

Optimizing Making Every Contact Count (MECC) Interventions: A Strategic Behavioral Analysis

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Objective: This Strategic Behavioral Analysis aimed to: identify barriers and facilitators to health care professionals' implementation of Making Every Contact Count (MECC); code behavioral 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 behavior change related activity to the barriers and facilitators for the target behavior enables identification of opportunities being missed in practice; thereby, facilitating intervention optimization. **Method:** A mixed-method 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 Behavior Change Wheel (BCW) and Behavior 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, and Emotions. National interventions aimed at supporting MECC implementation included on average 5.1 BCW intervention functions (Education, Modeling, Persuasion, and 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.

Keywords: Making Every Contact Count, Behavior Change Wheel, Strategic Behavioral Analysis, behavior change techniques

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Alcohol consumption, tobacco use, poor diet, and lack of physical activity are all recognized 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 Organization [WHO], 2018) while tobacco use continues to be the leading global cause of preventable death (WHO, 2019). Globally, 39% of adults were overweight and 13% were obese in 2016; with raised Body Mass Index (BMI) a major risk factor for noncommunicable diseases (WHO, 2017). Despite the complex nature of these behavioral risk factors, evidence suggests that the opportunistic delivery of brief interventions, referred to in this paper as screening and brief interventions (SBI), by health care professionals (HCPs) can be effective at helping reduce their impact on health.¹ A number of systematic reviews have concluded that the SBI approach is

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.

both effective and cost-effective at reducing alcohol consumption in the general population, when delivered in primary care settings (Anderson et al., 2017; Angus et al., 2017; Landy et al., 2016; O'Donnell et al., 2014; Schmidt et al., 2016) and general hospitals wards (McQueen et al., 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 behavioral domains also reported evidence of effectiveness of SBI for diet or exercise (Dunn et al., 2001).

However, the potential of HCPs to reduce the prevalence of behavioral risk factors contrasts sharply with practice. Research has shown that even when General Practitioners (GPs) are encouraged to screen for alcohol problems they underdeliver health-promoting advice (Kaner et al., 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 et al., 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 maximizing opportunities to advise patients who use tobacco, to quit (The Tobacco Use and Dependence Clinical Practice Guideline Panel, Staff, and Consortium Representatives, 2000) and are not engaging in weight conversations (Booth et al., 2015). Similarly, evidence suggests that HCPs are unsure about their capabilities to facilitate behavior change with patients, unwilling to discuss behaviors perceived as unrelated to the patient's visit and perceive interventions as burdensome (Keyworth et al., 2018).

A public health policy in the United Kingdom, 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.makeeverycontactcount.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 organizations 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 behavior change at scale has been recognized as an asset in helping to deliver on United Kingdom population health ambitions within both the NHS Long Term Plan (National Health Service, 2019), and Public Health England's Strategy 2020–2025 (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 behavior change through MECC SBIs, and identified some barriers for professionals (Dewhurst & Speller, 2015) while a recent review of reviews also identified a number of barriers and enablers to delivering behavior change interventions for patient-facing health care professionals (Keyworth et al., 2020). 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 behavioral 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 et al., 2014). An understanding of how and why an intervention works allows the intervention to be optimized 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 behavioral interventions (Bartholomew et al., 1998; Craig et al., 2008; Michie et al., 2014). This research was based on the Behavior Change Wheel (BCW; Michie et al., 2014). The BCW is an evidence-based tool for developing and characterizing behavior 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 behavior (the COM-B model), which details the key prerequisites for a behavior to occur; Capability, Opportunity, and Motivation. The model can be used to systematically categorize 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 behavioral influences that align closely with the components of COM-B and the Behavior Change Techniques Taxonomy Version 1 (BCTTv1); a comprehensive list of 93 behavior 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 behavior, and to identify which strategies would be best suited to targeting them.

