Behaviour Change Update: Stage 1

BCT analysis of existing, cost-effective interventions

Lion Shahab, PhD Emma Beard, PhD Benjamin Gardner, PhD

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1. Executive Summary

Seventy-nine cost-effective interventions across six different health behaviours (smoking cessation, diet, physical activity, alcohol, sexual health, multiple behaviour targets) were identified from 23 economic reports. Interventions were mainly of high intensity, set in primary care or the community, delivered by health professionals and aimed at individuals from the general population, involving pharmacological or other forms of support. Education, enablement, training and persuasion were the focus of the majority of interventions, clustering around BCTs concerning: shaping knowledge; goals and planning; social support; antecedents and natural consequences of behaviour; outcome comparison; and feedback and monitoring. Interventions included an average of ten BCTs with 'instructions on how to perform a behaviour', 'unspecified social support', 'information about health consequences' and 'problem solving' included in 81%, 67%, 57% and 53% of interventions, respectively. While the use of 'choice architecture' was common, being present in 71% of cost-effective interventions, prevalence was lower (29%) when stricter criteria to define 'choice architecture' were applied. Sexual health interventions were least cost-effective but no other characteristics or BCTs were related to cost-effectiveness estimates. However, these findings need to be interpreted cautiously given 1.) the limitations imposed by considering only cost-effective interventions in this report, 2.) the reliance on often incomplete information in published papers (possibly not accurately reflecting intervention content) and 3.) the lack of consensus for a definition of 'choice architecture'.

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3. Background

NICE has received a referral to update its guidance on behaviour change. The update will focus on evidence-based, individual-level behaviour-change techniques and interventions based on modifying the decision environment (or 'choice architecture') specifically in relation to smoking, alcohol, diet, physical activity and sexual health. It will include individual interventions for different population groups aged 16 years and older. There will be a particular emphasis on the techniques and skills practitioners require to help people sustain their new behaviour.

NICE uses economic analyses to compare the costs and benefits of an intervention to determine whether it provides value for money. The overall aim is to maximise the benefits relative to the resources available. The main method used by NICE is cost utility analysis which considers the length of life someone will gain, adjusted for quality of life experienced, as a result of intervening in a particular way (i.e. the 'quality-adjusted life year'; QALY). Other methods such as cost consequence analysis or cost benefit analysis may be used as appropriate.

Three reviews have been commissioned to inform the development of an update of the guidance on behaviour change (undertaken by Bazian). It is anticipated that a number of the interventions and behaviour change techniques (BCTs) that are likely to be identified in these reviews will be covered by NICE's existing economic analyses. However, it is also recognised that the three reviews might identify interventions and BCTs not already considered by NICE.

For the updated guidance a four-step approach to the economic analysis is proposed which seeks to maximise the use of existing evidence whilst ensuring there are no significant gaps. Should any significant gaps be identified, it may be possible to use NICE's existing models to fill those gaps. Should existing economic analyses and models be insufficient, a bespoke analysis will be commissioned to supplement existing analyses.

Stage 1

The first stage entails an analysis of interventions already assessed by NICE as cost effective with the aim of identifying and classifying the behaviour change techniques therein, including whether they are based on choice architecture. This analysis together with stage 2 will be used to determine whether there are any significant gaps that need to be addressed with a commissioned piece of work.

Stage 2

In stage 2, which will run contemporaneously with stage 1, the searches developed by Bazian and the NICE team for the effectiveness reviews will be adapted and run by NICE information services in the economic databases ECONLIT, NHS EED and HEED. The aim of this stage is to

determine whether there are any studies of cost effectiveness that address the areas covered by the effectiveness reviews.

Stage 3

The outputs from stage 1 and 2 will be used to determine whether there are any significant gaps in the interventions and behaviour change techniques in NICE's existing economic evidence base which need to be addressed to support the development of the guidance. If timelines allow, information from the effectiveness searches will also inform this stage.

