in a number of sections above, the ability to influence peers was considered to be critical.

> *“because they’ve probably got good links with a number of clinicians and they’ve encouraged peer review groups and so that’s then spread like a wave across the wider patch, so it’s been pretty effective” [2.54]* [Practice Owner]

> *“it's much more powerful when you've got either a clinical leader or another peer champion to say I hear that, but we have to do things differently and this is how we did it” [3.287]* [Dental Public Health Consultant]

> *“the peer champions because again they can see the challenges, how they overcome the challenges, how they got people motivated and keen as well. So might find that the understanding of the scheme, maybe the people who are really delivering it have probably got the best understanding I would say” [11.110]* [Specialist Registrar in Dental Public Health]

> *“people started to queue up for IPP, when can we get involved?” [5.149]* [LDN Chair]

> *“people knocking on the door saying can I join; I've heard this is a good thing” [3.310]* [Dental Public Health Consultant]

Commonly, this was linked to the ability of the leaders of the IPP programme to utilise their existing networks of fellow GDPs.

> *“it was existing networks and people whose opinion they valued already as clear thinkers and leaders. So it was interesting that there was a couple of points raised initially and although [LDN Chair] and I answered the questions they valued the peer more in terms of their opinion, particularly the early adopters, because they'd done it and been there and walked the walk and that was much more influential than me saying don't worry, it's fine” [3.187]* [Dental Public Health Consultant]

> *“once you get innovators on board propagating that peer championing amongst others. Sometimes you can facilitate that by seeding that so that you get somebody to start that going” [3.283]* [Dental Public Health Consultant]

Equally, the importance of respect was mentioned by a number of participants.

> *“that mutual respect as well with the peers helps because [LDN Chair] is very well regarded in the local area. I think because he’s been a clinician in the area as well. So, a lot of the practice owners do know him and, you know, they do respect what he says. And I think that’s helped” [6.124]* [Practice Manager]

The IPP model was also considered to be efficient by many.

> *“if you try and micromanage the programme, you have to invest a huge amount of time and a huge amount of training and education in the process and that’s not really sustainable. So the idea was to give*

them some training to start with, give them a load of resources, and then basically just organise smaller peer groups, peer review groups where they could run through the programmes in their own practices and then share best practice" [5.234] [LDN Chair]

In a number of practices, the clinical leadership came from the DCPs involved.

"hearing the DCP champions I think I would agree with that, because they're certainly able to share their experiences and share their knowledge base and they have a really good understanding of what's going on" [11.120] [Specialist Registrar in Dental Public Health]

"so not only the dentists but also it was really important to set up that peer support of the DCPs delivering it so they didn't feel isolated. And they can feel very isolated in a practice where there's no established networks the way there are with LDCs and clinical networks for dentists" [3.325] [Dental Public Health Consultant]

"the DCPs might just have that edge in terms of really appreciating what's going on" [11.125] [Specialist Registrar in Dental Public Health]

4.3.3 Financial Incentives

As highlighted in Chapter One, financial incentives in NHS dentistry play a significant part in influencing the level of clinical activity and the culture within the practice (Goodwin *et al.,* 2018; Tickle *et al*., 2011).

IPT8-IF NHS practices are provided with financial incentives (or reduction in activity targets): THEN they are more likely to adopt and engage with IPP

This IPT was wholly agreed by all those participants interviewed.

"the financial element was a big one, when to accept it" [1.207] [Practice Manager]

"So I would say if some kind of prevention becomes part of our contract, I think the majority of [people 19:41] would like to do it" [1.312] [Practice Manager]

"We are finding this with this flexible commissioning; we got a lot more uptake than I first anticipated, which was really good news, yeah. People want to...and I think it's just because they...also, they want to do it and they want...but they didn't want...they want to see that they can afford to do it" [4.426] [Practice Owner]

"dental practices, because they're independent business, will respond to tweaks in commissioning, so you can lead programmes by changing the remuneration dynamic. Otherwise, it's not sustainable, and otherwise you don't get investment in the programme by the practice, so you make subtle changes to the payment method, in this case we're saying that, we want you to deliver A, B, and C in practice prevention and that we're going to allow you to display some of your UDA activity to support that" [5.287] [LDN Chair]

"it has to be funded because otherwise it's not going to get the buy in from the practice owner, be they a clinician in the practice or remotely" [7.163] [Practice Owner]

"if you want to change contractual activity to deliver a certain outcome, then you just need to incentivise the behaviour that will deliver the outcome, so you've got to somehow make it better for them to deliver this intervention to deliver that outcome" [5.386] [LDN Chair]

"but the UDA target is definitely very challenging for dentists and there's methods where they can benefit the patients but without the widget counting. I think that's going to be very attractive to dentists really, so you're getting a win in terms of they can genuinely help the patients" [11.198] [Specialist Registrar in Dental Public Health]

“the target driven aspect of the contract is a big challenge for a lot of dentists. So I think that opportunity for reduction of UDA targets and replacement with something that’s going to beneficial for patients, because obviously it’s not just a case of reduction just for the sake of it, but actually there’s some benefit for patients as well” [11.198] [Specialist Registrar in Dental Public Health]

Although, this was framed slightly differently by one participant.

“for us it wasn't a financial incentive, it was an alternative to activity. So financial incentive could work, so if you're getting paid per pathway, yes, we know that from things like fee per item that that will drive activity, but this was more a target as an alternative to UDA activity, so that was an incentive itself in that it was seen as easier to achieve than UDAs” [3.386] [Dental Public Health Consultant]

“there was not a financial incentive but an incentive there in that it was an alternative way of delivering the contract without financial penalty of clawback” [3.394] [Dental Public Health Consultant]

The importance of passing-on’ the financial benefits to all practice members was also considered key.

“Especially if it’s filtered down to other members of staff and not the dentist. But I will say a big element of that was being remunerated” [1.312] [Practice Manager]

“certainly within my dentist, it doesn’t matter for the clinicians because it’s not costing them anything to have a nurse to deliver it. Because it’s not their business. Whereas, an independent would have to factor in the cost of having a nurse spare, effectively, to deliver that programme. But, yes, I certainly think if there is some sort of financial incentive, you would have more chance of getting buy-in” [6.135] [Practice Manager]

THEN they are more likely to change working practices to facilitate the implement IPP

Again, the importance of providing incentives that all members of the dental team could draw on was critical, given the reliance of the IPP programme on DCP support.

> *"nearly all of it is delivered by extended duty dental nurses who've probably been going on courses on fluoride varnish and dental health education ever since I qualified but having no output to deliver it, simply nowhere to deliver it because there's no... Practices aren't incentivised to do this" [5.255]* [LDN Chair]

> *"GDS contract as it stands with most dentists are in is that opportunities to use skill mix are really very limited within the contractual framework. So, there's certainly opportunities where there is that opportunity for dentists to really utilise the skill mix is definitely going to be beneficial" [11.234]* [Specialist Registrar in Dental Public Health]

> *"personally it's better with staff retention because [you're 08.24] using that skill mix, there's a lot of nurses that are dying to do other things other than just chairside. A lot of nurses do actually have the qualification for oral health education and have never used it. So, if you've got a nurse that's quite forward thinking, you're more likely to keep that member of staff because otherwise, she'll just leave" [6.147]* [Practice Manager]

> *"IPP, to a lesser extent, allowed me to fund people to come out of doing their normal nursing jobs because they would run the IPP sessions, but what led from that was flexible commissioning has obviously allowed an awful lot more to happen" [7.174]* [Practice Owner]

Although, this was mediated by the size of the practice.

> *"I think, it depends on the size of the...on the practice. Because if you're...for me the practice works really well with just three members of staff [Inaudible 00:16:37] and myself. But to get bigger, the IPP doesn't really justify it" [10.312]* [Practice Owner]

IPT9-IF NHS practices are offered a reduction in their Annual Contract Value or activity targets THEN it can release sufficient resources to deliver IPP

The theme of the importance of funding preventive programmes within the existing contractual framework continued with this IPT.

> *"we were struggling with the [UDAs 10:54]. And every little helps, that was the best thing" [1.186]* [Practice Manager]

> *"suddenly you can deliver your contract value in a different way and you're going to deliver it by delivering prevention. All of a sudden, the practice very quickly buys into that philosophy because they see the advantage of that, so it's incentivising it through a kind of financial remuneration package, and absolutely that influences the practice behaviour....[5.296]* [LDN Chair]

> *"Because there isn't as much pressure on you. I mean, obviously we have a contract and we've got X number of UDAs. There was...in one respect because I had insufficient dentists. Because I've got unallocated UDAs here, I had that luxury, if you like, of having some spare staff, but then it took a bit of the pressure off. I mean, it wasn't a vast amount, but it took a bit of the pressure off the UDA contract because we were delivering it in another way" [6.135]* [Practice Manager]

> *"It's a case of we've got a range of pathways, you find IPP works better, think great, and you're able to get those pathways. If you're*

struggling a bit with that and you're finding actually UDAs is a better...or a mixture, that sort of flexibility of approach I think is going to be good just from a business model as well" [11.220] [Specialist Registrar in Dental Public Health]

Although this was mediated by the scale and nature of the programme.

"the incentive...if you don't have to make major changes, is fine and can implement it. But if you've got to make major changes the incentive has to be significant" [10.338] [Practice Owner]

And again, the ability of remunerating DCPs as part of the current GDS contract was raised by a number of participants.

"GDS contract as it stands with most dentists are in is that opportunities to use skill mix are really very limited within the contractual framework. So there's certainly opportunities where there is that opportunity for dentists to really utilise the skill mix is definitely going to be beneficial" [11.234] [Specialist Registrar in Dental Public Health]

"they keep on banging on about a workforce mix. They want OHE nurses, they want helpers, however everything's still under a dentist's name" [1.448] [Practice Manager]

4.3.4 Behaviour change

Behaviour change on a micro level on the participants of the programme is explored in this theory area.

Behaviour change on a macro or practice level, is evaluated within the clinical leadership, financial incentives and skill mix theory area as they are seen as the promotors of behaviour change on a macro level

There was one main IPT in this area, although multiple outcomes had been identified by the stakeholder group and subsequent realist synthesis.

IPT10-IF NHS practices adopt the evidence-based prevention in IPP: THEN young children and their carers are more likely to adopt healthy behaviours

The impact of the IPP programme appeared to be positive in terms of reported health benefits.

> *"I'd say I was very pleasantly surprised about how many children were actually looking after their teeth. They already knew that they had two minutes to brush" [1.583]* [Practice Manager]

> *"we certainly have had quite a high proportion of the children involved where their diet's improved, the tooth brushing's improved, the interest from the parents has improved, and all those things are very likely to mean that their oral health will improve and they'll be less needy over time" [2.159]* [Practice Owner]

> *"both them and the parents have really picked up on the advice we've given and probably saved some treatment for them in the future. But I think for practices that are in more deprived areas the impact that this could have for them could be really huge, could have a massive difference" [2.182]* [Practice Owner]

This was linked to the change in the advice that was being provided.

> *"changing behaviours, better oral health, better dietary behaviours, changing behaviour, what we recognised is that we've taken it to the next level in that we were giving better advice, it was more patient-friendly and it was consistent because we're hitting all those things in DBOH" [5.424]* [LDN Chair]

THEN young children and their careers are more likely to attend more regularly

This IPT was considered important by many of the participants, but they also recognised the challenge of encouraging young children to attend on a regular basis.

> *"some of them attended regularly but there were definitely a few who would only come in when the child was in pain. And no matter what you did" [1.621]* [Practice Manager]

> *"once they realised the value from it that's a completely different situation then" [7.254]* [Practice Owner]

> *"that's been a little bit difficult. We've certainly seen that in some cases, but some of the people that probably needed the help most have been quite unreliable" [2.107]* [Practice Owner]

> *".... and I think for the cohort that we're talking about they tend to be less regular attenders and a wee bit more chaotic. And certainly, we saw a lot of DNAs in that group and they were having to double book appointments. So I think that probably won't have changed" [3.511]* Dental Public Health Consultant]

> *"but I think what you often find is families like this particular one, they have generations of poor oral health, and it's just expected that they have Gas or whatever. And it's about breaking that cycle....[6.215]* [Practice Manager]

THEN young children are more likely to improve their oral health

Again, many practices reported seeing improvements in their children's oral health.

> *"I saw many children whose oral health improved and I think more so children who were able to take ownership of their brushing routine. So perhaps not somebody who was five-year-old, but a ten or a 12-year-old who had active caries, but now said to me that they've got an*

electric toothbrush at both mum's and dad's and that" [1.632] [Practice Manager]

"we've generally found that, yeah" [2.118] [Practice Owner]

And the importance of using DCPs to deliver IPP was raised by a number of participants.

"as well, especially children, when it is dealt with by a dental nurse as opposed to a dentist, no disrespect to [name] or other dentists, but they are scary aren't they? So, when it's a nurse and you're just sat on a one-on-one basis chatting, talking, stickers, reward charts, things like that; they prefer that" [4.471] [Practice Owner]

4.3.5 'Skill-mix'

There was one main IPT in this area, although multiple outcomes had again been identified by the realist synthesis.

IPT11-IF NHS practices adopt greater levels of 'skill-mix': THEN the practice is more likely to promote IPP.

As highlighted above, the use of 'skill-mix' by the IPP programme was considered to be key.

"I think having an IPP would encourage a practice to have a better skill mix rather than a skill mix promoting IPP. Cause once you have the IPP you just go, do you know what? I can use an OHE nurse, I can use my therapist to talk about all this, so I feel it's that way round" [1.648] [Practice Manager]

"It's more effective being delivered through that means" [2.139] [Practice Owner]

For many, this was phrased as a financial advantage of IPP.

“dentists can’t do that, because the financial implications would be too high”...[1.528] [Practice Manager]

“yes, definitely; because to try and get the dentist to give that much time that, say and IPP visits take up, it would be, would make it, would be really counter-productive to the running of the practice and I think that would...that would destroy it because there’s no chance that you could afford” [4.498] [Practice Owner]

Again, the size of the practice was an important factor for many participants.

“I think certainly if they’ve got the capacity to deliver that. I suppose in basic terms you’ve got a bigger practice and they need to have more nurses and they might have a hygienist and therapists, and capacity just from rooms as well” [11.326] [Specialist Registrar in Dental Public Health]

For others, the ability to draw on the specific skills of a dedicated team was key.

“it's much better delivered by a dedicated team” [7.279] [Practice Owner]

This also empowered DCPs within the dental teams involved.

“for the staff themselves to give them a bit of empowerment and, yes, I can do more and also, for the practice itself because, you know, it sort of frees other staff up. Obviously, your staff retention as well” [6.248] [Practice Manager]

“we've had reports that people feel more valued, that they feel as though they've got a much more important role in the practice, that they've developed links with other practices. I think it was important to use the DCPs, that seemed to go down very well with patients

compared to, say, a dentist giving advice" [3.526] [Dental Public Health Consultant]

"And what we're seeing is the development of leadership within DCPs now, so they're starting to become empowered themselves, and that's really interesting because that's career development and personal development really and I don't think we've seen that across DCPs before, at all" [5.268] [LDN Chair]

THEN they are more likely to meet future population need (oral health) via programmes like IPP

The potential advantage of programmes like IPP to meet future population health need was articulated by many.

"I think the oral needs of the populations are increasing. People are living longer. So if you think about if people are living longer, they're going to need more restorations, which means they need more time at the dentist. So, it would be good to get the [simplified 41:26] treatment filtered down to the therapist, to the prevention message filtered down to the OHE nurses" [1.658] [Practice Manager]

"the actual programme itself is very much upstream in terms of the contract because you're looking at an element of flexible commissioning, contract reform, so that element of it is upstream really because it changes things at a contractual level which then enables the changes at the clinical level" [11.346] [Specialist Registrar in Dental Public Health]

"they're confident on how you broach the subject, so how do you initiate a conversation, so I think that would be transferable wider out of the child IPP programme to how do you broach saying on a medical history I see that you ticked that you smoke 20 a day, have you ever thought about...just they've got that skill set now on how to talk about

behaviour change in a way that they feel confident about" [3.551] [Consultant in Dental Public Health]

DCPs were also seen to be better at providing preventive messages, when compared to GDPs.

> *"personal experience, the nurses are actually better at delivering it than the dentists, and I don't know why that is, really. I think maybe the dentists maybe pitch it a little bit too high"[6.256]* [Practice Manager]

> *"let's face it, I don't think there are many dentists that want to sit for 10, 15 minutes showing a child how to brush their teeth. So, if they can pass that on to a dental nurse that's qualified to deliver that service, then that frees them up to do something else" [6.240]* [Practice Manager]

THEN it can free dentists to undertake more complex cases (pursuant to their training)

The response to this IPT was more nuanced.

> *"of opportunity to free up the dentists' time for some more complex...the endodontics or the crown and bridge work or the minor oral surgery side of things, and really utilising... And I think that's good from the skill mix as well. Not only empowering DCPs but it gives them an opportunity to develop further and to feel real, genuine positive benefits from the role" [11.363]* [Specialist Registrar in Dental Public Health]

> *"anecdotally that that's happened, that dentists have got time to focus on more complex treatments, although the dentists sometimes say it's nice to have a bit of nice relief. But I think the dentists recognise the skill mix, that they're better at it than they are, but I think it's given*

dentists a bit more breathing time and seeing the value in using that skill mix much more widely" [3.563] [Dental Public Health Consultant]

"you can meet the demand because dentists have only got a finite budget, dentists are expensive, why are they scaling teeth, for XXXX's sake, why are they giving prevention advice. So you use the most sensible person within the team to deliver a certain intervention, so you can deliver more care for the same buck, and actually, to be perfectly honest, those people then become specialists within that context so they're much better at it, you get quality improvement as well" [5.492] [LDN Chair]

4.4 Summary

The semi-structured interviews appeared to support the different IPTs that had been generated iteratively by the realist process. None of the IPTs were discounted and all were seen to be critical to the IPP programme. Equally, based on the feedback during this stage of the evaluation, there was not any evidence to suggest that these IPTs should undergo any significant modification. The interviews appeared to elaborate the central elements of the underlying programme theory rather than refute them and that that the IPTs appeared to reflect 'mid-range' theoretical positions, which unpacked both the contexts and mechanisms that led to the outcomes seen in the IPP programme.

Rogers' Diffusion of Innovation Theory, Rogers' Diffusion of Innovations (1983) publication, leads the way in considering how behaviour and practice change occurs in a cohort of professionals. In healthcare, it is evident that knowledge and information themselves are frequently insufficient to persuade people to change their behaviour. Furthermore, behaviour change occurs in a stepwise approach amongst a cohort: for example, there may initially be innovators who are willing and active in changing behaviour, but they may be followed sequentially by groups classified as early adopters, early majority, later majority and then eventually laggards (Rogers, 1983).

