


## ARTICLE

# Exploring barriers and enablers to the delivery of Making Every Contact Count brief behavioural interventions in Ireland: A cross-sectional survey study

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## Abstract

**Objectives:** The public health impact of the Irish Making Every Contact Count (MECC) brief intervention programme is dependent on delivery by health care professionals. We aimed to identify enablers and modifiable barriers to MECC intervention delivery to optimize MECC implementation.

**Design:** Online cross-sectional survey design.

**Methods:** Health care professionals ( $n = 4050$ ) who completed MECC eLearning were invited to complete an online survey based on the Theoretical Domains Framework (TDF). Multiple regression analysis identified predictors of MECC delivery (logistic regression to predict delivery or not; linear regression to predict frequency of delivery). Data were visualized using Confidence Interval-Based Estimates of Relevance (CIBER).

**Results:** Seventy-nine per cent of participants ( $n = 283/357$ ) had delivered a MECC intervention. In the multiple logistic regression (Nagelkerke's  $R^2 = .34$ ), the significant enablers of intervention delivery were 'professional role' (OR = 1.86 [1.10, 3.15]) and 'intentions/goals' (OR = 4.75 [1.97, 11.45]); significant barriers included 'optimistic beliefs about consequences' (OR = .41 [.18, .94]) and 'negative emotions'

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(OR = .50 [.32, .77]). In the multiple linear regression ( $R^2 = .29$ ), the significant enablers of frequency of MECC delivery were 'intentions/goals' ( $b = 10.16, p = .02$ ) and professional role ( $b = 6.72, p = .03$ ); the significant barriers were 'negative emotions' ( $b = -4.74, p = .04$ ) and 'barriers to prioritisation' ( $b = -5.00, p = .01$ ). CIBER analyses suggested six predictive domains with substantial room for improvement: 'intentions and goals', 'barriers to prioritisation', 'environmental resources', 'beliefs about capabilities', 'negative emotions' and 'skills'.

**Conclusion:** Implementation interventions to enhance MECC delivery should target intentions and goals, beliefs about capabilities, negative emotions, environmental resources, skills and barriers to prioritization.

#### KEYWORDS

alcohol and drug use, behavioural intervention, brief, chronic illness prevention, diet, eLearning, exercise, implementation strategy, Making Every Contact Count, smoking

## Statement of Contribution

### *What is already known on this subject?*

- Chronic diseases are the leading global cause of disability and premature mortality.
- Brief behavioural interventions delivered within health services – the focus on the Irish Making Every Contact Count (MECC) programme – have the potential to support people to change their health-related behaviour and curb escalating rates of chronic disease.
- The success of any such programme is dependent on widespread uptake and implementation across health services; international evidence suggests this is likely to be sub-optimal and problematic.
- The enablers and modifiable barriers to MECC intervention delivery in a health service with a nationally standardised training and support programme (such as Ireland) are unknown.
- This information is critical to inform optimisation of MECC implementation.

### *What does this study add?*

- We identified high levels of brief intervention delivery; however, also many missed opportunities and significant barriers to delivery.
- MECC delivery could be enhanced by addressing healthcare professionals' intentions and goals, barriers to prioritisation, environmental resources, beliefs about capabilities, negative emotions and skills.
- Future interventions should address these barriers by: (a) supporting setting intentions and goals; (b) improving training and (c) ensuring the environment is conducive to MECC delivery.

## INTRODUCTION

Chronic diseases are the leading global cause of disability and are responsible for 70% of deaths worldwide (World Health Organization, 2017). A significant proportion of this disease burden is attributable to seven leading behaviour-linked risk factors: high blood pressure, tobacco use, harmful use of alcohol, high blood cholesterol, overweight, low fruit and vegetable intake and physical inactivity. Accordingly, the World Health Organization has prioritized promotion of healthy behaviour as a key strategic objective to address escalating rates of chronic disease (World Health Organization, 2011).

In line with international trends, the burden of chronic disease in Ireland is substantial and is likely to increase over time due to an ageing population. Chronic diseases in Ireland are associated with 86% of mortality and 77% of the overall disease burden; patients with chronic diseases presently use approximately 70% of health resources (Department of Health, 2012). In Ireland, 18% of the population are current smokers, 34% consume the daily recommended portions of fruit and vegetables, 15% of drinkers binge drink (Department of Health, 2021) and only 46% achieve the minimum physical activity guidelines (Department of Health, 2019). Improving health-related behaviours is a key strategic goal within 'Healthy Ireland', a government-led programme which aims to enhance the physical and mental health of people in Ireland (Department of Health, 2013).

Health services provide an ideal setting for health promotion (McHugh et al., 2010). Brief behavioural interventions delivered within health services, where health care professionals offer advice and support for their patients, have potential to promote health-related behaviour and curb escalating rates of chronic disease. There is evidence that brief behavioural interventions can support people to adopt healthier behaviours including smoking cessation (Stead et al., 2013), physical activity (Lamming et al., 2017), dietary behaviours (Whatnall et al., 2018), alcohol consumption (Kaner et al., 2018) and drug use (Lynch et al., 2020). Public health guidance recommends that all health and social care professionals deliver brief behaviour change interventions, which have been demonstrated to be a cost-effective method of preventing chronic disease (National Institute for Health and Clinical Excellence, 2014).

Internationally, there have been a range of policy efforts to promote health care professionals' use of brief behaviour change interventions (Public Health England, 2016; Royal Australian College of General Practitioners, 2017; Whitelaw et al., 2012; Whitlock et al., 2002). 'Making Every Contact Count' (MECC) was first introduced in England and Wales and is an evidence-based behaviour change approach to underpin health promotion in the National Health Service (NHS; Public Health England, 2016). The MECC programme aims to train and enable every member of the health workforce to deliver brief behaviour change interventions. There is evidence to support the effectiveness of MECC training in improving and increasing use of client-centred skills to support behaviour change among health and social care practitioners (Lawrence et al., 2016). However, research carried out in England identified that there are significant variations in how MECC training is delivered which compromises the effectiveness of the programme, leading to the recommendation that MECC training should be standardized as a way to enhance MECC implementation (Chisholm et al., 2019).

The Irish Making Every Contact Count (MECC) programme was implemented in 2017 and is novel as it was designed as a national standardized programme to be delivered by the Health Service Executive (HSE, the National health service). As with MECC in the United Kingdom, the programme aims to train and enable health care professionals to use brief behavioural interventions in routine health care consultations to support patients in making health behaviour changes in relation to smoking, alcohol and drug use, physical activity and healthy eating (Health Service Executive, 2016).

