Title: Optimising Making Every Contact Count (MECC) interventions: A strategic behavioural analysis

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Abstract

Objective: This Strategic Behavioural Analysis aimed to: identify barriers and facilitators to healthcare professionals' implementation of MECC; code behavioural components of nationally delivered interventions to improve MECC implementation; assess the extent to which these components are theoretically congruent with identified theoretical domains representing barriers and facilitators. Comparing national interventions that aim to support implementation of behaviour change related activity to the barriers and facilitators for the target behaviour enables identification of opportunities being missed in practice thereby facilitating intervention optimisation.

Methods: A mixed-methods study involving: a systematic review to identify barriers and facilitators to implementing MECC classified using the COM-B model and Theoretical Domains Framework (TDF); a content analysis of national interventions to improve MECC implementation in England using the Behaviour Change Wheel (BCW) and Behaviour Change Techniques Taxonomy (BCTTv1); linking intervention content to barriers identified in the systematic review.

Results: Across 27 studies, the most frequently-reported barriers related to eight TDF domains: Environmental Context and Resources, Beliefs About Capabilities, Knowledge, Beliefs About Consequences, Intentions, Skills, Social Professional Role and Identity, Emotions. National interventions aimed at supporting MECC implementation included on average 5.1 BCW intervention functions (Education, Modelling, Persuasion, Training were used in all interventions) and 8.7 BCTs. Only 21% of BCTs potentially relevant to key domains were used across interventions. The majority of BCTs linked to seven of the eight most important domains were not used in any existing interventions.

Conclusions: Intervention developers should seize missed opportunities by incorporating more theoretically relevant BCTs to target barriers to implementing MECC. (Word count: 250)

Up to 5 Keywords: Making every contact count, Behaviour Change Wheel, Strategic Behavioural Analysis, Behaviour Change Techniques

Introduction

Alcohol consumption, tobacco use, poor diet and lack of physical activity are all recognised as significant public health problems. Worldwide, harmful alcohol use causes 3 million deaths annually and 5.1% of the global burden of disease(World Health Organisation, 2018) while tobacco use continues to be the leading global cause of preventable death(World Health Organisation, 2019). Globally, 39% of adults were overweight and 13% were obese in 2016, with raised body mass index (BMI) a major risk factor for non-communicable diseases(World Health Organisation, 2017). Despite the complex nature of these behavioural risk factors, evidence suggests that the opportunistic delivery of brief interventions, referred to in this paper as screening and brief interventions (SBI)[1], by healthcare professionals (HCPs) can be effective at helping reduce their impact on health. A number of systematic reviews have concluded that the SBI approach is both effective and cost-effective at reducing alcohol consumption in the general population, when delivered in primary care settings(Anderson, O'Donnell, & Kaner, 2017; Angus, Thomas, Anderson, Meier, & Brennan, 2016; Landy, Davey, Quintero, Pecora, & McShane, 2016; O'Donnell et al., 2014; Schmidt et al., 2016) and general hospitals wards(McQueen, Howe, Allan, Mains, & Hardy, 2011). There is also review-level evidence supporting the efficacy of SBIs delivered by physicians and nurses for smoking cessation in primary care, other health care settings and community settings(The National Institute for Health and Care Excellence, 2006). A systematic review across a number of behavioural domains also reported evidence of effectiveness of SBI for diet/exercise(Dunn, Deroo, & Rivara, 2001).

However, the potential of HCPs to reduce the prevalence of behavioural risk factors contrasts sharply with practice. Research has shown that even when General Practitioners (GPs) are

[1] SBI has been used here to refer to the face-to-face delivery of opportunistic brief interventions by a healthcare professional. This may have arisen as a result of discussion within a consultation, or following a question or prompt from the healthcare professional, as part of an assessment or consultation process. For example, asking if someone smokes tobacco.

encouraged to screen for alcohol problems they under-deliver health-promoting advice(Kaner, Heather, Brodie, Lock, & McAvoy, 2001), while nurses report avoiding engagement with people about alcohol use as they worry about depriving them of the social benefits of drinking (Lock & Kaner, 2004; Lock, Kaner, Lamont, & Bond, 2002). HCPs report concern about the potential negative impact of SBI on the patient and HCP relationship(Lock et al., 2002). HCPs are also not maximising opportunities to advise patients who use tobacco, to quit(Fiore, 2000) and are not engaging in weight conversations(Booth, Prevost, & Gulliford, 2015). Similarly, evidence suggests that HCPs are unsure about their capabilities to facilitate behaviour change with patients, unwilling to discuss behaviours perceived as unrelated to the patient's visit and perceive interventions as burdensome(Keyworth, Epton, Goldthorpe, Calam, & Armitage, 2018).

A public health policy in the UK, Making Every Contact Count (MECC), is "*an approach to behaviour change that utilises the millions of day to day interactions that organisations and people have with other people […] MECC enables the opportunistic delivery of consistent and concise healthy lifestyle information and enables individuals to engage in conversations about their health at scale*" (www.makingeverycontactcount.co.uk). MECC encourages HCPs and the wider workforce to deliver SBIs to people during routine consultations and contact. The current expectation is that all NHS organisations will commit to MECC and NHS England has included MECC in its Standard Contract Service Conditions. However, research has revealed that HCPs did not deliver interventions on half of the occasions in which they perceived a need(Keyworth et al., 2018). This approach to support behaviour change at scale has been recognised as an asset in helping to deliver on UK population health ambitions within both the NHS Long Term Plan(National Health Service, 2019), and Public Health England's Strategy 2020-25(Public Health England, 2019), for example on 'Smoke-free society', 'Healthier diets and healthier weight' and 'Personalisation and predictive prevention'.

An evaluation of MECC indicated that more could be done to encourage HCPs to enable positive behaviour change through MECC SBIs, and identified some barriers for professionals(Dewhirst & Speller, 2015) while a recent review of reviews also identified a number of barriers and enablers to delivering behaviour change interventions for patient-facing healthcare professionals(Keyworth, Epton, Goldthorpe, Calam, & Armitage, 2020). In order to develop successful interventions which might encourage HCPs to become more involved in MECC SBI there is a need to further explore the potential barriers and facilitators to HCPs' delivery of MECC SBIs. In addition, there is a need to evaluate existing behavioural interventions, that aim to increase SBI delivery, to identify any missed opportunities for future interventions to seize.

According to the National Institutes of Health (NIH) Stage Model, an understanding of change mechanisms is often critical for developing the most effective interventions and to guide the enhancement or simplification of existing interventions(Onken, Carroll, Shoham, Cuthbert, & Riddle, 2014). An understanding of how and why an intervention works allows the intervention to be optimised or adapted to meet the needs of special populations or developed for other clinical endpoints. A range of frameworks exist that guide the development and evaluation of behavioural interventions (Bartholomew, Parcel, & Kok, 1998; Craig et al., 2008; Michie, Atkins, & West, 2014). This research was based on the Behaviour Change Wheel (BCW) (Michie et al., 2014). The BCW is an evidence-based tool for developing and characterising behaviour change interventions, and is recommended by NICE guidance PH49 (National Institute for Health and Care Excellence, 2014). It contains at its core a model of behaviour (the COM-B model), which details the key prerequisites for a behaviour to occur; Capability, Opportunity and Motivation. The model can be used to systematically categorise the barriers and facilitators into these three components, which, given the alignment of the COM-B model with the BCW's list of intervention functions, allows the selection of appropriate intervention strategies. The BCW also maps on to other frameworks, such as the Theoretical Domains Framework (TDF); a list of fourteen categories (or "domains") of behavioural

influences that align closely with the components of COM-B and the Behaviour Change Techniques Taxonomy version 1 (BCTTv1); a comprehensive list of 93 behaviour change techniques (BCTs)(Michie et al., 2013). Together, these tools can be used to more closely assess the theoretical underpinnings of barriers and facilitators associated with a behaviour, and to identify which strategies would be best suited to targeting them.

In this way, behaviour change science can support the development and design of complex interventions and improve their effectiveness(Michie, Hyder, Walia, & West, 2011). In addition, it can also help to evaluate and optimise existing interventions by allowing a better characterisation of their functions and active ingredients, and by identifying missed opportunities that could be seized. This process provides insight into the causal mechanisms and effect modifiers of an intervention, helping the translation of research into practice and the optimisation of interventions for the future (Bellg et al., 2004). This study used the tools described above in a process similar to that used by Lawrenson et al.(Lawrenson et al., 2018), termed in the present paper as a 'Strategic Behavioural Analysis' (SBA). The SBA approach varies but here is used to describe a process whereby barriers to and facilitators of a behaviour are derived from the literature (or primary research) and coded into theoretical domains such as those listed in the TDF (a process sometimes termed 'behavioural diagnosis'). A separate step involves identifying interventions applied in national policy which are aimed at changing the behaviour and coding the content of these into the BCW and BCTs (a process sometimes termed 'intervention content analysis'). The results of these two steps are then compared to check for 'theoretical congruence' between the determinants of the behaviour and the techniques used to change the behaviour. This process uses pre-defined matrices describing links between theoretical domains and the intervention functions and behaviour change techniques suitable for addressing those domains. The full process is described as a Strategic Behavioural Analysis – it is strategic as the methodology is increasingly being applied in a policy context to assess

entire policy and programme areas, evaluating the behavioural content of 'live interventions' (although interventions found in the research literature can also be analysed for strategic fit).

Therefore, the aim of this project was to provide recommendations for behaviour change interventions that support HCPs' delivery of MECC SBIs. The project had the following objectives:

1. Identify the key behaviours of HCPs (and the barriers and facilitators associated with those behaviours) that relate to the implementation and delivery of MECC SBIs (work package 1).
2. Identify current, nationally-available interventions (including policies, programmes and services) that target these behaviours among HCPs in the UK (work package 2).
3. Establish (i) the behavioural components of interventions that address the main barriers and facilitators associated with the above behaviours, and (ii) identify opportunities to strategically improve the interventions (or their implementation) to increase the delivery of SBIs by HCPs, in order to ultimately improve population health outcomes (work package 3).

Methods

This research was based on publicly available published data and therefore did not require research ethics committee approval.

Work Package 1: Rapid Systematic Review of Barriers and Facilitators

To identify the barriers and facilitators associated with HCPs' delivery of MECC SBIs, a rapid systematic review was conducted. Rapid reviews are a form of knowledge synthesis in which components of the systematic review process are simplified or omitted to produce information in a timely manner(Khangura, Konnyu, Cushman, Grimshaw, & Moher, 2012). This rapid review used the principles of systematic reviewing however sifting and data extraction were carried out by only one reviewer with a 10% sample checked at each stage of the review to ensure accuracy and quality while working to a tight deadline. This rapid review was registered with PROSPERO international prospective register of systematic reviews (CRD42018089687) and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)(Moher, Liberati, Tetzlaff, & Altman, 2009). Studies were included if they focussed on the following HCPs: doctors, nurses, allied health professionals, pharmacists, healthy living pharmacies counter staff, drug and alcohol staff, auxiliary staff within healthcare settings (such as porters, healthcare assistants and reception/booking teams), dentists, dental staff or paramedics within health, pharmacy (including community pharmacy) and dental care settings worldwide. Included studies needed to focus on barriers or facilitators to uptake and embedding delivery of MECC SBI and in order to reach consensus we aimed to include as many relevant studies as possible, therefore relevant SBI literature from countries other than the UK was included. Any empirical study design either published or in the grey literature from 2005 onwards (when the concept of MECC was first introduced) was included. Literature was restricted to that written in the English Language as translation services were not available. Studies which focused on firefighters or police officers or

that investigated extended interventions, health coaching or MECC plus (a broader MECC approach which may include conversations to help people think about wider determinants such as debt management, housing and welfare rights advice) were excluded. Opinion pieces, editorials and studies carried out before 2005 were also excluded.

A search was conducted in March 2018, using terms based on the concepts of "making every contact count" and "barriers/facilitators" of the following databases: Medline, EMBASE, PsycINFO, Scopus, OpenGrey (http://www.opengrey.eu/), The Healthcare Management Information Consortium (HMIC) database (www.ovid.com/site/catalog/DataBase/99.jsp?top=2&mid=3&bottom=7&subsection=10), The National Technical Information Service (NTIS) (www.ntis.gov/), PsycEXTRA (www.apa.org/psycextra/), NICE evidence search (https://www.evidence.nhs.uk/). For full search terms see supplementary material. An initial screening of titles and abstracts against the inclusion criteria was made by one of the authors (CH) to identify potentially relevant papers followed by screening of the full papers identified as possibly relevant in the initial screening. The first 10% of the sample was checked at each stage by another one of the authors (DNB). CH extracted relevant data, including barriers and facilitators, using a standardised data extraction form(Centre for Reviews and Dissemination, 2009). The first 10% of the sample was checked by DNB. The quality of each study selected for inclusion was examined by CH using the Critical Appraisal Skills Programme tool for Qualitative Studies and the Centre for Evidence-Based Management Critical Appraisal of Survey tool as appropriate. The first 10% of the sample was checked by DNB.