Even earlier work, from three decades prior, explored how practice change occurred in agricultural communities over a period of time, identifying processes that increased the likelihood that behaviour change will occur (Bohlen et al., 1958). The assumption may be that all clinicians want to give patients the best care, however each individual is constrained by professional time and resources as well as individual motivations. National guidelines can require dynamic adaptation for local use. The majority of clinicians cannot and often do not identify as national leaders – they work instead in a single department of a single organisation e.g., a district general hospital, and look after a cohort of patients with a distinct sociodemographic and medical profile. This setting is very unlikely to perfectly replicate or represent the populations used in published studies which underlie the guideline statements, and so a local guideline adaptation process is often required. The local guideline adaptation process must first establish that (i) the guideline is achievable in practice and if so (ii) which of its recommendations can be altered without affecting its rigour and validity (The Clinical Guidelines Education Team, Nottingham., 2001).

Given that the semi-structured interviews reflected self-reported views on the IPP programme, the research team also wanted to determine if there was any evidence of change in clinical activity or proxies for oral health amongst young children to further test IPT10. Notwithstanding the caveats relating to the lack of a comparator and the inability to ascribe causation, due to the descriptive nature of the reporting, it appears that the IPP programme did increase attendance and the use of fluoride in young patients, which would be commensurate with a reduction in disease in young children. Taken together with the semi-structured interviews, this would appear to provide support for IPT10. No evidence was found for a reduction in access to adult patients or patient charge revenue during the IPP programme.

The Chapter began by explaining briefly the methodology used for teaching back sessions, and then reported upon how each of the five initial programme theories. The Chapter discussed the approach to the testing theory phase of the study, but primarily reports upon the testing and the

narrative from the testing theory phase, and refinement of the Initial Programme Theories developed throughout Chapter Three.

The subsequent modification of the IPTs is described in the Chapter Five.

CHAPTER FIVE: MODIFIED PROGRAMME THEORY DEVELOPMENT

5.1. Introduction

Chapter five describes the refinement of the Initial Programme Theories (IPTs) into Modified Programme Theories (MPTs), describes the stakeholders involved and moves to describe the responses to the refined IPT and the prioritisation and the development of the final programme theory.

5.2. Method

Once the interviews were transcribed and representative quotes were inputted into a table and coded All the IPTs presented for the In-Practice Prevention (IPP) programme received support from the participants interviewed. The *IF* element of the *IF-THEN* propositions was broken down into their composite parts ('mechanisms' and 'contexts'), to facilitate the creation of the Modified Programme Theories expressed as [C, M, O] configurations (CMOC) for each theory area.

5.3 Development of the modified programme theory

Given this, the *IF* element of the *IF-THEN* propositions was broken down into their composite parts ('mechanisms' and 'contexts'), to facilitate the creation of the Modified Programme Theories expressed as [C, M, O] configurations (CMOC) for each theory area. These are summarised in Figures 5.1 to 5.5 below. The only additional themes that emerged from the interviews were the potential for DCPs to clinically lead the IPP programme within certain practices and the impact of practice size. In the interests of parsimony, these were added to the relevant IPTs as mechanisms.

The CMOCs are:

$CMOC_1$ -Institutional Logic

$COMC_2$ – Clinical Leadership

$CMOC_3$ – Financial Incentives

$COMC_4$ – Behaviour Change

$CMOC_5$ – Skill Mix

5.3.1 Institutional Logic

The first Context Mechanism Outcome Configuration ($CMOC_1$) related to 'institutional logic' (Figure 5.1). The institutional logics at any given NHS practice not only includes dentistry as a business but also professional ethics and other contextual factors (Goodwin *et al.,* 2018; Watt *et al.,* 2004). As highlighted by Brocklehurst *et al.* (2021), "the drive to maintain (and maximise) the viability of an NHS practice does appear to be tempered by a practice owner's view about their sense of duty to their patients and their ideas about how best to deliver care for their patients and community". This directly links to $CMOC_3$ but also encompasses the practice owners' views about the importance of prevention and the use of 'skill-mix' ($CMOC_5$). Where practice owners upheld the underlying objectives and values within the IPP programme, there was much more ownership and 'buy-in' to the programme across the practice, which improved the level of engagement and ensured better consistency of the preventive messages across the dental team.

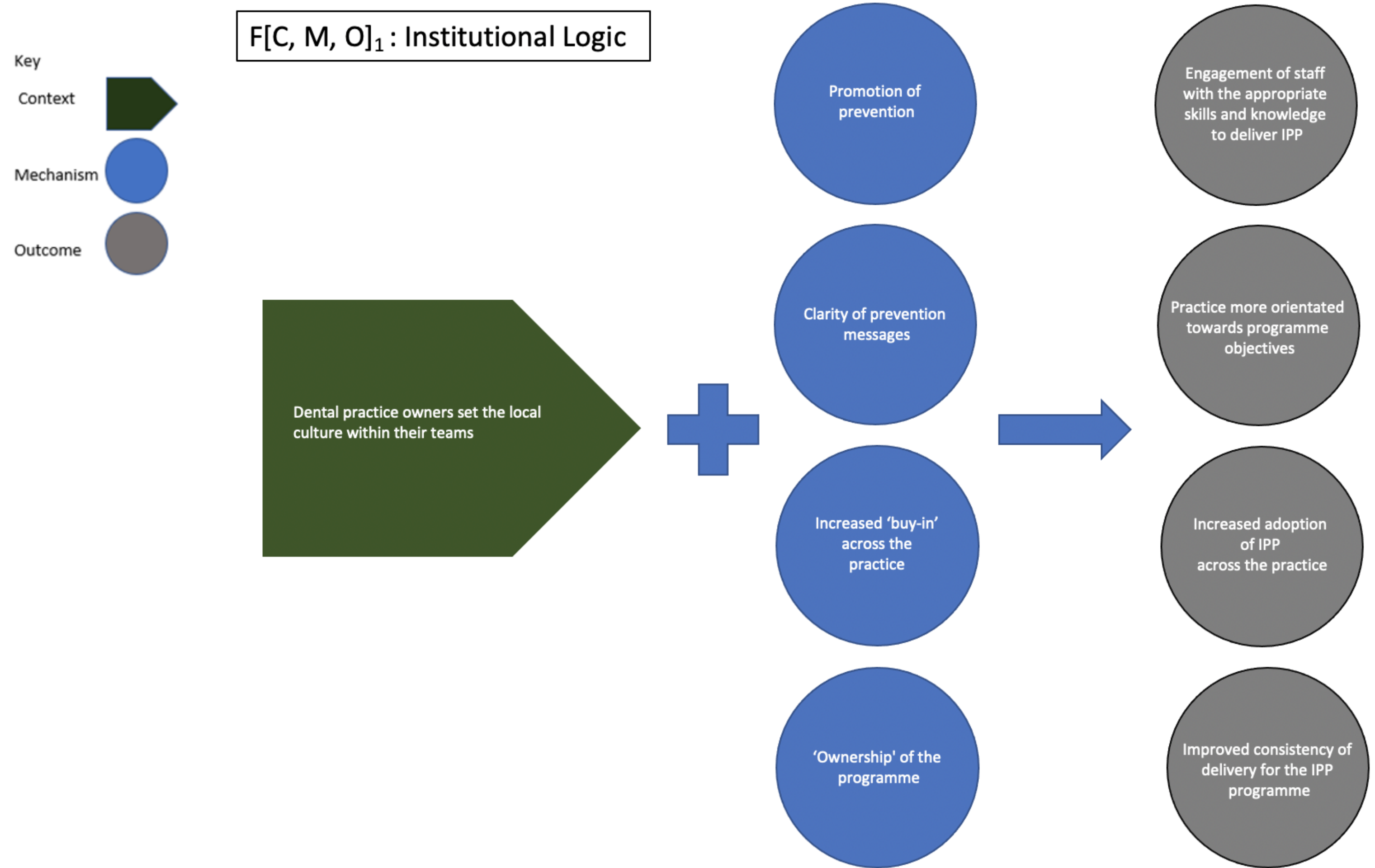

Figure 5.1: CMOC for the 'institutional logic' theory area

5.3.2 Clinical Leadership

The second CMOC ($CMOC_2$) related to clinical leadership (Figure 5.2). The potential of 'clinical leadership' has been the subject of a substantive amount of interest in the NHS and the research literature (NHS Leadership Model, 2014). In dentistry, a number of clinically led programmes have been evaluated, which appear to support its importance (Moore *et al*., 2015; Brocklehurst *et al*., 2013). In IPP, the programme leaders were respected members of their local dental community, who all had experience of practice ownership. As a result, they understood the needs of local practitioners and were able to exert a sense of empowerment within the local dental profession. They were also able to exert 'peer-to-peer' influence, which was then cascaded across practice owners, as they 'bought-in' to IPP, increasing programme adoption and spread.

Given their understanding of the financial drivers and institutional logistics within their local practices, they were also able to ensure that the financial incentives within IPP where appropriate and would engender change to deliver to a public health objective ($CMOC_1$ & $CMOC_3$). Of equal importance, was the multiple-agency approach to the IPP programme. This ensured top-level 'buy-in', ensuring the support for the development and the delivery of IPP, despite a number of concerns about its impact on access and patient charge revenue.

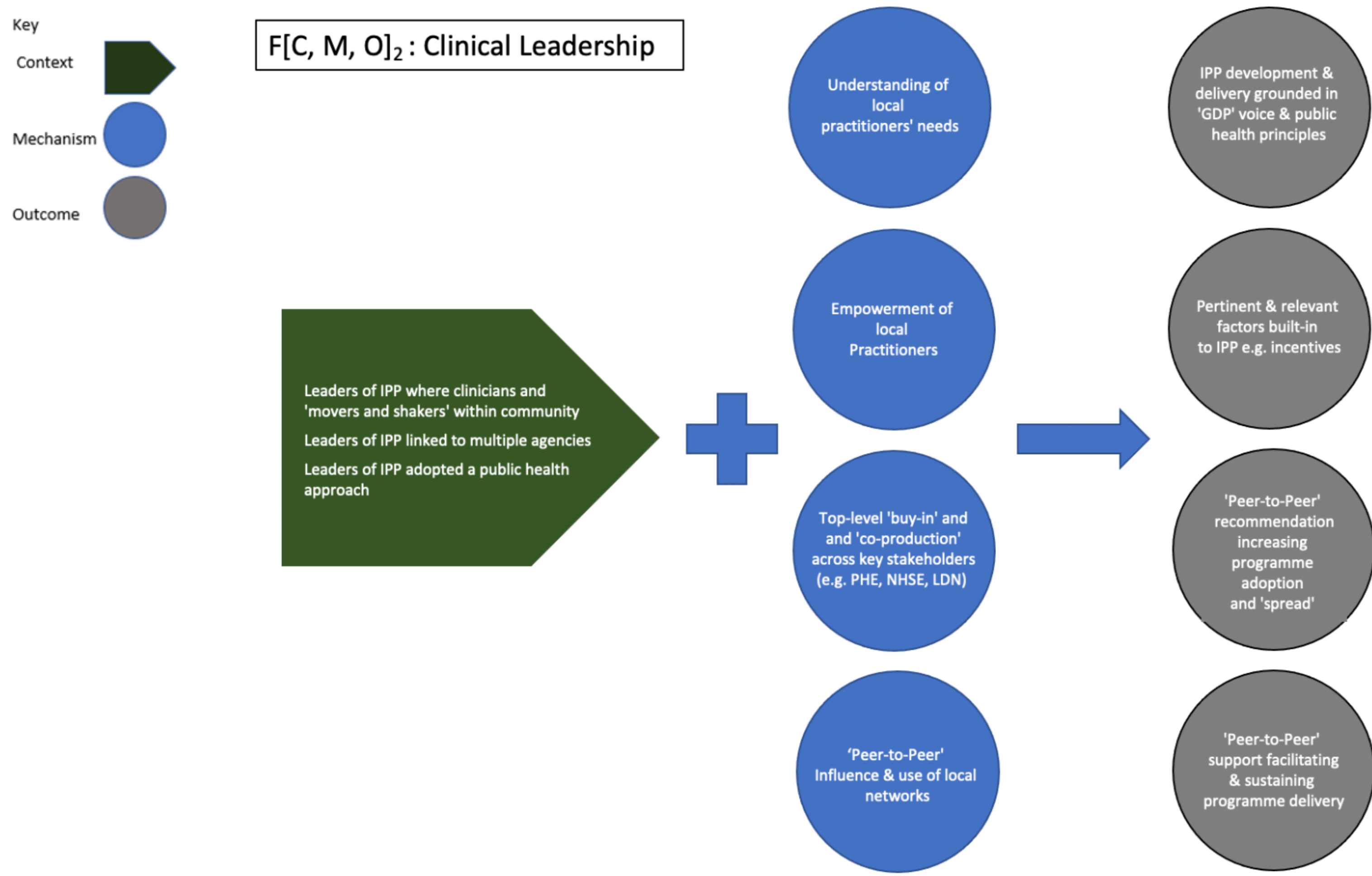

Figure 5.2: CMOC for the 'clinically leadership' theory area

5.3.3 Financial Incentives

The third CMOC ($CMOC_3$) related to financial incentives (Figure 5.3). Dental practice owners in the NHS are sensitive to the incentives in their remuneration system, which can influence the institutional logic of the practice ($CMOC_1$) and the utilisation of 'skill-mix' ($CMOC_5$) (Brocklehurst *et al*., 2021; Harris *et al*., 2013). As highlighted in Chapter One, retrospective payment systems have been shown to lead to over-treatment in order to maximise profit (Birch, 1988; Chalkley & Tilley, 2006). In these systems, the incentive for practices is to increase the volume of clinical activity delivered, which may not always promote prevention or the greater use of 'skill-mix' to provide care. In contrast, per-capita remuneration systems can give practices greater autonomy on what to focus on (Grytten, 2005), which may place greater emphasis on prevention and the use of the whole dental team. However, per capita systems can lead to under-treatment and patient selection; a preference for low-risk patients or those with low levels of disease, given that funding for these practices is capped and unrelated to clinical activity (Grytten, 2005).

The IPP programme was designed to be underpinned by financial incentives within the current General Dental Service regulations (GDS, 2006). To facilitate this, each NHS Practice was paid £12.20 per prevention appointment (up to three permitted) and this total resource displaced the same value of UDAs. In this way prevention activity was substituted for UDA activity, targeting of resource at prevention. This approach to 'flexible commissioning' was designed to reduce the pressure on delivering the clinical activity necessary to meet their Annual Contract Value (ACV) target, whilst also encouraging targeted preventive behaviours.

As highlighted during the testing phase of the realist evaluation, all the interviewed practice owners believed this was key to the adoption of the IPP programme. NHS practices reported the ability of this approach to free-up available resources within the practice that had previously been tied to the delivery of clinical activity to meet the ACV. In turn, this enabled practice

owners to change their working practices and some reported that they were able to change their internal payment structures to facilitate IPP. Unlike the current regulations, ‘flexible commissioning’ facilitated the generation of practice income through preventive activities. This links back to the multi-sectoral working approach that had involved the Local Dental Network, dental commissioners, and dental public health input, to align incentives with population health objectives ($CMOC_2$).

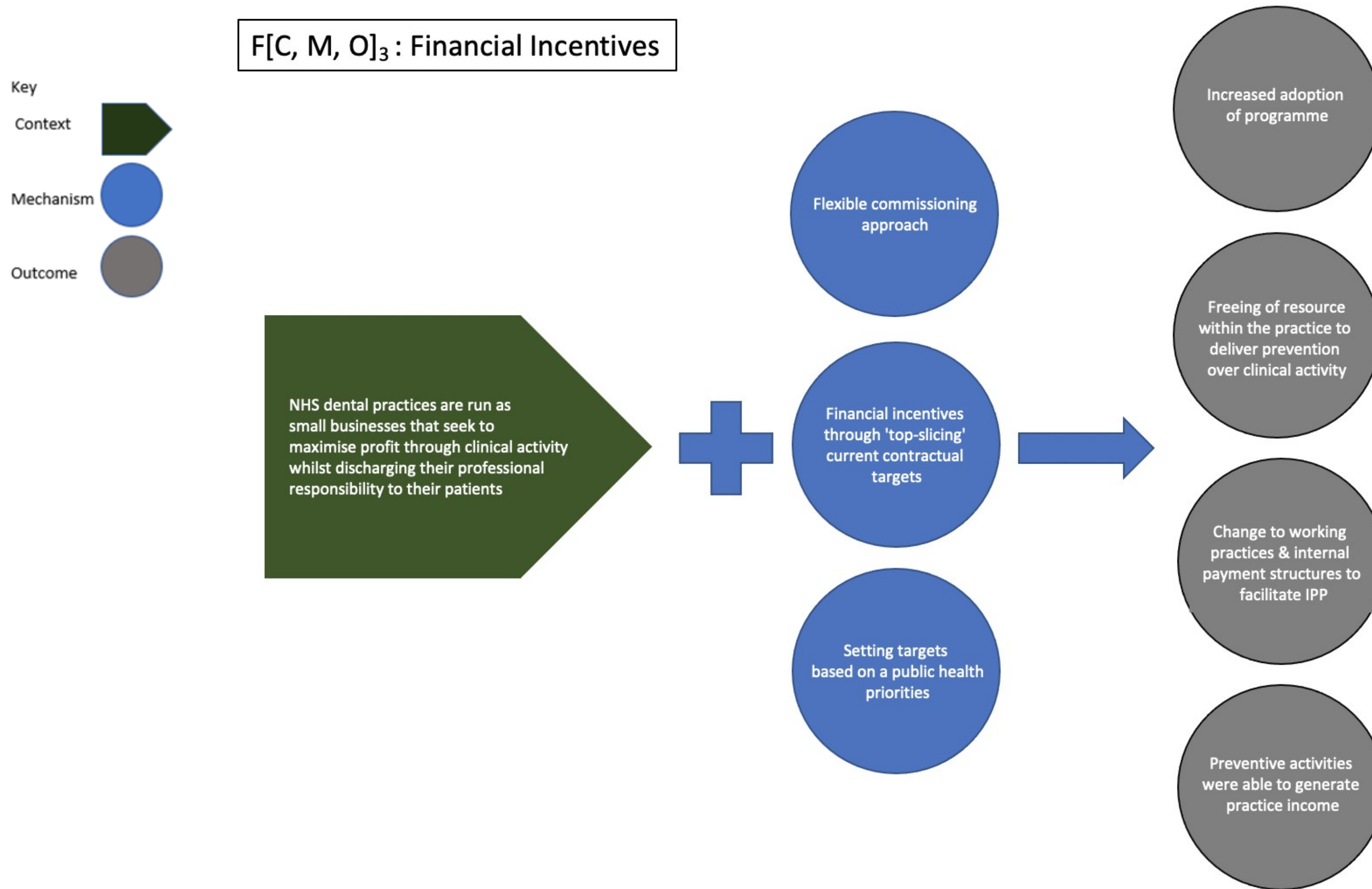

Figure 5.3: CMOC for the 'financial incentives' theory area

5.3.4 Behaviour Change

The aforementioned CMOCs facilitated behaviour change within the practice ($CMOC_4$). An understanding of the importance of institutional logics ($CMOC_1$) and the financial incentives necessary to promote the IPP programme ($CMOC_3$), together with the leadership to promote 'clinically owned and clinically led' activity ($CMOC_2$) appeared critical at a practice level. Equally, the role of 'champions' within each practice to act as human intermediaries and promote 'peer-to-peer' behavioural change was key. In some practices this was driven by the practice owner ($CMOC_1$), whilst in others it was driven by Dental Care Professionals who had become empowered by the role that IPP had provided ($CMOC_5$).