Within the Irish MECC initiative, an introductory e-learning training programme is available for health care professionals, as well as an optional follow-up half-day skills workshop focused on role-playing key brief behaviour change skills. The MECC training programme in Ireland uses the '5As approach' to brief interventions, a flexible framework that is used to assist health care professionals in guiding their patients in conversations about behaviour change. It proposes five key steps to a brief intervention for behaviour change summarized in by the 5As mnemonic: ask about the behaviour; advise on the need for behaviour change; assess readiness to change; assist with exploring benefits and barriers of change, iden-

tifying options for change and goal setting; and arrange referral to more intensive support if appropriate. The 5As framework was originally developed for smoking cessation (The Clinical Practice Guideline Treating Tobacco Use and Dependence 2008 Update Panel, Liaisons, and Staff, 2008) and then successfully adapted for various other health concerns (e.g., obesity, Vallis et al., 2013). The roll-out of MECC in Ireland is supported by a national MECC implementation team and local Health Promotion and Improvement staff. The approach to MECC in Ireland is unique due to this national standardized training and support available for implementation including an optional paper-based recording tool for documenting MECC interventions delivered.

The potential positive impact of the MECC programme on patient outcomes is dependent on widespread uptake and implementation across the health service. In an international systematic review of reviews by Keyworth et al. (2020b), barriers and enablers of brief behaviour change interventions internationally were synthesized. Factors that affected brief intervention delivery included perceptions of knowledge, skills and professional role, beliefs about resources and support required and health care professionals' own health behaviours. Other barriers included lack of time, a perceived lack of prioritization of behaviour change interventions and negative attitudes associated with patients' perceptions of risk and motivation. Additional enablers were training, a suitable workplace environment for MECC delivery and health care professionals' positive attitudes towards delivery of such interventions.

Limited international literature focuses on the implementation of standardized national brief behaviour intervention programmes, such as the Irish MECC programme. Evaluations of the MECC programme in the United Kingdom suggest that while health care professionals value the 'intuitive' nature of the programme, its evidence-based approach and good fit with practice, there has been varied take-up of the programme in different parts of the health service (Nelson et al., 2013). It is likely that there is significant room for improvement in relation to implementation. For example, a national survey of UK health care professionals demonstrated that only half of health care professionals delivered brief interventions when they perceived that patients would benefit from them (Keyworth et al., 2018). In qualitative interviews with health care professionals in the United Kingdom, professionals were positive about the value of MECC interventions but had concerns about their capability to do and were limited by their work environment (Keyworth et al., 2019).

The current study builds on the existing literature by making use of the Theoretical Domains Framework (TDF), a comprehensive framework of determinants of behaviour (Cane et al., 2012; Michie, 2005) to explore barriers and enablers to MECC delivery in Ireland. In addition to using regression techniques to understand determinants of MECC delivery, we use the novel Confidence Interval-Based Estimation of Relevance (CIBER) approach (Peters & Crutzen, 2018) to select relevant determinants of MECC delivery to target in future interventions. Selections are based on the association between MECC delivery and the determinants of MECC delivery and room for improvement of each determinant based on its univariate distribution.

This study is part of the pre-registered 'Making MECC Work' research programme (Meade et al., 2022a), which aims to develop a collaborative implementation strategy to optimize MECC delivery in Ireland. The aim of the present study was to identify and quantify modifiable individual-level and organizational-level barriers and enablers to the implementation of MECC in routine health care to identify target determinants for future interventions to enhance MECC delivery.

## METHODS

### Design

A cross-sectional online survey of health care professionals was used to examine individual-level and organizational-level barriers and enablers to MECC delivery. We report our study according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines (von Elm et al., 2007). All study materials and data are available at the 'Making MECC Work' Open Science Framework page (Meade et al., 2022b) [https://osf.io/9a5vj/?view\\_only=50695e0be81e460e8de1c04dbd3c83e1](https://osf.io/9a5vj/?view_only=50695e0be81e460e8de1c04dbd3c83e1).

## Ethics statement

Ethical approval for the study was obtained from the University of Galway Research Ethics Committee (ref: R20.Jun.16).

## Sampling and recruitment

Details of sample size assumptions and sample size calculations have been previously published (Meade et al., 2022a). All health care professionals who completed the online MECC eLearning training programme from June 2018–March 2021 ( $n = 4050$ ) were invited to take part in the online survey via an e-mail invitation from the Health Service Executive MECC team on the 12th of April 2021. We aimed to achieve a response rate of 10% (i.e.,  $n = 405$ ). The survey was hosted by Qualtrics, a GDPR compliant online survey tool. Initially the survey was due to open for participants for a six-week period. However, a national cyber-attack that affected the health services e-mail system meant that the data collection period was extended until the end of September 2021 (5.5 months in total) as staff did not have access to their email from mid-May until July. The survey was re-launched in July 2021 and two further reminder emails were sent to staff in September 2021. Links to the survey were also posted on the study twitter page during this time. Health care professionals were offered the opportunity to enter a prize draw for one of four €50 shopping vouchers as an incentive to participate.

## Measures

The survey collected information on demographics, type of training attended (whether they had attended a 'Follow-Up Skills Workshop' in addition to the standard online MECC eLearning training programme), delivery and recording of MECC interventions and barriers and enablers to intervention delivery. A copy of the survey is publicly available via the Open Science Framework (Meade et al., 2022b).

The primary outcome measure to assess level of use of MECC interventions was a single question asking participants if they have ever delivered a MECC intervention (yes/no). Participants had attended MECC eLearning so would have been familiar with what a MECC intervention is. However, a definition was also presented within the survey. The secondary outcome measure was a one-item measure of the proportion of times participants deliver a MECC intervention to patients when they feel it is appropriate to offer an intervention. Participants were also asked what health behaviours they have addressed in any MECC interventions delivered. They were also asked how frequently they document MECC interventions and how easy it is to document these on five-point Likert scales.

The next section of the survey contained 44 five-point Likert scale items designed to assess potentially modifiable barriers and enablers to MECC brief intervention delivery. These items were informed by the Theoretical Domains Framework (TDF; Cane et al., 2012; Michie, 2005). Items from an existing TDF survey of implementation behavioural determinants (Huijg et al., 2014) were adapted to the MECC context. TDF items were refined through consultations with the Study Management Team, the Study Steering Committee, the MECC Implementation Group and the Health Psychology Public Advisory Panel.