Stage 4

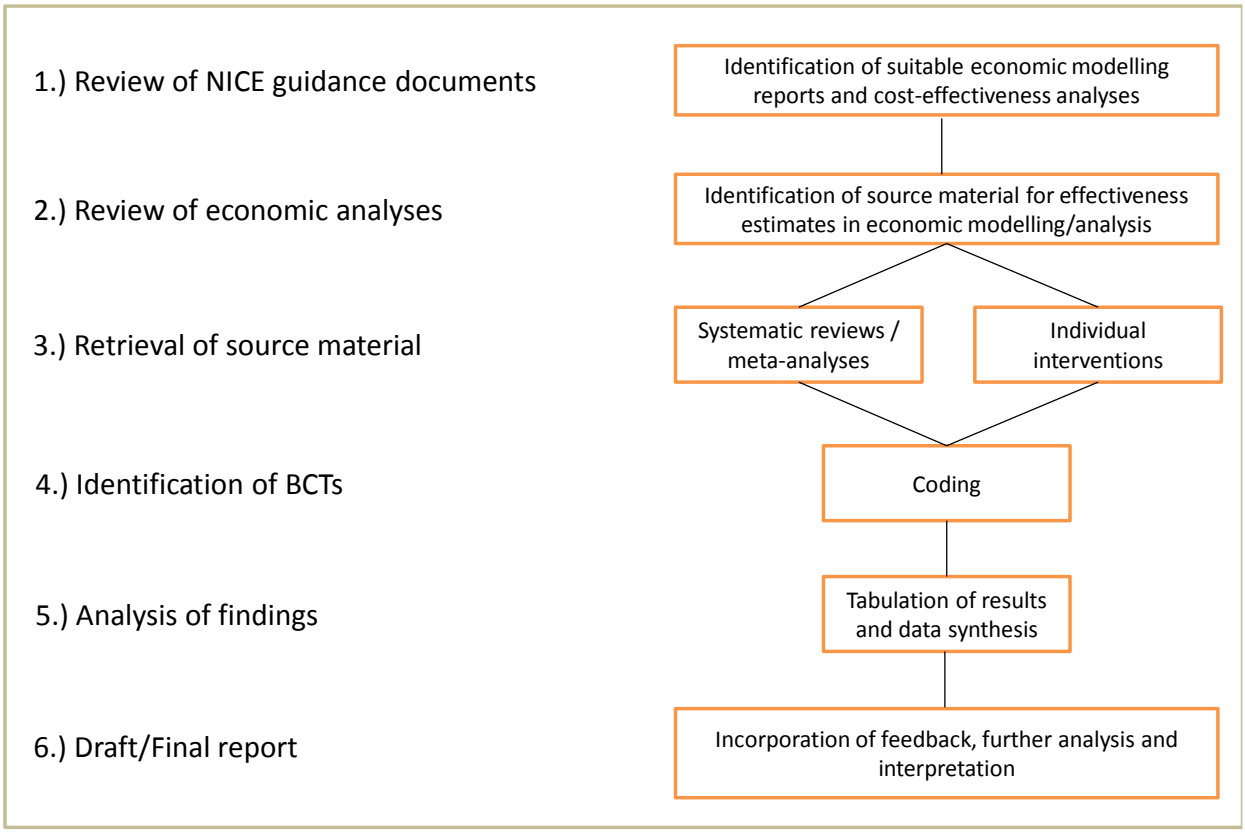
The last stage will synthesize relevant existing NICE economic analyses and, if necessary, supplement these with a bespoke (commissioned) analysis to fill any significant gaps

The current report represents findings from Stage 1 of this process.

4. Methodology

The sequence of steps taken in the production of this report is provided in Figure 1.

FIGURE 1: REPORT PROCEDURE



4.1 Review of NICE guidance documents

Given the focus of this report on BCTs, NICE guidance documents relevant to behaviour change, focusing across six behavioural domains (smoking, diet, physical activity, alcohol, sexual health and multiple health behaviours), were searched. Nineteen relevant NICE guidance documents, listed below, were identified.

Smoking:

- PH1 Brief interventions and referral for smoking cessation
- PH5 Workplace interventions to promote smoking cessation
- PH10 Smoking cessation services

- PH15 Identifying and supporting people most at risk of dying prematurely
- PH26 Quitting smoking in pregnancy and following childbirth

Diet:

- PH11 Maternal and child nutrition
- PH27 Weight management before, during and after pregnancy

Physical activity:

- PH2 Four commonly used methods to increase physical activity
- PH8 Physical activity and the environment
- PH13 Promoting physical activity in the workplace
- PH17 Promoting physical activity for children and young people

Alcohol:

- PH7 School-based interventions on alcohol
- PH24 Alcohol use disorders: preventing harmful drinking

Sexual Health:

- PH3 Prevention of sexually transmitted infections and under 18 conceptions[2]
- PH33 increasing the uptake of HIV testing among black Africans in England
- PH34 Increasing the uptake of HIV testing among men who have sex with men

Multiple Health Behaviours:

- PH6 Behaviour change
- PH25 Prevention of cardiovascular disease
- PH35 Preventing type 2 diabetes

4.2 Review of economic analyses

Each NICE guidance document has one or more economic analyses associated with it, mostly in the form of economic modelling reports., and these were used to identify interventions for coding. Where these were not available, cost-effectiveness analyses were retrieved. A total of 23 economic reports were identified (see Appendix 1 for details).[1] Economic reports

[1] With the exception PH6, PH7, PH17, PH33 and PH34, which provided systematic, narrative reviews of the cost-effectiveness literature, all NICE guidance had an economic modelling report associated with it.