'Human intermediaries' is a term used to describe interpersonal contact to facilitate knowledge exchange through expertise and influence (Williams *et al*., 2013), promoted through a "range of interchangeable roles between producers and users of evidence" (Thompson *et al.,* 2006; Sin, 2008; Milner *et al.,* 2006). Here, clinicians within the practice were able to exert influence on the actions of their colleagues, guiding them towards the evidenced-based approaches to care contained within the IPP programme (Lewis & Edwards, 2008; Flodgren et al., 2011). A number of examples were given of their role in monitoring, maintaining standards and identifying where education and training was required (Williams *et al*., 2013).

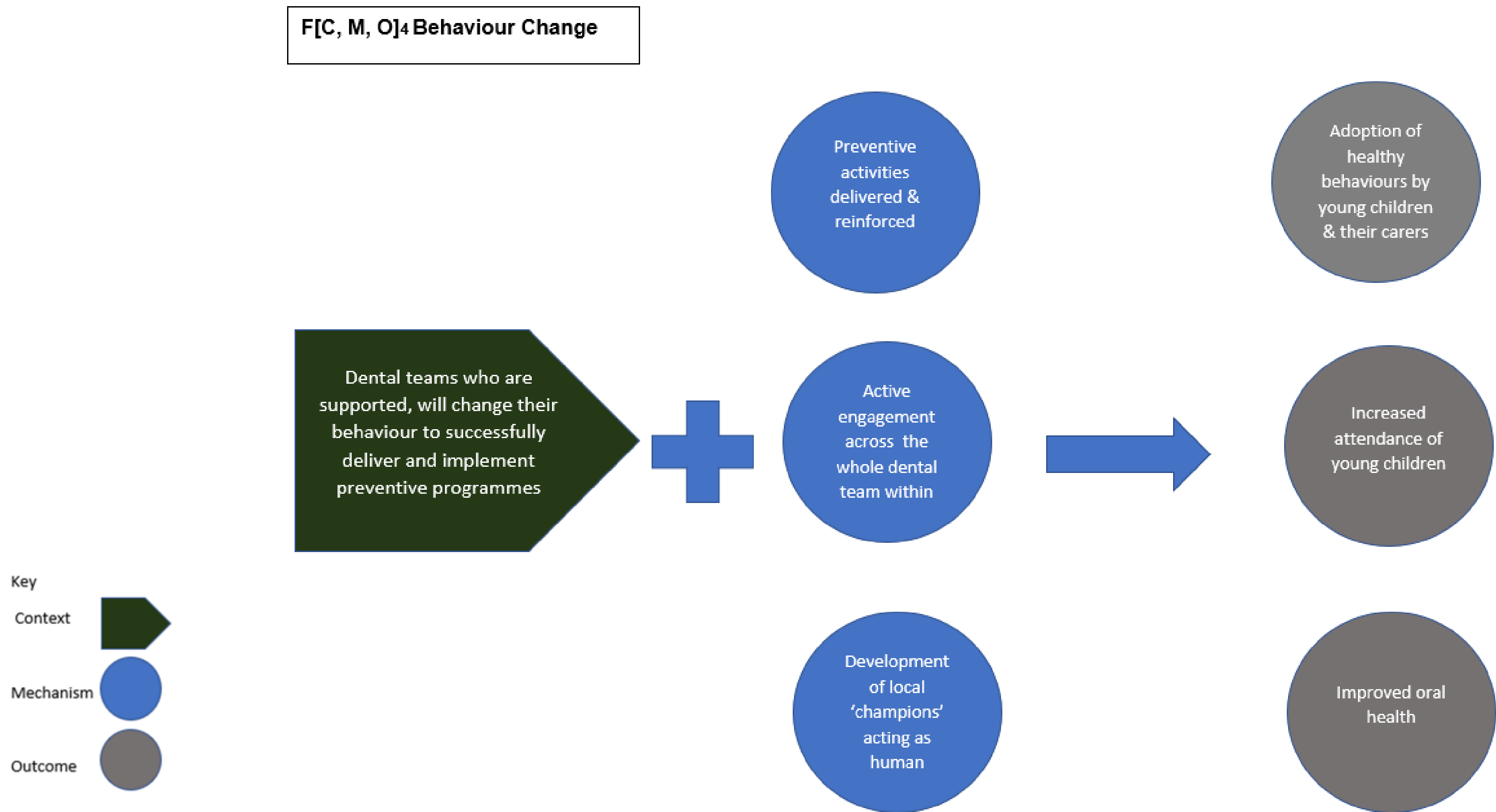

Figure 5.4: CMOC for the 'behaviour change' theory area

5.3.5 Skill Mix

The final CMOC ($CMOC_5$) was related to 'skill-mix'. The use of 'skill-mix' in NHS dentistry has been advocated for some time, but its implementation appears to have lagged behind that seen in medical specialties (Brocklehurst & Macey, 2015; Gallagher & Wilson, 2009). This has been suggested to be an important step forward in addressing the current and future population oral health need. In two recently published realist evaluations, both identified institutional logics ($CMOC_1$) and contractual limitations ($CMOC_3$) as a key barrier to the greater use of 'skill-mix' in NHS dentistry (Brocklehurst *et al*., 2021; Barnes *et al.,* 2020). Barnes et al., argue that there are multiple mechanisms that act within these theory areas: appropriate referral systems to promote utilisation; workplace values and culture; good communication within the practice; and experience of working with Dental Care Professionals; and team training.

IPP promoted 'skill-mix' and for many of those interviewed, it appeared to empower the Dental Care Professionals (DCPs) involved, particularly the Dental Nurses. By changing the financial incentives within the practice to favour prevention ($CMOC_3$), a number of practices reported the 'freeing-up' of the latent potential within their dental teams to champion and promote a preventive culture through mediation ($CMOC_4$). One limiting factor cited was the availability of surgery space, which was echoed in a recent study (Brocklehurst *et al*., 2021). However, despite this, the 'flexible commissioning' approach appeared to better utilise the latent skills available within each practice. Equally, some practices reported Dental Nurses and other DCPs exerting 'peer-to-peer' influences across traditional professional and hierarchical boundaries.

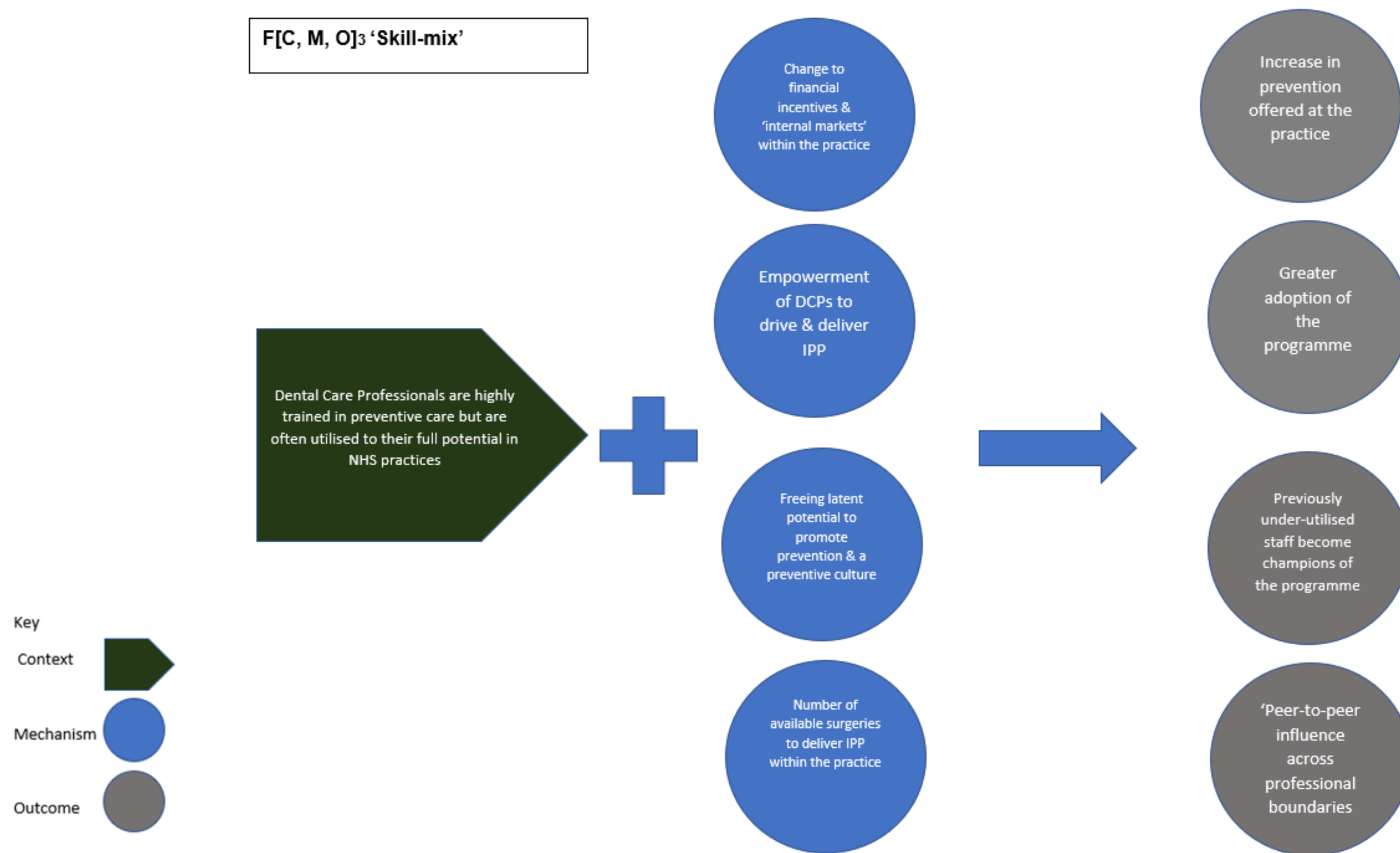

Figure 5.5: CMOC for the 'skill-mix' theory area

5.4. Prioritisation of the theory areas

In the final step of the realist evaluation cycle, the refined CMOCs were taken to a group of stakeholders to develop the final programme theories. In similarity with the preceding phases, 'teacher-learner cycles' were utilised, such that the participants were first presented with the CMOC for each theory area (and their associated narrative), before inviting feedback and comment (Nanninga & Glebbeek, 2011; Manzano, 2016). This process had provided further insight to theory development in the earlier phases and ensured the resulting theory was grounded in the experience of the IPP programme and expressed as modified programme theories.

A similar balance of participants to those outlined in Chapter Four, which are detailed in Table 5.1. were used at this stage of the research. There was representation from the practitioners who were involved in the IPP programme, their dental teams, Public Health England, and NHS Commissioners (n=10). Ahead of the meeting, all the participants had been provided with the CMOCs (Figures 5.1-5.5) in a diagrammatical form, with a brief explanation of the theory area.

Table 5.1: Key stakeholders invited to the final meeting

Stakeholder type	Justification	#
NHS England Dental Commissioner **Consultant in Dental Public Health** **Specialist Registrar in Dental Public Health** **Local Dental Network Chair**	To confirm the contextual factors that shaped the implementation of the IPP programme	4
Dental Practice Owners	To confirm the mechanisms operating at the level of mid-range theory that sustained or potentiated the effects seen or created unexpected consequences in the implementation of the IPP programme (from the perspective of the practice owner)	2
Dental Team Members (Dental Nurses and Associate Dentists)	To confirm the mechanisms operating at the level of mid-range theory that sustained or potentiated the effects seen or created unexpected consequences in the implementation of the IPP programme (from the perspective of the employees at the dental practice)	4

At the beginning of the workshop, participants were asked to prioritise the five theory areas in order of importance. This is presented in Table 5.2.

Table 5.2: Ranking of the five theory areas for IPP

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	Total	Rank
	Dental team (TEAM)	Commissioner (COM)	Practice owner (OWN)	Practice owner	Local Dental Network (LDN)	Dental team	Dental team	Dental team	Public Health England (PHE)	Public Health England		
1- Institutional logic / practice culture	4	4	2	2	3.5	4	4	5	4	5	**37.5**	**4**
2-Clinically leadership	2	1	1	1	3.5	1	1	1	2	1	**14.5**	**1**

3-Financial incentives in the NHS contract	5	3	3.5	3.5	1	2	3	4	3	4	**31**	**3**
4-Behaviour change	3	5	5	5	5	5	5	3	5	3	**44**	**5**
5-'Skill-Mix'	1	2	3.5	3.5	2	3	2	2	1	2	**22**	**2**

These scores were then returned to after the detailed discussion of each theory area, to ensure they reflected the participants' views. Pertinent and purposeful quotes that agree or disagree with the IF-THEN statements are provided below, using the abbreviations in Table 5.2 to indicate the stakeholder group.

5.4.1 Clinical Leadership (ranked as #1)

All the stakeholders were unanimous that this theory area was the most important. It was expressed that clinical leadership is a priority as it was believed that without the leadership from the top there would be little drive or motivation to implement IPP in the first instance.

> *"so I think for me clinical leadership is probably at the top because I don't think it would have happened in the first place without it. And then skill mix, because, again, you need that in order for the programme to work" [FINAL COM]*

> *"the most important thing would be the clinical leadership. I agree with the others, you've got to have the drive behind it for it to happen" [FINAL TEAM]*

> *"that definitely helped, all the meetings and things that were arranged so that we could ask things as we were going along, as it was developing" [FINAL TEAM]*

> *"clinical leadership, because it was setting it up originally, so we did need quite a lot of the meetings and the networking was really helpful because we were sort of bouncing off each other" [FINAL TEAM]*

> *"if you haven't got the leadership at the top wanting to drive this forward, it's not going to happen and we've got to have that mindset of wanting to be involved with this sort of thing" [FINAL OWN]*

"I think it wouldn't have happened if that wasn't in place" [FINAL TEAM]

5.4.2 'Skill-mix' (ranked as #2)

The next most important theory area was 'skill-mix'. Again, the majority of the stakeholders agreed how important this was. Without the use of skill mix, in particular dental nurses the intervention would not be viable for the practices to deliver the intervention. The use of skill mix also allowed dental nurses to use qualifications and skills that they had not been able to use skills previously in NHS dental practice. Skill mix also meant that the implementation of IPP did not have an impact on PCR and access levels in the area, which was a concern of the NHS Commissioners.

> *"they've actually gained a sense of self-worth because it's actually allowed them to utilise some of the skills that they've had but never been able to use before. So, I think that is definitely a positive. Because I think what we found is a lot of the nurses within the dental profession do actually have the qualification for oral health promotion and education and fluoride varnish, but they've never actually been given the opportunity to use it" [FINAL TEAM]*

> *"so obviously from me delivering it point of view, the skill mix I would probably put at the top" [FINAL TEAM]*

> *"you need that skill mix, which hopefully we all managed to have from our DCPs" [FINAL OWN]*

> *"we need the skill mix and practice in order to deliver" [FINAL TEAM]*

5.4.3 Financial Incentives (ranked as #3)

In slight contrast to the prevailing literature on the importance of financial incentives, the stakeholders rated this theory area behind clinical leadership and ‘skill-mix’. However, it was still seen as important to the success of the IPP programme. NHS Dentistry is a business any intervention has to be financially viable dentists and their practices need to be able to afford any intervention that they deliver.

> *“because I think obviously nothing works in business if you can’t afford to do it” [FINAL OWN]*

> *“people won’t do things for nothing, so you have to have a way of recognising what’s going on, so I think that’s really important as well” [FINAL COM]*

> *“financial incentives.... ....because I think you can shift programme development by applying those” [FINAL LDN]*

> *“financial incentives, it’s the sustainability scenario. So in my opinion, it’s only sustainable if that’s in place. We can do an awful lot with people volunteering, but only for so long” [FINAL TEAM]*

5.4.4 Institutional Logic (ranked as #4)

Institutional Logic was ranked by the group at #4. It was felt that without institutional logic and practice culture that the practices would not have the infrastructure and motivation to implement IPP.

> *“the institutional logistics and practice culture, that can be obviously a barrier to this progressing if the leadership within the practice doesn’t allow for the go ahead” [FINAL COMM]*

"if you've got the staff in place that have got the right attitude and have got the right skills, then that will empower the rest of the team to continue and deliver the programme" [FINAL TEAM]

5.4.5 Behaviour change (ranked as #5)

Interestingly, many felt that behaviour change was an outcome in itself, if the first three theory areas were in place.

"behaviour change probably is something that we see on the back of everything else falling into place" [FINAL COM]

"behaviour change is something that just sort of follows on afterwards" [FINAL OWN]

5.5. Development of the final programme theory

After the ranking of the theory areas, each CMOC was discussed in detail. This involved presenting the CMOC in diagrammatical form (using Figures 5.1 to 5.5) and teaching back the findings from the preceding phases. The individual elements were then discussed (i.e. 'Context', 'Mechanisms' and 'Outcomes') to ensure that we had captured all of the key factors within the IPP programme. The CMOCs were then refined further and in some cases additional 'Mechanisms and 'Outcomes' were added, where these materially added to the understanding of the mid-range theory in each theory area.

The final agreed CMOCs are presented in Figures 5.6 to 5.10 below, along with key points made by the stakeholders in the meeting. The figures are also arranged in order of the priority identified in Table 5.2.

5.5.1 Clinical Leadership

This theory area was considered to be the most important factor in the success of the IPP programme (Figure 5.6).