In this way, behavior change science can support the development and design of complex interventions and improve their effectiveness (Michie et al., 2011). In addition, it can also help to evaluate and optimize existing interventions by allowing a better characterization 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 optimization 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 Behavioral Analysis" (SBA). The SBA approach varies but here is used to describe a process; whereby, barriers to and facilitators of a behavior are derived from the literature (or primary research) and coded into theoretical domains such as those listed in the TDF (a process sometimes termed "behavioral diagnosis"). A separate step involves identifying interventions applied in national policy that are aimed at changing the behavior 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 behavior and the techniques used to change the behavior. This process uses predefined matrices describing links between theoretical domains and the intervention functions and behavior change techniques suitable for addressing those domains. The full process is described as a SBA—it is strategic as the methodology is increasingly being applied in a policy context to assess entire policy and program areas, evaluating the behavioral content of "live interventions" (although interventions found in the research literature can also be analyzed for strategic fit).

Therefore, the aim of this project was to provide recommendations for behavior change interventions that support

HCPs' delivery of MECC SBIs. The project had the following objectives:

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

Method

This research was based on publicly available published data and 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 et al., 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 et al., 2009). Studies were included if they focused on the following HCPs: doctors, nurses, allied health professionals, pharmacists, healthy living pharmacies counter staff, drug and alcohol staff, auxiliary staff within health care settings (such as porters, health care 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 to reach consensus we aimed to include as many relevant studies as possible; therefore, relevant SBI literature from countries other than the United Kingdom was included. Any empirical study design either published or in the gray literature from 2005 onward (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 that 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 Health care 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/), and NICE evidence search (<https://www.evidence.nhs.uk/>). For full search terms see [online supplemental materials](#). An initial screening of titles and abstracts against the inclusion criteria was made by one of the authors (Catherine Haighton) 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 (Dorothy Newbury-Birch). Haighton extracted relevant data, including barriers and facilitators, using a standardized data extraction form (Centre for Reviews and Dissemination, 2009). The first 10% of the sample was checked by Newbury-Birch. The quality of each study selected for inclusion was examined by Haighton using the Critical Appraisal Skills Program tool for Qualitative Studies and the Center for Evidence-Based Management Critical Appraisal of Survey tool as appropriate. The first 10% of the sample was checked by Newbury-Birch.

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 policies has not taken place and 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 to identify opportunities currently being missed at a national level and facilitating intervention optimization 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 April 11, 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 et al., 2018). Key stakeholders were asked to identify any programs, interventions or policies implemented or available (e.g., online) nationally that (a) target behaviors that support the implementation and delivery of MECC SBIs among health, pharmacy and dental care professionals and (b) fit within the intervention functions as listed in the BCW (Michie et al., 2014). Interventions could be aimed at any of the following intervention functions (education, persuasion, incentivization, coercion, training, enablement, modeling, environmental restructuring, or restrictions) and were excluded if they did not fit within the intervention functions or did not aim to change behavior 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 behavior, were aimed at the implementation and delivery of SBI for only one target behavior 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, all proposed interventions were researched further and based on the information about them that was publicly available were screened by two of the authors (Catherine Haighton and Angela Rodrigues) against the inclusion/exclusion criteria.

Work Package 3: Strategic Behavioral Analysis

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

1. One behavior change expert (Angela Rodrigues) 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.

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., 2013, 2014) 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.