## Questionnaire validation

Following evidence of poor model fit for several one-factor models of the original 14 TDF domains in confirmatory factor analyses, we used exploratory factor analyses to investigate the factor structure of our TDF survey (see [Supporting Information](#) for factor analysis details). Content and face validity of the final factor structure was discussed and agreed by the study management team which included academics

and partners from the health service MECC team. This resulted in 11 subscales of our TDF scale being identified: knowledge, skills, professional role, beliefs about capabilities, optimistic beliefs about consequences, intentions/goals, barriers to prioritization, fit with clinical practice, environmental resources, social influences and negative emotions.

## Data analysis

We described the mean and standard deviation for the demographic data, MECC training uptake, use of MECC interventions and barriers and enablers identified to the delivery of MECC brief interventions by health care professionals. A mean score for each TDF subscale was computed. Ordinary Least Squares regression analyses were used to examine predictive relationships between the TDF-informed barriers and enablers, time since participants' completed the eLearning training, whether participants had attended the 'Follow-Up Skills Workshop', and health care professionals' delivery of MECC interventions. Multiple logistic regression was used for the binary primary outcome of MECC delivery (yes/no). Multiple linear regression was used for the continuous secondary outcome, the proportion of times participants reported delivering a MECC intervention when deemed appropriate.

CIBER analyses (Peters & Crutzen, 2018) were conducted to examine and visualize the distribution of each predictor and their univariate relationships with delivery of MECC interventions and frequency of MECC delivery. The CIBER analysis was used to select relevant determinants of MECC delivery to target in future implementation interventions to enhance MECC delivery. Selections were based on the association between MECC delivery and the determinants of MECC delivery and room for improvement of each determinant based on its univariate distribution. Analyses were conducted using SPSS v27 and Jamovi 2.2.2.

## RESULTS

### Participant characteristics

Demographic characteristics of the sample ( $n = 357$ ) are presented in Table 1. Most were female ( $n = 317$ , 88.8%) and the average age was 44 years. The most common professional categories reported were nurses ( $n = 161$ , 45.1%), physiotherapists ( $n = 79$ ; 22.1%), midwives ( $n = 24$ , 6.7%), health care assistants ( $n = 17$ , 4.8%) and occupational therapists ( $n = 16$ , 4.5%). The remaining 60 (16.8%) of health care professionals represented 20 different professional categories, and there were less than 10 participants per professional category. The average number of years in role was around 15 years. While we cannot directly compare our demographics to HSE statistics on the profile of health care professionals in Ireland, the demographic patterns of the participants' professional groups are broadly consistent with the HSE workforce. According to the HSE, 'nurses and midwives' (combined category) are the most prevalent health care professional group, followed by 'patient and client care' (including care assistants), and 'health and social care professionals' (including therapy professions; Health Service Executive, 2022). The most common health service settings in which respondents worked were acute hospital services ( $n = 136$ ; 35.3%), primary care services ( $n = 95$ ; 26.6%) and mental health services ( $n = 70$ ; 19.6%). Participants responded from all 9 Community Health Organizations in Ireland and from 29 out of 49 hospitals in Ireland. Most participants completed the online MECC training programme in 2019 ( $n = 135$ ; 37.8%) or 2020 ( $n = 123$ ; 34.5%). 106 participants (29.7%) had attended the 'Enhancing your Brief Intervention Skills' workshop following their completion of online training.

TABLE 1 Sample demographic and occupational characteristics

Variable	<i>N</i>	(%)	Mean	Range	<i>SD</i>
Sex					
Female	317	(88.8)			
Male	39	(10.9)			
Other	1	(.3)			
Age, years			44.4	22–68	9.8
Health care Professional Role					
Nurse	161	(45.1)			
Physiotherapist	79	(22.1)			
Midwife	24	(6.7)			
Health care assistant	17	(4.8)			
Occupational Therapist	16	(4.5)			
Other professional groups	60	(16.8)			
Years working in professional role	354		14.6	0–46	10.1
Health Service Executive Employee					
Yes	332	(93)			
No	25	(7)			
Health Service Setting					
Acute Hospital Services	126	(35.3)			
Primary Care Services	95	(26.6)			
Mental Health Services	70	(19.6)			
Social Inclusion Services	1	(.3)			
Disability Services	2	(.6)			
Older Person Services	26	(7.3)			
Health and Well-being Services	10	(2.8)			
Not reported	2	(.6)			
Non-Health Service Executive work setting (e.g., charities)	25	(7)			
Year MECC eLearning completed					
2018	51	(14.4)			
2019	135	(37.8)			
2020	123	(34.5)			
2021	46	(12.9)			
Not reported	2	(.6)			
Attended 'Enhancing Brief Intervention Skills' workshop					
Yes	106	29.7			
No	251	70.3			

## Delivery of MECC interventions

Detailed information on participants' delivery of MECC interventions is documented in Table 2. In relation to the primary outcome, 283 participants (79.3%) reported having ever delivered a MECC brief intervention. For the secondary outcome, participants reported that of the weekly patients they see, they consider it appropriate to offer MECC interventions to 62.5% of these. They report delivering MECC interventions an average of 54.4% of the time when appropriate.

TABLE 2 Delivery of MECC interventions

Question	<i>N</i>	(%)	Mean (%)	Range	<i>SD</i>
Thinking of the patients you see in a typical week, what percentage of them do you think it is appropriate to deliver a MECC brief intervention to?			62.5	0–100	28.6
Have you ever delivered a MECC brief intervention?					
Yes	283	(79.3)			
No	74	(20.7)			
Total	357				
Of the weekly patients for whom it is appropriate to deliver MECC brief interventions, what percentage of them do you usually manage to deliver a MECC brief intervention to?			54.4	0–100	28.0
Have you delivered MECC brief interventions to patients in relation to					
Physical Activity	243	(85.9)			
Healthy Eating	238	(84.1)			
Smoking	237	(83.7)			
Alcohol and Drug Use	150	(53.0)			
Total	283				
When using a MECC brief intervention, how often do you document the interventions you deliver in a patient's record?					
Always	93	(32.9)			
Most of the time	89	(31.4)			
Sometimes	69	(24.4)			
Rarely	22	(7.8)			
Never	10	(3.5)			
Total	283				
Where do you document MECC brief interventions that you deliver? (select all that apply)					
MECC Client Record	24	(8.8)			
Patient paper records	212	(77.7)			
Electronic patient records	49	(17.9)			
Other	23	(8.4)			
Total	273				

Of those who had delivered MECC, smoking (83.7%), physical activity (85.9%) and healthy eating (84.1%) were the most common behavioural targets. Fewer reported delivering MECC interventions in the context of alcohol and drug use (53%). There was variation in how often participants recorded (documented) MECC interventions they delivered. Ninety-three participants (32.9%) ‘always’ recorded interventions and 89 participants (31.4%) recorded interventions ‘most of the time’. The most common place for participants to record MECC interventions were patient paper records ( $n = 212$ ; 77.7%).