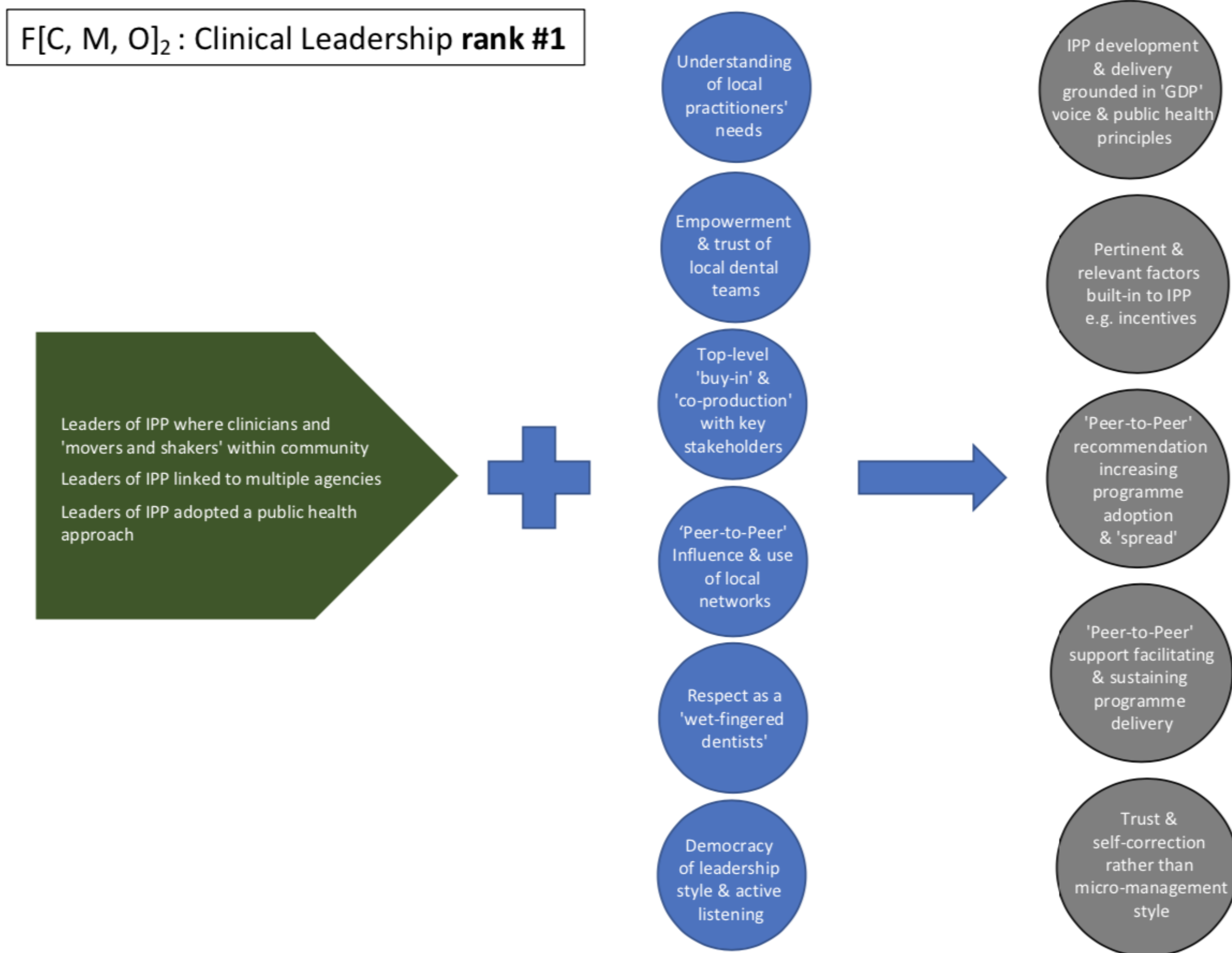

Figure 5.6: Final CMOC for 'clinically leadership'

A further two mechanisms were added to the CMOCs that grounded the theory area further at the mid-range level. These were the respect produced by having clinicians leading the IPP programme, so called 'wet-fingered' and the democratic leadership style, which actively listened to the concerns expressed by their colleagues during the implementation of the programme. This generated an additional outcome, which was described as higher levels of trust and self-correction by participating practices i.e., that the use of colleagues in leadership positions promoted a more positive relationship and moved away from a micro-management commissioning style.

> *"I think buy-in is hugely important and I think collective ownership of the programme is hugely important. And actually, trying to get that philosophy across is central isn't it? So, you're operating as individual practices within a larger system, so you're all contributing to the success of the programme. That's really important" [FINAL LDN]*

> *"I think the other important point, and this might come in the culture, but there was definitely a philosophy of improving quality of delivery collectively. So, there was quite a strong peer review element across the programme. The practices would learn from each other and improve service for patients as a result of that. I think that's also important.... .... a 'peer-led learning' focused sort of programme" [FINAL OWN]*

> *"I think the peer champions were very powerful.... ....we did some stakeholder evenings for practices and I watched [PRACTICE OWNER] in action. And although [LDN] and I have spoken to practices, it was much more powerful coming from [PRACTICE OWNER] as the peer champion. So he was able to say to them, I know this is really new and it's a bit scary, but I've walked the walk and it's fine" [FINAL PHE]*

“I think if you haven’t got the leadership at the top wanting it to happen and ensuring that it will happen come what may, then I think that is important” [FINAL OWN]

“I think the fact that he is so well respected in the dental community, especially locally, has been absolutely vital for the success of this programme. Because he was a wet fingered dentist, he’s been there, he knows the issues that practices could have faced in terms of engagement from associates, and also the financial implications of taking the risk of doing this. So, I think it was really important” [FINAL OWN]

“number one was the kind of democratic leadership which we use. So, it wasn’t very hierarchical, people could challenge the programme, and they did” [FINAL LDN]

“we trusted the practices to deliver, because you can’t micromanage a programme in every single practice because they’re all radically different.... ....I couldn’t spend my time micromanaging it, it would have been impossible. So, we provided a framework and basically said to practices, deliver it within the context of your own organisations [FINAL LDN]

“the outcome of the peer-to-peer influence and the feedback that resulted, that loop created a responsive programme that allowed the programme to evolve so that strengths were incorporated and any problems could be addressed [FINAL COM]

5.5.2 ‘Skill-mix’

The final theory for ‘skill-mix’ is provided in Figure 5.7.

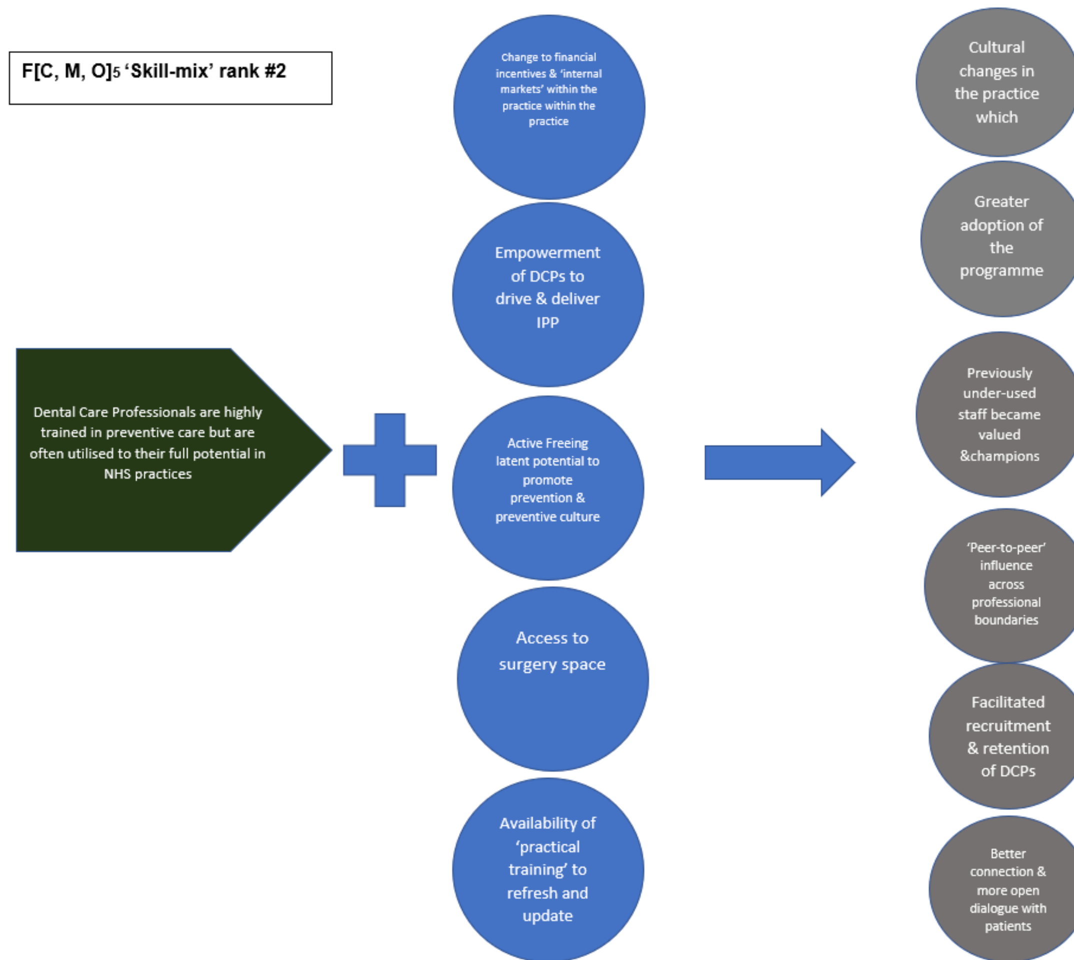

Figure 5.7: Final CMOC for 'skill-mix' theory

Following discussion within the group, practical training to refresh and update competencies were added as a mechanism. Two further outcomes were added and agreed by all the group. These related to the fact that the IPP programme had facilitated the recruitment and retention of DCPs by practice owners and that as a result of the practical training element within IPP, a more productive, connected, and open dialogue was possible with patients and their families. This is alluded to below in the amendments made to the CMOC on behaviour change.

> *"I think one [most important element] was the DCPs supporting each other and leading each other" [FINAL PHE]*

> *"we've had huge challenges in North Yorkshire and Humber in some practices in terms of recruitment. So particularly the coastal practices, they've only got 180 degrees of land to recruit from because the rest of it is... And so, this has been an opportunity where they could use either existing skill mix or part of the time recruited skill mix instead of having to recruit an associate" [FINAL TEAM]*

> *"I can personally back that up from someone who has recruited associates and have a lot of them. Does it make a difference to helping you deliver targets when you can get your target delivered? But delivering something that's actually worthwhile and by DCPs? Yes, it does" [FINAL OWN]*

> *"because they can help me deliver the target just as an associate could. Not obviously to the same level, but it may be only two or three per cent that made all the difference to whether the target was hit or not hit" [FINAL OWN]*

> *"but the DCPs did roll it out in the practices, so it was all led by them really. So that's kind of key from that perspective, that they were vital to rolling it out. Because I haven't got clinicians leading the way in practices, so the DCPs had to do it" [FINAL OWN]*

“it was nice to be able to use those UDAs in a positive way and deliver prevention in an area where it’s high needs and DCPs being able to do that. And getting the nurses to where they need to be through peer groups in order to deliver that in practice, I just think that’s important to put in there” [FINAL TEAM]

“I think that the DCPs felt a greater fulfilment, greater rewarding, job satisfaction, and they felt valued more as well. And they felt that they’ve got a bigger role in the overall dental team in that sense. And I think that was very important, that rather than just being an assistant, they were suddenly... And do you know what? The patients often really connected with them, or the parents would connect with them very well, hearing from them rather than it just being from the dentist. And they could have a greater...sometimes a greater one-to-one conversation” [FINAL OWN]

“I’ve seen it with my own eyes, where the patients had a better connection with the DCPs” [FINAL OWN]

“I think skill mix is one of the real positive things to come out of IPP and the value placed on some of the extraordinarily effective prevention deliveries that developed out of it. So, in terms of their own personal development and their professional development and their value in the practice, it had a huge impact” [FINAL LDN]

“the limiting step for this programme, though, is training, because it’s quite difficult to train the numbers of extended duty dental nurses that you need if you’re going to really deliver this kind of programme at scale” [FINAL LDN]

“to scale it up on a national programme that the training is key” [FINAL OWN]

"there are lots of DCPs that gained the qualification several years ago and haven't had any actual updated training.... ....we did quite a lot of role-play, what they would say in certain scenarios. I think some of the training that some of the girls had received wasn't sufficient, if I'm honest. There was a lot of theory-based but not a lot of practical, in terms of how to have a conversation when things are difficult. If you come against, say, a parent that's quite defensive, how to deal with that. So that was one of the things that we did within our area and we did quite a lot of role-play. We did quite a few sessions on that and I think the peer support that the girls had between themselves was vital" [FINAL TEAM]

5.5.3 Financial Incentives

Figure 5.8 describes the final CMOC for financial incentives.

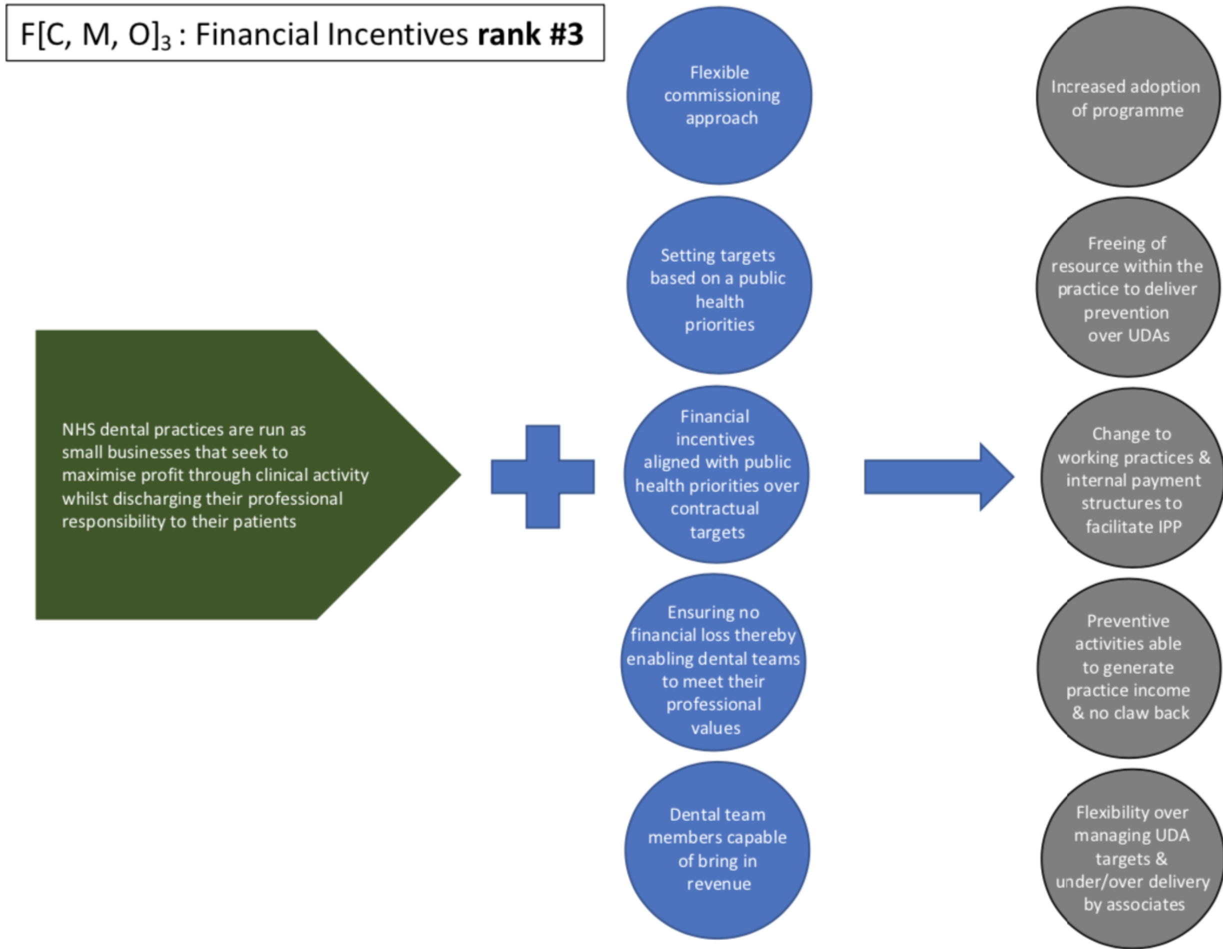

Figure 5.8: Final CMOC for 'financial incentives'

For this theory area, two additional mechanisms were thought to be important to add. One described the idea that dental teams would be free to deliver prevention as they were trained to do, which they likened to operating to their full professional values, if dental practices were ensured they did not suffer any financial loss i.e., that financial incentives per se was considered to be a broader concept than simply being paid to do a clinical activity. Instead, they articulated that as long as they did not lose out on any contractual value, they were happy to engage in the programme and that this engagement linked to a sense of professional achievement. The second mechanism that was added related to dental team members acting as revenue generators. This produced two specific outcomes, the generation of practice income without claw-back within the GDS contract and a flexibility over meeting UDA targets within this contract.

> *"as a practice owner, but someone who, as you know, passionately believes in public health, if you really want anyone to do anything, it doesn't matter what walk of life, you align, you work out what you want and then align the financial incentives accordingly" [FINAL OWN]*

> *"it's about ensuring that if you take part in a flexible commissioning programme, you're not going to be financially disadvantaged but you may be financially advantaged. So, clearly, if you want to incentivise something, there has to be a financial hook to achieve that, and if you align that with the public health priority, you're going to deliver the outcome that you require through incentivised activity" [FINAL OWN]*

> *"it will be very rare, for example, for you to float the idea of a flexible commissioning programme that reduced profit and get people to get involved. Simply because it has to be sustainable long-term and it wouldn't be if practices were losing money delivering it. So, it doesn't have to be huge, but it has to be at least commensurate and, if possible, slightly better, but delivered in a different way, if that makes sense" [FINAL OWN]*

> *"as long as you're not disadvantaged, then the benefits of a different work pattern can.... ....providing you're not disadvantaged financially, if you're disadvantaged, then it's a no-go. But you don't have to have a huge financial gain, it can be just the status quo as far as finances go, providing if then there are other benefits to doing it and it's more rewarding work" [FINAL OWN]*

> *"I think that's a really important point. It's not necessarily a financial incentive, it's a quality-of-life incentive sometimes. And I agree, it can't be financially disadvantageous, but there are other things that are important in terms of improving the quality of your working day really and the working balance by using a different skill mix" [FINAL PHE]*

> *"[another element] needs mentioning, is that when you have a lot of associates, you have some that, as you know, deliver. Some of them that under-deliver. If the practice has got that little bit of wriggle room that belongs to the practice, that it can deliver the target another way that is not, frankly, associate-dependent, it makes all the difference" [FINAL OWN]*

5.5.4 Institutional Logic

The final CMOC for institutional logic is provided in Figure 5.9.