were searched for interventions, focusing only on individuals aged 16 years or above, which showed evidence of cost-effectiveness[2]. This yielded a total 79 interventions considered to be cost-effective or likely to be cost-effective according to the NICE threshold (see Appendix 1 for details).[3] Cost-effectiveness information was extracted where available, mostly in the form of incremental cost-effectiveness ratios (ICER)[4], measured in cost per disability or quality-adjusted life years gained[5]. Data were derived directly or calculated from figures in reports (reported costs of interventions and incremental QALY), representing costs for the average intervention user and, where necessary, converted into GBP at time of original analysis. As some of the economic analyses carried out sensitivity analysis, varying cost-effectiveness estimates based on varies factors such as user characteristics, both lower (most optimistic) and upper (most pessimistic) limits of cost-effectiveness estimates were recorded where available. In cases where no such sensitivity analysis was carried out, the single cost-effectiveness estimate was included as both the lower and upper limit.[6] In addition, based on descriptions in economic reports, interventions were characterised according to a number of broad categories derived by consensus among the authors of this report, outlined below:

Intervention intensity (low; medium; high): *Low*: one face-to-face contact or other direct contact lasting up to 5 minutes or any non-specific (impersonal, e.g. through media) contact; *Medium:* one face-to-face contact or other direct contact lasting more than 5 minutes, or one face-to-face contact or other direct contact lasting up to 5 minutes on more than one occasion; *High:* any face-to-face contact or other direct contact lasting more than 5 minutes on more than one occasion.

[2] The National Institute for Health and Clinical Excellence (NICE) evaluates the effectiveness as well as cost-effectiveness of treatments so as to make recommendations about the implementation in the UK National Health Service [1]. NICE has adopted a cost-effectiveness threshold of £20,000-£30,000 per QALY above which interventions are unlikely to be recommended. However, there is debate about the correct level of this threshold which is considered implicit rather than explicit [2] and varies enormously between countries [3]. In fact, in NHS settings the cost-effectiveness threshold for circulatory diseases and cancers is below £20,000 [4] whilst NICE recommendations in practice have a much higher threshold [5].

[3] As the remit of this report is on cost-effective interventions, it does not consider interventions that were found be cost-ineffective and therefore not included here. We note, however, that there were some intervention types that straddled the boundary of what is considered cost-effective, depending on the assumptions applied (notably some sexual health interventions reported in PH3, multiple health behaviour interventions reported in PH25, diet interventions reported in PH27). In addition, not all reports had economic modelling analyses associated with them and instead included systematic, narrative reviews of cost-effectiveness analyses of individual interventions, some of which were not cost-effective or, due to lack of data, judged unlikely to be cost-effective (described in PH6, PH7, PH11, PH17 and PH34).

[4] Cost effectiveness compares the impact of two or more alternative courses of action with regards to their costs and benefits. Within the health care setting such cost-effectiveness analysis (CEA) usually focuses on the additional cost per additional unit of health gain created by one compared with another intervention: the incremental cost-effectiveness ratio (ICER) [6].

[5] CEA uses either life-years (LY) or quality/disability adjusted life years (QALY/DALY) gained [7]. The former simply counts the additional years added to a person's life due to an intervention while the latter weights these years according to the perceived life quality in terms of a number of factors such as pain/discomfort, mobility and mental well-being [8]. Each QALY/DALY is assigned a value between 1.0 (perfect health) and 0.0 (death). The fact that the worth of extended life in the future is considered to be less than if immediately realised due to the uncertainties we associate with future events is also considered in CEA [9]. Each LY or QALY/DALY is therefore discounted by a fixed amount per year, typically between 1.5%-3.5% [10].

[6] Where ICER are reported, interventions can be recorded as dominant (i.e. both less costly and more effective than the comparison condition) or dominated (i.e. both more costly and less effective than the comparison condition). For this reason, dominant interventions were recorded as £0 per QALY/DALY/LY gained and CEA estimates for dominated interventions were derived from comparison with other another control condition, if provided, or no estimate was recorded.

Setting (primary or secondary care; community, workplace or other): Interventions were classified according to the main location/physical environment in which interventions took place.

Mode of delivery (physician; health professional; media; combination; other/not specified): The main route that was used to deliver the intervention was recorded. Note that health professionals included nurses, pharmacists, psychologists, dieticians and other qualified personnel.

Target level (individual; group; population): Interventions were characterised according to the target recipient of delivery.

Supporting material (none; self-help; electronic; mixture): The use of supporting material was recorded including written (self-help) or electronic (e.g. telephone, mobile phone, computer) material.

Other categories: Interventions were also characterised according to whether they used pharmacological support, incentives or social marketing and whether they targeted the general population or vulnerable populations (e.g. pregnant women, individuals at risk of disease, those from low socio-economic groups)

Finally, interventions as described in economic reports were characterised with regards to their main functions according to the behaviour change wheel (BCW) framework [11]. Interventions could have several of the functions shown in Table 1.