Work Package 2: Identification of national interventions and policies to facilitate MECC SBI

Key stakeholders in the field of MECC SBI were consulted to identify existing nationally available interventions and policies aimed at facilitating HCPs' delivery of MECC. Stakeholder engagement was

the process used to identify nationally implemented interventions and policies, rather than a traditional literature review, because formal evaluation of MECC national interventions and polices has not taken place and therefore we did not expect to find relevant details in the research literature. The focus of this work package was on nationally implemented interventions and policies aimed at facilitating HCPs' delivery of MECC in order to identify opportunities currently being missed at a national level and thereby facilitating intervention optimisation nationally. A list of stakeholders was generated by the project steering group and members of the project team. Key stakeholders, including Consultants in Public Health, Academics with research interests in MECC, Senior Managers at Health Education England, Public Health Commissioners, Workforce Leads in the NHS were emailed in March 2018 asking for their help in identifying interventions. In addition, the project team attended a meeting of the national MECC advisory group on 11th April 2018 to present the project and ask for further help in identifying interventions to facilitate MECC. The national MECC advisory group is led by Public Health England and Health Education England, working in collaboration with key partners including NHS England(Harling, Cheminade, & National MECC advisory group, 2018). Key stakeholders were asked to identify any programmes, interventions or policies implemented or available (e.g. online) nationally that (i) target behaviours that support the implementation and delivery of MECC SBIs among health, pharmacy and dental care professionals and (ii) fit within the intervention functions as listed in the BCW(Michie et al., 2014). Interventions could therefore be aimed at any of the following intervention functions (education, persuasion, incentivisation, coercion, training, enablement, modelling, environmental restructuring, restrictions) and were excluded if they did not fit within the intervention functions or did not aim to change behaviour directly such as providing information only, links to other resources only, or an audit. For example, providing information only would not be coded as the intervention function education as this is the process of facilitating learning, or the acquisition of knowledge, skills, values, beliefs, and habits. Educational methods include teaching, storytelling, discussion and directed research but not providing information only. Interventions were also excluded if they were aimed at changing patient

rather than HCP behaviour, were aimed at the implementation and delivery of SBI for only one target behaviour such as smoking (rather than MECC) or where there was not enough information to extract BCTs. Stakeholders simply provided the names of potentially relevant interventions therefore all proposed interventions were researched further and based on the information about them that was publically available were screened by two of the authors (CH and AR) against the inclusion/exclusion criteria.

Work Package 3: Strategic Behavioural Analysis

We used COM-B and TDF as frameworks(Francis, O'Connor, & Curran, 2012; Michie et al., 2014; Michie et al., 2005) to synthesise and appraise the barriers and facilitators of MECC identified in our review, taking the following steps:

1. One behaviour change expert (AR) independently classified each barrier/facilitator identified in the systematic review into categories aligning with the six components of the COM-B model(Michie et al., 2014) and the 14 domains of the TDF(Francis et al., 2012; Michie et al., 2005) applying more than one category if appropriate.
2. This coding process was subject to a 10% random sample second independent coding and compared for accuracy. Inter-rater reliability (i.e. the degree of agreement between the two coders) for the 10% random sample was compared by calculating percent agreement. The results showed 75% agreement. Discrepancies in coding were reconciled through discussion.
3. For each barrier and facilitator, we recorded the frequency of each, i.e. how many studies each barrier/facilitator was identified in.
4. For each TDF domain, we established elaboration i.e. the number of barriers that were identified as fitting within that domain.

5. To identify the key TDF domains for MECC, we then ranked the TDF domains in terms of importance using established criteria: frequency (number of times the domain appeared across all papers) and elaboration (as defined by the number of barriers that were identified as fitting within that domain across all included studies)(Lawrenson et al., 2018). A cut-off was established, using standard methodology(Atkins et al., 2020), whereby TDF domains that were highlighted by three or more papers with evidence of elaboration (more than one barrier) were included as a key domain.

In order to explore to what extent the barriers and facilitators to MECC were targeted by nationally-available interventions and the existence of any missed opportunities for intervention design, we performed the following mapping exercise:

1. Identified national interventions were subject to content analysis using the BCW. Available documentation (including intervention plans and materials if available) was reviewed and appraised. Existing coding frameworks provided by the BCW guide(Michie et al., 2014; Michie et al., 2013) were used to code intervention content: Appendix 4 (p.259 of the guide) for BCTs, and Table 2.1 (p.111 of the guide) to code intervention functions.
2. The coding of BCTs and intervention functions was carried out as two independent exercises. The first interventions included (equivalent to 10%) were cross-checked by one of the authors (CH) to ensure consistency of this coding process. Where discrepancies were found the coding decisions were updated.
3. The outputs of these analysis stages were then combined by mapping the TDF domain coding of the barriers to the BCT and intervention function coding of the national interventions. This was achieved by using two available matrices that map the TDF to the BCT Taxonomy v1(Cane, Richardson, Johnston, Ladha, & Michie, 2015; Michie, Johnston, Hardeman, & Eccles, 2008). This analysis investigated the level of theoretical congruence

between existing intervention strategies for MECC and the published literature on barriers and facilitators influencing its delivery. This was achieved by the following steps:

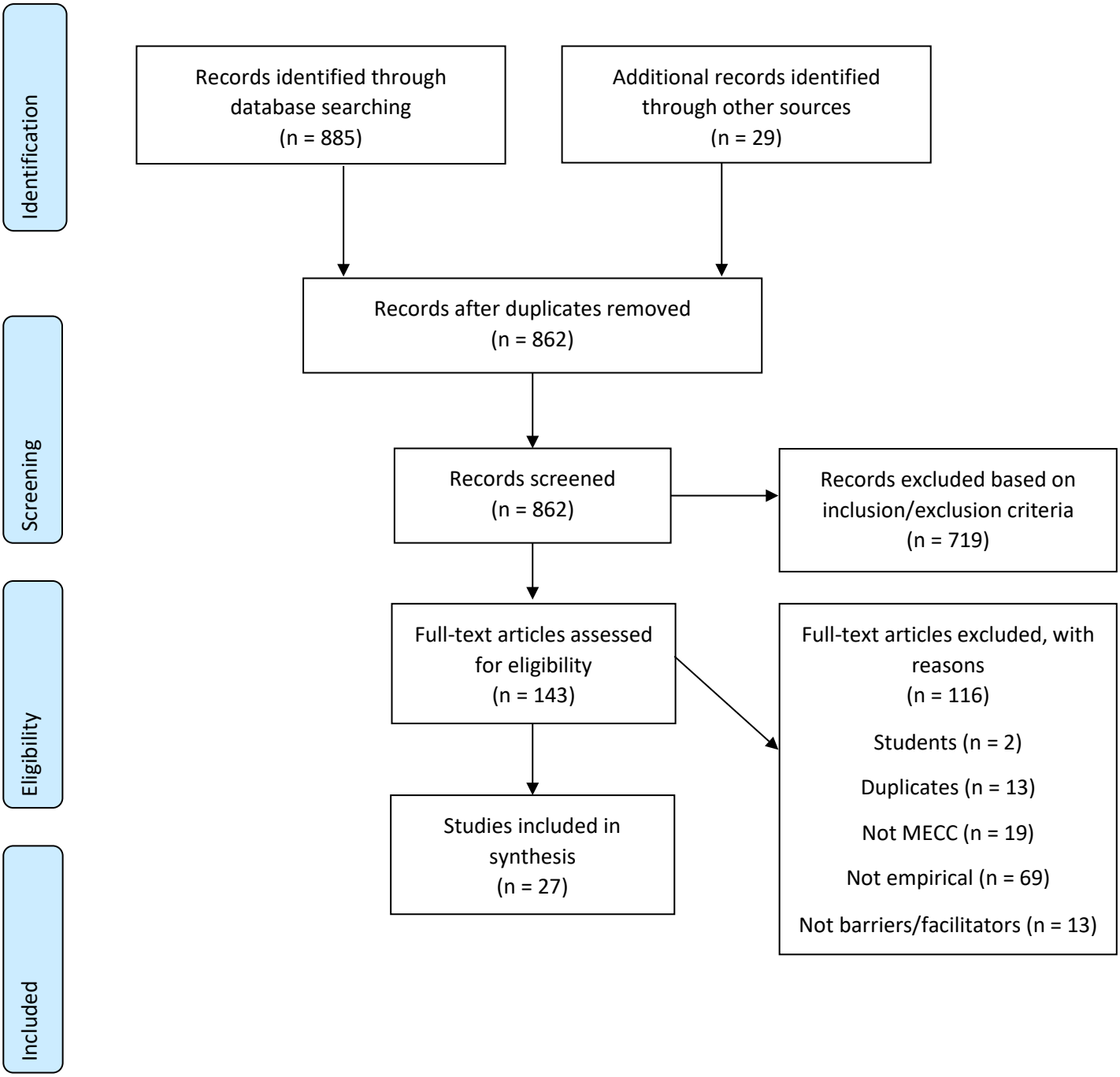
a. The extent to which the BCTs identified in the national interventions targeted the key TDF domains (identified in the barrier coding exercises) was investigated. Each BCT identified was coded as either low congruence (did not target any key TDF domain), medium congruence (targeted at least one key TDF domain) or high congruence (targeted 2+ key TDF domains).
b. TDF domains were also mapped to BCTs to identify missed and seized opportunities for targeting each key TDF domain. The same matrices were consulted as in the previous step to identify which BCTs were theoretically congruent with the key TDF domains for each behaviour. The frequency with which each BCT was identified in existing interventions was examined. An opportunity was considered to have been missed if a theoretically congruent BCT had never been identified in existing interventions, whereas an opportunity was considered to have been seized if a theoretically congruent BCT was identified in an existing intervention at least once.
c. A similar exercise was also conducted in order to assess the congruence between the identified intervention functions of existing interventions, and the COM-B and TDF categorisations of the barriers for the behaviour they were aiming to target. The matrix contained in Table 2.2 (page 113) was used for this exercise(Michie et al., 2014).

Results

Work Package 1: Rapid Systematic Review of Barriers and Facilitators

Twenty-seven studies were identified which met the inclusion criteria (Figure 1). Table 1 (supplementary material) provides a summary of these studies. The quality of the studies ranged from very good (n=8) through good (n=9) and fair (n=8) to poor (n=2). No studies were rated as very poor. The majority of studies were based in the UK (n=15) or the Republic of Ireland (n=4) with the remainder of the studies based in Australia (n=3), Saudi Arabia (n=1), Germany (n=1), Denmark (n=1) and Netherlands (n=1). One study reported data from 11 different European countries.

Figure 1: PRISMA Flow Diagram



Barriers and facilitators are presented in separate tables (Table 2 and 3 supplementary material) and are categorised into factors affecting HCPs directly, patient factors (as attributed by HCPs) and organisational factors (again, as attributed by HCPs) to facilitate understanding about what needs to be changed by whom. The most common barriers associated with delivery of MECC for HCPs directly were (i) lack of time, (ii) lack of training, (iii) lack of evidence of effectiveness, (iv) perception of it

being someone else's responsibility, and (v) lack of confidence. The most frequent barrier associated with patient factors was patients' lack of motivation to change. At the organisational level the most frequent barriers were (i) lack of resources, (ii) the organisation of care (e.g., priority given to routine tasks, no continuity of care), and (iii) a culture which focuses on treatment rather than prevention. The most common facilitators for HCPs directly were (i) being part of role and (ii) improved rapport/relationship with patients. No facilitators were identified for patient-level factors. At the organisational level, the most frequent facilitators were (i) availability of resources, (ii) staff availability, and (iii) management support.