## Predictors of MECC delivery

### Attendance at follow-up skills workshop

There was no significant relationship between whether participants had attended an additional MECC follow-up skills workshop and their delivery of MECC interventions (OR = 1.54 [.85, 2.79],  $p = .157$ ) and the frequency with which they delivered MECC interventions ( $b = 2.74$ ,  $p = .446$ ).



## Theoretical domains framework factors

Descriptive statistics for the 11 TDF Domains are presented in Table 3. The result of the CIBER analyses revealed that each of the 11 TDF domains was significantly associated with whether participants had delivered a MECC intervention or not (see Figure 1) and with how frequently they delivered a MECC intervention when appropriate to do so (see Figure 2). The CIBER analysis suggests that six TDF domains may be useful targets for future interventions: ‘intentions/goals’, ‘barriers to prioritisation’, ‘environmental resources’, ‘beliefs about capabilities’, ‘negative emotions’ and ‘skills’.

### Bivariate analysis between TDF domains and outcomes

#### *Intentions/goals*

Higher scores on having ‘intentions/goals’ to deliver MECC were significantly associated with being more likely to have delivered a MECC intervention (OR = 5.33 [3.21, 8.87],  $p < .001$ ) and a higher frequency of MECC delivery ( $b = 22.0$ ,  $p < .001$ ). The mean score of intentions/goals was 3.53 ( $SD = .62$ ), suggesting there is some room for improvement in this domain.

#### *Barriers to prioritization*

Higher scores on experiencing ‘barriers to prioritisation’ in relation to MECC were associated with being less likely to have delivered a MECC intervention (OR = .64 [.48, .87],  $p = .00$ ) and a lower frequency of MECC delivery ( $b = -10.4$ ,  $p < .001$ ). The mean score of 3.32 ( $SD = .92$ ) suggests that there is room for improving scores in this domain.

#### *Environmental resources*

Higher scores on ‘environmental resources’ were significantly positively correlated with having ever delivered a MECC intervention (OR = 1.66 [1.23, 2.25],  $p < .001$ ) and the frequency of MECC delivery ( $b = 8.92$ ,  $p < .001$ ). The mean score for this domain is 3.09 ( $SD = .86$ ), indicating that there is room for improvement of environmental resources to support MECC delivery.

#### *Beliefs about capabilities*

Higher scores on ‘beliefs about capabilities’ in relation to MECC delivery were significantly associated with being more likely to have delivered a MECC intervention (OR = 2.27 [1.63, 3.17]) and a higher frequency of MECC delivery ( $b = 13.0$ ,  $p < .001$ ). The mean score for beliefs about capabilities was 3.24 ( $SD = .83$ ) indicating that there is some room for improvement in this domain.

#### *Negative emotions*

Higher scores on ‘negative emotions’ (stress/nervousness in relation to MECC delivery) were associated with a decreased likelihood that participants had delivered a MECC intervention (OR = .36 [.25, .50]) and with a decreased frequency of MECC delivery ( $b = -13.2$ ,  $p < .001$ ). The mean score for this domain was 2.43 ( $SD = .82$ ) indicates that there is room for improvement in this domain.

#### *Skills*

A higher score on ‘skills’ was significantly associated with a higher likelihood of having ever delivered a MECC intervention (OR = 2.24 [1.61, 3.13]) and with more frequent delivery of MECC interventions ( $b = 10.8$ ,  $p < .001$ ). The mean score for skills was 3.55 ( $SD = .80$ ) indicating that there is room for improvement in this domain.

TABLE 3 TDF domain subscale scores descriptive statistics

TDF domain subscale and relevant survey items (number of items)	Mean score – range 0–5 (SD)
Knowledge (3)	3.95 (.69)
I am aware of the objectives of MECC brief interventions	
I am familiar with the content of MECC brief interventions	
I know how to deliver MECC brief interventions	
Skills (3)	3.55 (.80)
I have received enough training in how to deliver MECC brief interventions	
I have the skills to deliver MECC brief interventions	
During MECC training, I have had enough opportunity to practice delivering MECC brief interventions	
Professional Role (3)	4.2 (.71)
Conducting MECC brief interventions is part of my work as a health care professional	
As a health care professional, it is my job to implement MECC brief interventions	
Delivering MECC interventions with my patients is consistent with my health care profession	
Beliefs about capabilities (3)	3.24 (.83)
I am confident that I can deliver MECC brief interventions even when my patients are not motivated	
I am confident that I can deliver MECC interventions when there is little time	
For me, delivering MECC brief interventions with my patients is easy	
Optimistic beliefs about consequences (9)	3.78 (.52)
I am optimistic about the benefits of delivering MECC brief interventions	
With regard to delivering MECC brief interventions I'm always optimistic about the outcomes	
With regard to delivering MECC brief interventions I hardly ever expect things to go well <sup>a</sup>	
I believe that delivering MECC interventions is a good idea	
If I deliver MECC brief interventions, it will benefit patients' health	
If I deliver MECC brief interventions, it might damage my relationship with my patients <sup>a</sup>	
If I deliver MECC brief interventions, people in my workplace would think better of me	
If I deliver MECC brief interventions, I would feel like I am making a difference to patients	
If I deliver MECC brief interventions, I feel my patients would appreciate it	
Intentions/goals (8)	3.53 (.62)
I intend to deliver MECC brief interventions in future	
I will definitely deliver a MECC brief intervention to next appropriate patient	
I have a clear plan regarding the circumstances in which I should deliver MECC brief interventions	
Delivering MECC brief interventions is something I do automatically	
I keep track of how well I'm doing with regard to the delivery of MECC brief interventions	
I have a clear plan of how I will deliver MECC brief interventions	
It is easy to decide when to deliver MECC brief interventions in routine clinical practice	
It is possible for me to prioritize delivering MECC brief interventions	
Barriers to prioritization (2)	3.32 (.92)
Generally, other aspects of care take precedence over delivering MECC brief interventions	
Generally, there are more urgent priorities than delivering MECC brief interventions	
Fit with clinical practice (2)	3.9 (.66)
Delivering MECC brief interventions is a good fit with routine clinical practice	
It is possible for me to adapt the delivery of MECC brief interventions in routine clinical practice to my patients' needs	