TABLE 1: INTERVENTION FUNCTIONS

Intervention type	Definition	Examples
Education	Increasing knowledge or understanding	Providing information to promote healthy eating
Persuasion	Using communication to induce positive or negative feelings or stimulate action	Using imagery to motivate increases in physical activity
Incentivisation	Creating expectation of reward	Using prize draws to induce attempts to stop smoking
Coercion	Creating expectation of punishment or cost	Raising the financial cost to reduce excessive alcohol consumption
Training	Imparting skills	Advanced driver training to increase safe driving
Restriction	Using rules to reduce the opportunity to engage in the target behaviour (or to increase the target behaviour by reducing the opportunity to engage in competing behaviours)	Prohibiting sales of solvents to people under 18 to reduce use for intoxication
Environmental restructuring	Changing the physical or social context	Providing on-screen prompts for GPs to ask about smoking behaviour

Intervention type	Definition	Examples
Modelling	Providing an example for people to aspire to or imitate	Using TV drama scenes involving safe-sex practices to increase condom use
Enablement	Increasing means/reducing barriers to increase capability or opportunity[1]	Behavioural support for smoking cessation, medication for cognitive deficits, surgery to reduce obesity, prostheses to promote physical activity

Adapted from [11]

4.3 Retrieval of source material

After identification of cost-effective interventions in economic reports, the source for effectiveness estimates used in economic analyses of these interventions was identified. These could either be from publications reporting primary data pertaining to the interventions, or secondary summaries located in systematic reviews/meta-analyses. A total of 115 relevant source materials were initially identified from economic analyses (see Appendix 1). In cases where insufficient detail was provided on intervention content in systematic reviews/meta-analyses, original studies were retrieved, resulting in a total of 338 papers/reviews being reviewed (see Appendix 12).

Retrieval of source material followed a specific schedule. Material was primarily retrieved online. Where electronic versions of the articles of interest were unavailable, corresponding authors, co-authors and educational institutions within London were contacted and hard full-text copies obtained if possible. When hard copies were unavailable, interventions were coded using the information given in online abstracts and in the reviews from which they were identified.

4.4 Identification of BCTs

Interventions were coded using a taxonomy of 93 BCTs (BCT taxonomy v1) developed by Michie and colleagues [12], presented in Appendix 13. The taxonomy was developed through a process of consensus among a large expert panel of international academics and behaviour change practitioners, and aims to provide a comprehensive list of discrete generic techniques that may be used in behaviour change interventions. Techniques are included within the taxonomy if they (a) are used with the aim of changing behaviour, (b) are the proposed 'active ingredient' of an intervention, (c) are the smallest component compatible with retaining the proposed active ingredient, (d) can be used alone or in combination with other BCTs, (e) are observable and replicable, (f) can have a measurable effect on a specified behaviour, and (g) are the smallest unit that has the potential to bring about behaviour change [12].

The taxonomy remains under development, and an earlier 89-item BCT taxonomy (May 2012)[7] is being used by Bazian as part of the evidence reviews for the present NICE public health guidance update. Techniques within the taxonomy are organised hierarchically into 16 theoretical clusters: 1) social support, 2) regulation, 3) feedback and monitoring, 4) associations, 5) repetition and substitution, 6) antecedents, 7) shaping knowledge, 8) self-belief, 9) scheduled consequences, 10) reward and threat, 11) goals and planning; 12) comparison of outcomes; 13) identity, 14) natural consequences, 15) comparison of behaviour and 16) covert learning. The taxonomy includes a standard definition of and detailed coding instructions for each BCT, including examples of instances in which each BCT should or should not be coded.

Coding followed standard guidelines [13]: BCTs were coded only where coders believed that there was unequivocal evidence for their inclusion in a given intervention. In total 338 separate papers were coded across 79 interventions for six types of health behaviours (smoking, diet, exercise, alcohol use, sexual health, and multiple behaviours). A subset of 66 articles (20%) was coded in batches by a second coder with disagreements resolved through discussion after each batch. Agreement was 97%, with a mean Cohen's Kappa of 0.74, indicating good inter-rater reliability. Details of BCTs identified in each intervention according to the health behaviour targeted are provided in Appendices 2-11.

4.5 Identification of 'choice architecture'

The term 'choice architecture' as described in the popular text *Nudge* [14] has no precise, operational definition, but is generally used to refer to elements of a decisional context, and/or the configuration of those elements, that influence the behavioural decisions taken by an individual, and the modification of these which may thereby have the potential to change people's behaviours [15]. It may be defined as a collection of environmental tools that "alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives" [14]. This involves several principles including defaults, expecting error, understanding mapping, structuring complex choices and creating incentives through which decisions are influenced based on how choices are presented.