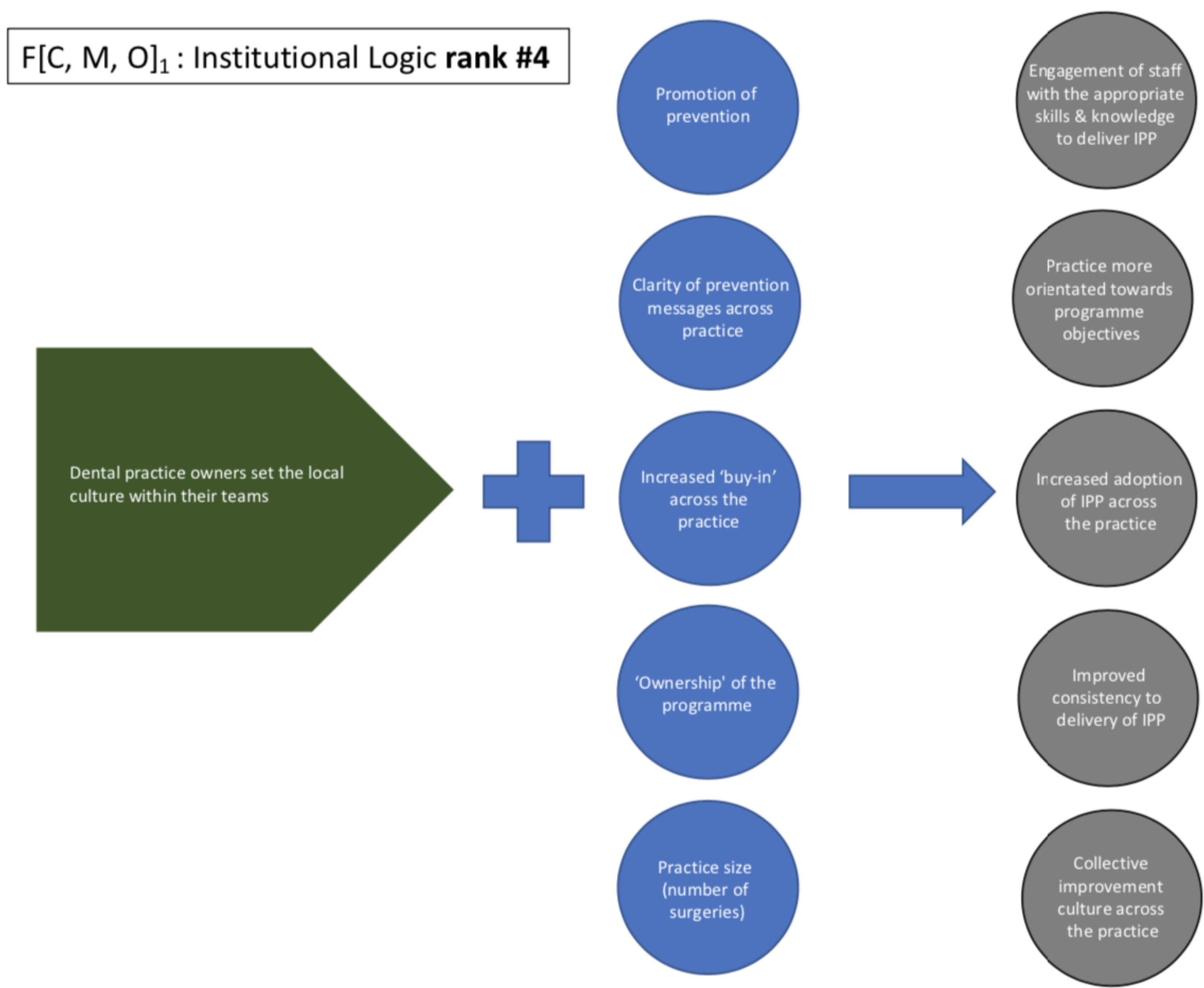

Figure 5.9: Final CMOC for 'institutional logic'

Following discussion within the group, it was argued that practice size should be an additional mechanism. This was thought to be important as it constrained or facilitated the use of skill- mix within the practice by providing more surgery space. Equally, an additional outcome was added, which all the participants agreed upon. This related to the development of a collective improvement culture across participating IPP practices.

> *"we might want to add.... ....the size of the practice. So, our attrition rate in IPP was very small, but there was one practice that almost fell, who has a very small practice. And he had difficulties in delivering it because of surgery space and he didn't have a dedicated or health promotion room that he could use" [FINAL LDN]*

> *"because of the size differences, they will have different means and ways, and so the factors will differ. I think in a smaller practice, like mine is, the clinical leadership, if I wasn't wanting to.... ....if we have a problem, I'll be there saying, right, we can get round this, let's figure out how we can do it" [FINAL OWN]*

> *"there's a greater buy-in if there's clarity of the programme and it's as simple as possible" [FINAL LDN]*

> *"there [was] a lot of, shall we say, institutional resistance to change to it being about a whole team approach, not just in dentist approach.... ....to be very frank with you, if certain of our associates initially had had their way, this would never have happened. But because the management at the top, in this case, me, was going to have this come hell or high water, that's why it happened. And now it's no problem, it's just part of the culture and they all go with skill mix and actually they're genuinely relaxed about it" [FINAL OWN]*

> *"if you've got somebody that is leading it within that particular practice and that has a passion for prevention, that makes a huge difference, whether they are an associate or a DCP or a practice manager. I think*

that is vitally important, that you've got the right person leading it no matter what position they hold in that practice" [FINAL TEAM]

5.5.5 Behaviour change

Figure 5.10 details the final CMOC for behaviour change.

For this theory area, an additional mechanism was added relating to a mechanism that described the importance of practical training within the IPP programme. Equally, the outcomes in the initial CMOC were completely reconfigured to express and capture the views of the participants at the level of modified programme theory. These included increased confidence in delivering prevention by DCPs, the development of a positive feed-back loop that reinforced the relationship and delivery of the preventive elements of the programme, an outcome relating to practical understanding of IPP, and the acknowledgement of the potential and value of DCPs within the dental team.

> *"I know [TEAM] had a lot of calls from practices. [TEAM] really initially knew more than really any other DCP situation involved in this programme, but they really helped the other DCPs wrap their heads round the practicalities" [FINAL OWN]*

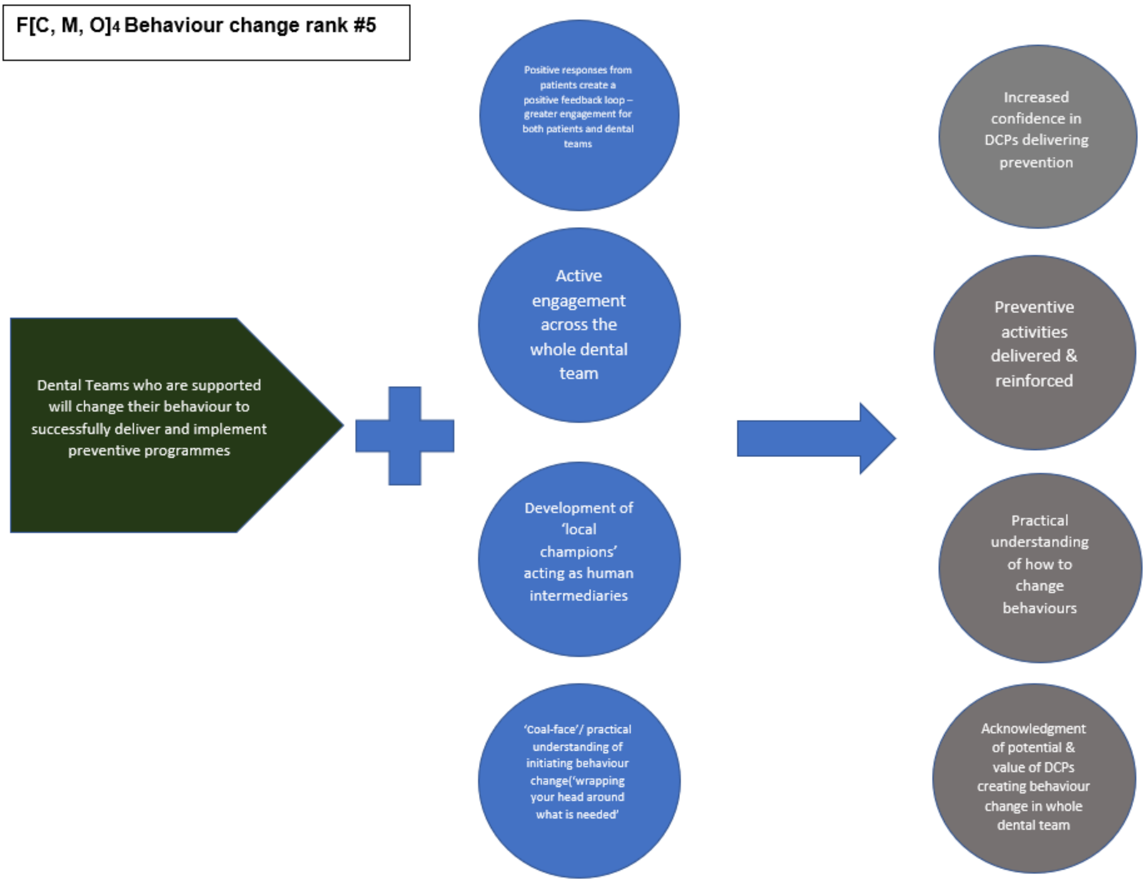

Figure 5.10: Final CMOC for 'behaviour change'

“as a result of that confidence grew and there was a kind of natural feedback loop which made people more engaged with the programme, because they began to see the value in delivering it and they began to see the positive feedback from patients and actually some behaviour change that was taking place” [FINAL OWN]

“once you got to the tipping point of extended duty dental nurses feeling confident delivering it and they were getting good results, then you’ve got even more engagement and behaviour change within the programme” [FINAL OWN]

“having that training and the roleplays that we did within the area were key to delivering and giving confidence to the DCPs. You’re moving them up a level and giving them more responsibility and they had to go into practices and they had to deliver that to the dentists in the practices and get their clinicians on board. So for me the champion was key to that happening, in my area anyway” [FINAL OWN]

“they wanted to learn more and they wanted it to be a success. I think in terms of behaviour change, I saw behaviour change not only with the DCPs, because they felt valued, but I also saw a behaviour change in the dentists on how they regarded the dental nurse. They seemed to respect them a lot more” [FINAL TEAM]

“dentists were actually asking the DCPs who were delivering the programme what the current guidelines were with things like fizzy drinks and additives and sugar content in various things. And we’ve also had more request from the whole team really to become more involved in oral health promotion events within the practice as well. So obviously the ultimate goal is to have a behaviour change with the patients so that that changes their oral health outcomes, but I think as an add on, we’ve got a behaviour change with the whole team at the end of it” [FINAL TEAM]

5.6. Summary

The top three theory areas were clinical leadership, ‘skill-mix’ and financial incentives. However, all five theory areas appear to exist with some level of interdependence, reflecting what happens when a complex intervention is introduced into a complex health system. The use of a realist paradigm allowed these different influences to be teased out, but also looked at ‘in the round’. This highlights a key difference between the underlying philosophical approach in realist evaluations, compared to positivism and empiricism adopted by experimental designs and the traditional evidence-based paradigm.

Overall, clinical leadership was seen as critical. Important mechanisms were a) understanding local practitioners' needs; b) empowerment and trust; c) top-level 'buy-in' and 'co-production'; d) ‘peer-to-peer' influence; e) respect; and f) the democratic nature of the leadership style. This produced the following outcomes: a) a programme that was grounded in 'GDP' voice and public health principles; b) pertinent and relevant factors were built into IPP (e.g., incentives and training); c) 'peer-to-peer' recommendation and adoption; d) sustainability of the programme; and e) the reliance on trust and self-correction over a micro-management style.

The utilisation of ‘skill-mix’ within the programme was facilitated by the following mechanisms: a) a change to financial incentives and 'internal markets' within the practice; b) empowerment of DCPs to drive and deliver IPP; c) releasing latent potential to promote prevention and a preventive culture; d) practice size; and e) the availability of 'practical training' to refresh and update competencies. These mechanisms led to the following outcomes: a) a culture change in the practice which favoured prevention; b) greater adoption of the IPP programme; c) previously under-used staff becoming valued and champions of IPP; d) 'peer-to-peer' influence across professional boundaries; e) improved recruitment and retention of DCPs; and f) better connection and a more open dialogue with patients and the families.

Financial incentives were also seen as critical and were operationalised through the following mechanisms: a) a flexible commissioning approach; b) the setting of targets based on public health priorities; c) aligning financial incentives with public health priorities; d) ensuring no financial loss; e) the potential of other dental team members to attract revenue. This produced the following: a) increased adoption of IPP; b) freeing of resource within the practice to deliver prevention over UDAs; c) changes to working practices and internal payment structures to facilitate the programme; d) preventive activities able to generate practice income and reduce claw-back; and e) flexibility over managing UDA targets and under/over delivery of the ACV.

It was interesting that with these theory areas in place, it appeared to promote an institutional logic that encouraged the use of 'human intermediaries' to promote behaviour change, both within the practice and within the target population of the IPP programme. This in turn enabled Dental Nurses to take a lead role in the delivery of the intervention and were seen to be very capable.

In this Chapter the refinement of the Initial Programme Theories (IPTs) into Modified Programme Theories (MPTs),has been described and details the stakeholders involved and moved on to describe the responses to the refined IPT and the prioritisation and the development of the final programme theory.

Chapter Six aspires to clarify the explanatory power of programme theories from Chapter Five and test these against another preventive programme for young children in the Yorkshire and Hull area, Starting Well Thirteen.

CHAPTER SIX:

ANCHORING A FINAL PROGRAMME THEORY

6.1. Introduction

In this Chapter, the explanatory power of programme theories from Chapter Five are tested on a further preventive programme for young children in the Yorkshire and Hull area, Starting Well Thirteen. This programme was introduced some 12 months after IPP in the region. It details the methods used for this “teach back” session and the rational for stakeholders invited to test the programme theories from IPP and test if they transfer to SW. The Chapter moves on to discuss the results of the semi structured interviews and discusses each programme theory in turn, and concludes with a summary of the findings

6.2. Methods

Following the same process as detailed in Chapter Four, semi-structured interviews were undertaken with key stakeholders in the Starting Well Thirteen (SW) programme. Stakeholders were presented with the final programme theory from the In-Practice Prevention programme in *IF -THEN* propositions and were asked how well these applied to the SW programme. Key similarities and differences were explored.

1. *Institutional logic:* factors that influenced the implementation of the IPP programme as a result of the culture within the dental practice.
2. *Clinical leadership*: the importance of leadership within the dental practice and the local commissioning team.
3. *Financial incentives*: the importance of the financial incentives associated with IPP programme for dental practices.

4. *Behaviour change*: factors that influenced the adoption of the evidence-based oral health messages in the IPP programme, along with behaviour change; and
5. *Skill-mix*: the importance of using non-dentist members of the dental team to the delivery of the IPP programme.

The stakeholders that were invited to participate in the final theory testing phase are highlighted in Table 6.1. Given the range, geographic distribution and limited availability of the different stakeholders, the research team could not arrange a single focus group and so undertook semi-structured interviews with representatives from each stakeholder type. As a result of the COVID pandemic, the semi-structured interviews were undertaken using Microsoft Teams, audio recorded and transcribed verbatim.

Table 6.1: Key stakeholders invited to participate in the theory-testing stage

Stakeholder type	Justification
Senior Lecturer in Dental Public Health	Evaluated SW
Starting Well Thirteen Research Assistant	Research assistant in SW evaluation
Local Dental Network Chair	Involved in the implementation and delivery of SW in North Yorkshire & Humber region
Lead for Maternity, Children and Young	Involved in the implementation and delivery of SW in North Yorkshire & Humber region
People within Public Health Hull City Council	Involved in the implementation and delivery of SW in North Yorkshire & Humber region

A semi-structured interview schedule based on the IF-THEN statements was utilised (Table 6.2). Open-ended questions were also included to draw out the opinions of the stakeholders. Interviews lasted no longer than 60 minutes. During the interviews, each participant was presented with the set of final programme theories presented as the IF-THEN propositions that had been developed. They were then asked to reflect on whether or not, and in what ways, the statements captured their views about the Starting Well Thirteen programme. This 'teacher-learner' approach ensured a focus remained on the key issues of the final programme theories that facilitated (or not) the Starting Well Thirteen programme, testing out the stakeholders' responses to the different IPTs. IF-THEN propositions discussed in Chapter Four were used as it was felt that these were easier for the Stakeholders to understand than the MPTs that were generated ion Chapter Five. As mentioned in Chapter Four all the IPTs presented for the In-Practice Prevention (IPP) programme received support from the participants interviewed and required very little modification from the IPP Stakeholders.

Table 6.2 PTs framed as IF-THEN propositions

Theory Area	
Institution logic	1-*IF* the culture within a practice promotes prevention *THEN* they are more likely to employ staff with the appropriate skills and knowledge and adopt SW 2-*IF* the culture within a practice was not clear on the messages within SW *THEN* the programme would not be delivered consistently 3-*IF* the 'buy-in' to SW wasn't consistent across the practice *THEN* the programme would not be adopted uniformly 4-*IF* the practice principal (practice owner) did not 'own' the programme, *THEN* SW would not be delivered across the practice
Clinical leadership	5-*IF* clinicians are empowered to take on leadership roles *THEN* they can play a more significant role in how programmes like SW are developed and delivered 6-*IF* a programme like SW is developed in partnership with key stakeholders *THEN* IPP will be better designed and shaped for use in the NHS practice 7-*IF* clinicians adopt leadership roles: *THEN* they can become empowered to shape change to improve local oral health through SW

	THEN they can facilitate the implementation of SW amongst their peers (peer-to-peer influence)
Financial incentives in the NHS dental contract	8-*IF* NHS practices are provided with financial incentives (or reduction in activity targets): *THEN* they are more likely to adopt and engage with a preventive programme *THEN* they are more likely to change working practices to facilitate the implement SW 9-*IF* NHS practices are offered a reduction in their Annual Contract Value or activity targets *THEN* it can release sufficient resources to deliver SW
Behaviour change	10-*IF* NHS practices adopt the evidence-based prevention in SW *THEN* young children and their carers are more likely to adopt healthy behaviours *THEN* young children and their careers are more likely to attend more regularly *THEN* young children are more likely to improve their oral health
'Skill-mix'	11-*IF* NHS practices adopt greater levels of 'skill-mix' *THEN* the practice is more likely to promote SW *THEN* they are more likely to meet future population need (oral health) via programmes like SW *THEN* it can free dentists to undertake more complex cases (pursuant to their training)

6.3. Results

Overall, three semi-structured interviews were held with representatives from the different stakeholder groups. Each PT within each theory area is presented sequentially, with thick description and participant accounts.