TABLE 3 (Continued)

TDF domain subscale and relevant survey items (number of items)	Mean score – range 0–5 ( <i>SD</i> )
Environmental Resources (4)	3.09 (.86)
In the organization I work in, delivering MECC brief interventions is routine	
In the organization I work in, there is sufficient time to deliver MECC brief interventions	
Within my workplace there is sufficient implementation support for delivering MECC brief interventions	
Prior to delivering MECC brief interventions, staff are provided with sufficient training to deliver MECC brief interventions	
Social Influences (3)	3.75 (.71)
My colleagues are/ would be willing to support me with problems relating to delivering MECC brief interventions	
Most colleagues whose opinion I value would approve of me delivering MECC brief interventions	
Most colleagues who I respect deliver MECC brief interventions where possible	
Negative Emotions (2)	2.43 (.82)
I generally feel nervous about delivering MECC brief interventions	
Having to deliver MECC interventions adds to my feelings of stress at work	

<sup>a</sup>Reverse scored item. For subscales 'barriers to prioritization' and 'negative emotions' a higher score indicates a barrier to MECC delivery. For all other subscales a higher score indicates an enabler of MECC delivery.

### Knowledge

A higher score on 'knowledge' of MECC was significantly associated with both a higher likelihood of having ever delivered a MECC intervention (OR = 1.65 [1.17, 2.32]) and with more frequent delivery of MECC interventions ( $b = 7.95, p < .001$ ). The mean score for knowledge was 3.95 ( $SD = .69$ ) indicating that most participants were already scoring high in knowledge and that there is little room for improvement in this domain.

### Professional role

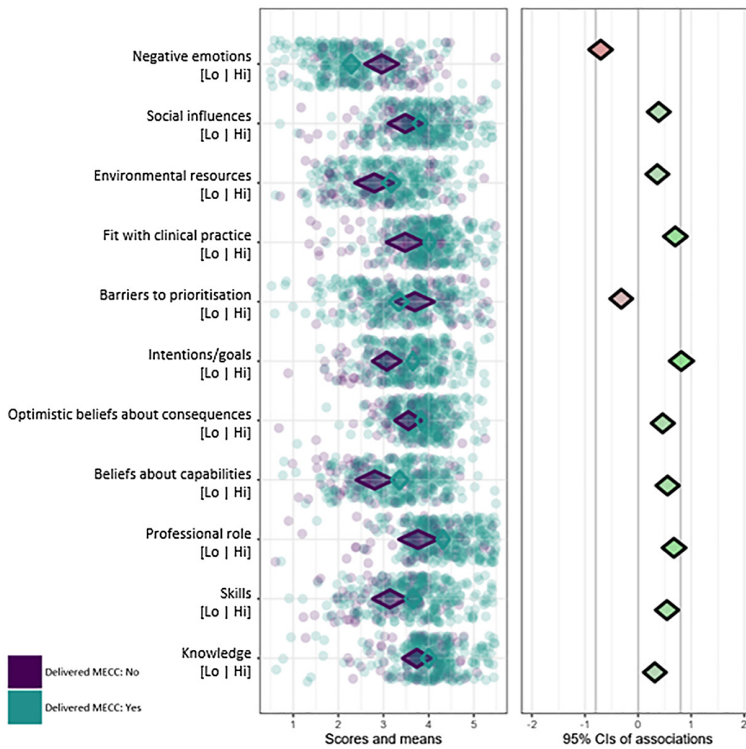
Those who reported higher scores on how MECC fitted with their 'professional role', were significantly more likely to have delivered a MECC intervention (OR = 2.99 [1.98, 4.52]) and delivered MECC more frequently ( $b = 16.0, p < .001$ ). The mean score for professional role was 4.2 ( $SD = .71$ ) indicating that scores were relatively high for this domain and there is little room for improvement in this domain.

### Optimistic beliefs about consequences

Higher 'optimistic beliefs about consequences' were significantly associated with being more likely to have delivered a MECC intervention (OR = 2.76 [1.67, 4.55]) and higher frequency of MECC delivery ( $b = 18.6, p < .001$ ). The mean score for this domain was 3.78 ( $SD = .52$ ) indicating that there is little room for improvement in scores in this domain.

### Fit with clinical practice

Higher scores on MECC's 'fit with clinical practice' were associated with a higher likelihood of participants having delivered a MECC intervention (OR = 3.40 [2.20, 5.24]) and higher frequency of MECC delivery ( $b = 19.1, p < .001$ ). The mean score for this domain was relatively high at 3.9 ( $SD = .66$ ) indicating that there is little scope for improving scores on this domain.



**FIGURE 1** Output of the Confidence Interval-based Estimation of Relevance (CIBER) analysis regarding determinants of whether participants had ever delivered a MECC intervention. Diamonds in the left-hand panel indicate the mean TDF subscale scores and corresponding 99.99% confidence interval for each TDF domain (1 = strongly disagree, 5 = strongly agree). Green dots represent health care professionals who had delivered a MECC intervention, purple dots represent those who had not ever delivered a MECC intervention. Diamonds in the right-hand panel represent the 95% confidence intervals of the associations between each determinant and whether health care professionals had ever delivered a MECC intervention.