Work Package 2: Identification of national interventions and policies to facilitate MECC SBI

We identified 28 interventions that were reported by key stakeholders as having been widely adopted to promote the delivery of MECC SBIs by HCPs. However, 19 were excluded, as they did not meet the inclusion criteria and therefore only nine were deemed suitable for coding of BCTs and intervention functions (MECC Level 2 Training, Health Education England E Learning for Health MECC eLearning Resources, Making Every Contact Count E-Learning Package for Essex, MECC Online Training (Wessex), All Our Health Guidance, Everyday Interactions, Healthy Living Pharmacy, The Commissioning for Quality and Innovation (CQUIN) framework, Making Every Contact Count E-Learning Package for West Midlands). The main reasons for exclusion were (i) not a national programme (What Matters To You, Person Centred Care), (ii) not targeted at HCPs (One you), (iii) targeting specific behaviours (National Tobacco Strategy, Connect 5), and (iv) not enough information to extract BCTs/aimed at changing patient rather than HCP behaviour(n=14 Childhood Obesity Plan, Maternity transformation, Patient activation, Shared decision making, Local partnerships to improve health and care, CVD prevention NHS health checks, Workforce strategy, NHS Standard Contract, National Nursing Strategy, Health Promoting Hospitals, Joint Strategic Needs Assessments, Social prescribing, Generic professional capabilities framework domain 4, Healthy Literacy Toolkit).

Work Package 3: Strategic Behavioural Analysis

The TDF/COM-B content analysis of barriers associated with the delivery of MECC SBIs are presented in Table 4. Most barriers were categorised within TDF domains that linked to the COM-B components of Reflective Motivation (n barriers =19) and Physical Opportunity (n barriers =18). Specifically, the TDF domains that formed the majority of the theoretical mechanisms behind the barriers identified in the literature were (i) Environmental Context and Resources (n barriers =18), (ii) Beliefs About Consequences (n barriers =7), and (iii) Beliefs About Capability (n barriers =7). Based on the frequency and elaboration of the domains, the following eight should be prioritised for change as detailed in table 4; (i) Environmental Context and Resources (Physical Opportunity), (ii) Beliefs About Capabilities (Reflective Motivation), (iii) Knowledge (Psychological Capability), (iv) Beliefs About Consequences (Reflective Motivation), (v) Intentions (Reflective Motivation), (vi) Skills (Psychological Capability & Physical Capability combined[1])), (vii) Social Professional Role and Identity (Reflective Motivation), and (viii) Emotions (Automatic Motivation).

[1] Note that the definition of Skills used for this exercise combines Physical Skills and Cognitive/Interpersonal Skills (see Table 1.5, p.88 of The Behaviour Change Wheel(Michie et al., 2014)). Furthermore, both types of Skill are linked to the same intervention functions and BCTs in the mapping matrices used throughout this paper. Therefore, although Physical Skills and Cognitive/Interpersonal Skills have been coded separately in Tables 2 and 3 (supplementary material) listing barriers and facilitators, they are combined here as one domain.

Table 4. Prioritisation of TDF domains for the delivery of MECC by frequency and thematic elaboration.

Ranking	TDF Domain (COM-B)	Frequency (No. of studies identified in; max n=27)	Elaboration (Number of barriers)
1	**Environmental Context and Resources (physical opportunity)**	23	18
2	**Beliefs about capabilities (reflective motivation)**	16	7
3	**Knowledge (psychological capability)**	16	6
4	**Beliefs about consequences (reflective motivation)**	15	7
5	**Intentions (reflective motivation)**	15	3
6	**Skills (psychological capability & Physical Capability combined)**	12	2
7	**Social Professional Role and Identity (reflective motivation)**	9	2
8	**Emotions (automatic motivation)**	8	3
9	Reinforcement	7	1
10	Social Influences (social opportunity)	2	1
Joint 11th – 14th	Memory, Attention, and Decision Making	0	0
	Behavioural Regulation	0	0
	Goals	0	0
	Optimism	0	0

In total, across the nine included interventions, 11 different BCTs were aimed at HCPs and 22 BCTs were aimed at changing patient behaviour. Some interventions included BCTs aimed both at healthcare professionals and patients (n=4). Table 5 (supplementary material) describes the intervention functions, method of delivery and HCP-targeted BCTs identified in each intervention. Looking at the BCTs observed to have high theoretical congruence, the most frequently identified BCTs were (i) Feedback on Behaviour, (ii) Information About Health Consequences, and (iii) Behavioural Practice/Rehearsal. These BCTs were paired with domains rated as important in the assessment of barriers/facilitators to MECC SBI implementation – specifically Knowledge and Beliefs About Consequences.

A rating of high congruence indicates that these BCTs would likely address the barriers to promote delivery of MECC SBIs (see Table 6). Of the 11 BCTs identified in interventions, one BCT had low theoretical congruence, four had medium congruence and six had high theoretical congruence. The BCT of Instruction on How to Perform the Behaviour was observed to have low theoretical congruence as the mapping matrix suggested it was not congruent with any of the eight important domains. BCTs with medium congruence were (i) Demonstration of behaviour, (ii) Restructuring the physical environment, (iii) Restructuring the social environment and (iv) Habit formation. BCTs with high congruence were (i) Feedback on Behaviour, (ii) Information About Health Consequences, (iii) Behavioural Practice/Rehearsal, (iv) Information About Antecedents, (v) Information About Social and Environmental Consequences and (vi) Credible Source.

Table 6. Theoretical congruence between the BCTs identified in MECC interventions and the key TDF domains linked to barriers and facilitators of MECC.

BCT	Frequency (n interventions, max 9)	Linked TDF domains according to integrated mapping matrix*	Domain importance ranking**	Theoretical congruence between BCT and domain***
Feedback on behaviour (2.2)	9	**Beliefs about capabilities**	2	**HIGH**
		Beliefs about consequences	4	
		Knowledge	3	
		Goals	11-14	
Information about health consequences (5.1)	9	**Knowledge**	3	**HIGH**
		Beliefs about consequences	4	
Behavioural practice / rehearsal (8.1)	9	**Beliefs about capabilities**	2	**HIGH**
		Skills	6	
Information about antecedents (4.2)	8	**Environmental context and resources**	1	**HIGH**
		Knowledge	3	
Information about social environmental consequences (5.3)	7	**Knowledge**	3	**HIGH**
		Beliefs about consequences	4	
Credible source (9.1)	2	**Beliefs about consequences**	4	**HIGH**
		Intentions	5	
		Goals	11-14	
Demonstration of behaviour (6.1)	9	**Skills**	6	**MED**
		Social Influences	10	
Restructuring the physical environment (12.1)	8	**Environmental Context and Resources**	1	**MED**
Restructuring the social environment (12.2)	2	**Environmental Context and Resources**	1	**MED**
		Social influences	10	
Habit formation (8.3)	7	**Skills**	6	**MED**
Instruction on how to perform the behaviour (4.1)	9	None	N/A	**LOW**

* TDF x BCT mapping matrices(Cane et al., 2015), (Michie et al., 2008).

**Domain ranking based on thematic analysis of barrier/facilitators literature (see Table 2 and 3 supplementary material).

***Classification of theoretical congruence: Low: BCT is not paired with any of the 6 key domains identified as important in the thematic analysis; Medium: BCT is paired with at least one domain identified as important;

High: BCT is paired with two or more domains identified as important. TDF domains in bold type are ranked as one of the eight most important domains.

Table 7 shows whether intervention functions identified in the nine interventions were appropriate for targeting the eight most important TDF/COM-B components. The domains Beliefs About Consequences, Beliefs About Capabilities, Social Professional Role and Identity, and Intentions all fit within the Reflective Motivation component of COM-B, and could potentially be targeted through the functions of Education, Enablement, Persuasion, Incentivisation, Coercion and Modelling. Education, Persuasion and Modelling were identified in all interventions. Enablement was identified in eight interventions. Barriers and facilitators related to the domain Emotion (sitting within Automatic Motivation) could potentially be targeted through the functions of Enablement (identified in the majority of interventions), Incentivisation, Coercion, Modelling (identified in all nine interventions) and Persuasion (identified in all nine interventions). The functions of Incentivisation and Coercion were not identified in any of the nine interventions, representing missed opportunities to target the barriers and facilitators associated with Emotion and domains associated with Reflective Motivation. Barriers and facilitators related to the domain Environmental Context and Resources could potentially be targeted by Enablement (identified in eight interventions), Training (identified in nine interventions), Environmental Restructuring (identified in three interventions) and Restriction. Whilst Environmental Restructuring is theoretically appropriate, the low frequency indicates that the majority of interventions missed opportunities to target barriers and facilitators related to Environmental Context and Resources such as having a lack of time or funding to deliver MECC.

Table 7. Seized and missed opportunities: Intervention functions linked with MECC interventions.

	Intervention functions (number of interventions serving each function)								
TDF domain (COM-B)	Education (n=9)	Enablement (n=8)	Environmental restructuring (n=3)	Incentivisation (n=0)	Coercion (n=0)	Modelling (n=9)	Persuasion (n=9)	Training (n=9)	Restriction (n=0)
Skills (Physical capability)									
Knowledge, Skills (Psychological capability)									
Professional role, Beliefs about capabilities; Beliefs about consequences; Intentions (Reflective motivation)									
Emotion (Automatic motivation)									
Environmental context and resources (Physical opportunity)									
* (Social opportunity)									

Table seven displays links between the intervention functions coded in existing MECC interventions, and the intervention functions linked to the top TDF domains. Vertical lines indicate an opportunity seized, grid lines indicate an opportunity missed, and black indicates where an intervention function matches the COM-B component but was not linked to any of the top TDF domains. *None of the eight most important TDF domains were linked to Social Opportunity.

Table 8 presents the frequency with which BCTs paired with important TDF domains were identified in existing interventions. BCTs linked to seven of the eight most important domains (Beliefs About Capabilities, Beliefs About Consequences, Skills, Social Professional Role And Identity, Environmental Context And Resources, Emotion and Intentions) were not used to their full potential (i.e., less than 50% of relevant BCTs were used in existing interventions). This finding indicates numerous missed opportunities for intervention design. Opportunity seized was the highest for the domain Knowledge (57% of the BCTs theoretically linked to this domain were used at least once in interventions). The

domains of Social Professional Role and Identity, Emotion and Intentions represented the greatest number of missed opportunities.

Table 8. Frequency with which BCTs theoretically congruent with important theoretical domains were used in existing interventions

BCTs paired with TDF domains	BCT Frequency, n interventions	**% Potential relevant BCTs used at least once***
Beliefs About Capabilities		
Verbal Persuasion to Boost Self-Efficacy	0	13%
Focus on Past Success	0	
Self-Monitoring of Behaviour	0	
Self-Monitoring of Outcome of Behaviour	0	
Graded Tasks	0	
Problem Solving	0	
Goal Setting (Behaviour)	0	
Goal Setting (Outcome)	0	
Coping Skills	0	
Behavioural Practice/Rehearsal	9	
Social Support (Unspecified)	0	
Social Support (Emotional)	0	
Social support (Practical)	0	
Feedback (Behaviour)	9	
Feedback (Outcome)	0	
Self-Talk	0	
Knowledge		
Information on Health Consequences	9	57%
Biofeedback	0	
Antecedents	8	
Feedback on Behaviour	9	
Information on Social/ Environmental Consequences	7	
Information on Emotional Consequences	0	
Salience of Consequences	0	
Beliefs About Consequences		
Information about Emotional Consequences	0	25%
Salience of Consequences	0	
Covert Sensitization	0	
Anticipated Regret	0	
Information on Social/ Environmental Consequences	7	
Pros and Cons	0	
Vicarious Reinforcement	0	
Threat	0	
Comparative Imagining of Future Outcomes	0	
Self-Monitoring of Behaviour	0	
Self-Monitoring of Outcome of Behaviour	0	
Information on health consequences	9	
Feedback on Behaviour	9	
Biofeedback	0	
Feedback on outcome(s) of behaviour	0	
Persuasive communication (Credible Source)	2	
Skills		
Graded tasks	0	19%
Behavioural rehearsal/practice	9	
Habit reversal	0	
Body changes	0	
Habit Formation	7	
Goal setting (outcome)	0	
Goal setting (behaviour)	0	

Monitoring by others without feedback	0	
Self-monitoring	0	
Reward (outcome)	0	
Self-reward	0	
Incentive	0	
Material reward	0	
Non-specific reward	0	
Demonstration of the Behaviour (modelling)	9	
Generalisation of target behaviour	0	
Social Professional Role and Identity		
Social support (unspecified)	0	0
Social support (emotional)	0	
Social support (practical)	0	
Environmental Context and Resources		
Restructuring the Physical Environment	8	33%
Discriminative (learned) cue	0	
Prompts/ Cues	0	
Avoidance/ changing exposure to cues for the behaviour	0	
Adding objects to the environment	0	
Restructuring the Social Environment	2	
Emotion		
Reduce negative emotions	0	0
Information about emotional consequences	0	
Self-assessment of affective consequences	0	
Social support (emotional)	0	
Conserving mental resources	0	
Intentions		
Commitment	0	0
Behavioural contract	0	

* This is a fraction of the number of BCTs used in the included interventions by the total number of BCTs available for a specific domain (e.g. Knowledge domain 4/7 f= 57%)

BCTs with high congruence (i.e., those that were identified as being present in the intervention and theoretically relevant to the TDF domains rated as most important for delivery of MECC SBIs) related to providing feedback about the behaviour, providing information about health, social and environmental consequences, practicing or rehearsing the behaviour, providing information about antecedents, and using a credible source. These BCTs were considered to have likely addressed the barriers to HCPs' delivery of MECC SBIs. The majority of BCTs linked to seven of the eight most important domains (Beliefs About Capabilities, Beliefs About Consequences, Skills, Social Professional Role and Identity, Environmental Context and Resources, Emotion, and Intentions) were not used in existing interventions. This finding indicates numerous missed opportunities for intervention design.