6.3.1 Institutional Logic

As previously mentioned, institutional logics are described as "systems of cultural elements (values, beliefs, and normative expectations) by which people, groups, and organizations make sense of and evaluate their everyday activities and organize those activities in time and space" (Harris & Holt, 2013). In this theory area, there were four related IF-THEN statements, which focused on the culture of the dental practice in relation to the implementation and delivery of the IPP programme.

PT1-IF the culture within a practice promotes prevention THEN they are more likely to employ staff with the appropriate skills and knowledge and adopt SW

The participants interviewed all agreed that this was an important element of the SW programme. Comments relating to the presence of a prevention champion prior to the implementation of SW go hand in hand with the preventive culture of the practice, which reinforced PT1. Previous experience in IPP was seen to have an enabling effect on the implementation and delivery of the SW programme.

> *"so some practices had prevention champions, they had people in post who were already kind of primed to do this, I think, had some inherent skill sets and just grabbed this and ran with it"….[SW1.231_Senior Lecturer in Dental Public Health]*

> *"because IPP preceded Starting Well by about a year to 14 months, so I think the practices that took on board Starting Well who were running IPP could deliver it better in Hull, for example because they*

were already trained, they are all ready to go, they already sit on the [inaudible 0.18.47], they already work with local authority et cetera, et cetera in terms of outlooks"….[SW2.274_LDN Chair]

Also noted was the previous experience of the Champion and how the dental nurses were able to draw on that previous experience to implement and deliver SW

"for us it tended to be the same stuff that we're delivering the Starting Well as the IPP, so they already had that" …[SW3.147_Practice Manager]

"from the Champions in Hull, you know they're expected to go out and do a lot of work and community. And sometimes that's a bit of a skill in itself"…[SW3.211__ Lead for Maternity, Children and Young People within Public Health Hull City Council]

Those practices that did not already have a preventive champion prior to SW found that implementation of SW was more problematic, especially in practices where the champion found the implementation of SW difficult, and the leadership was not present in the practice.

"the champion plays a very important role. If the champion has already some experience in preventing activities, I think it is knowing to facilitate their role, but I see that for those champions that don't have any background in prevention, prevention activities, it has been more difficult to adapt to this role" ….[SW2.46_Research Assistant]

As mentioned in IPP a key element was the peer support that was embedded in the IPP programme, and it was highlighted in SW that the dental nurses supported each other with the SW. Also highlighted in this section was the enthusiasm that the dental nurses had for the SW programme

“some practices had prevention champions, they had people in post who were already kind of primed to do this, I think, had some inherent skill sets and just grabbed this and ran with it, to the point they were actually helping out other practices”[SW1.233]…Senior Lecturer in Dental Public Health]

“probably…one of the best things from Starting Well was the enthusiasm…[SW1.24_Senior Lecturer in Dental Public Health]

“….I’ve never seen that before, and who’d have ever expected it, that someone would be so enthusiastic, they’d be helping out other practice prevention champions in other practices…..[SW1.236_ Senior Lecturer in Dental Public Health]

“…You know that that comes with its challenges and should be recognized. It’s there's some candid development needed there. Suppose because it's quite hard to go out and work with children centres [visiting Day nurseries to give oral health advise]. Day Nursery is engaged with the public outside [parents and other educational providers] and that sort of thing. I suppose it's [nursery] a protected environment to them and you know working in dental so it's a different challenge that we're asking and so do [deliver prevention e.eg toothbrushing]”.[SW3.215]

“a lot of the nurses that were involved in delivering it and being the champion for their practice did need that peer support. And so we and they enable them to meet on a regular basis where they could just come together and discuss the issues that we had and how somebody is overcome because somebody obviously might have had the same issue as them but managed to overcome that particular problem”…[SW3.972_Practice Manager]

“and whilst the peer support wasn't in those practices that were involved, so it wasn't just the you know the management side of it or

the dentist. It was actually those that were on the ground that we're delivering it. And that's very important, particularly as I said earlier, know some of them have never actually delivered any sort of intervention like that at all. " [SW3.979_Practice Manager]

PT2-IF the culture within a practice was not clear on the messages within SW THEN the programme would not be delivered consistently

Practice culture was also considered to be key in the implementation of SW and was seen as a barrier to the implementation of the programme, if prevention was not seen as valuable within the practice, issues with associates referring patients to the programme would arise. A key issue that was raised for SW was getting the buy-in from dentists in the practice who are working as "associates" and not the owner or practice principle.

"I think that would get in the way. I mean, the practice prevention champions, they had great difficulty with some of the performers. What's in it for a performer [associate]? [SW1.28 Senior Lecturer in Dental Public Health]

" a lot of the practices struggled with the GDP's, particularly with the Starting Well, because a lot of them are not keen to see children under the age of 1 and even though as far as their, uh, remuneration aspect is constant, they're easy UDA so you know you might not necessarily be able to do that clinical examination, but you could give prevention messages across, whereas a lot of clinicians are not keen on, you know, doing that side of things" [SW2.147 Practice Manager]

"But then you've got other practices where the clinicians love seeing the children and love, you know, dealing with parents of and very young children or infants"…[SW3.153_Practice Manager

> *“it's going to be difficult for the whole practice to develop a preventative programme because I think everybody in the practice needs to be engaged in the activities” [SW2.64_Research Assistant]*

PT3-IF the ‘buy-in’ to SW wasn’t consistent across the practice THEN the programme would not be adopted uniformly

The importance of ‘buy-in’ across the practice was believed to be key for the programme to be delivered, in addition to support for the champion. Also highlighted was the role of the associate dentist, who received no financial benefit for the intervention, here team training was considered fundamental to the adoption of the programme in the practice

> *“training for all, for the whole practice is important and also the support of every member of the team, not just the principal and the champion, I think everybody has to take part in this” [SW2.67_Research Assistant]*

IPT4-IF the practice principal (practice owner) did not ‘own’ the programme, THEN SW would not be delivered across the practice

The potential influence of the practice principal was supported by many of those interviewed and again, this was commonly referred to as ‘clinical leadership’. The leadership for the implementation came from the champion rather than the practice principle, however support or ownership for SW was necessary from the principle to ensure it was delivered across the practice

> *“the practice principle lent quite heavily upon the practice prevention champion” [SW1.295_Senior Lecturer in Dental Public Health]*

> *“if a practice prevention champion who is floundering a bit, not too sure what to do, not getting much of a steer from the boss. We’ve got some money coming in, we can have some meetings, sure, have the meetings, having real difficulty getting traction. I mean, there’s the*

whole thing about leadership and achieving change in practice as well." [SW1.246_Senior Lecturer in Dental Public Health]

"it is important for the champion to have the support from the owner or the principal because they need to have, for instance, for them starting well they need to have some, the champion needs some time to deliver the activities and the prepare the information [required for payment for delivering SW] that they are going to submit" [SW2.99_Research Assistant]

"I think it's important that the owner or the principal gives them the time to do their activities and also to have the support to attend some training"[SW2.104_Research Assistant]

The role of other members of the team other than the principle, particularly the practice manager could influence the implementation of SW.

"I think for other practices where the manager maybe wasn't as interested in in health promotion as I am, I think some of the things did go by the wayside" [SW3_Practice Manager]

"You've got to really want to do it and make a difference in that way it's different. I suppose prevention as well. Yeah, you know it's different to treatment at you. You're taking a different approach I think." [SW3- Lead for Maternity, Children and Young People within Public Health Hull City Council]

"What else is around it as well. So, we've got a really good overall health advisor group in Hull. I've got really good support from PHP through [PHP 1] and [PHP 2] and she's brilliant in it. You know, supporting the referral pathways and things like that, so I think if you've got things like that already in place, it helps because you can come together, and you know and help practices I

suppose".[SW3.304__ Lead for Maternity, Children and Young People within Public Health Hull City Council]

6.3.2 Clinical Leadership

The potential of 'clinical leadership' has been the subject of a substantive amount of interest in the NHS and the research literature (NHS Leadership Model, 2014). In dentistry, a number of clinically led programmes have been evaluated, which appear to support its importance (Moore *et al*., 2015; Brocklehurst *et al*., 2013). In IPP, the programme leaders were respected members of their local dental community, who all had experience of practice ownership.

IPT5-IF clinicians are empowered to take on leadership roles THEN they can play a more significant role in how programmes like SW are developed and delivered

The majority of the participants interviewed all agreed on the importance of having a clinical leader responsible for the development and delivery of the programme.

> *"where it really worked in Starting Well and IPP and flexible commissioning, there was established clinical leadership" [SW1.LDN Chair]*

> *"the support from the local authorities to give their importance of their preventive programme in their locality and also having the support of the LDN chair is also" [SW2.129_Research Assistant]*

> *"if a practice prevention champion who is floundering a bit, not too sure what to do, not getting much of a steer from the boss. We've got some money coming in, we can have some meetings, sure, have the meetings, having real difficulty getting traction. I mean, there's the whole thing about leadership and achieving change in practice as well." [SW1.246_Senior Lecturer in Dental Public Health*]

“you just need a champion in the practice. That's gonna drive it forward” [SW3.552_Practice Manager]

IPT6-IF a programme like SW is developed in partnership with key stakeholders THEN SW will be better designed and shaped for use in the NHS practice

SW was developed by NHSE and COHIPB I as a response to a Ministerial commitment to improve the oral health of children. However, it relied on collaboration with BDA, LDN and LDCs for successful implementation. As a result, implementation relied on a clinical leader that has clinical knowledge, and with the energy and the drive the programme forward.

“ you’ve then got someone with clinical knowledge who can go between practices and sort of try and drive things along. It doesn’t have to be…it probably shouldn’t be a consultant”….[SW1.349_Senior Lecturer in Dental Public Health]

“a kind of clinical leader with NHSE&I to then go…to lead the practices, to help and support them to direct them, I think that’s probably what’s needed with this kind of programme”….[SW1.361_Senior Lecturer in Dental Public Health]

“getting the stakeholders to work together, I think it’s really hard to deliver this programme in the current system arrangements that we’ve got, because PHE consultants in public health, that workforce has been absolutely chopped back”….[SW1.373_Senior Lecturer in Dental Public Health]

The personality of those leading the implementation appeared to be a facilitating factor.

“I think there’s something about individuals, and I think there’s something about the…not all LDN chairs would say their job is the

same. I think it's about how the system around them facilitates that"…[SW1.436_ Senior Lecturer in Dental Public Health]

"All leaders have to be led, they have to be empowered, they have to be told they can do this. I mean, you've got weird people like [LDN Chair] who just don't care, and who'll go out and say, this is what needs doing, and just go out and prod the system to kind of create that space for themselves"…[SW1.441_ Senior Lecturer in Dental Public Health]

It was highlighted that the multi-agency focus of SW meant that the leader faced a number of challenges to influence and implement SW.

"you're not employed by the NHS, so you're, kind of, trying to influence agendas, and that works in some places and not in others, very much about personalities. You've got local authorities who may or may not want to play ball, you know, everyone's distracted"… [SW1.378_Senior Lecturer in Dental Public Health]

However, the multi-agency involvement created a relationship and awareness of Primary Dental Care with other Health Care Agencies.

…. Starting Well weirdly started that integration of oral health into local authority…local authority commissioning. I mean, I've got great relationships now with people like [Director of Public Health] et cetera, et cetera, because we've…Starting Well devised that, but I think that's a huge success, actually…[SW1.409_LDN Chair]

PT7-IF clinicians adopt leadership roles: THEN they can become empowered to shape change to improve local oral health through SW

This was not seen to be the general situation in SW programme

"it really hasn't happened. I mean, the number of times I've spoken to the local authorities, okay, so when do you see NHSE&I, it's like, they

never come, they don't even come to the health and wellbeing board" [SW1.395_Senior Lecturer in Dental Public Health]

However, empowerment was seen to be an important factor and that empowerment was a greater influence to allow for clinical leadership to develop.

"All leaders have to be led, they have to be empowered, they have to be told they can do this. I mean, you've got weird people like [LDN Chair] who just don't care, and who'll go out and say, this is what needs doing, and just go out and prod the system to kind of create that space for themselves" [SW1.442__Senior Lecturer in Dental

"I think there's something about individuals, and I think there's something about the…not all LDN chairs would say their job is the same" [SW1.347__Senior Lecturer in Dental Public Health]

PT7-IF clinicians adopt leadership roles: THEN they can facilitate the implementation of SW amongst their peers (peer-to-peer influence)

This was not seen generally as the case for SW

"it just hasn't worked like that in many areas, I think there's something about…I think it requires people who'd got the time and the energy to…you open doors, you go round and see people, you develop relationships. And also, you're doing something like Starting Well on the back of an already mature system then, and mature relationships, people who are already primed to talk to each other"[SW1.415_Senior Lecturer in Dental Public Health]

"You've got to really want to do it and make a difference in that way it's different. Where can I suppose prevention as well? Yeah, you know it's different to treatment at you. You're taking a different

approach I think" .[SW3.298_ Lead for Maternity, Children and Young People within Public Health Hull City Council]

"academic knowledge, but there's also have they practical skills and the practical experience. But I think if somebody feels comfortable in a particular area, they're more likely to be successful because they'll believe in themselves and they'll be leaving the program and that obviously lends itself to the success of any particular programme" [SW3.380_Practice Manger]

"you know you need multi-level leadership, don't you? You know right from where [Lead for Maternity, Children and Young People within Public Health Hull City Council] sits, you know, commissioning, my position,, this position, the DCP champions themselves. So everyone here had to have that level of leadership and buy in" SW3.1849_LDN Chair]

6.3.3 Financial Incentives

As highlighted in Chapter One, financial incentives in NHS dentistry play a significant part in influencing the level of clinical activity and the culture within the practice (Goodwin *et al.,* 2018; Tickle *et al*., 2011).

IPT8-IF NHS practices are provided with financial incentives (or reduction in activity targets): THEN they are more likely to adopt and engage with SW

This PT was wholly agreed by all those participants interviewed.

"of course it doesn't have to be new money, it could be existing money, but used in a different way, so we just ask you for change delivery within existing"[SW1.496_Senior Lecturer in Dental Public Health]

"I think they have complemented each other to be honest because I think Starting Well offered incentives in starting programmes, whereas

IPP offered actual, the delivery of prevention and it financed that, the actually delivering it, so I think they complemented it well, each other well. And I think IPP kind of started some of the Starting Well programmes app because practitioners that had delivered IPP had a lot of the things in place ready for Starting Well" [SW2.2666_LDN Chair]

"And the other point about it is that [in IPP] all the monies in the interaction, interfaces with patients, yes, all the money is there. And with Starting Well, if you think about it, all the money is with the team, there's nothing in Starting Well that facilitates the actual interaction with the patient. It's quite possible to use all the money from Starting Well to hold meetings, to educate me and my team, to have a champion, yes, but there is nothing in there if you like that actually incentivises the interaction with the patient" [SW2.281_LDN Chair]

"the NHS works, it encourages clinicians to do as little as they possibly need to do to get paid. What they feel is a realistic amount for the work that they've done. And for them to go over and above…there needs to be some remuneration either for the clinician themselves individually if they're going to take a lead, or perhaps at the practice" [SW3.491_Practice Manger]

THEN they are more likely to change working practices to facilitate the implement SW

Again, the importance of providing incentives that all members of the dental team could draw on was critical, given the reliance of the SW programme on DCP support.

Renumeration was consider key,

“be very clear what you want to be achieved, enable people to do it financially, and give them support to do that” [SW1.500_Senior Lecturer in Dental Public Health]

“there has to be some sort of remuneration to encourage them to. To take that, you know, don't get me wrong, there are some clinicians and some practices that are not like that, but the vast majority of them are, and they've got a business to run” [SW3.1070_Practice Manager]

“Teach the staff to deliver the oral health messages so you like train the trainer, so to speak, up DDA. Emphasis that you would have had maybe going into the community and actually talking to each of those parents or whatever. It's going to have much more of an impact on, you know a group setting. Train them how to brush their teeth, and I know there are some people that think that applying fluoride in schools is a good idea, but realistically” [SW3.870_Practice Manager]

IPT9-IF NHS practices are offered a reduction in their Annual Contract Value or activity targets THEN it can release sufficient resources to deliver SW

As SW monies were for the administration of the intervention rather than delivery of prevention, there was concern that the prevention could not be measured, which raised concerns that commissioners would not be able to measure delivery.

“If you moved away from counting the number of fillings people are doing, you’re suddenly into a problem of, as a hard-nosed commissioner, are they actually doing what I’ve asked them to do in return for the money” [SW1.506_Senior Lecturer in Dental Public Health]

“commissioners start to lose all sense of what the dentists are doing in return for the money, and PCR’s completely dry, patient charge revenues dried up, and that makes us suspect that the dentists are

not doing anything in return for the cash" [SW1.520_Senior Lecturer in Dental Public Health]

In contrast IPP measured the number of interventions

"with obviously the IPP in the Starting Well that works so well because you had unallocated UDA's and you've got a certain amount of money for each appointment that that you delivered, and so that was that was good. But none of that really went to the clinicians and you know went to the practice pot if you like" [SW3.1075_Practice Manager]

6.3.4 Behaviour change

Behaviour change on a micro level was not evaluated by the SW research team and therefore and it was therefore not possible for the SW Stakeholders to comment on behaviour change on the participants of the SW programme.

Behaviour change on a macro or practice level, is evaluated within the clinical leadership, financial incentives and skill mix are promotors of behaviour change on a macro level

6.3.5 'Skill-mix'

There was one main IPT in this area, although multiple outcomes had again been identified by the realist synthesis.

IPT11-IF NHS practices adopt greater levels of 'skill-mix': THEN the practice is more likely to promote SW.