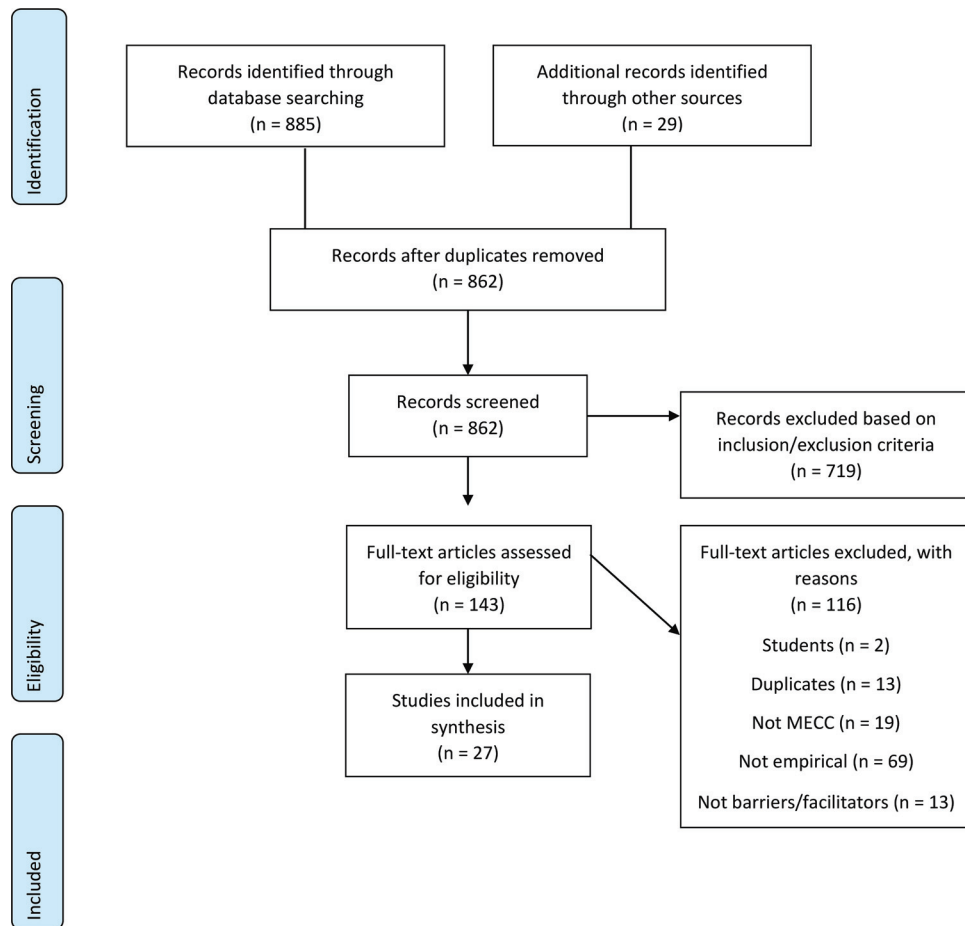
2. The coding of BCTs and intervention functions was carried out as two independent exercises. The first interventions included (equivalent to 10%) were cross-checked by one of the authors (Catherine Haighton) to ensure consistency of this coding process. Where discrepancies were found the coding decisions 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 et al., 2015; Michie et al., 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 behavior. 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 to assess the congruence between the identified intervention functions of existing interventions, and the COM-B and TDF categorizations of the barriers for the behavior they were aiming to target. The matrix contained in Table 2.2 (p. 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 that met the inclusion criteria (see Figure 1). Online supplemental materials Table S1 provides a summary of these studies. The quality of the studies

Figure 1
PRISMA Flow Diagram



Note. See the online article for the color version of this figure.

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 United Kingdom ($n = 15$) 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.

Barriers and facilitators are presented in separate tables (online supplemental materials Table S2 and S3) and are categorized into factors affecting HCPs directly, patient factors (as attributed by HCPs) and organizational 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 (a) lack of time, (b) lack of training, (c) lack of evidence of effectiveness, (d) perception of it being someone else's responsibility, and (e) lack of confidence. The most frequent barrier associated with patient factors was patients' lack of motivation to change. At the organizational level the most frequent barriers were (a) lack of resources, (b) the organization of care (e.g., priority given to routine tasks, no continuity of care), and (c) a culture that focuses on treatment rather than prevention. The most

common facilitators for HCPs directly were (a) being part of role and (b) improved rapport/relationship with patients. No facilitators were identified for patient-level factors. At the organizational level, the most frequent facilitators were (a) availability of resources, (b) staff availability, and (c) 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 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, and Making Every Contact Count E-Learning Package for West Midlands). The main reasons for exclusion were (a) not a national program (What

Table 1*Prioritization 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 (N 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 and 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 11–14	Memory, attention, and decision making	0	0
	Behavioral regulation	0	0
	Goals	0	0
	Optimism	0	0

Note. MECC = Making Every Contact Count; TDF = Theoretical Domains Framework; COM-B = a model of behavior. Bold text denotes the TDF domains to be prioritized for change.

Matters To You, Person Centred Care), (b) not targeted at HCPs (One you), (c) targeting specific behaviors (National Tobacco Strategy, Connect 5), and (d) not enough information to extract BCTs/aimed at changing patient rather than HCP behavior ($n = 14$; 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, and Healthy Literacy Toolkit).