Discussion

Our systematic review identified 27 studies examining barriers and facilitators to the delivery of MECC SBIs. The most common barriers associated with delivery of MECC for HCPs were lack of time, lack of training, perceived lack of evidence of effectiveness, perception it is someone else's responsibility, and lack of confidence. In their recent review of reviews Keyworth et al also identified time, training and attitudes towards delivering interventions as barriers or enablers to delivery of health behaviour change interventions although they also identified perceived lack of prioritisation of health behaviour change, negative attitudes towards patients and perceptions of patient risk, and perceptions of patient motivation as further barriers(Keyworth et al., 2020). Categorising the barriers and facilitators identified in our systematic review revealed that the eight most important TDF domains were (by order of importance): Environmental Context and Resources (Physical Opportunity), Beliefs About Capabilities (Reflective Motivation), Knowledge (Psychological Capability), Beliefs About Consequences (Reflective Motivation), Intentions (Reflective Motivation), Skills (Psychological Capability), Social/Professional Role and Identity (Reflective Motivation), and Emotion (Automatic Motivation). All nine identified interventions served the functions of Education, Persuasion and Training. Environmental restructuring was only identified in three interventions, indicating that the majority of interventions missed opportunities to target barriers and facilitators related to Environmental Context and Resources, which was the most important domain identified in our analysis. Only 11 BCTs were identified in the included interventions

There were substantial opportunities for improvement; the majority of BCTs paired with seven of the eight most important TDF domains were not used in existing interventions. This finding indicates numerous missed opportunities for intervention design. Most of the BCTs used in the interventions aiming to promote delivery and implementation of MECC SBIs that were included in this analysis did not target organisational change. Barriers at the organisational levels were prominent and it would

be relevant to address this in future intervention packages. Contextual factors are broadly known as the physical, social and organisational environment that enable and constrain people and procedures(May et al., 2007; Squires et al., 2015). Change in healthcare systems is often regarded as complex and these factors can have an important impact on the uptake and implementation of complex healthcare behaviour change interventions(Braithwaite, Churruca, Long, Ellis, & Herkes, 2018; May, Johnson, & Finch, 2016; Moore et al., 2015).

Based on the investigation of the fit between identified barriers and facilitators and BCTs identified in interventions, there are numerous opportunities for further intervention design and development of a national service specification for HCPs training in MECC which could be developed following the stepwise approach used in the BCW. . A more diversified intervention package is needed, especially one that targets the barriers and facilitators identified in this strategic behavioural analysis. For instance, the number of BCTS currently used is rather narrow. Though the priority should be to include a broader set of BCTs in future interventions to address the key domains related to the identified barriers (i.e. BCTs targeting more than one domain) and not just to increase the number of BCTs as evidence suggests a lack of association between the number of BCTs used and the effectiveness of an intervention(Michie, Jochelson, Markham, & Bridle, 2009). Likewise, whilst training is important there needs to be a better balance of intervention functions used to address the domains. Incentives, coercion and restriction are not used at all in current interventions. In moving forward with this work, the design and delivery of these BCTs would be recommended to be co-designed with experts in the subject area using explicit criteria. For any new intervention the APEASE criteria for designing and evaluating interventions should be considered. Factors such as affordability, practicability, effectiveness and cost-effectiveness, acceptability, side-effects/safety and equity need to be considered in order to determine whether an intervention is feasible.

The development of a specification for the MECC intervention could be informed by the BCW step-by-step method for designing behaviour change interventions(Michie et al., 2014), with some steps being informed by evidence that becomes newly available. For instance, recent evidence can help further understand the challenges of delivering MECC(Keyworth et al., 2018) and the impact of a newly developed training intervention on improving HCPs self-rated confidence, competence and intention to use specific BCTs in their MECC conversations(Bull & Dale, 2020). In addition, it will also be important to conduct feasibility and piloting studies to further understand the acceptability of any newly developed intervention, including process evaluation(Araújo-Soares, Hankonen, Presseau, Rodrigues, & Sniehotta, 2019; Craig et al., 2008; Moore et al., 2015).

Strengths and limitations

This strategic behavioural analysis has linked the underlying barriers and facilitators for HCP delivery of MECC to the behavioural components of national interventions that support MECC implementation. For the first time this enables those responsible for national policy interventions to take a strategic overview of which interventions are likely to require further development to optimise their effectiveness in terms of targeting the likely mechanisms of HCP behaviour change. It also allows policy-makers to note gaps and opportunities for using all potential intervention functions in their toolkit to improve implementation of MECC. Interventions that include components to target factors influencing behaviour (i.e. barriers/facilitators) are more likely to be effective in achieving behaviour change(Michie et al., 2008). However, it was unclear to what extent specific barriers and facilitators to the implementation of MECC were targeted in current interventions as the analysis was at domain level only. A strategic behavioural analysis is an innovative approach to address such questions by applying behavioural theory and evidence-based tools that have been developed to understand and classify influences on behaviour and intervention content.

Despite its strengths, there are three main limitations to this approach. An important factor to consider in interpreting these data is the importance attributed to certain BCTs when using the current matrices(Cane et al., 2015; Michie et al., 2008) to assess the congruence of the link between BCTs and key TDF domains. For instance, Instructions On How To Perform The Behaviour was considered to be of low congruence due to not being paired with any TDF domain. However, if following the most recent Theory & Techniques Tool (not in circulation when the work was conducted) (https://theoryandtechniquetool.humanbehaviourchange.org/) this BCT could have been linked with the TDF domain Skills and attributed medium priority. Indeed, even though this BCT was considered of low theoretical congruence, it should be acknowledged that it is not necessarily redundant. For instance, the 'Health Behaviour Change Competency Framework'(Dixon & Johnston, 2010) highlights the importance of providing instructions on how to perform a behaviour for HCPs behaviours, as the practical application of BCTs within SBI delivery relies on adequate knowledge of how to do so in the first place.

Another limitation when using these matrices and this methodology is that the TDF domain Environmental Context And Resources and BCTs associated with it will not be given enough priority (maximum will be medium priority). This is due to the fact that: 1) the number of BCTs for Environmental Context And Resources is smaller compared to other domains; and 2) the BCTs for Environmental Context And Resources tend to be very unique and mostly only relevant to this domain. Future procedures designed to assess congruence could also factor in the importance of each TDF domain (e.g. with BCTs from the top domains given high priority). In light of this, some caution should be taken when interpreting the findings in this prioritisation exercise given this caveat. Finally, one of the challenges when conducting the strategic behavioural analysis was the fragmented nature of some of the training provided. At times, information was difficult to find and fragmented across various documents/resources. In this study, we have accessed the same links as HCPs would for training, which highlights the challenges of having to navigate through different links

and resources to find the relevant information/training. Aside from the missed opportunities identified through the intervention function and BCT mapping exercises, this further identifies potential for existing interventions to be improved.

Implications for practitioners, policymakers and future research

As mentioned above, a gap was identified in this analysis of existing national interventions, which highlighted a current lack of use of BCTs linked to seven of the eight most important TDF domains (Beliefs About Capabilities, Beliefs About Consequences, Skills, Social/Professional Role and Identity, Environmental Context And Resources, Emotion and Intentions). An increased use of these BCTs not currently being used in national interventions but which are associated with the TDF domains identified as most important from our analysis of barriers and facilitators are recommended. For example, Discriminative (learned) cue (Environmental Context and Resources) could be provided in the form of an NHS app or other digital tool for recording MECC interventions which offers reward for activity. We present some of these BCTs in table 9 (supplementary material) along with their definition and examples of how these could be implemented in practice. However, it is important to note that these are just suggestions and that consultations with relevant stakeholders and policy teams will lead to more developed recommendations. Therefore, suggested next steps are to obtain perspectives from stakeholders and behaviour change experts by conducting a prioritisation exercise on which of the potentially relevant BCTs could be implemented in existing or new interventions.

Conclusions

To conclude, this study found that the most important theoretical domains associated with barriers and facilitators to HCPs' delivery of MECC SBIs were environmental context & resources, beliefs about capabilities and knowledge, with a further five being additionally prioritised for intervention. However, the nine interventions identified and analysed in this research used a narrow range of behaviour change strategies, and the majority of relevant BCTs for targeting key TDF domains were

not used - knowledge was best targeted, with 57% of relevant techniques being delivered in the form of online training. To better address barriers and facilitators identified in this work, more BCTs targeting organisational factors, the environmental context and resources available to HCPs, and their beliefs about capability to enact change are needed to encourage healthcare professionals to promote positive behaviour change amongst their patients.

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Supplementary Material:

Search Terms

“making every contact count” OR “healthy conversation skill*” OR “health chat*” OR “every contact a health improvement contact”

AND

Accept* OR Access* OR Adher* OR Attitude* OR Awareness OR Barrier* OR Begin OR Behaviour* OR Belief* OR Block* OR Cease OR Cessation OR Change OR Compliance OR Comply OR Complie* OR Confiden* OR Constrain* OR Decreas* OR Delay* OR Deliver* OR Driver* OR Efficacy OR Effect* OR Enable* OR Embed* OR Encourag* OR Enhance* OR Facilitat* OR Factor* OR Hindrance* OR Hinder* OR Impact* OR Impede* OR Implement* OR Improve* OR Incentive* OR Increas* OR Influence* OR Inhibit* OR Initiate OR Intention* OR Knowledge OR Motivat* OR Norm* OR Obstacle* OR Obstruct* OR Offer OR Opportunit* OR Optimi?* OR Percept* OR Practice* OR Prevent* OR Provision* OR Provid* OR Promot* OR Reduc* OR Refer* OR Refus* OR Restrict* OR Restrain* OR Satisfact* OR Support* OR Sustain OR "Take up" OR Uptake OR Utili?* OR View* OR Willing*

Table 1: Summary of studies included in the rapid systematic review of barriers and facilitators

Reference	Behaviour (as described in article)	Participants	Measure of behaviour	Country	Study sample trained in MECC prior to measure of behaviour?
1. Al-Doghether, M., A. Al-Tuwijri, and A. Khan, Obstacles to prevention intervention: Do physicians' health habits and mind-set towards preventive care play any role? Saudi Medical Journal, 2007. 28(8): p. 1269-1274 (Al-Doghether, Al-Tuwijri, & Khan, 2007)	Preventive intervention for alcohol, smoking, nutrition, human immunodeficiency virus (HIV), blood pressure control, etc.	Family and general physicians (164/182) from five health sectors of Riyadh	Self-report questionnaire	Saudi Arabia	No
2. Ampt, A., et al., Attitudes, norms and controls influencing lifestyle risk factor management in general practice. BMC Family Practice, 2009. 10(59) (Ampt et al., 2009)	Lifestyle behavioural risk factor screening and management within a 45–49 year old health check consultation	15 GPs and one practice nurse from two geographical areas in Sydney	Qualitative interviews (n=29)	Australia	No
3. Brotons, C., et al., Prevention and health promotion in clinical practice: the views of general practitioners in Europe. Preventive Medicine, 2005. 40: p. 595-601 (Brotons et al., 2005)	Evidence-based health promotion and disease prevention recommendations in primary care	2082 GPs listed from national colleges of each country	Self-report questionnaire	Eleven European countries	No
4. Casey, D., Nurses' perceptions, understanding and experiences of health promotion. Journal of Clinical Nursing, 2007. 16: p. 1039-1049 (Casey, 2007)	Health promotion by enabling people to increase control over and to improve their health	Eight nurses from an acute 33-bed surgical ward	Qualitative observations and interviews	Republic of Ireland	No
5. Chisholm, A., et al., Current challenges of behavior change talk for medical professionals and trainees. Patient Education and	Behaviour change talk - engaging in theoretically derived effective behaviour	Medical professionals (doctors) and trainees (n = 29) in a large	Qualitative interviews	UK	No