There was positive reinforcement for this theory, which also tied in with practice culture as discussed earlier in this Chapter

“practices had prevention champions, they had people in post who were already kind of primed to do this, I think, had some inherent skill sets and just grabbed this and ran with it, to the point they were actually helping out other practices” [SW1.233_Senior Lecturer in Dental Public Health]

“in some practices that are running the programs they were having to start to think about rewarding the DCP champions because they suddenly became quite valuable” [SW3.1118_LDN Chair]

The DCPs that were involved in the intervention were valued by the practice and value in the DCP delivered sessions were seen as valuable by the practices

“certainly within the [Practice] practices that I was involved with and you know it. It was like protected time. So previously whenever we'd had any oral health sessions with children before, in the starting, well, you know we had a nurse that had those qualifications and they had a clinic, which wasn't very often. And if anybody called in sick, then that clinic would be cancelled whereas within… and they weren't pulled off to cover staff shortages. I think that's the difference, and I think there's practice is actually valued it. So they were less likely to cancel their sessions.” [SW3.1123_Practice Manager]

There was also renumeration and career progression involved for the DCPs

“[Practice] they have like a gradient system for their nurses, and if they do extra duties and they get so many points, we want to get somebody points, then you go up at a pay scale and we've now got some practices where there was maybe only one DCP in that practice that was delivering IPP or Starting Well. And now there are more nurses coming forward. Who want to do it. Uh, and I think part of it is because they've seen how enjoyable it is, but also that it does increase their pay packet at the end of the month”

"peer to peer support, you know, there was just like, that's interesting, never seen that before, who'd have thought it" [SW1.242_ Senior Lecturer in Dental Public Health]

There was also a benefit for the practice in terms of staff development and retention.

"the benefits of that, obviously from a practice point of view is staff, retention and empowering the staff making them feel valued. A lot of nurses don't just want to be a dental nurse, but the rest of their lives. They'd like to do something you know a bit more rewarding, shall we say. Although dental nurse who can be rewarding. It's not for everybody." [SW3.1462_Practice Manger]

THEN they are more likely to meet future population need (oral health) via programmes like IPP

THEN it can free dentists to undertake more complex cases (pursuant to their training)

6.4. Summary

Due to the nature of the SW programme and its subsequent evaluation, I was unable to test the 'behaviour change' programme theory and only partially test the 'skill-mix' theory. However all the theory areas appear to exist with some level of interdependence, reflecting what happens when a complex intervention is introduced into a complex health system.

For SW, clinical leadership was seen as significant, reference was made to the clinical leadership that was present in IPP which followed into SW. Important mechanisms that were seen in IPP which were duplicated to some extent were: a) understanding local practitioners' needs; b) empowerment and trust; c) top-level 'buy-in'; d) 'peer-to-peer' influence; e) respect; and f) the democratic nature of the leadership style. This produced the following

outcomes: a) a programme that was grounded in 'GDP' voice and public health principles; b) 'peer-to-peer' adoption.

The utilisation of ‘skill-mix’ within the programme was facilitated by the following mechanisms: a) a change to financial incentives and 'internal markets' within the practice; b) empowerment of DCPs to drive and deliver SW; c) releasing latent potential to promote prevention and a preventive culture;. These mechanisms led to the following outcomes: a) a culture change in the practice which favoured prevention; b) greater adoption of the SW programme; c) previously under-used staff becoming valued and champions of SW; d) 'peer-to-peer' influence across professional boundaries; and e) improved recruitment and retention of DCPs.

Financial incentives were also seen as critical and were operationalised through the following mechanisms: a) monies available for the champions to set time aside for practice meetings and audit ; b) the setting of targets based on public health priorities; c) aligning financial incentives with public health priorities; d) ensuring no financial loss; e) the potential of other dental team members to attract revenue. This produced the following: a) adoption of SW; b) freeing of resource within the practice to deliver prevention; c) changes to working practices and internal payment structures to facilitate the programme; and d) preventive activities able to generate practice income

It was interesting that with these theory areas in place, it appeared to promote an institutional logic that encouraged the use of ‘human intermediaries’ to promote behaviour change, both within the practice and within the target population of the SW programme. This in turn enabled Dental Nurses to take a lead role in the delivery of the intervention and were seen to be very capable.

In this Chapter the explanatory power of programme theories from Chapter Five are tested on a further preventive programme for young children in the Yorkshire and Hull area, Starting Well Thirteen have been explored.

In Chapter Seven , the results of the thesis, strengths and weaknesses and implications for future research will be discussed. The results of the realist evaluation of the In-Practice Prevention (IPP) programme will be first explored, before summarising how explanatory these programme theories were for the Starting Well Thirteen (SW) programme. The strengths and weaknesses of undertaking a realist evaluation will then be considered, before describing potential avenues for future research.

CHAPTER SEVEN:

DISCUSSION AND RECOMMENDATIONS

7.1. Introduction

The aim of this study was to evaluate a preventive programme undertaken within NHS dental practices in Yorkshire and the Humber, an area with high levels of dental caries and significant health inequalities and to test the programme theories with another prevention programme Starting Well Thirteen (SW)

In this Chapter, the results of the thesis, strengths and weaknesses and implications for future research will be discussed. The results of the realist evaluation of the In-Practice Prevention (IPP) programme will be first explored, before summarising how explanatory these programme theories were for the Starting Well Thirteen (SW) programme. The strengths and weaknesses of undertaking a realist evaluation will then be considered, before describing potential avenues for future research.

The research questions outlined in Chapter One were:

- What works in which circumstances and for whom in the IPP programme?
- Do incentives in the GDS promote preventive orientated NHS practices?
- Does IPP better utilise role-substitutive models in general dental practice. And if so, how.
- Is IPP influenced by the institutional logics in NHS dental practices.
- Are there any substantive barriers and enablers to IPP?

- Are there any unintended consequences for participating NHS practices?
- Does the IPP programme offer an attractive and effective strategy for NHS policymakers that could be rolled out beyond Hull & The Humber

7.2. Novel contribution

The use of flexible commissioning to deliver a preventive programme using skill mix was an unusual model and its evaluation has unpicked the underlying context and mechanisms to understand the importance of the Final Programme Theories and how the five theory areas interact with one another.

By uncovering/ unearthing and presenting the underlying programme theory areas and CMOs, we are able to explain how a complex intervention within a complex health system, and the very human elements within it, actually make the programme work.

7.3. Realist evaluation of the In-Practice Prevention programme

The main aim of the research was to evaluate the impact of the In Practice Prevention programme (IPP). The aim of this study was to undertake a realist evaluation to evaluate the IPP programme in order to understand "what works, for whom and under what circumstances Pawson (2006). It sought to identify potentially causal and contingent explanations and underlying attributes that underpin what works (i. e. the successful implementation of the IPP) in the form of CMO configurations (CMOCs). The emergent programme theory from the IPP programme was then applied to the SW programme to identify key similarities and differences and determine how explanatory the IPP programme theory was for SW, another key preventive programme undertaken in the North-East of England.

The IPP programme was developed by the Local Dental Network in Yorkshire and Hull in response to an Oral Health Needs Assessment, which was published in 2015. The underpinning logic model was that providing General Dental Practitioners (GDPs) with incentives could promote the delivery of prevention, using care-pathways that utilised the whole dental team. The IPP programme was underpinned by financial incentives, which reduced the participating GDPs' Annual Contract Value (ACV). The IPP programme is important given its potential to contribute to an understanding of how the principles of flexible commissioning could be implemented. This study provides useful and current information on the GDPs response to change in renumeration and the use of DCPs to deliver preventive interventions via flexible commissioning to deliver evidenced based prevention to children in areas of high dental needs and social deprivation. The results are timely given that NHS England and Welsh Government are currently undergoing "system reform" looking at how DCPs are able to contribute to NHS dentistry, with the current regulations and restrictions on the ability of DCPs to deliver NHS dental care and to provide a financially viable contract to incentivise GDPs to use this model.

There are advantages and disadvantages with any methodology. The main advantage with using a realist approach to an evaluation is that it addresses the layers of complexity that is found in interventions like IPP and SW and seeks to identify 'what works and for whom and what contexts' (Pawson & Tilley 2001). By recognising all the components of what makes an intervention successful, the methodology forces the unpacking and analysis of the programme to focus on the context and mechanisms, which provided a useful insight into what are potential barriers to the successful implementation to a preventive dental programme.

The study developed and tested the theory areas, and they are detailed below to explain their impact within IPP and how testing against SW which is a similar preventive intervention verifies the validity of theory areas that this evaluation has established.

7.3.1 Clinical Leadership

Clinical leadership was viewed as being the lead to the development and implementation of IPP in the area. The leader the LDN Chair was also involved in the development of IPP in conjunction with Public Health England (PHE) and NHS England (NHSE) commissioners in the region. The character of the LDN Chair was mentioned during stakeholder engagement of *“who's a can-do person”* [3.212_Consultant in Dental Public Health].

The passion and drive for prevention in the clinical lead should not be underestimated and the importance of empowerment should not be dismissed

The leadership from a well-respected and so called ‘wet-fingered’ dentist and the democratic leadership style promoted a more positive relationship and moved away from the micro-management commissioning style.

The support during the implementation of IPP in the early stages was seen as vital to ensure that issues are addressed by peer leadership and implementation

The implementation of IPP included training events arranged and delivered by the clinical lead for IPP and this promoted peer support between the DCPs implementing and delivering IPP in practice. This peer support was not within the practice setting, but also extended to DCPs in other practices involved in IPP.

Peer recommendation resulted in GDPs in the area contacting PHE and NHSE Commissioners to join in IPP.

In SW the sentiment regarding the clinical lead in the region was echoed and the importance was highlighted by the lack of leadership in other areas.

Changes facilitated or driven by clinical leaders, people, being innovative that leads to improvements in quality, care and services is considered valuable

and essential. In both IPP and SW, the LDN Chair for North Yorkshire & Humber played a significant role providing clinical leadership and is credited for the successful multi agency development of IPP, ensuring that training and education for the IPP nurses, implementation meetings, and peer to peer sessions to facilitate the implementation of IPP. The attributes of clinical leaders appeared to be clinical competence, clinical knowledge, approachability, motivation, empowerment, decision-making, effective communication, being a role model, and visibility (Stanley 2006).

Stanley (2011) proposed that effective clinical leadership leads to innovation and innovation leads to change, and that change leads to improvements in care, service, quality, and professionalism and that “Real improvements in quality, care and services come from effective, insightful change and positive innovation that is derived from people who are prepared to take the lead and act on their ideas.” It can be argued that that the LDN Chair was this type of leader and Cook (2001), considers these types of clinical leaders are ones that employ a Congruent, approach to leadership (a Congruent leader is someone who is followed because their values and beliefs are matched by their actions).

7.3.2 Skill Mix

The use of skill mix in NHS dentistry has been advocated for sometime but, as mentioned in Chapter Five, implementation has lacked in its adoption unlike medical specialities. There are barriers to use of skill mix in NHS dentistry.

Dental Care Professional DCPs are highly trained in prevention and as highlighted in the Steel Report (Steel 2009) prevention in, and the use of DCPs are an important step in addressing the current and future population oral health needs. It has however been highlighted that there are multiple barriers to the greater use of DCPs in NHS dentistry. Dispite the General Dental Council (GDC) allowing “direct access”, the NHS Rules and Regulations, and in particular the Performers List Regulations, require a

Dentist with a Performer Number to open a NHS course of treatment, however there are no such restrictions on DCPs in the “Private” sector of dentistry. In addition to these contractual barriers, there is also the use of Prescription Only Medicines (POMS) which require a Patient Specific Direction (PSD) or a Patient Group Direction (PGD). Currently these mechanisms are available for Dental Hygienists and Dental Therapists, however Dental Nurses can only administer a POM via a PSD. This requires an appropriate referal systems to ensure that utilization of the DCP workforce to be able to deliver the prevention. The need for a robust referal sytem to ensure that appointment time is not wasted is essential and that a patient is not turned away, or that clinicans are not disturbed during clinical procedures, as it has been shown the risk of adverse events are higher when a clinician is disturbed during a procedure (Pemberton 2014).

The workplace culture and values are hand in hand with ensuring that there are appropriate referal pathways for patients to access care and prevention from DCPs. The insight of the value of the care delivered by the DCP facilitates the dentists’ ability to ensuring that the correct referal is made, which in turn allows the DCP to deliver the care requested and avoids a wasted appointment and the need to reappoiont. Good communication within the practice is also necessary. This can be facilitated by the DCP ensuring that these measures are in place and this can result in dental practices within IPP, witness the DCPs becoming empowered and taking lead roles within IPP. In addition, a number of the IPP dental nurses offered peer support to other dental nurses in the nearby dental practices in implementing IPP, this helped build the confidence of the dental nurses. Access to training and refreshing of knowledge were also seen as mechanisms to improve the confidence of the dental nurses to deliver IPP and act as a reassurance to the dentist that refered children on the IPP that the dental nurses were confident and competent to carry out the intervention

Practices reported that, where they had been able to implement IPP and the greater use of skill mix, there was greater use of under utilised staff members that already had the skills to be able to deliver prevention, but until IPP had

not been able use their new prevention knowledge in their roles in the practices. IPP faciltated the use of greater skill mix by providing a framework of identifying appropriate patients, and evidenced based preventive advice but, importantly, a funding mechanism to allow practices to deliver prevention. As a result, the dental nurses felt valued and empowered as they were able to contribute to the delivery of care and NHS Contract value. Practices reported that staff recruitment and retention improved, and encouraged applications from dental nurses with prevention qualifications to apply when they were made aware that the practice was involved with IPP.

The implementation of skill mix is however limited to the size of the practice and, in particular, the availbility of surgery space, which indicated that dental practices with multiple surgeries are needed to be able to use skill mix effectively. Some practices managed alternative ways of securing space to deliver IPP by using a dedicated room, which was equipped with everything that was required to deliver IPP without dental equipment and dental chair, others used surgery downtime to deliver IPP. This willlingness to adapt and develop ways to implement the intervention should also be attributed to the institutional logic and culture within the practice to drive the implementation and deliver prevention to children with high levels of dental disease. The clinical leadership from the practice principle to make those changes should also not be overlooked, as should the DCPs who developed processes to ensure that IPP was delivered appropriately and the empowerment of the DCPs and subsequent leadership of IPP.

7.3.3 Financial Incentives

As mentioned in Chapter One, NHS dental practices are run as small businesses that seek to maximise profit through clinical activity, whilst discharging their professional responsibility. NHS dental practices and their owners are sensitive to incentives in their renumeration and can influence behaviours within a practice, in particular the institutional logics and the utilisation of skill mix, Chapter One discussed how different payment systems can lead to the change in dental care treatment in order to maximise profit

and these may not promote the prevention or the greater use of skill mix, and that per capita renumeration systems may produce a greater importance of prevention and skill mix.

The use of flexible commissioning for the delivery of IPP allowed the provision of prevention to contribute to the Annual Contract Value (ACV) of the practice. The use of flexible commissioning allows for local commissioners to set targets to dental practices based on public health priorities in the area. IPP was highlighted as an area of high child dental caries and as such IPP provided a financial incentive aligned with the public health needs of the area and the dental practices' contractual targets. This enables practices with the institutional logic and the available skill mix in the practice to deliver targeted prevention.

Dental practices were then able to deliver evidenced based, targeted prevention in areas of high need, without financial loss and, as previously mentioned, empowered DCPs but also made them feel valued members of the dental team as they were now considered to be generating revenue and contributing to delivering to the ACV. This seemed important to the dental nurses as previously they sensed that they were considered a cost to the delivery of dental care and ACV.

As mentioned in Chapter Six, IPT9 can be expressed as a mid-range theory as it suggests that if NHS practices are offered financial incentives that are sufficient to release enough resource then practices are able to deliver dental prevention programmes.

Highlighted in the testing phase of the realist evaluation, dental practice owners felt that flexible commissioning was key to the uptake of IPP as it allowed practices to free up latent resources in the practice, namely the prevention qualified dental nurses, that had previously been bound to aid delivering clinical activity. In addition, dentists that felt obliged to deliver prevention, were now able to delegate this important area to more suitably qualified dental team members, which in return enabled the dentists to

change their working practice, in line with the principles of Prudent Health Care of the Bevan Commission.

The Bevan Commission is Wales's health and care think tank and Prudent Health Care and their mission is the challenge thinking in practice in health and care and are committed to ensuring NHS in Wales to achieve its ambition of building sustainable, integrated health and care services that meet the needs of the people. The four principles of Prudent Health Care are:

1. Achieve health and wellbeing with the public, patients and professionals as equal partners through co-production.
2. Care for those with the greatest health need first, making most effective use of skills and resources.
3. Do only what is needed – no more, no less – and do no harm.
4. Reduce inappropriate variation using evidenced-based practices consistently and transparently.

Flexible commissioning facilitated practice income generation through preventive activities, this links back to the multi-agency approach in the development of IPP, which involved the Local Dental Network, dental commissioners and Dental Public Health input to align with local public health need and population health objectives.

7.3.4 Institutional Logic

As discussed in Chapter Five institutional logics at any given NHS dental practice not only includes dentistry as a business, but also professional ethics and other contextual factors and that the drive to maintain and maximise the viability of an NHS dental practice appears to be moderated by the practice owners' sense of duty of care to their patients and their ideas of how to best deliver dental care to their patients and their community. (Brocklehurst 2021). This directly links to financial incentives, but also

includes the practice owners' views on the importance of prevention and the use of skill mix to deliver prevention.

If the institutional logic within the practice aligned with the objectives and values of IPP, there was seen to be an increased buy-in and ownership of the programme, which in turn led to an improved level of buy-in and a more consistent approach to IPP delivery and the consistency of the preventative messages across the whole practice. In addition, the infrastructure of the practice was seen to be prepared for the delivery of prevention in terms of capacity to deliver and space available to deliver the preventive intervention.

Consequently, Starting Well Thirteen (SW) practices that had been involved in IPP were able to deliver the programme "*And also, you're doing something like Starting Well on the back of an already mature system then, and mature relationships, people who are already primed to talk to each other*"….[SW1.415_Senior Lecturer in Dental Public Health], indicating that the institutional logic was in line with prevention and able to adapt to the preventive programme in a suitable and viable way.

Similar to IPP, the presence of an experienced prevention champion in the practice was an enabler and their presence attributed in part to the institutional logic of the practice, where dental practice principals and owners had set the culture within their teams and already had a buy in for prevention

7.3.5 Behaviour Change

For the successful implementation and delivery of a preventive programme it is fundamental that there is behaviour change within the dental team. As previously mentioned, financial incentives, institutional logic and skill mix are essential elements for the implementation of a preventive programme, it is those elements that facilitate the behaviour change; however behaviour change is difficult, especially in a busy target driven NHS dental practice. For both IPP and SW the change was driven by the DCPs within the practice who delivered the intervention. Empowerment of the DCPs came from the

IPP training and reinforcing of the prevention activities delivered within the practice, but also DCPs from other dental practices became “Champions” and facilitated implementation in other dental practices in the area. Providing “a real” understanding and problem-solving solutions aided the behaviour change. This change in behaviour required active engagement with all members of the dental team, from the principle to the associate dentists and reception staff, to ensure consistent referral to IPP children at risk of dental caries.