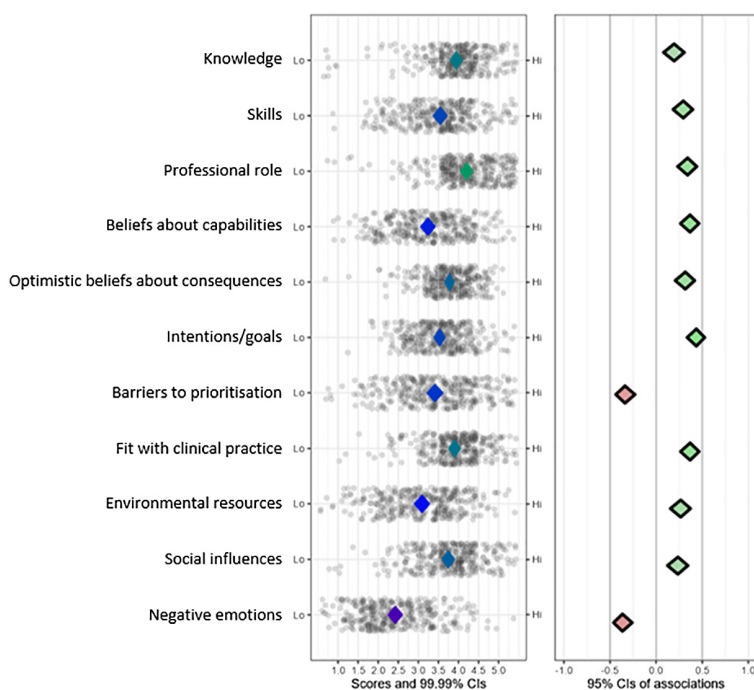
### *Social influences*

Higher scores on (positive) ‘social influences’ on MECC delivery were positively associated with an increased likelihood participants had delivered a MECC intervention (OR = 1.89 [1.32, 2.70],  $p < .001$ ) and with a higher frequency of MECC delivery ( $b = 9.84$ ,  $p < .001$ ). The mean score for this domain was 3.75 ( $SD = .71$ ) indicating that there is little room for improvement in this domain.

## Multivariate analysis

### Predicting the primary outcome: Ever delivered a MECC intervention

A logistic regression was conducted with delivery of MECC interventions (yes/no) as the outcome variable, and with attendance at the ‘Enhancing your Brief Intervention Skills’ workshop, time since completion of eLearning and the 11 domains of the TDF as predictors (see Table 4). In the multiple logistic regression (Nagelkerke's  $R^2 = .34$ ), the significant positive predictors of delivering MECC interventions were ‘professional role’ (OR = 1.86 [1.10, 3.15]) and ‘intentions/goals’ (OR = 4.75 [1.97, 11.45]); the significant negative predictor was ‘negative emotions’ (OR = .50 [.32, .77]) and ‘optimistic beliefs about consequences’ (OR = .41 [.18, .94]).



**FIGURE 2** Output of the Confidence Interval-based Estimation of Relevance (CIBER) analysis regarding determinants of how frequently participants deliver MECC interventions to patients for whom it would be appropriate to offer an intervention. Diamonds in the left-hand panel indicate the mean TDF subscale scores and corresponding 99.99% confidence intervals for each TDF domain (1 = strongly disagree, 5 = strongly agree). Diamonds in the right-hand panel represent the 95% confidence intervals of the associations between each determinant and how often health care professionals deliver a MECC intervention when appropriate to do so.

## Predicting the secondary outcome: The proportion of times participants reported delivering a MECC intervention when deemed appropriate

A multiple regression analysis was conducted with the proportion of times participants reported delivering a MECC intervention when deemed appropriate and attendance at the 'Enhancing your Brief Intervention Skills' (yes/no) workshop and the 11 domains of the TDF as predictors (see Table 5). In the multiple regression ( $R^2 = .29$ ), the significant positive predictors of frequency of MECC delivery were intentions/goals ( $b = 10.16, p = .02$ ) and professional role ( $b = 6.72, p = .03$ ). The significant negative predictors are 'negative emotions' ( $b = -4.74, p = .04$ ) and 'barriers to prioritisation' ( $b = -5.00, p = .01$ ).

## DISCUSSION

Behaviour-linked risk factors have been identified as the 'epidemic of the 21<sup>st</sup> century' by the World Health Organization (World Health Organization, 2012). Health care professionals can play an important role in promoting healthy behaviour by delivering behaviour change interventions during consultations with their patients. There is evidence that such interventions can be successful in promoting healthy behaviour and improving health outcomes. Furthermore, current clinical guidelines endorse the delivery of behaviour change interventions to reduce the incidence of chronic diseases (National Institute for Health and Clinical Excellence, 2014). While we know that health care professionals have previously reported a lack of confidence and competence in holding health behaviour change conversations with patients (Bright et al., 2021), it has been shown that it is possible to significantly improve confidence,

**TABLE 4** Logistic regression of predictor variables associated with the primary outcome, having delivered a MECC intervention (with significant predictors in bold font).

Predictor	Estimate	SE	Z	p	Odds ratio	95% CI lower	95% CI upper
Intercept	-4.42	2.21	-2.01	.05	.01	.00	.91
Attended enhancing brief intervention skills workshop (yes/no)	.06	.39	.15	.88	1.06	.50	2.26
<b>Negative emotions</b>	<b>-.69</b>	<b>.22</b>	<b>-3.12</b>	<b>.00</b>	<b>.50</b>	<b>.32</b>	<b>.77</b>
Social influences	-.12	.32	-.36	.72	.89	.48	1.67
Environmental resources	-.36	.29	-1.27	.21	.70	.40	1.22
Fit with clinical practice	.54	.32	1.70	.09	1.71	.92	3.19
Barriers to prioritization	.28	.22	1.27	.20	1.32	.86	2.05
<b>Intentions/goals</b>	<b>1.56</b>	<b>.49</b>	<b>3.48</b>	<b>&lt;.00</b>	<b>4.75</b>	<b>1.97</b>	<b>11.45</b>
<b>Optimistic beliefs about consequences</b>	<b>-.89</b>	<b>.42</b>	<b>-2.10</b>	<b>.04</b>	<b>.41</b>	<b>.18</b>	<b>.94</b>
Beliefs about capabilities	.17	.26	.65	.52	1.18	.71	1.97
<b>Professional role</b>	<b>.62</b>	<b>.27</b>	<b>2.33</b>	<b>.02</b>	<b>1.86</b>	<b>1.10</b>	<b>3.15</b>
Skills	.22	.26	.84	.40	1.24	.75	2.06
Knowledge	.12	.25	.47	.64	1.13	.68	1.86
Year completed MECC eLearning							
2019–2018	.21	.54	.38	.70	1.23	.43	3.55
2020–2018	-.24	.53	-.45	.65	.79	.28	2.24
2021–2018	-.75	.60	-1.25	.21	.47	.15	1.53

**TABLE 5** Linear regression of predictor variables associated with frequency of MECC delivery (with significant predictors in bold font).