Counseling, 2012. 87: p. 389-394 (Chisholm, Hart, Lam, & Peters, 2012)	change techniques for a wide range of health-related behaviour such as smoking, diet and exercise (e.g., goal setting and motivational interviewing) with patients	urban conurbation in the North West			
6. Dewhirst, S. and V. Speller, Wessex Making Every Contact Count (MECC) Pilot. 2015 (Dewhirst & Speller, 2015)	Making Every Contact Count	Staff from therapy services, diabetes services, occupational health, minor injuries, heart failure, respiratory teams, housing office in three pilot sites in Wessex	Self-report questionnaires (pre n=100, post n=101), qualitative interviews (pre n=14, post n=18), Organisation Assessment Tool (OAT)	UK	Yes
7. Donoghue, G., et al., Assessment and management of risk factors for the prevention of lifestyle-related disease: a cross sectional survey of current activities, barriers and perceived training needs of primary care physiotherapists in the Republic of Ireland. Physiotherapy, 2014. 100: p. 116-122 (Donoghue, Cunningham, Murphy, Woods, & Aagaard-Hansen, 2014)	Assessment and management of behavioural risk factors	Primary care physiotherapists (163/220)	Self-report questionnaire	Republic of Ireland	No
8. Donovan, H. and N. Davies, The value and contribution of nursing to public health in the	Public health via making every contact count using all opportunities to provide	Nurses and commissioners	Self-report questionnaire (n=219)	UK	No

UK: Final report. 2016 (Donovan & Davies, 2016)	accurate and up-to-date advice so that people are supported to make good lifestyle choices.		Qualitative interviews (n=16)		
9. Elwell, L., et al., Patients' and practitioners' views on health behaviour change: A qualitative study. Psychology and Health, 2013. 28(6): p. 653-674 (Elwell, Povey, Grogan, Allen, & Prestwich, 2013)	Lifestyle behaviour change	Health professionals (n=13) in general practice surgeries in Leeds	Qualitative focus groups	UK	No
10. Elwell, L., et al., Health professional perspectives on lifestyle behaviour change in the paediatric hospital setting: a qualitative study. BMC Pediatrics, 2014. 14(71) (Elwell, Powell, Wordsworth, & Cummins, 2014)	Lifestyle behaviour change brief advice	33 health professionals (nurses, junior doctors, allied health professionals and clinical support staff in an acute children's hospital	Qualitative interviews	UK	No
11. Geense, W., et al., Barriers, facilitators and attitudes influencing health promotion activities in general practice: an explorative pilot study BMC Family Practice, 2013. 14(20) (Geense, van de Glind, Visscher, & van Achterberg, 2013)	Lifestyle interventions	Dutch GPs (n=16) and Practice Nurses (n=9) in primary care	Qualitative interviews (n=25)	Netherlands	No
12. Jacobsen, E., et al., Perspectives on lifestyle intervention: The views of general practitioners who have taken part in a health promotion study. Scandinavian Journal of Public Health, 2005. 33: p. 4-10 (Jacobsen, Rasmussen, Christensen, Engberg, & Lauritzen, 2005)	Health promotion: administering preventive health checks and initiating health discussions on aspects of lifestyle	Five general practitioners	Qualitative focus groups	Denmark	No

13. John Dawson Associates, Every Contact Counts: Evaluation of Training Programme for Front Line Staff. 2013 (John Dawson Associates, 2013)	Every Contact Counts	Front line staff in 8 organisations in Liverpool	Self-report questionnaire (n=75, 36 pre training / 39 post-training – train the trainer) (n=336, 168 pre training / 168 post-training - cascade training) Semi-structured interviews / focus groups	UK	Yes
14. Lambe, B. and C. Collins, A qualitative study of lifestyle counselling in general practice in Ireland. Family Practice, 2010. 27: p. 219-223 (Lambe & Collins, 2010)	Lifestyle behaviour change	56 primary health care practitioners (GPs, practice nurses, public health nurses, social workers, physiotherapists, occupational therapists)	Qualitative focus groups (n=6)	Republic of Ireland	No
15. Laws, R., et al., An exploration of how clinician attitudes and beliefs influence the implementation of lifestyle risk factor management in primary healthcare: a	Lifestyle risk factor management	23 clinicians (community nurses, allied health practitioners, Aboriginal health	Qualitative interviews (n=48)	Australia	No

grounded theory study. Implementation Science, 2009. 4(66) (Laws et al., 2009)		workers), five managers, and two project officers in three community health teams in New South Wales			
16. Laws, R., et al., "Should I and Can I?": A mixed methods study of clinical beliefs and attitudes in the management of lifestyle risk factors in primary health care. BMC Health Services Research, 2008. 4(44) (Laws et al., 2008)	Lifestyle risk factor management	Primary health care clinicians from three community health teams from two Area Health Services in the state of New South Wales	Self-report questionnaires (n=59) and qualitative interviews (n=22)	Australia	No
17. McMahon, N. and C. Connolly, Health promotion knowledge, attitudes and practices of chartered physiotherapists in Ireland: A national survey. Physiotherapy Practice and Research, 2013. 34: p. 21-28 (McMahon & Connolly, 2013)	Health promotion: the process of enabling people to increase control over, and to improve their health	2753 registered members of the Irish Society of Chartered Physiotherapists	Self-report questionnaires (n=526)	Republic of Ireland	No
18. Nelson, A., C. de Normanville, and K. Payne, Making every contact count: an evaluation. 2013 (Nelson, de Normanville, & Payne, 2013)	Making Every Contact Count (MECC)	Key stakeholders (n=12) engaged in the delivery of MECC in organisations in Yorkshire, Humber and the North West of England	Qualitative interviews	UK	Yes

19. Pattinson, L. and A. Jessop, The delivery of health improvement information during radiotherapy treatment: a survey of UK therapy radiographers. Journal of Radiotherapy in Practice, 2016. 15(2): p. 114-130 (Pattinson & Jessop, 2016)	Providing health improvement information to patients	Society and College of Radiographers (SCoR) (n=102)	Self-report questionnaires	UK	No
20. Percival, J., Promoting health: making every contact count. Nursing Standard (2014+), 2014. 28(29): p. 37 (Percival, 2014)	Make every patient contact count	40 nurses in London and Manchester	Self-report questionnaire	UK	Yes
21. Royal Society for Public Health, Healthy Conversations and the Allied Health Professional. 2015 (Royal Society for Public Health, 2015)	Healthy conversations	Over 2000 Allied Health Professionals	Self-report questionnaires, qualitative interviews and focus groups	UK	Yes
22. Tinati, T., et al., Implementation of new Healthy Conversation Skills to support lifestyle changes - what helps and what hinders? Experiences of Sure Start Children's Centre staff. Health & Social Care in the Community, 2012. 20(4): p. 430-437 (Tinati et al., 2012)	Healthy conversation skills	Sure Start Children's Centre staff (n=110) attending one of 13 follow-up workshops in Southampton	Self-report questionnaires	UK	Yes
23. Uscreates, Insight into patient and staff attitudes on the appropriates of receiving and delivering healthy lifestyle advice. 2012 (Uscreates, 2012)	Brief lifestyle advice	49 doctors, nurses, health care professionals, health care assistants, rehab assistants, health trainers, clinic/reception staff, porters and house	Qualitative interviews	UK	No

		keepers in primary and secondary care in NHS Midlands and East			
24. Walkenden, S. and K. Walker, Perceptions of Physiotherapists about their role in health promotion at an acute hospital: a qualitative study. Physiotherapy, 2015. 101: p. 226-231 (Walkenden & Walker, 2015)	Health promotion via making every contact count	22 physiotherapists in an acute inpatient setting	Qualitative focus groups (n=3)	UK	No
25. Walter, U., et al., Putting prevention into practice: qualitative study of factors that inhibit and promote preventive care by general practitioners, with a focus on elderly patients. BMC Family Practice, 2010. 11(68) (Walter et al., 2010)	Preventive care	German general medical practitioners in Berlin and Hannover	Qualitative interviews (n=32)	Germany	No
26. The Roundhouse Consultancy MK Ltd, Opportunities, barriers and enablers for 'Making Every Contact Count' (MECC) to be introduced into the optometry curriculum and workforce training and development. 2016 (The Roundhouse Consultancy MK Ltd, 2016)	Making every contact count	Practising optometrists and members of the Local Eye Health Network in the West Midlands	Interviews	UK	No
27. Chisholm A, et al., Public health practitioners' views of the 'Making Every Contact Count' initiative and standards for its evaluation. Journal of Public Health, 2018 (Chisholm A, Ang-Chen P, Peters S, Hart J, & J, 2018)	Making every contact count	13 public health practitioners	Qualitative interviews	UK	Yes

Table 2: Summary of barriers associated with delivery of MECC SBIs, as attributed by HCPs. Note that the number of mentions may differ from the number of references listed as some papers mentioned the barrier more than once.			
Barriers	**Number of Mentions & References**	**Evidence Extract/Statement**	**COM-B component (TDF domain)**
HCP			
Lack of time	n = 23 (Al-Doghether et al., 2007; Ampt et al., 2009; Brotons et al., 2005; Casey, 2007; Chisholm et al., 2012; Dewhirst & Speller, 2015; Donoghue et al., 2014; Elwell et al., 2013; Elwell et al., 2014; Geense et al., 2013; John Dawson Associates, 2013; Lambe & Collins, 2010; Laws et al., 2009; McMahon & Connolly, 2013; Percival, 2014; Royal Society for Public Health, 2015; The Roundhouse Consultancy MK Ltd, 2016; Tinati et al., 2012; Uscreates, 2012; Walkenden & Walker, 2015)	"Time constraints added to the problem and even though doctors recognised that behaviour change had the potential to reduce disease and hence save time in the longer term, they also felt there was often limited time to address the issues, arguing that it was too demanding a task to simply 'tack on' at the end of a consultation."(Chisholm et al., 2012) p391	Physical Opportunity (Environmental Context & Resources)
Lack of training	n = 13 (Al-Doghether et al., 2007; Casey, 2007; Chisholm et al., 2012; Donovan & Davies, 2016; Lambe & Collins, 2010; Laws et al., 2008; McMahon & Connolly, 2013; Pattinson & Jessop, 2016; The Roundhouse Consultancy MK Ltd, 2016; Uscreates, 2012; Walter et al., 2010)	"This category describes the factors which nurses felt hindered their health promotion role; five factors were identified. These were lack of empowerment, the organisation of care, a lack of training and skills, heavy workload, and lack of time."(Casey, 2007) p1043	Psychological Opportunity (Cognitive and Interpersonal Skills)
Lack of evidence for effectiveness/appropriateness	n = 9 (Ampt et al., 2009; Chisholm et al., 2012; Dewhirst & Speller, 2015; Elwell et al., 2014; Geense et al., 2013; Jacobsen et al., 2005; Laws	"Participants felt that there was little visible evidence available to them to demonstrate the effectiveness of providing lifestyle change brief advice in	Psychological Capability (Knowledge) Reflective Motivation (Beliefs About Consequences)

	et al., 2008; Royal Society for Public Health, 2015; Walkenden & Walker, 2015)	this setting. This perspective stemmed from the uncertainty as to whether they would come into contact with the same patient and family again in the future."(Elwell et al., 2014) p3	
Someone else's responsibility/appropriateness of role	n = 8 (Ampt et al., 2009; Chisholm et al., 2012; Elwell et al., 2013; Laws et al., 2009; Laws et al., 2008; Nelson et al., 2013; Pattinson & Jessop, 2016; Uscreates, 2012)	"The GPs' perception of their professional role also influenced the amount of assessment, with one GP admitting to not asking about specific dietary intake as he "was not a dietician" and doubted the effectiveness of general dietary recommendations."(Ampt et al., 2009) p4	Reflective Motivation (Intentions, Beliefs About Capability, Professional Role/Identity) Psychological Capability (Knowledge)
Lack of confidence	n = 7 (Chisholm et al., 2012; Dewhirst & Speller, 2015; Laws et al., 2009; Laws et al., 2008; Royal Society for Public Health, 2015; The Roundhouse Consultancy MK Ltd, 2016; Tinati et al., 2012)	"In contrast, low implementers tended to reveal a lack of knowledge/skills or confidence. "*Oh, I don't have the confidence...not through knowledge or understanding... just through the confidence to speak to the person about it* (Low implementer, team 1)."(Laws et al., 2008) p6	Reflective Motivation (Beliefs About Capability)
Lack of funding (i.e. compensation/reimbursement/incentives)	n = 6 (Al-Doghether et al., 2007; Brotons et al., 2005; Chisholm A et al., 2018; Chisholm et al., 2012; Geense et al., 2013; The Roundhouse Consultancy MK Ltd, 2016; Walter et al., 2010)	"Others said they had referred patients to these programs in the past, but due to lack of proven effectiveness and reimbursements they stopped referring."(Geense et al., 2013) p3	Physical Opportunity (Environmental Context & Resources) Automatic Motivation (Reinforcement)
Lack of knowledge	n = 5 (Laws et al., 2008; Pattinson & Jessop, 2016; The Roundhouse Consultancy MK Ltd, 2016; Walkenden & Walker, 2015; Walter et al., 2010)	"Key barriers identified were staff responsibility and lack of knowledge and training of therapy	Psychological Capability (Knowledge)