In many cases the DCPs used novel ways to remind the dentists to refer to IPP and shared their processes with each other at regular IPP meetings that were facilitated by the “Champions” and the LDC Lead. These meetings were part of the education and training that the Dental nurses received from Health Education England which evolved in to regular IPP meetings This peer support is embedded in both SW and IPP where implementation was successful, although it does appear to be an unintended consequence resulting from fluoride varnish and oral health education training that was given for IPP.

7.4. Exploring the explanatory power of programme theory

The realist approach is a form of theory-driven evaluation developed to strengthen the explanatory power of evaluation studies and contribute to evidence-based policy and practice. It is a generic approach that can be applied to many fields of research, including health and social care social interventions.

Evaluations of programmes tend to look at an intervention and measure “did this work?” The realist approach allows the unpacking of the intervention and picks out what it is in this instance that works in this situation and discusses what the particular context and mechanism are that make the intervention work. For the evaluation of IPP, it was particularly relevant to find those contexts and mechanisms that delivered a favourable outcome to the intervention locally developed with dentists, the LDN, PHE and NHS E

Commissioners and implemented in dental practices in the area. The practices varied in size, location and culture and the study was able to unpick and explore the underlying causes which facilitated or hindered the implementation of IPP.

Ultimately the use of realist methodology allowed the study to pick apart the programme and produced, an explanation of the locally developed programme, developed in partnership with dentists in the area, and PHE and NHS E commissioners that had the insight and drive to deliver prevention and make a change to the oral health of children in this socially deprived area. It explored the impact of involvement of the local teams in its development. An evaluation without the realist lens would not have unpicked these underlying causative factors.

The further testing of the Final Programme Theories (FPTs) was carried out in SW, which was, providing a reassurance that the FPTs were valid. As a result, a set of programme theories through an iterative and inductive approach were developed and tested with the stakeholders in IPP.

7.5. Strengths and weaknesses of the research

This was a study providing current evidence on how the development and implementation of a child dental caries prevention programme that was developed with a multi-agency involvement involving the use of skill mix and flexible commissioning can enable GDPs' working in the NHS to deliver prevention in areas of social deprivation and high dental needs. The study was practical in that a preventive programme was provided to patients as the evaluation progressed, so the outcomes observed could be expected to be seen if the intervention was rolled out across the NHS. There were no restrictions placed on reporting the findings of the study.

The design of the programme, the use of a realist lens and the final testing of the programme theories to a similar prevention programme was a strength. The use of the realist lens provided an opportunity to evaluate a complex

intervention and provided an understanding of why the intervention worked, in what circumstances, and by whom. Comparisons were then made between the IPP intervention practices and testing the final programme theories.

7.6. Recommendations

7.6.1 Policy

England is a large and diverse country, and the developments of national prevention interventions should be developed in partnership with key stakeholders and offered with local adaptation in order to be implemented in a way that is appropriate for the area, the population, and the dental team. Policy should set a broad framework and require local adaptation and local involvement in shaping unique local area responses.

Dentistry is a business with professional obligations, the implementation of preventive programmes delivered via skill mix must have a measurable financial outcome in order to facilitate the behaviour change within NHS dental practices

7.6.2 Research

Throughout this study the LDN Chair has played an integral part in the development, refinement, training and implementation and evaluation of IPP and the implementation of SW in the area. From their involvement I am intrigued and would like to ask the question “What are the driving forces behind clinical leadership, the intrinsic motivation that is required to drive programmes for better health forward, is it leadership training, empowerment, or passion?”

Another area of research could be “How do you create or replicate a leadership role in other areas to get the same or similar size results?”

Or, “What happens if you have an absence of this leadership? Can different mechanisms be fired or alternative contexts created to fire the same responses without that leadership element?”

Further research relating to the barriers of using role substitution within the NHS so that DCPs are able to contribute to the prevention and treatment of dental disease in the UK is required.

7.6.3 Practice

Behaviour change is difficult in any situation and NHS dental practices are busy working environments, therefore change needs clear clinical leadership and a practice culture that supports the intervention is necessary

The size and infrastructure of a dental practice needs to be contemplated when considering the use of skill mix.

Empowering DCPs to contribute to achieving contract values results in greater satisfaction in the workplace as well as improved staff retention and should be considered.

The financial model on offer should be in line with the business model of the practice.

7.7. Personal reflection

By undertaking this research I have moved from a basic understanding of research and the role of skill mix in dentistry to understanding the complex nature of dental service NHS contracts, service commissioning, implementation, and delivery.

I have developed and have through knowledge and understanding of my own and related subject areas, as well as an understanding of strategic direction and the ability to consider multiple perspectives within dentistry.

This knowledge and understanding will undoubted have helped me in my current professional role.

I have developed an understanding of research methodologies and techniques and recognise the value of alternative research paradigms. Through this project I have managed documents that recorded my activity in this project including designing systems for data collection and to acquire and collate information.

I have also learned a great deal about ways of disseminating the results of my research, in not only the tradition method of being published in a peer reviewed journal (Appendix 9) but also in the creation of an animation to disseminate the findings in a visual and digital way (Appendix 10)

I have become aware of some of my personal abilities; however I realise that there are still boundaries to my knowledge, skills and expertise and I hope to develop these further.

7.8. Concluding remarks

Given the findings of the realist evaluation, clinical leadership, 'skill mix' and financial incentives were seen as the most important elements of the IPP programme this was also reinforced in the testing of the FPTs with SW. Aligning public health priorities with potential financial incentives within the existing NHS contract was key. Equally, the utilisation of the whole of the dental team was critical for the success of the IPP programme and created local champions that drove the institutional logic within the practice and behaviour change.

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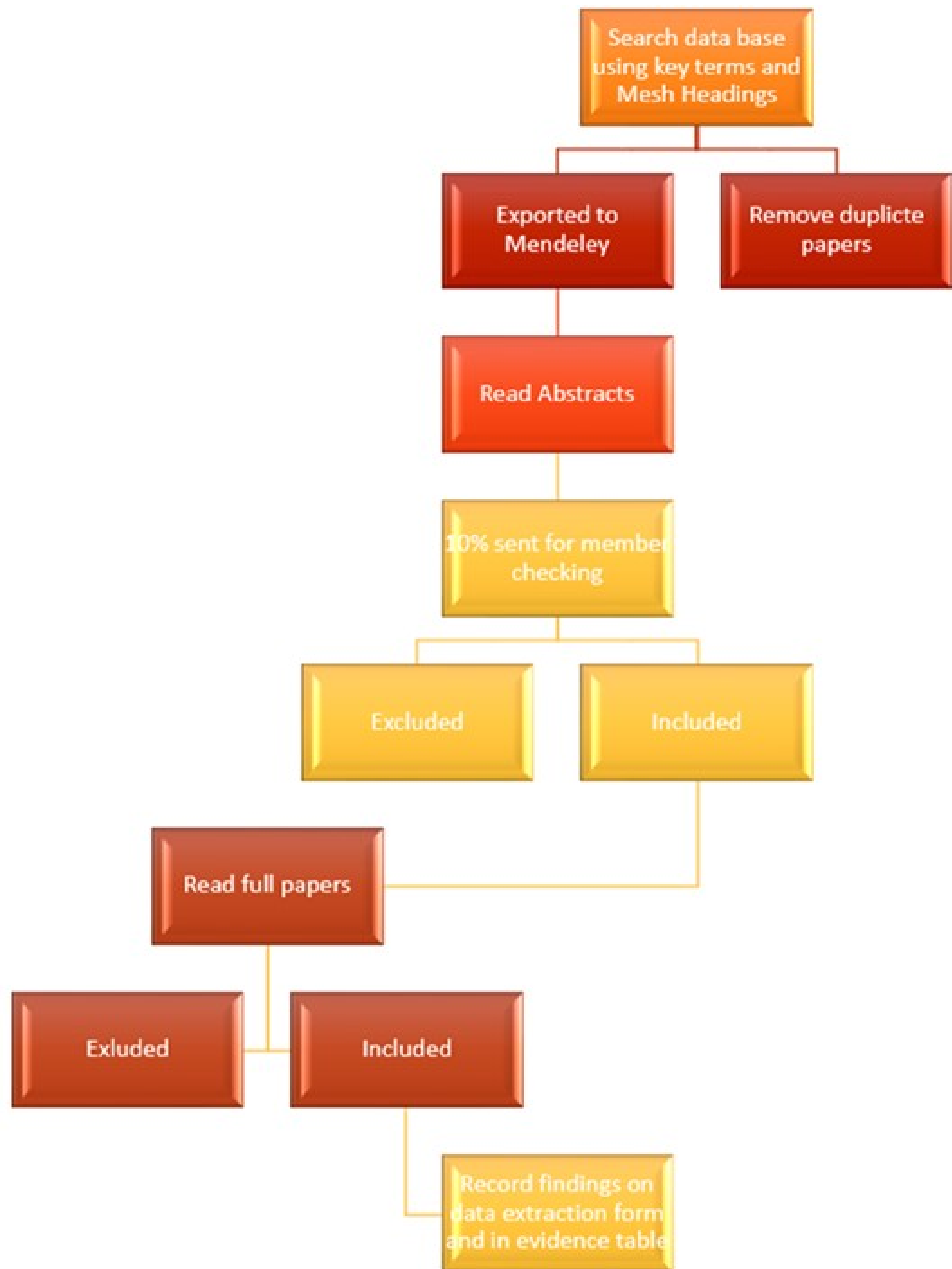
APPENDICES

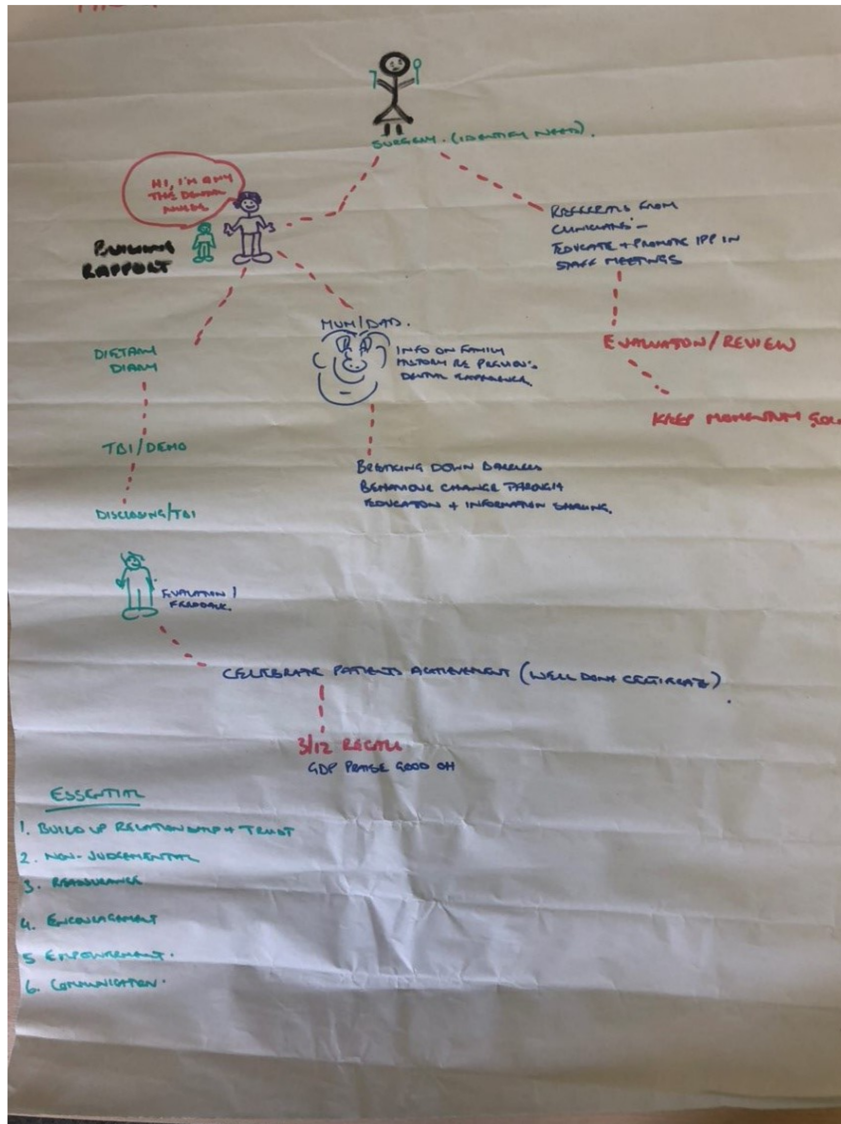
Appendix 1: Stakeholder Engagement Information

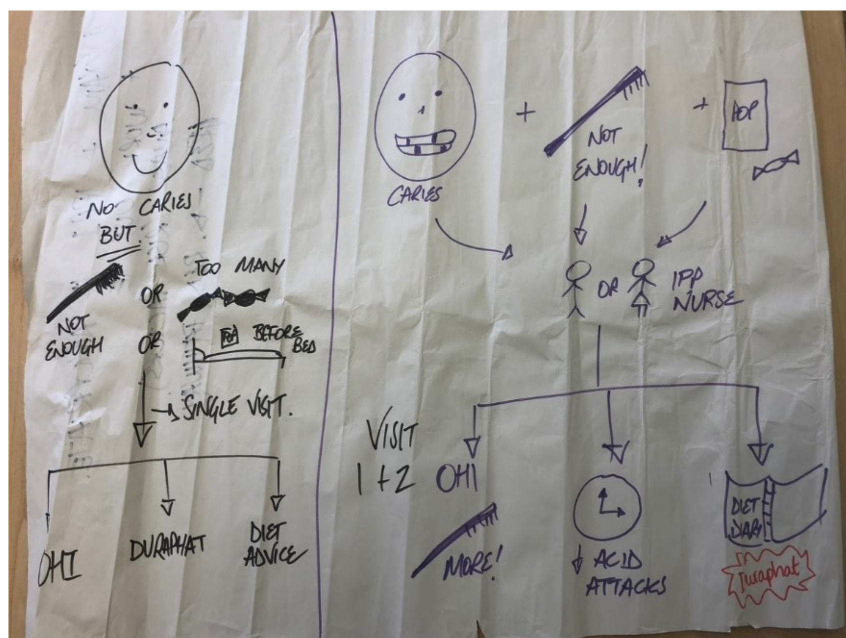
	Commissioners	Practice	Staff	System	Public
Commissioners		Practices with an eye on the future. Resulted in early and late adopters. Leadership, motivation from "movers and shakers" financial, capacity of the practice and the culture of the practice Top slicing process = target problem areas = reducing delivery pressures	Quality Assurance of what is being delivered Peer review Quality Assurance DCP's Share best practice (e.g. scripts) Run audits Programme snowballing from one practice to another	Cross boundaries commissioning PHE and NHSE Driven by LDN and LDC	Commissioners worked together with LDN and PHE to develop a business case This led to a new experience ......moving from focusing on "access"...to a clinically led programme, with minimal risk...however there is still concern that access may drop and that the PCR may be reduced
Practice	Seen as something above and beyond what a dentist delivers		Infrastructure in place to be able to increase skill mix Dentists view IPP differently to the dental nurses Implementation of IPP required a change in the practice culture	There was a need for a whole team approach, dentists, receptionists and dental nurses Change the culture and eating habit Value for money Money saved Additional activity Patient Benefit Need to get patient engagement Clinical Belief Care pathway based on evidence developed with the flexibility for local adaptation	IPP has a direct benefit to patients giving preventive information IPP is prescriptive, following a care pathway intervention consistency
Staff		Staff skill mix and training of DCPs to deliver the intervention "Pride" in making it work there is a need for problem solving e.g. reminder systems Motivational for the staff involved and allows for a DCP to deliver care there by evolving in to their role Need to be qualified in FV application		Dental nurses given responsibility, but not all were given the option, seen as "this is what is happening" Improved status in the practice, promoting a culture of development, career pathway. IPP raised confidence levels	Parents are demanding IPP
System	Potential barriers to IPP could come from Dental check by 1 Starting well Complacency	Challenges to implementing IPP come from • Setting up • Capacity (infrastructure) • Audit • Starting well • Submissions • Appropriate appointments	The dental nurses have the time and affordability to deliver IPP, deliver evidence based prevention, they were confident in the delivery. Understanding DBOH and have become the expert Dental nurse also felt that they were more approachable and friendlier than the dentist		Patients and their families would benefit, every member would have access to information and there is a cascading effect on the preventative advice.
Public	Patient and public demand recognised by commissioners. If this works wider outcomes: Community appeal Domiciliary care Young people Care homes Older generation	Identified a need to change the culture of the practice and patients	Parents role, changing habits Patient attendance Communication, Parent's lack of resources for tooth brushes (may be able to be supplied by start well in the future)	Public awareness and knowledge, "what do they know?" What do they want to know?" and "What they need to know"	

Appendix 2: Realist Synthesis Process



Appendix 3: An example of a rich picture from the workshop





Appendix 4: IPP Interviews, working document

IPP_IF_THEN transcripts interviews with coding 20 October 2020.docx

Appendix.5: Abstraction

https://1drv.ms/x/s!Ag-HxUmQhu5wmUdXT1vEwU_Aq4C8?e=wRZWqB

Appendix.6: Theory Areas

https://1drv.ms/w/s!Ag-HxUmQhu5wmUYnVfftDNVC3KeR?e=eyk05i

Appendix7: IPP IF Then Transcripts

IPP_IF_THEN transcripts interviews with coding 20 October 2020

Appendix 8: SW IF THEN Transcripts

IPP_IF-THEN_transcripts Starting Well 1 1

Appendix 9: BDJ Article

https://www.nature.com/articles/s41415-022-4140-y#citeas

Appendix10: IPP Animation

https://viewcreativeltd.egnyte.com/fl/HIizGVuHRo#folder-link/?p=e27d4236-1cb0-4af3-8fcf-bbe425c3b6ee

Appendix11: IPP Presentations

https://1drv.ms/p/s!Ag-HxUmQhu5wmVQXoe6Rc13FGLxV?e=ghwTeC

https://1drv.ms/p/s!Ag-HxUmQhu5wmVNMXO4-x8kq_5ol?e=UV6YC2

Appendix 12: Relevant and Good Enough Flow Chart

Relevant and good enough flow chart.docx

Appendix 13 : Search Terms

Result List _ "clinically led" _ EBSCOhost.pdf

Result List _ "clinically owned" _ EBSCOhost.html

Result List _ "incentive theory of motivation" AND dental _ EBSCOhost.html

Result List _ (skill-mix or skill mix) AND intervention _ EBSCOhost.pdf

Result List _ behaviour change AND implement AND intervention _ EBSCOhost.pdf

Result List _ incentive theory of motivation _ EBSCOhost.pdf

Result List _ institutional logics _ EBSCOhost.pdf