As interventions considered in this report do not generally make explicit reference to 'choice architecture', the authors of this report agreed by consensus to operationalize this construct on the basis of particular BCTs that were identified. In particular, evidence of 'choice architecture' is provided if interventions included any of the BCTs presented in Table 2. As an example, the 'nudging' commonly seen in commercial contexts such as placing sweets at the end of checkouts in supermarkets in the line of sight of children would involve

[7] Specifically, BCT taxonomy v1 differs from the 89-item BCT taxonomy (May 2012) in that one item from the 89-item taxonomy ('incentive', defined as 'inform that future rewards or removal of punishment will be contingent on performance of behaviour') has been partitioned into five discrete BCTs in BCT taxonomy v1. These are: *material incentive for behaviour* (BCT60); *material incentive for outcome* (BCT61); *social incentives* (BCT62); *non-specific incentives* (BCT63); and *self-incentives* (BCT64; these are defined in Appendix 13). As Appendices 2-11 show, three of these BCTs (61, 62, 64) were not present in any of the coded papers. BCT60 was coded in 9 papers and BCT63 in 4 papers. Aside from adding specificity to our coding, the distinction between types of incentives thus had minimal impact on our findings.

'prompts/cues' (BCT 15), in that the sweets act as a prompt to ask parents to buy them. It would also involve 'restructuring the physical environment' (BCT 30), in so far as the sweets are placed within easy reach of children, as well 'adding objects to the environment' (BCT 34). Similarly, the lack of mirrors in casinos to maintain the illusion of a glamorous lifestyle [16] may be seen as an example of reducing prompts and cues (BCT 15) or avoidance/reducing exposure to cues (BCT 32) to nudge people into a behaviour (i.e. continuing to gamble). Likewise, increasing the visual (if not actual) presence of police officers to reduce criminal behaviour provides an example of restructuring the social environment (BCT 31). Lastly, putting the emphasis on the percentage of fat-free (as opposed to fat-containing) content in various foods to persuade people to purchase items would be an example of framing/re-framing (BCT 79; see Table 2 for further examples).

TABLE 2: OPERATIONALISATION OF CHOICE ARCHITECTURE ACCORDING TO BCTS

BCT Number	Description	Definition	Examples
15	Prompts/Cues	Introduce or define environmental or social stimulus with the purpose of prompting or cueing the behaviour. The prompt or cue would normally occur at the time or place of performance	Put a sticker on the bathroom mirror to remind people to brush their teeth
16	Reduce prompts/cues	Withdraw gradually prompts to perform the behaviour (includes 'Fading')	Reduce gradually the number of reminders used to take medication
30	Restructuring the physical environment	Change, or advise to change the environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour (other than prompts/cues, rewards and punishments)	Advise to keep biscuits and snacks in a cupboard that is inconvenient to get to Arrange to move vending machine out of the school
31	Restructuring the social environment[8]	Change, or advise to change the social environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour (other than prompts/cues, rewards and punishments)	Advise to minimise time spent with friends who drink heavily to reduce alcohol consumption
32	Avoidance/ reducing exposure to cues for the behaviour	Advise on how to avoid exposure to specific social and contextual/physical cues for the behaviour, including changing daily or weekly routines	Suggest to a person who wants to quit smoking that their social life focus on activities other than pubs and bars which have been associated with smoking

[8] Note that 'restructuring the social environment' (BCT 31) does not include provision of normative information to change behaviour as this is captured by 'social comparison' (BCT 89) and/or 'information about others' approval (BCT 90) which was judged not to form part of choice architecture (but see [15] regarding the inherent problem arising from the vague definition of a 'nudge').

BCT Number	Description	Definition	Examples
34	Adding objects to the environment	Add objects to the environment in order to facilitate performance of the behaviour	Provide free condoms to facilitate safe sex Provide attractive toothbrush to improve tooth brushing technique
79	Framing/ reframing	Suggest the deliberate adoption of a perspective or new perspective on behaviour (e.g. its purpose) in order to change cognitions or emotions about performing the behaviour (includes 'Cognitive restructuring')	Suggest that the person might think of the tasks as reducing sedentary behaviour (rather than increasing activity)

Adapted from [12]

However, given the lack of a clear definition of 'choice architecture' and nudging, in sensitivity analysis 'choice architecture' was restricted to those BCTs in Table 2 that were significantly correlated across all interventions, suggesting that they relate to the same underlying construct.

4.6 Analysis of findings

Data from economic reports were recorded in a MS Word file and individual papers were analysed and BCT recorded in a standardised coding form before being transferred into a MS Word file. All data were then entered into IBM SPSS v.20. Descriptive statistics were used to describe interventions and associated BCTs. Where appropriate, differences according to intervention characteristics were analysed using t-tests or one-way ANOVAs and χ^2- or Fisher Exact tests for continuous and categorical variables, respectively. Forced entry, forward and backward multiple linear regression analyses were carried out to evaluate the independent association of intervention characteristics and the presence of BCTs with cost-effectiveness estimates. The Tukey correction was applied in post hoc analyses.