		radiographers."(Pattinson & Jessop, 2016) p2	
Difficulty in dealing with challenging patients (e.g., do not listen, not ready to receive advice, want a 'quick fix', resistant or defensive/negative behaviour)	n = 5 (Laws et al., 2008; Nelson et al., 2013; Percival, 2014; The Roundhouse Consultancy MK Ltd, 2016; Walkenden & Walker, 2015)	"While low implementers also used some of these strategies, they expressed a number of concerns about client acceptance including being seen as judgmental, receiving negative reactions from clients and damaging the clinician-client relationship. "You know, we're on their turf, that's the way I look at it. We're a guest, we're a professional guest in their home, and we can't judge social issues you know" (Low implementer, team 1). "If I push how many cigarettes do you have a day, you know, they'd be saying 'why are you asking me this? I'm not coming here for drug and alcohol counselling, I'm coming here for a different issue" (Low implementer, team 2)."(Laws et al., 2008) p5	Automatic Motivation (Emotion) Reflective Motivation (Beliefs About Consequences, Beliefs About Capability)
Damaging to doctor patient relationship	n = 3 (Chisholm et al., 2012; Lambe & Collins, 2010; Laws et al., 2008)	"An interaction with a patient with whom a relationship was established made doctors feel that they were countering the work they had previously done to build the relationship and potentially risked damaging this. Participants contrasted the health benefits with the risks of damaging the doctor–patient relationship that they valued and many	Reflective Motivation (Beliefs About Consequences)

		reported that they chose to prioritize maintaining this relationship, thereby avoiding behaviour change discussions." (Chisholm et al., 2012) p393	
Own (negative) lifestyle behaviour	n = 3 (Dewhirst & Speller, 2015; Laws et al., 2008; Walter et al., 2010)	"Physicians' own health-related habits and their attitudes towards prevention were important determinants of their delivery of preventive care. GPs recommended preventative measures less often or with less conviction if they did not practice preventive measures themselves."(Walter et al., 2010) p5	Reflective Motivation (Beliefs About Capability) Automatic Motivation (Emotion)
Problems getting referrals/Lack of referral options	n = 2 (Dewhirst & Speller, 2015; John Dawson Associates, 2013)	"Referrals were described as another 'grey area'. Staff needed to know about the services available in the area and what they provided, and whether they were simply 'signposting' or more formally making a referral to them."(Dewhirst & Speller, 2015) p9	Physical Opportunity (Environmental Context & Resources)
Personal lack of interest in providing preventive services	n = 1 (Donoghue et al., 2014)	N/A	Reflective Motivation (Intentions)
Individuality in behaviour change needs (e.g., you can't use one strategy for different people)	n = 1 (Elwell et al., 2013)	"Individuality in behaviour change needs: 'you can't use one strategy for different people'. Both patients and health professionals noted that different patients and health behaviours require different solutions and 'one-size-fits-all'	Reflective Motivation (Beliefs About Capabilities) Psychological Capability (Knowledge, Cognitive and Interpersonal Skills)

		and 'change everything' approaches were challenged: Marie (Health Professional): It's individual, everybody's different, they're all different, you can't use one strategy for different people.' (929:931) (FG2)."(Elwell et al., 2013) p658	
Lack of continuity of advice given	n = 1 (Elwell et al., 2014)	"Continuity of information was an area of concern in that patients could receive different information depending on who was delivering lifestyle change support. For example, one participant discussed the issue of different health care workers providing contrasting information and emphasised the need to be 'singing from the same sheet'."(Elwell et al., 2014) p4	Physical Opportunity (Environmental Context & Resources)
Intervening too late	n = 1 (Elwell et al., 2013)	"Too late: 'I'm no spring chicken anymore'. Concern about lifestyle change being encouraged when it is already too late to intervene was expressed by health professionals, and the view that intervention should begin in early childhood was presented."(Elwell et al., 2013) p659	Reflective Motivation (Beliefs About Consequences)
Ethical concerns about giving lifestyle advice (e.g., individual as part of a context)	n = 1 (Jacobsen et al., 2005)	"The GPs take the view that factors other than lifestyle have an influence on illness and symptoms; that lack of patient compliance is a serious problem; and that many patients live in circumstances that render trivial or pointless any attempt to	Psychological Capability (Knowledge) Reflective Motivation (Beliefs About Consequences)

		change their lifestyle. The GPs have ethical misgivings on the following grounds: that it is problematic to focus one-sidedly on lifestyle changes if patients also live in circumstances likely to provoke illness; that there is a danger of making healthy patients ill; and that patients may develop a bad conscience if they do not succeed in changing their lifestyle, which may in turn damage the trust between doctor and patient."(Jacobsen et al., 2005) p7	
Level of risk to the patient (e.g., if the patient already exhibited signs of poor nutrition (such as obesity), more intensive assessment of diet and physical activity would usually be undertaken)	n = 1 (Ampt et al., 2009)	"The level of risk to the patient appeared to inform the intensity of the assessment. For example, if the patient already exhibited signs of poor nutrition (such as obesity), more intensive assessment of diet and physical activity would usually be undertaken."(Ampt et al., 2009) p4	Reflective Motivation (Beliefs About Consequences)
<u>Patients (from the HCP perspective)</u>			
Lack of patient motivation to change	n = 10 (Al-Doghether et al., 2007; Chisholm et al., 2012; Donoghue et al., 2014; Elwell et al., 2013; Geense et al., 2013; Jacobsen et al., 2005;	"This may be related to patient resistance. GPs reported that many patients get offended if they raise the subject of lifestyle behaviours with them.	Reflective Motivation (Intentions)

	Lambe & Collins, 2010; Laws et al., 2009; Tinati et al., 2012; Walter et al., 2010)	Patients may not realise that their lifestyle behaviours are related to their condition and so 'can get very shirty and think that we're being judgemental'."(Lambe & Collins, 2010) p221	
Level of patient prior knowledge/awareness of need to change	n = 2 (Chisholm et al., 2012; Elwell et al., 2013)	"Further, patients' awareness regarding the importance of behaviour change was thought to influence whether they would attempt to discuss these issues. For example, one participant (25, doctor, paediatrics) highlighted that with overweight children, it can seem futile to attempt to discuss behaviour change if the patient (and/or patients' parents) were unaware that changes to behaviour were required."(Chisholm et al., 2012) p392	Psychological Capability (Knowledge)
Family and peer pressure for patients	n = 2 (Chisholm et al., 2012; Dewhirst & Speller, 2015)	"Family and peer pressure were often seen as a considerable barrier to changing healthy lifestyles. *'But the families are also likely to be near to each other, in social housing you are likely to have families within walking distance of each other…so if there's drug abuse going on from grandparents, that will be going on in all properties…'* [PCC] *'And then another patient said to me again, his wife continues to smoke, so it's very, very*	Social Opportunity (Social Influences)

		hard, that's kind of a barrier…' [SHFT]."(Dewhirst & Speller, 2015) p64	
Patient ability to change	n = 1 (Chisholm et al., 2012)	One key factor centred upon patients' ability to change: regardless of whether the doctor was skilled in techniques that were effective, there was a view that patients still might not be able to implement changes."(Chisholm et al., 2012) p392	Reflective Motivation (Beliefs About Capability)
Patient attitudes towards behaviour change	n = 1 (McMahon & Connolly, 2013)	"Respondents were asked to identify factors that both prevent and facilitate the undertaking of health promotion activities in practice. Time and resource constraints (i.e. staffing, funding) were identified by 62.2% (*n* = 265) of respondents as the primary factor limiting health promotion activities. This was followed by a lack of health promotion training 11.5% (*n* = 49), patient attitudes 5.6% (*n* = 24), service structure 4.7% (*n* = 20) and having an unclear remit 1.9% (*n* = 8)."(McMahon & Connolly, 2013) p25	Reflective Motivation (Beliefs About Consequences)
View that non-clinical staff are not appropriate advice providers	n = 1 (Uscreates, 2012)	"Some warn that they would be openly hostile to attempts by non-clinicians to provide advice. In general, these patients respect the opinions of doctors above all. Others feel that all staff are capable of providing at least low-level advice and	Reflective Motivation (Professional Role/Identity)

		information, such as informing about a service or handing out a leaflet. However, while they are prepared to listen to advice from non-clinical staff, many feel they are more likely to act on advice from staff with medical qualifications – or would seek a second opinion from a clinician. Doctors are generally felt to be the most authoritative sources."(Uscreates, 2012) p20	
Organisational (from the HCP perspective)			
Lack of resources	n = 5 (Chisholm A et al., 2018; Donoghue et al., 2014; Donovan & Davies, 2016; Elwell et al., 2014; Royal Society for Public Health, 2015)	"Access to health promotion resources was a problem at times and health professionals reported that resources such as leaflets were often not available when an opportunity to intervene presented; "I personally find that the leaflets aren't available when you actually need them" (Allied Health Professional 8, 6.5 years in profession, not MECC trained)."(Elwell et al., 2014) p5	Physical Opportunity (Environmental Context & Resources)
The organization of care (e.g., priority given to routine tasks, no continuity of care)	n = 3 (Casey, 2007; Chisholm A et al., 2018; Dewhirst & Speller, 2015)	"Most nurses indicated that the way care was organised was another barrier. Three nurses felt that the routine dominated and time was prioritised to complete the routine: …you know, you feel that sometimes you have a routine to… do and you have so many hours in the day just to carry it out and sometimes that	Physical Opportunity (Environmental Context & Resources)

		(health promotion) can be put to second-best kind of thing…. (AO3)."(Casey, 2007) p1043	
Focus on treatment vs prevention culture	n = 3 (Chisholm A et al., 2018; Lambe & Collins, 2010; Walter et al., 2010)	"To deliver lifestyle counselling, according to participants, would require a considerable reorganisation of the general practice setting because currently 'the whole system is set up to write prescriptions' (GP)."(Lambe & Collins, 2010) p221	Physical Opportunity (Environmental Context & Resources)
Limited capacity of the practice (e.g., personnel and time)	n = 2 (Ampt et al., 2009; Chisholm et al., 2012)	"Those GPs who did fully assess nutrition, or specifically asked about physical activity, were influenced by other factors. These included the capacity of the practice (eg a nurse who undertook assessments), or the expressed interest of the GP in these risk factors."(Ampt et al., 2009) p4	Physical Opportunity (Environmental Context & Resources)
Lack of support from middle management	n = 1 (Dewhirst & Speller, 2015)	"Conversely there were organisational barriers, for example lack of support from middle management: *'it's middle management will be the challenge…because they're somehow managing the additional demands of having to release staff and monitor staff with MECC versus delivering their own work and their workloads…the challenges are often around…convincing them that's it's worthwhile...to invest at this early*	Physical Opportunity (Environmental Context & Resources)

		stage to get gains further on.' [PCC]."(Dewhirst & Speller, 2015) p62	
Access to further support for patients/clients	n = 1 (Dewhirst & Speller, 2015)	"In all the sites there were remarks about the services that they were able to refer patients or clients to for further support. In the City Council the connections with the Health Improvement Team and the Healthy Living Centre needed to be sustained and kept up to date: *'…I don't think we've seen them since [the training]… I pop in there now and again with my tenants but …I don't see the professionals… Something about them seeing you as a service to keep you up to date, you know and give you all the tools you need…even if they came here once a month and just said, oh we're running this now…those things are available.'* [PCC]."(Dewhirst & Speller, 2015) p76	Physical Opportunity (Environmental Context & Resources)
Complexity of recording system for MECC	n = 1 (Dewhirst & Speller, 2015)	"Recording both the initial MECC contact and any further contacts with other services was also found to be difficult and was frequently mentioned as something to sort out with further roll out. *'…these links definitely need to be stronger and seamless. We're looking at …having an automated system for [smoking cessation], so that's going to be really good, referrals will be a lot easier,*	Physical Opportunity (Environmental Context & Resources)