Predictor	b	SE	95% confidence interval		T	p	$\beta$
			Lower	Upper			
Intercept <sup>a</sup>	1.01	22.56	-43.42	45.44	.04	.96	
Attended enhancing brief intervention skills workshop (yes/no)	-2.65	3.46	-9.46	4.15	-.77	.44	-.09
<b>Negative emotions</b>	<b>-4.74</b>	<b>2.33</b>	<b>-9.32</b>	<b>-.16</b>	<b>-2.04</b>	<b>.04</b>	<b>-.13</b>
Social influences	.98	2.75	-4.43	6.40	.36	.72	.02
Environmental resources	-.78	2.55	-5.80	4.23	-.31	.76	-.02
Fit with clinical practice	4.15	3.59	-2.91	11.22	1.16	.25	.08
<b>Barriers to prioritization</b>	<b>-5.00</b>	<b>1.81</b>	<b>-8.53</b>	<b>-1.39</b>	<b>-2.73</b>	<b>.01</b>	<b>-.16</b>
<b>Intentions/goals</b>	<b>10.16</b>	<b>4.32</b>	<b>1.66</b>	<b>18.67</b>	<b>2.35</b>	<b>.02</b>	<b>.20</b>
Optimistic beliefs about consequences	-4.37	4.45	-13.13	4.40	-.98	.33	-.07
Beliefs about capabilities	4.15	2.42	-.62	8.92	1.71	.09	.12
<b>Professional role</b>	<b>6.72</b>	<b>3.10</b>	<b>.63</b>	<b>12.82</b>	<b>2.17</b>	<b>.03</b>	<b>.14</b>
Skills	.38	2.60	-4.74	5.50	.15	.89	.01
Knowledge	-.17	2.41	-4.91	4.57	-.07	.94	-.00
Year completed MECC eLearning							
2019–2018	1.29	4.46	-7.50	10.08	.29	.77	.05
2020–2018	-2.76	4.70	-12.02	6.50	-.59	.59	-.10
2021–2018	.58	5.89	-11.02	12.18	.10	.92	.02

<sup>a</sup>Represents reference level.

competence and intention to deliver behaviour change interventions as a result of skills training (Bull & Dale, 2021).

The National MECC Programme in Ireland is novel as it is a rare example of a national standardized programme aiming to train and support a broad range of health care professionals. Understanding the enablers and barriers of the implementation of this programme adds to our knowledge base. This knowledge is essential for enhancing the implementation of the programme in Ireland, as well as providing useful information to guide the implementation of similar programmes elsewhere.

This is the first study to our knowledge to examine quantitatively the determinants of engaging in a national programme of brief intervention delivery among a broad range of health care professionals. We have used a comprehensive framework of determinants of behaviour—the Theoretical Domains Framework—to identify and quantify barriers and enablers to MECC implementation among health care professionals who had completed the MECC training. Around 80% of participants reported that they had delivered a MECC intervention at least on one occasion after completing MECC eLearning; however, it is concerning that around a fifth of those in our study had never delivered a MECC intervention, despite attending training. This confirms previous research that there are missed opportunities for brief intervention delivery (Keyworth et al., 2018).

Further missed opportunities are clear from our data around frequency of delivery. We found that health care professionals considered it would be appropriate to offer MECC brief interventions to just under two thirds of the patients they see in a typical week and reported delivering MECC interventions to just over half of these. These findings are similar to those reported in the United Kingdom, where Keyworth et al. (2018) found that health care professionals reported that they considered that 55.9% of patients whom they saw in a typical week would benefit from a behaviour change intervention and that they delivered interventions on only a half of such occasions.

All 11 TDF domains were significantly associated with both whether participants had ever delivered a MECC intervention and how frequently they deliver MECC interventions. In particular, six predictive domains had substantial room for improvement in scores, including: 'intentions and goals', 'barriers to prioritisation', 'environmental resources', 'beliefs about capabilities', 'negative emotions' and 'skills'.

In our multivariate analysis, the significant enablers of ever having delivered a MECC intervention were 'professional role' and 'intentions/goals'. 'Optimistic beliefs about consequences' and 'negative emotions' were significant barriers. It should be noted that 'optimistic beliefs about consequences' was a significant positive enabler of MECC delivery in bivariate analyses. In our multivariate analysis, the significant barriers to frequency of MECC delivery were 'negative emotions' and 'barriers to prioritisation'. The significant enablers were 'intentions/goals' and 'professional role'.

In our multivariate analyses, three common significant predictors were found for our primary and secondary outcome measures ('intentions/goals', 'professional role' and 'negative emotions'). One key difference between our predictors of our primary outcome measure (having ever delivered a MECC intervention) versus our secondary outcome (frequency of MECC delivery) in our multivariate analysis was that barriers to prioritization was relevant to frequency of MECC delivery and not whether participants had ever delivered a MECC intervention. Health care professionals may have had the opportunity to try MECC out once but using MECC frequently may be hampered by barriers to prioritization.

The enablers and barriers identified in our study mirror those reported in previous research. A previous qualitative study with health care professionals in the United Kingdom (Keyworth et al., 2019) which also used the TDF to explore barriers and enablers to delivery of brief behaviour change interventions identified four domains which were important in intervention delivery: environmental context and resources, beliefs about consequences, beliefs about capabilities and social and professional role and identity. All of these factors emerged as important within our survey.

'Intentions and goals' emerged as the strongest predictor of delivery of MECC interventions and frequency of MECC delivery. Also, there was significant room for improvement within this domain. Those who reported that they had a clear plan in relation to delivery of MECC and that they keep track of their delivery were more likely to deliver MECC interventions and delivered them more frequently. This suggests that future interventions to improve implementation, and increase delivery, could focus

on supporting health care professionals to plan for MECC intervention delivery, monitor their use of MECC interventions, and develop habits around MECC implementation. Given the variety in participant responses around documenting and recording of MECC delivery, focusing MECC training and resources on supporting health care professionals to document their interventions may support them to enhance their intentions and goals.

'Professional role' was also an important enabler of MECC delivery in our study, as has been identified in previous research (Bouma et al., 2022; Keyworth et al., 2019; Yamada et al., 2015). Those who considered the delivery of MECC interventions as consistent with their health care professional role, were more likely to deliver MECC interventions and delivered them more frequently. A systematic review of delivery of behaviour change interventions (Keyworth et al., 2020b), found that often health care professionals see the introduction of discussions about health behaviours as outside their disciplinary area of expertise and therefore beyond the scope of the consultation. In our current sample, we did not identify much room for improvement in participants score on 'professional role'. This may be because our sample, those who signed up to MECC training, were more likely than health professionals more generally to feel that MECC was consistent with their professional role. However, this could be an important factor to target when encouraging a broader range of health care professionals to sign up to MECC training.