5. Results

5.1 General characteristics of interventions

Overall, 79 cost-effective interventions were identified. Over half of these (41) were smoking cessation interventions. This was followed by alcohol interventions (10), interventions for physical activity (8), interventions for diet (7) or to improve sexual health (7) and interventions with multiple health targets (6). Table 3 provides broad characteristics of these interventions (see Appendix 1 for further details of individual interventions). Nearly half of interventions were classified as being of high intensity, mainly set in primary care or the community and delivered by health professionals. Interventions mostly targeted individuals from the general population. About half of interventions used some form of supporting material and a third pharmacological support. The use of specific incentives or social marketing was relatively uncommon.

TABLE 3: INTERVENTION CHARACTERISTICS BY HEALTH BEHAVIOUR

	All (N=79)	Smoking (N=41)[1]	Diet (N=7)[2]	Physical Activity (N=8)[3]	Alcohol (N=10)[4]	Sexual Health (N=7)[5]	Multiple health targets (N=6)[6]	P*
				% (N)				
Intervention Intensity								
Low	**36.7 (29)**	36.6 (15)	14.3 (1)	62.5 (5)	50.0 (5)	28.6 (2)	16.7 (1)	0.456
Medium	**16.5 (29)**	17.1 (7)	0 (0)	12.5 (1)	20.0 (2)	28.6 (2)	16.7 (1)	
High	**46.8 (37)**	46.3 (19)	85.7 (6)	25.0 (2)	30.0 (3)	42.9 (3)	66.7 (4)	
Setting		a,b	a	a,b	a,b	b	a,b	
Primary Care	**34.2 (27)**	41.5 (17)	0 (0)	12.5 (1)	10.0 (1)	85.7 (6)	33.3 (2)	*0.028*
Secondary Care	**2.5 (2)**	2.4 (1)	0 (0)	0 (0)	10.0 (1)	0 (0)	0 (0)	
Community	**26.8 (21)**	22.0 (9)	71.4 (5)	37.5 (3)	10.0 (1)	14.3 (1)	33.3 (2)	
Workplace	**13.9 (11)**	14.6 (6)	0 (0)	37.5 (3)	20.0 (2)	0 (0)	0 (0)	
Other[≠]	**22.8 (18)**	19.5 (8)	28.6 (2)	12.5 (1)	50.0 (5)	0 (0)	33.3 (2)	
Delivery Mode		a	a,b	a,b	b	a,b	a,b	
Physician	**12.7 (10)**	14.6 (6)	0 (0)	0 (0)	20.0 (2)	14.3 (1)	16.7 (1)	*0.002*
HP	**48.1 (38)**	53.7 (22)	71.5 (5)	37.5 (3)	10.0 (1)	71.4 (5)	33.3 (2)	
Media	**5.1 (4)**	9.8 (4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Mix	**13.9 (11)**	17.1 (7)	0 (0)	12.5 (1)	0 (0)	0 (0)	50.0 (3)	
Other[±]	**20.3 (16)**	4.9 (2)	28.6 (2)	50.0 (4)	70.0 (7)	14.3 (1)	0 (0)	
Target Level		a	a,b	a,b	b	a,b	b	
Individual	**69.6 (55)**	82.9 (34)	71.4 (4)	62.5 (5)	30.0 (3)	100 (7)	16.7 (1)	*0.008*
Groups	**12.7 (10)**	9.8 (4)	14.3 (1)	12.5 (1)	20.0 (2)	0 (0)	33.3 (2)	
Population	**17.7 (14)**	7.3 (3)	14.3 (1)	25.0 (2)	50.0 (5)	0 (0)	50.0 (3)	
Population								
General	**68.4 (54)**	63.4 (26)	42.9 (3)	100 (8)	70.0 (7)	100 (7)	50.0 (3)	0.063
Vulnerable	**31.6 (25)**	36.6 (15)	57.1 (4)	0 (0)	30.0 (3)	0 (0)	50.0 (3)	

	All (N=79)	Smoking (N=41)[1]	Diet (N=7)[2]	Physical Activity (N=8)[3]	Alcohol (N=10)[4]	Sexual Health (N=7)[5]	Multiple health targets (N=6)[6]	*P**
Supporting Material								
None	**54.4 (43)**	46.3 (19)	85.7 (6)	62.5 (5)	80.0 (8)	57.1 (4)	16.7 (1)	0.504
Self-help	**32.9 (26)**	34.1 (14)	14.3 (1)	25.0 (2)	20.0 (2)	42.9 (3)	66.7 (4)	
Electronic	**3.8 (3)**	7.3 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Mix	**8.9 (7)**	12.2 (5)	0 (0)	12.5 (1)	0 (0)	0 (0)	16.7 (1)	
Pharmacological support	**34.2 (27)**	58.5 (24)[a]	14.3 (1)[a,b]	0 (0)[b]	0 (0)[b]	14.3 (1)[a,b]	16.7 (1)[a,b]	*<0.001*
Social marketing	**12.7 (1)**	12.2 (5)	0 (0)	12.5 (1)	10.0 (1)	0 (0)	50.0 (3)	0.085
Incentives	**15.2 (12)**	14.6 (6)	0 (0)	25.0 (2)	20.0 (2)	14.3 (1)	16.7 (1)	0.841
Cost-effectiveness^				*Mean (SEM)*				
Lower Estimate[$]	**£2,046 (460)[a]**	£1,017 (191)[a]	£4,125 (1,830)[a]	£276 (91)[a]	£1,614 (1,614)[a]	£9,857 (3,406)[b]	£1,683 (1,093)[a]	*<0.001*
Upper Estimate[$]	**£5,792 (1,688)[a]**	£1,803 (282)[a]	£10,982 (6,271)[a]	£1,231 (363)[a]	£3,621 (2,272)[a]	£31,503 (15,008)[b]	£9,636 (6,577)[a]	*<0.001*