		and I think that needs to be a separate thing in itself, how can we refer much easier, and make it seamless.' [HHFT]."(Dewhirst & Speller, 2015) p77	
Lack of cooperation with other disciplines	n = 1 (Geense et al., 2013)	Secondly, GPs and PNs experienced barriers related to their own practice: they stated they have a lack of time in their consultations to discuss lifestyle issues with their patients. Moreover, they mentioned there is a lack of corporation with other disciplines."(Geense et al., 2013) p4	Physical Opportunity (Environmental Context & Resources)
Lack of empowerment	n = 1 (Casey, 2007)	"Some nurses reported that they felt disempowered in the system, in particular, in relation to medical personnel because doctors undervalued nurses' perspective and experience: …I think doctors should listen to us a bit more… they should pay a bit more attention to what we have to say…. Sometimes I feel maybe it's that they (the doctors) feel what is she, she's only a nurse….(AO2)."(Casey, 2007) p1043	Reflective Motivation (Professional Identity/Role, Beliefs About Capability) Automatic Motivation (Emotion)
Contradictory government policy	n = 1 (Geense et al., 2013)	"At last, contradictory policy of the government is an experienced barrier as well: for instance GPs mentioned the inconsistent smoking policy (in 2008 smoking was banned in all restaurants,	Physical Opportunity (Environmental Context & Resources)

		clubs and hotels but this was overturned in 2012).”(Geense et al., 2013) p4	
The focus of acute settings on discharge	n = 1 (Walkenden & Walker, 2015)	“Barriers specific to the acute hospital setting identified by participants included the acutely unwell nature of patients and the focus on discharge: ‘I find that, in hospital, the pressure is to get them fit enough to be safe to manage very basic tasks at home and then our input is very minimal whilst they’re in the acute setting, um, so I find I am less talking about exercise and more about their activities of daily living.’ (Respondent 8, Band 6).”(Walkenden & Walker, 2015) p229	Physical Opportunity (Environmental Context & Resources)
Absence of guidelines	n = 1 (Al-Doghether et al., 2007)	“Likewise, the physicians reported a lack of training and absence of clear guidelines to be a particularly significant hindrance to counselling in the areas of alcohol, nutrition, HIV, exercise, cholesterol, breast-feeding, and so forth.”(Al-Doghether et al., 2007) p1272	Physical Opportunity (Environmental Context & Resources)
Lack of staff	n = 1 (Donoghue et al., 2014)	“The most common barriers cited were lack of time (74%, 20/163); uncertainty about what services to provide (66%, 108/163); limited access to other services, particularly dieticians (84%,137/163), smoking cessation officers (86%, 140/163) and professionals	Physical Opportunity (Environmental Context & Resources)

		that provide alcohol addiction counselling (95%, 155/163); and lack of interest from patients (77%,126/163).”(Donoghue et al., 2014) p119	
Lack of overview of health promoting programs in the neighbourhood	n = 1 (Geense et al., 2013)	“Thirdly, GPs and PNs stated they experience problems regarding the content of health promotion programs. According to them, there is a lack of proven (long-term) effectiveness, and next to this, there is no overview of existing programs in the neighbourhood.”(Geense et al., 2013) p4	Physical Opportunity (Environmental Context & Resources)
Lack of privacy in hospital environment	n = 1 (Elwell et al., 2014)	“For example, it was felt that privacy was an issue, especially in relation to discussing lifestyle topics that may be perceived as sensitive, for instance talking about sexual health with young people; “we’ve got a four bedded bay area so conversations in there are difficult” (Nurse 26, 15 years in profession, not MECC trained).”(Elwell et al., 2014) p4	Physical Opportunity (Environmental Context & Resources)
Lack of communication between organisations	n = 1 (Chisholm A et al., 2018)	“Lack of communication between organisations also worried participants that provider organisations were interpreting MECC differently in relation to training content.”(Chisholm A et al., 2018) p6	Physical Opportunity (Environmental Context & Resources)

Table 3: Summary of facilitators associated with delivery of MECC, as attributed by HCPs			
Facilitators	**Reference**	**Evidence Extract/Statement**	**COM-B component (TDF domain)**
HCPs			
Part of role	n = 5 (Ampt et al., 2009; Elwell et al., 2014; Laws et al., 2009; Laws et al., 2008; Walkenden & Walker, 2015)	"GPs varied in their attempts to motivate their patients to change risk behaviour. This was discussed in the wider context of how much preventive care they were involved in generally, whether they felt effective as a motivator, and whether it was an expected role of GPs."(Ampt et al., 2009) p4	Reflective Motivation (Professional role/identity)
Rapport/relationship with patients	n = 4 (Casey, 2007; Chisholm et al., 2012; Elwell et al., 2013; Laws et al., 2008)	"Five nurses reported that building a rapport and getting to know the patient were important prerequisites for undertaking health promotion: I mean you build up a relationship with them in an intimate sort of way, you know…. (AO7)."(Casey, 2007) p1043	Reflective Motivation (Beliefs About Consequences)
Training	n = 3 (Casey, 2007; Royal Society for Public Health, 2015; The Roundhouse Consultancy MK Ltd, 2016)	"Almost all the nurses reported that the provision of education training and skills in relation to health promotion would be extremely important in helping them to undertake and fulfil their health promotion role."(Casey, 2007) p1044	Psychological Capability (Cognitive and Interpersonal Skills)
Improved health in the future	n = 3 (Dewhirst & Speller, 2015; Elwell et al., 2014; Uscreates, 2012)	"reductions in hospital admissions; often a health promotion message could prevent future admissions not just on the mental health side but also on the	Reflective Motivation (Beliefs About Consequences)

		medical and potentially the surgical side" (Nurse 30, 30 years in profession, not MECC trained)."(Elwell et al., 2014) p5	
Benefits to patients	n = 3 (Dewhirst & Speller, 2015; Elwell et al., 2014; Laws et al., 2009)	"In contrast when participants had witnessed families having made changes to their lifestyles, offering support felt worthwhile. Although at the same time it was acknowledged that for some paediatric sub-specialties such opportunities rarely arise; "we notice some changes with them and that's the rewarding bit then, is that you get some feedback and I think not all ward areas are that lucky that they've got the same people coming in and out" (Nurse 26, 15 years in profession, not MECC trained)."(Elwell et al., 2014) p3	Reflective Motivation (Beliefs About Consequences)
Lifestyle behaviours of clinicians	n = 2 (Brotons et al., 2005; Laws et al., 2008)	"However for high implementers this was either not an issue, or was even an enabler. Two high implementers reported having changed some aspects of their own lifestyle and found this helpful when giving advice to clients. "being an ex-smoker I feel more qualified to give them advice" (High implementer, team 3). Other high implementers recognised that they had a lifestyle risk factor, but this did not deter them from providing intervention to others "because I feel I'm	Reflective Motivation (Beliefs About Capability) Automatic Motivation (Emotion)

		a little overweight, I sometimes feel a bit funny telling people what to eat...but it doesn't stop me doing it" (High implementer, team 3).”(Laws et al., 2008) p7	
Improved relationships	n = 2 (Dewhirst & Speller, 2015; Tinati et al., 2012)	“If they had built a relationship with a parent and felt they would be receptive to this style of communication, they were more willing to practise their healthy conversation skills.”(Tinati et al., 2012) p433	Social Opportunity (Social Influences)
Effectiveness of brief advice	n = 2 (Elwell et al., 2014; Laws et al., 2008)	“Value of intervention recognised but difficulty in assessing and measuring outcomes.”(Laws et al., 2008) p5	Psychological Capability (Knowledge) Reflective Motivation (Beliefs About Consequences)
Personal interests (e.g., interest in addressing drug and alcohol issues)	n = 1 (Ampt et al., 2009)	“Those GPs who had experience and interest in addressing drug and alcohol issues reported being consistent in assessing alcohol intake; others had increased this screening as a result of implementing the health check, and some others felt this screening was only possible during such a health check.”(Ampt et al., 2009) p4	Reflective Motivation (Intentions)
Local knowledge	n = 1 (Donovan & Davies, 2016)	“Local knowledge was identified as being important in relation to detailed understanding of the local community and in relation to clients and service users being able to approach nurses. The	Reflective Motivation (Beliefs About Capabilities)

		situation is often diverse and relationship based and differs depending on the stability of the service provision and accessibility of data available about local populations. Concerns were expressed that if nurses have bases distant from the communities they are caring for this is not just inefficient in terms of travel time but distances patients and clients from professionals."(Donovan & Davies, 2016) p21	
Reimbursement	n = 1 (Geense et al., 2013)	"Reimbursements and subsidies determine participation and development of health promotion programs."(Geense et al., 2013) p5	Physical Opportunity (Environmental Context & Resources) Automatic Motivation (Reinforcement)
Benefits of using the skills	n = 1 (Tinati et al., 2012)	"Conversely, a good understanding of the new skills and their effectiveness facilitated implementation: Using them on people you know well. Using self-reflection. Seeing the benefits it had on others. (Participant 111)."(Tinati et al., 2012) p434	Psychological Capability, (Knowledge) Reflective Motivation (Beliefs About Consequences)
Opportunities to intervene	n = 1 (Tinati et al., 2012)	"Conversely, where staff were able to identify and create opportunities, this facilitated their implementation of the skills: Opportunities that make it easy to bring up healthy conversation skills i.e. if parents mention that they would like to	Reflective Motivation (Beliefs About Capabilities)

		lose weight or learn to cook. (Participant 14).”(Tinati et al., 2012) p434	
Positive preventive experiences	n = 1 (Walter et al., 2010)	“One GP, who normally had a skeptical attitude about prevention, talked about an example of successful prevention in a 65-year old woman who was previously a heavy smoker and had a very high cholesterol level: “She stopped after I told her again clearly what would happen [...]. I myself was astonished when she told me that after only a few weeks she had stopped smoking and now only needs medication to keep her blood pressure down, which she has got used to very well, has lost weight and has even enrolled at a gym. That is definitely a case where I would say that preventative guidance has at least helped” (HGP04). Positive remarks came from two physicians who explicitly stated that they enjoyed using preventative measures.”(Walter et al., 2010) p5	Reflective Motivation (Beliefs About Capabilities) Physical Capability (Skills)
Information about other services and where to refer	n = 1 (The Roundhouse Consultancy MK Ltd, 2016)	NA	Psychological Capability (Knowledge) Physical Opportunity (Environmental Context & Resources)
Confidence	n = 1 (Laws et al., 2008)	“In the interviews, high implementers generally expressed more confidence in	Reflective Motivation (Beliefs About Capabilities)

		addressing lifestyle risk factors than did low implementers. "I guess I'm fairly comfortable in the way that I do it. I'm not often shown the door" (High implementer, team 1).”(Laws et al., 2008) p5	
Education (health promotion included in the undergraduate curriculum)	n = 1 (The Roundhouse Consultancy MK Ltd, 2016)	NA	Psychological Capability (Knowledge) Physical Capability (Skills)
Organisational (from HCP perspective)			
Resources in terms of interventions and leaflets in their practice	n = 2 (Casey, 2007; Geense et al., 2013)	“Easy accessible health promotion programs due to broad inclusion criteria and affordability.”(Geense et al., 2013) p5	Physical Opportunity (Environmental Context & Resources)
Staff availability	n = 2 (Casey, 2007; Geense et al., 2013)	“The majority of nurses indicated that more resources in terms of leaflets, finance, equipment, staff, support from management and resources for a health promotion specialist would help them in their health promotion role. (…) More than half the nurses identified the provision of more staff as an important facilitator.(Casey, 2007) p 1043	Physical Opportunity (Environmental Context & Resources)
Management support	n = 2 (Casey, 2007; John Dawson Associates, 2013)	“Support from management in undertaking health promotion was also identified as an important facilitating	Physical Opportunity (Environmental Context & Resources)

		resource. In the following excerpt the nurse felt that it was not only important that managers gave support to nurses, but that they should also act as role models: …if it… starts at the senior level and there's good work practice in the ward, it'll continue on and as people come in to the ward, they'll gradually get into the routine of it and it'll continue… good practice it'll rub, rub off on everyone…. (AO6)."(Casey, 2007) p1044	Social Opportunity (Social Influences)
Support via professional networks	n = 1 (The Roundhouse Consultancy MK Ltd, 2016)	NA	Physical Opportunity (Environmental Context & Resources)
Continuity of care	n = 1 (Elwell et al., 2013)	"Continuity was also discussed in relation to patient experiences and the importance of not being referred to a number of different services to attain support. There was a belief that patients value provision of support from the same service over time. Maya discussed patient feedback in relation to this and felt that this continuity helped patient retention to lifestyle behaviour change initiatives, as it was helpful for patients to attain support from the same people: Maya (Community Support Worker): I think some of the feedback we've had from patients, the ones that we've	Physical Opportunity (Environmental Context & Resources)

		managed to retain on the programme, is that it's because we haven't passed them from pillar to post, it's because it's been erm well received because it's an in house service, and because they see us here initially, they see us in a group session, they see us out in the community when we deliver the exercise sessions, so it's continuous. (121:128) (FG2)(Elwell et al., 2013) p668	
Collaboration with other disciplines	n = 1 (Geense et al., 2013)	"Overview/ social map of disciplines and health promotion programs."(Geense et al., 2013) p6	Physical Opportunity (Environmental Context & Resources)
Signposting	n = 1 (Royal Society for Public Health, 2015)	"Keeping up to date with local services was a challenge for participants, with the wide range and ever-changing types of organisations AHPs can signpost to. A national database of information or signposting hotline were suggested as one way of bringing all of the signposting information together, although this was also recognised to be a challenge."(Royal Society for Public Health, 2015) p19	Physical Opportunity (Environmental Context & Resources)