Work Package 3: Strategic Behavioral Analysis

The TDF/COM-B content analysis of barriers associated with the delivery of MECC SBIs are presented in Table 1. Most barriers were categorized 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 (a) Environmental Context and Resources (n barriers = 18), (b) Beliefs About Consequences (n barriers = 7), and (c) Beliefs About Capability (n barriers = 7). Based on the frequency and elaboration of the domains, the following eight should be prioritized for change as detailed in Table 1; (a) Environmental Context and Resources (Physical Opportunity), (b) Beliefs About Capabilities (Reflective Motivation), (c) Knowledge (Psychological Capability), (d) Beliefs About Consequences (Reflective Motivation), (e) Intentions (Reflective Motivation), (f) Skills (Psychological Capability & Physical Capability combined), (g) Social Professional Role and Identity (Reflective Motivation), and (h) Emotions (Automatic Motivation).²

In total, across the nine included interventions, 11 different BCTs were aimed at HCPs and 22 BCTs were aimed at changing patient behavior. Some interventions included BCTs aimed both at health care professionals and patients ($n = 4$). Online supplemental materials Table S4 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 (a) Feedback on (identi)Behavior, (b) Information About Health Consequences, and (c) Behavioral Practice/Rehearsal. These BCTs were paired with domains rated as important in the assessment of barriers/facilitators to MECC (identi)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 2). 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 Behavior 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 (a) Demonstration of behavior, (b) Restructuring the physical environment, (c) Restructuring the social environment, and (d) Habit formation. BCTs with high congruence were (a) Feedback on Behavior, (b) Information About Health Consequences, (c) Behavioral Practice/Rehearsal, (d) Information About Antecedents, (e) Information About Social and Environmental Consequences, and (f) Credible Source.

Table 3 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, Incentivization, Coercion, and Modeling. Education, Persuasion, and Modeling were identified in all interventions. Enablement was

² 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 S2 and S3 (online supplemental materials) listing barriers and facilitators, they are combined here as one domain.

Table 2
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 behavior (2.2)	9	Beliefs about capabilities Beliefs about consequences Knowledge Goals	2 4 3 11–14	HIGH
Information about health consequences (5.1)	9	Knowledge	3	HIGH
Behavioral practice/rehearsal (8.1)	9	Beliefs about consequences Beliefs about capabilities	2	HIGH
Skills	6			4
Information about antecedents (4.2)	8	Environmental context and resources	1	HIGH
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			
Demonstration of behavior (6.1)	9	Goals Skills	11–14 6	MED
Restructuring the physical environment (12.1)	8	Social Influences Environmental Context and Resources	10 1	MED
Restructuring the social environment (12.2)	2	Environmental Context and Resources	1	MED
Habit formation (8.3)	7	Social influences	10	MED
Instruction on how to perform the behavior (4.1)	9	Skills None	6 N/A	LOW

Note. MECC = Making Every Contact Count; TDF = Theoretical Domains Framework; COM-B = a model of behavior; BCT = Behavior Change Techniques.

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

** Domain ranking based on thematic analysis of barrier/facilitators literature (see online supplemental materials Table S2 and S3).

*** Classification of theoretical congruence: Low: Behavior Change Technique (BCT) is not paired with any of the six 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 3
Seized and Missed Opportunities: Intervention Functions Linked With MECC Interventions

TDF domain (COM-B)	Intervention functions (number of interventions serving each function)								
	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)									

Note. MECC = Making Every Contact Count; TDF = Theoretical Domains Framework; COM-B = a model of behavior. Table 3 displays links between the intervention functions coded in existing MECC interventions, and the intervention functions linked to the top TDF domains. Light grey indicates an opportunity seized, dark grey indicates 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.

^a None of the eight most important TDF domains were linked to Social Opportunity.

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), Incentivization, Coercion, Modeling (identified in all nine interventions), and Persuasion (identified in all nine interventions). The functions of Incentivization 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. While 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 4 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.