HP Health professional (nurse, pharmacist, psychologist etc); [1]From 6 economic reports; [2]From 4 economic reports; [3]From 4 economic reports; [4]From 2 economic reports; [5]From 3 economic reports; [6]From 4 economic reports; *Significant overall differences are in italics; [≠]This refers to state/policy level interventions (.e.g. changes in legislation or physical infrastructure) or interventions in non-specific settings (e.g. online/phone interventions), [±]This refers to delivery by peers, teachers, researchers or the state;^in £/QALY or DALY saved (For seven interventions - the use of peer support to improve diet, a family-based behavioural treatment for physical activity, three comprehensive programmes to reduce alcohol consumption and the decrease in outlet density to curb alcohol use, a peer education and recruitment programme to improve sexual health - no estimates were provided); [$]A breakdown of the number of interventions below either the £20,000 or £30,000 per QALY/DALY threshold is provided in Appendix 14; [a,b] Different letters indicate significant difference at p<0.05 (Tukey-corrected)

All interventions fell below the accepted £20,000-£30,000 per QALY/DALY saved cost-effectiveness threshold, although sensitivity analyses suggested that some interventions may have ICER compared with standard interventions that lie above this threshold (see Appendix 14).

There were some differences between health behaviour interventions. While diet interventions were mostly set in the community, interventions to improve sexual health were predominantly based in primary care; there were no other significant differences in post-hoc analysis, adjusting for multiple comparisons (Table 3). Post-hoc analysis also showed that while most interventions were delivered by health professionals or physicians, smoking interventions in particular differed from alcohol interventions which, like physical activity interventions, were primarily delivered by other means, mostly by the state, i.e. to change legislation or the physical infrastructure. Interventions for alcohol consumption and those targeting multiple health behaviours were often population-wide, differing from other health behaviour interventions (particularly those targeting smoking), which mostly operated at the level of individuals or groups (Table 3). Smoking cessation interventions were also much more likely to involve pharmacological support than most other interventions. Even though all interventions fell below the accepted cost-effectiveness threshold, compared with interventions focusing on other health behaviours, those that

aimed to improve sexual health were on average least cost-effective ($F(5, 71)=9.7$, $p<0.001$ for the lower estimate and $F(5,66)=7.0$, $p<0.001$ for the higher estimate; see Table 3).

5.2 Main functions of interventions

Overall, the most common functions, identified in over three quarters of interventions, were to increase knowledge and/or understanding as well as to increase capability and/or opportunity (Table 4). Over half of interventions provided some form of training and used communication persuasively to stimulate action. Nearly a quarter of interventions aimed to restructure the environment by changing physical or social contexts. The use of modelling, restriction, incentivisation and particularly coercion was relatively uncommon.

TABLE 4: INTERVENTION FUNCTIONS BY HEALTH BEHAVIOUR

	All (N=79)	Smoking (N=41)[1]	Diet (N=7)[2]	Physical Activity (N=8)[3]	Alcohol (N=10)[4]	Sexual Health (N=7)[5]	Multiple health targets (N=6)[6]	*P**
				% (N)				
Education	**82.3 (65)**	90.2 (37)^{a}	85.7 (6)^{a,b}	62.5 (5)^{a,b}	50.0 (5)^{b}	85.7 (6)^{a,b}	100 (6)^{a,b}	*0.040*
Enablement	**75.9 (60)**	78.0 (32)^{a}	71.4 (5)^{a,b}	100 (8)^{a}	30.0 (3)^{b}	85.7 (6)^{a,b}	100 (6)^{a,b}	*0.003*
Training	**57.0 (45)**	53.7 (22)^{a}	85.7 (6)^{a}	75.0 (6)^{a}	0 (0)^{b}	85.7 (6)^{a}	83.3 (5)^{a}	*<0.001*
Persuasion	**55.7 (44)**	73.2 (30)^{a}	14.3 (1)^{a,b}	37.5 (3)^{a,b}	20.0 (2)^{b}	71.4 (5)^{a,b}	50.0 (3)^{a,b}	*0.003*
Environmental restructuring	**21.5 (17)**	4.9 (2)^{a}	42.9 (3)^{a,b}	50.0 (4)^{b}	50.0 (5)^{b}	0 (0)^{a,b}	50.0 (3)^{a,b}	*0.001*
Modelling	**15.2 (12)**	4.9 (2)	42.9 (3)	25.0 (2)	0 (0)	28.6 (2)	50.0 (3)	*0.007*
Restriction	**12.6 (10)**	0 (0)^{a}	28.6 (2)^{a,b}	0 (0)^{a,b}	60.0 (6)^{b}	28.6 (2)^{a,b}	0 (0)^{a,b}	*<0.001*
Incentivisation	**7.6 (6)**	14.6 (6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0.304
Coercion	**3.8 (3)**	0 (0)	0 (0)	0 (0)	10.0 (1)	28.6 (2)	0 (0)	0.059