Table 5: Main characteristics and content details of interventions aimed at improving MECC

Intervention	Delivery	Setting	Target Group	BCTs	Intervention functions
1. MECC Level 2 training. Online training (TEnT PEGS toolkit for behaviour change conversation(Chisholm, Hart, Mann, & Peters, 2014)) http://www.tentpegs.info/tentpegs-resources.html	Online	Primary, Secondary, Community	HCPs AHPs	Feedback on behaviour Instructions on how to perform behaviour Information about antecedents Information about health consequences Demonstration of the behaviour Behavioural practice/rehearsal	Education Modelling Persuasion Training
2. Health Education England E Learning for Health MECC eLearning resources. Interactive learning resources to support people develop the knowledge and understanding to make every contact count by asking others about their health and wellbeing https://www.e-lfh.org.uk/programmes/making-every-contact-count/	Online	Primary, Secondary, Community	HCPs AHPs	Feedback on behaviour Instructions on how to perform behaviour Information about antecedents Information about health consequences Information about social and environmental consequences Demonstration of the behaviour Behavioural practice/rehearsal Habit formation	Education Enablement Modelling Persuasion Training

Intervention	Delivery	Setting	Target Group	BCTs	Intervention functions
				Restructuring the physical environment	
3. Making Every Contact Count E-Learning Package for Essex. E-learning module on Making Every Contact Count (MECC) http://www.meccessex.co.uk/	Online	Primary, Secondary, Community	HCPs AHPs	Feedback on behaviour Instructions on how to perform behaviour Information about health consequences Demonstration of the behaviour Behavioural practice/rehearsal Restructuring the physical environment	Education Enablement Persuasion Training Modelling
4. MECC Online Training (Wessex) Making Every Contact Count (MECC) toolkit has been developed as a practical guide to support the implementation of the programme. http://www.wessexphnetwork.org.uk/mecc	Online Written materials / guidelines	Primary, Secondary, Community	HCPs AHPs	Feedback on behaviour Instructions on how to perform behaviour Information about antecedents Information about health consequences Information about social and environmental Demonstration of the behaviour Behavioural practice/rehearsal Habit formation	Education Environmental restructuring Modelling Persuasion Training

Intervention	Delivery	Setting	Target Group	BCTs	Intervention functions
				Restructuring the physical environment Restructuring the social environment	
5. All our health guidance. A call to action to healthcare professionals working with patients and the population to prevent illness, protect health and promote wellbeing. https://www.gov.uk/government/publications/all-our-health-about-the-framework	Online Written materials / guidelines	Primary, Secondary, Community	HCPs	Feedback on behaviour Instructions on how to perform behaviour Information about antecedents Information about health consequences Information about social and environmental Demonstration of the behaviour Behavioural practice/rehearsal Habit formation Credible source Restructuring the physical environment	Education Environmental restructuring Modelling Persuasion Training
6. Everyday interactions. A tool to support healthcare professionals to better measure their public health impact in line with the aims of All Our Health.	Online Written materials / guidelines	Primary, Secondary, Community	Nurses Midwives Dentists AHPs Pharmacists	Feedback on behaviour Instructions on how to perform behaviour Information about antecedents Information about health consequences	Education Enablement Modelling Persuasion Training

Intervention	Delivery	Setting	Target Group	BCTs	Intervention functions
https://www.rsph.org.uk/uploads/assets/uploaded/2c2132ff-cdac-4864-b1f1ebf3899fce43.pdf				Information about social and environmental Demonstration of the behaviour Behavioural practice/rehearsal Habit formation Restructuring the physical environment	
7. Healthy Living Pharmacy. The Healthy Living Pharmacy framework is a tiered commissioning framework aimed at achieving consistent delivery of a broad range of high quality services through community pharmacies to meet local need, improving the health and wellbeing of the local population and helping to reduce health inequalities. https://psnc.org.uk/services-commissioning/locally-commissioned-services/healthy-living-pharmacies/	Online Written materials / guidelines	Primary, Community	Pharmacists Pharmacy staff	Feedback on behaviour Instructions on how to perform behaviour Information about antecedents Information about health consequences Information about social and environmental Demonstration of the behaviour Behavioural practice/rehearsal Habit formation Restructuring the physical environment	Education Enablement Modelling Persuasion Training

Intervention	Delivery	Setting	Target Group	BCTs	Intervention functions
8. CQUIN. The Commissioning for Quality and Innovation (CQUIN) framework supports improvements in the quality of services and the creation of new, improved patterns of care. https://www.england.nhs.uk/nhs-standard-contract/cquin/cquin-17-19/	Online Written materials / guidelines	Primary, Secondary	HCPs	Feedback on behaviour Instructions on how to perform behaviour Information about antecedents Information about health consequences Information about social and environmental Demonstration of the behaviour Behavioural practice/rehearsal Habit formation Restructuring the physical environment Restructuring the social environment	Education Enablement Environmental restructuring Modelling Persuasion Training
9. Making Every Contact Count E-Learning Package for West Midlands. E-learning supports workers to build the prevention of poor health and the promotion of healthy living into their day-to-day business.	Online	Primary, Secondary, Community	Workers in health, social care, or the voluntary sector	Feedback on behaviour Instructions on how to perform behaviour Information about antecedents Information about health consequences Information about social and environmental	Education Enablement Modelling Persuasion Training

Intervention	Delivery	Setting	Target Group	BCTs	Intervention functions
http://learning.wm.hee.nhs.uk/node/33				Demonstration of the behaviour Behavioural practice/rehearsal Habit formation Restructuring the physical environment	

Table 9 Examples of how to implement relevant BCTs for targeting key TDF domains

BCT (and associated TDF domain)	Definition	Example of how to implement the BCT
Prompts/cues (Environmental Context & Resources)	Introduce or define environmental or social stimulus with the purpose of prompting or cueing the behaviour. The prompt or cue would normally occur at the time or place of performance	• Place a prompt on the computer system to ensure MECC is completed before moving on through system. • Questionnaires assessing lifestyle behaviour could be handed out by receptionists for patients to complete in waiting room – patient handing this to HCP at start of appointment would be a prompt and would also involve the patient in actively opening this conversation, making MECC initiation easier.
Adding objects to the environment (Environmental Context & Resources)	Add objects to the environment in order to facilitate performance of the behaviour	• Provide checklist for MECC conversations, or provide checklists for appointment procedures that include MECC as a usual step. • Establish or simplify and streamline existing systems for recording MECC interactions and referring patients. • Provide materials for HCPs (e.g., leaflets on different risk factors, treatment or self-help options, top tips document with case studies of HCPs overcoming common barriers in various roles/specialisms.
Verbal persuasion to boost self-efficacy (Beliefs About Capabilities; Intentions)	Tell the person that they can successfully perform the wanted behaviour, arguing against self-doubts and asserting that they can and will succeed	• Provide regular line manager feedback persuading staff member they are capable of overcoming barriers to delivery of MECC discussing specific barriers to delivery for that staff member. • During face-to-face training sessions or workshops, include discussion on perceived barriers so that training can address these concerns. • Establish online communities with social network champions or other points of support who can encourage HCPs and problem solve.

		• Provide examples of MECC and show the HCP how they can successfully incorporate these strategies into short appointments, e.g., using videos from Health Education England.
Focus on past success (Beliefs About Capabilities)	Advise to think about or list previous successes in performing the behaviour (or parts of it)	• Encourage HCPs to remember occasions when they have had positive experiences delivering MECC; for example, where HCPs have successfully engaged in MECC conversations before. • Line managers could encourage focus on past success during feedback (however, may be important to avoid this strategy for HCPs who have not yet engaged in MECC or who have had negative experiences, as inability to recall past successes may reinforce perceptions of barriers).
Self-monitoring of behaviour (Beliefs About Capabilities; Beliefs About Consequences; Skills)	Establish a method for the person to monitor and record their behaviour(s) as part of a behaviour change strategy	• Provide a space for HCPs to record whether a MECC conversation occurred at the end of each appointment (e.g., a tick-box in existing systems for recording patient notes) and provide visual progress charts. • Encourage self-reflection at the end of consultations to note down where they delivered well and where improvements could be made (technique could be combined with other strategies such as developing a toolkit to overcome identified barriers).
Graded tasks (Beliefs About Capabilities; Skills)	Set easy-to-perform tasks, making them increasingly difficult, but achievable, until behaviour is performed	• Break down the behaviours required to deliver MECC into smaller steps or goals (e.g., focusing on one particular MECC-relevant behaviour at a time, focusing on one particular patient group at a time, starting by delivering MECC in settings such as the NHS Health Check where patients are more likely to be receptive) and set incremental goals for HCPs to build on this behaviour gradually (e.g., starting to deliver MECC in settings outside of the NHS Health Check, such as regular reviews of patients with long-term conditions). Ensure that the end-point is for HCPs to deliver MECC to all patient groups and not just those who are perceived to be more receptive and motivated for behaviour change.

Problem solving, including Coping Skills (Beliefs About Capabilities; Intentions)	Analyse, or prompt the person to analyse, factors influencing the behaviour and generate or select strategies that include overcoming barriers and/or increasing facilitators	• Ask HCPs to identify their own personal barriers to delivering MECC and ask them to list practical solutions for overcoming these barriers (or, if no solutions available, identify viable alternatives e.g., if no local services are available for referrals, direct patients to other resources such as digital tools).
Goal setting – Behaviour (Beliefs About Capabilities; Intentions; Skills)	Set or agree on a goal defined in terms of the behaviour to be achieved	• Encourage HCPs to set a goal (e.g., for a target percentage of patients seen for whom they will aim to initiate MECC conversations each day/week).
Social support – unspecified (Beliefs About Capabilities; Intentions; Social Professional Role and Identity)	Advise on, arrange or provide social support (e.g. from friends, relatives, colleagues,' buddies' or staff) or noncontingent praise or reward for performance of the behaviour. It includes encouragement and counselling, but only when it is directed at the behaviour	• Designate certain members of staff to act as community social support for other HCPs who may be less confident with delivering MECC. • Provide online network for HCPs to share concerns and solutions.
Social support – emotional (Beliefs About Capabilities; Intentions; Social Professional Role and Identity; Emotions)	Advise on, arrange, or provide emotional social support (e.g. from friends, relatives, colleagues, 'buddies' or staff) for performance of the behaviour	• Similar strategies to social support (unspecified) could be used, specifically to provide emotional support for HCPs who lack confidence/are worried or concerned about MECC conversations.
Social support – practical (Beliefs About Capabilities; Intentions;	Advise on, arrange, or provide practical help (e.g. from friends, relatives, colleagues, 'buddies'	• Similar strategies to social support (unspecified) could be used, specifically to provide practical support for HCPs who experience barriers

Social Professional Role and Identity)	or staff) for performance of the behaviour	associated with resources (e.g., time, capacity, administrative requirements) and other practical issues.
Feedback – outcome (Beliefs About Capabilities; Beliefs About Consequences; Intentions)	Monitor and provide feedback on the outcome of performance of the behaviour	• Where possible, provide feedback to HCPs on numbers of patients who are engaging with services (e.g., seeing stop smoking advisers, enrolled at weight management services)
Self-talk (Beliefs About Capabilities)	Prompt positive self-talk (aloud or silently) before and during the behaviour	• Prompt HCPs to remind themselves of the benefits of MECC before patient interactions, and to encourage themselves of their likely successful performance; suggest this as a tip for dealing with anxiety around delivering MECC. • Encourage HCPs to write themselves encouraging notes/mantras.