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 behavior, providing

Table 4*Frequency With Which BCTs Theoretically Congruent With Important Theoretical Domains Were Used in Existing Interventions*

BCTs paired with TDF domains	BCT frequency, <i>n</i> interventions	% Potential relevant BCTs used at least once ^a
Beliefs about capabilities		
Verbal persuasion to boost self-efficacy	0	13%
Focus on past success	0	
Self-monitoring of behavior	0	
Self-monitoring of outcome of behavior	0	
Graded tasks	0	
Problem solving	0	
Goal setting (behavior)	0	
Goal setting (outcome)	0	
Coping skills	0	
Behavioral practice/rehearsal	9	
Social support (unspecified)	0	
Social support (emotional)	0	
Social support (Practical)	0	
Feedback (behavior)	9	
Feedback (outcome)	0	
Self-talk	0	
Knowledge		
Information on health consequences	9	57%
Biofeedback	0	
Antecedents	8	
Feedback on behavior	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 behavior	0	
Self-monitoring of outcome of behavior	0	
Information on health consequences	9	
Feedback on behavior	9	
Biofeedback	0	
Feedback on outcome(s) of behavior	0	
Persuasive communication (credible source)	2	
Skills		
Graded tasks	0	19%
Behavioral rehearsal/practice	9	
Habit reversal	0	
Body changes	0	
Habit formation	7	
Goal setting (outcome)	0	
Goal setting (behavior)	0	
Monitoring by others without feedback	0	
Self-monitoring	0	
Reward (outcome)	0	
Self-reward	0	
Incentive	0	
Material reward	0	
Nonspecific reward	0	
Demonstration of the behavior (modeling)	9	
Generalization of target behavior	0	
Social professional role and identity		
Social support (unspecified)	0	0
Social support (emotional)	0	
Social support (practical)	0	

Table 4 (continued)

BCTs paired with TDF domains	BCT frequency, <i>n</i> interventions	% Potential relevant BCTs used at least once ^a
Environmental context and resources		
Restructuring the physical environment	8	33%
Discriminative (learned) cue	0	
Prompts/cues	0	
Avoidance/changing exposure to cues for the behavior	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
Behavioral contract	0	

Note. MECC = Making Every Contact Count; TDF = Theoretical Domains Framework; COM-B = a model of behavior; BCT = Behavior Change Techniques.

^a 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 $4/7 f = 57\%$).

information about health, social and environmental consequences, practicing or rehearsing the behavior, 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 toward delivering interventions as barriers or enablers to delivery of health behavior change interventions although they also identified perceived lack of prioritization of health behavior change, negative attitudes toward patients and perceptions of patient risk, and perceptions of patient motivation as further barriers (Keyworth et al., 2020). Categorizing the (identifiers 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 organizational change. Barriers at the organizational 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 organizational environment that enable and constrain people and procedures (May et al., 2007; Squires et al., 2015). Change in health care systems is often regarded as complex and these factors can have an important impact on the uptake and implementation of complex health care behavior change interventions (Braithwaite et al., 2018; May et al., 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 that 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 behavioral 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 et al., 2009). Likewise, while 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 codesigned 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 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 behavior 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 et al., 2019; Craig et al., 2008; Moore et al., 2015).

Strengths and Limitations

This strategic behavioral analysis has linked the underlying barriers and facilitators for HCP delivery of MECC to the behavioral 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 optimize their effectiveness in terms of targeting the likely mechanisms of HCP behavior change. It also allows policymakers 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 behavior (i.e., barriers/facilitators) are more likely to be effective in achieving behavior 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 behavioral analysis is an innovative approach to address such questions by applying behavioral theory and evidence-based tools that have been developed to understand and classify influences on behavior and intervention content.

Despite its strengths, there are three main limitations to this approach. An important factor to consider in interpreting these data are 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 Behavior 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 Behavior Change Competency Framework” (Dixon & Johnston, 2010) highlights the importance of providing instructions on how to perform a behavior for HCPs behaviors, 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: (a) the number of BCTs for Environmental Context And Resources is smaller compared with other domains; and (b) 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 prioritization exercise given this caveat. Finally, one of the challenges when conducting the strategic behavioral 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 that 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 that offers reward for activity. We present some of these BCTs in online supplemental materials Table S5 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 behavior change experts by conducting a prioritization 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 and resources, beliefs about capabilities and knowledge, with a further five being additionally prioritized for intervention. However, the nine interventions identified and analyzed in this research used a narrow range of behavior 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 organizational factors, the environmental context and resources available to HCPs, and their beliefs about capability to enact change are needed to encourage health care professionals to promote positive behavior change among their patients.

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