'Negative emotions'—where health care professionals reported that delivering MECC made them feel nervous and added to their work-related stress—was identified as an important barrier to MECC delivery. Relatedly, 'skills' were an important enabler of MECC delivery. Both of these domains were identified as areas for possible improvement. There is evidence to suggest that health care professionals often find discussing health behaviour change with their patients difficult (Gott, 2004; Michie, 2007; Vogt et al., 2005). Increasing clinician skill in communication around behaviour change has the potential to reduce these negative emotions and empower health care professionals to deliver more effective and less stressful consultations, including training in strategies such as using positive reinforcement to raise patients' confidence and to support health care professionals in being non-judgemental (Keyworth et al., 2020a). Strategies that health care professionals can use to enhance the acceptability of health behaviour change conversations include delivering health behaviour change talk in a general, non-personal way, and avoiding approaches which engender resistance (Albury et al., 2019). Skills training is also likely to enhance participants' 'beliefs about capabilities' (Schröder et al., 2020).

However, it must be noted that 21% of our sample who had completed MECC eLearning did not deliver a MECC intervention. As identified in previous literature, training alone may not be sufficient to increase MECC delivery (Malan et al., 2015). Interventions to enhance motivation to engage in MECC and health care professionals' opportunity to do so may also be important.

While training is clearly important to support health care professionals in relation to developing skills, reducing negative emotions and enhancing participants' beliefs about capabilities, our study also shows that broader workplace stresses and environments affect MECC delivery. 'Barriers to prioritisation', such as competing time pressures, demands and tasks, were identified as obstacles to MECC intervention delivery. The barrier of behaviour change interventions not being seen as high enough priority within clinical consultations has been previously highlighted in a systematic review of interventions (Alageel et al., 2018; Keyworth et al., 2020b).

We also found that health care professionals generally rated poor 'environmental resources'—including not having sufficient time, support or training—as an important barrier to MECC delivery, and we identified significant room for improvement in this domain. The challenges of delivering behaviour change interventions within time pressured consultations is commonly reported (Elwell et al., 2013; Keyworth et al., 2019; Malan et al., 2015; Um et al., 2013) and is an important consideration for interventions to enhance MECC delivery.

Those who reported 'optimistic beliefs about consequences' (a strong belief about the effectiveness of MECC), were more likely to have delivered a MECC intervention and to deliver MECC interventions more frequently. Previous research suggests that health care professionals do not believe interventions will be effective in changing patients' behaviour (Dewhurst et al., 2017). However, in our sample, participants generally had optimistic beliefs about consequences, and there was not much room for improve-



ment in scores on this domain. To encourage other health care professionals to take up MECC training, it may be useful for the MECC team to highlight evidence demonstrating the effectiveness (Lamming et al., 2017; Stead et al., 2013; Whatnall et al., 2018), and cost effectiveness (National Institute for Health and Clinical Excellence, 2014) of brief behaviour change interventions. Also, health care professionals could be advised about the growing evidence that patients value such conversations with health care professionals (Aveyard et al., 2012; Keyworth et al., 2020a).

Strengths of this study include that it is the first to examine quantitatively the determinants of engaging in a national, standardized programme of brief intervention delivery among a broad range of health care professionals. This survey is one study within a programme of research, which uses an integrated knowledge translation approach, bringing together academic researchers with implementation and health psychology expertise, knowledge users with strategic and context-specific knowledge, patient and public contributors and health care professionals to optimize MECC implementation. A strength of this research is that its findings will be used directly to impact the delivery of MECC by developing an evidence base and implementation blueprint to support the integration of brief behaviour change interventions into the Irish health system.

However, the study also has a number of limitations. These include that the sample may not be representative of national health care professional populations, due to the nature of the sample (recruited through the list of people who completed MECC training). Also, our survey response rate at 8.8% is relatively small and falls short of our target 10% response rate. The study may have been under powered to detect large effects. It is also likely that participants in the survey chose to participate as they have some particular interest in MECC and therefore may not represent the views of the population more widely. The survey was conducted during the COVID-19 pandemic, which may have affected participants' responses. A further limitation of this cross-sectional study is that there was variation in the time since participants had completed MECC training. Future prospective research could determine duration of intervention effect and identify when top-up training might be required.

In conclusion, this study has identified a number of promising areas for future interventions to enhance brief intervention delivery. In particular, supporting health care professionals to set intentions and goals around brief intervention delivery is a promising strategy. This could be achieved through enhanced systems for planning, documenting and recording MECC delivery. Provision of training which increases communication skills and enhances health care professionals' perceptions around their own ability to deliver interventions are likely to increase intervention delivery. Such training should include information about the effectiveness of brief behavioural interventions and evidence that patients' value behaviour change discussions (Aveyard et al., 2016). Such information may be useful in alleviating some of the negative emotions associated with MECC delivery. Finally, it is essential that the work environment of any health care professional is conducive to, and supportive of, MECC delivery. Where a health care professional believes that MECC intervention delivery is part of their role and is routine practice within their service, they are more likely to deliver interventions. Health care professionals need adequate time and support to prioritize brief behavioural intervention delivery.

## AUTHOR CONTRIBUTIONS

**Oonagh Meade:** Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; validation; visualization; writing – original draft; writing – review and editing. **Maria O'Brien:** Conceptualization; funding acquisition; supervision; writing – original draft; writing – review and editing. **Chris Noone:** Data curation; formal analysis; investigation; methodology; validation; visualization; writing – original draft; writing – review and editing. **Agatha Lawless:** Conceptualization; methodology; project administration; writing – original draft; writing – review and editing. **Jenny McSharry:** Conceptualization; funding acquisition; methodology; writing – original draft; writing – review and editing. **Helen Deely:** Methodology; writing – review and editing. **Jo Hart:** Funding acquisition; methodology; writing – review and editing. **Catherine B. Hayes:** Funding acquisition; methodology; writing – review and editing. **Chris Keyworth:** Funding acquisition; methodology; writing – review and editing. **Kim Lavoie:** Funding acquisition; methodology; writing –

review and editing. **Orla McGowan**: Writing – review and editing. **Andrew W. Murphy**: Funding acquisition; methodology; writing – review and editing. **Patrick J. Murphy**: Funding acquisition; methodology; writing – review and editing. **Orlaith O'Reilly**: Conceptualization; funding acquisition; methodology; writing – review and editing. **Molly Byrne**: Conceptualization; formal analysis; funding acquisition; investigation; methodology; project administration; supervision; validation; writing – original draft; writing – review and editing.

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## CONFLICT OF INTEREST STATEMENT

No competing interests were disclosed.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available on the Open Science Framework project 'Enhancing the implementation of the Making Every Contact Count brief behavioural intervention programme in Ireland - the "Making Mecc Work" project' (Meade et al., 2022b).

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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