[1]From 6 economic reports; [2]From 4 economic reports; [3]From 4 economic reports; [4]From 2 economic reports; [5]From 3 economic reports; [6]From 4 economic reports;*Significant overall differences are in italics; [a,b] Different letters indicate significant difference at $p<0.05$ (Tukey-corrected)

Intervention functions differed significantly according to the health behaviour targeted. In contrast to other interventions, alcohol and, less so, physical activity interventions had a weaker focus on education. However, both these interventions were at different ends of the spectrum regarding enablement, which formed part of all physical activity interventions but only a third of alcohol interventions. In addition, the latter, unlike other health behaviour interventions, did not focus on training (Table 4). The use of persuasion to change behaviour and stimulate action was particularly common among smoking cessation (and sexual health)

interventions and less prevalent among alcohol (and diet) interventions. Environmental restructuring was a common feature of physical activity and alcohol (as well as multiple behaviour) interventions but uncommon in smoking cessation (and sexual health) interventions. Although modelling was more prevalent in diet and multiple health behaviour interventions, post-hoc analyses revealed no significant differences between any particular intervention types. As an intervention function, restriction was present in over half of alcohol intervention but uncommon in other interventions. There were no differences between interventions in terms of incentivisation or coercion to create expectations of punishment or cost, both being a main function of only a minority of interventions (Table 4).

5.3 BCT clusters in interventions

BCTs were clustered into superordinate categories as shown in Table 5. Out of a total of 16 BCT clusters, 7 (shaping knowledge, goals and planning, social support, antecedents, natural consequences, comparison of outcomes and feedback and monitoring) were particularly prevalent, coded for in over half of the interventions considered. A further 6 BCT clusters (regulation, comparison of behaviour, self-beliefs, reward and threat, repetition and substitution and associations) were commonly identified, coded for in approximately a third or more of cost-effective interventions. While about one in five interventions contained BCTs pertaining to the BCT cluster identity, the use of covert learning or scheduled consequences was rare. On average, BCTs included in interventions came from seven clusters with a maximum of 15 out of 16 possible BCT clusters present in a given intervention (Table 5).

TABLE 5: BCT CLUSTERS AND TOTAL NUMBER OF BCTS BY HEALTH BEHAVIOUR

	All (N=79)	Smoking (N=41)[1]	Diet (N=7)[2]	Physical Activity (N=8)[3]	Alcohol (N=10)[4]	Sexual Health (N=7)[5]	Multiple health targets (N=6)[6]	*P*
				% (N)				
Shaping knowledge (BCT36-39)	**79.7 (63)**	90.2 (37)[a]	100 (7)[a,b]	62.5 (5)[a,b]	30.0 (3)[b]	85.7 (6)[a,b]	83.3 (5)[a,b]	*0.002*
Goals and planning (BCT65-73)	**73.4 (58)**	85.4 (35)[a]	28.6 (2)[b]	75.0 (6)[a,b]	50.0 (5)[a,b]	71.4 (5)[a,b]	83.3 (5)[a,b]	*0.030*
Social support (BCT1-3)	**68.4 (54)**	80.5 (33)	28.6 (2)	75.0 (6)	50.0 (5)	42.9 (3)	83.3 (5)	*0.036*
Antecedents (BCT30-35)	**63.3 (50)**	58.5 (24)	100 (7)	87.5 (7)	50.0 (5)	42.9 (3)	66.7 (4)	*0.130*
Natural consequences (BCT82-87)	**58.2 (46)**	68.3 (28)	14.3 (1)	62.5 (5)	50.0 (5)	28.6 (2)	83.3 (5)	*0.032*
Comparison of outcomes (BCT75-BCT78)	**51.9 (41)**	63.4 (26)[a]	0.0 (0)[b]	37.5 (3)[a,b]	50.0 (5)[a,b]	57.1 (4)[a,b]	50.0 (5)[a,b]	*0.021*

	All (N=79)	Smoking (N=41)[1]	Diet (N=7)[2]	Physical Activity (N=8)[3]	Alcohol (N=10)[4]	Sexual Health (N=7)[5]	Multiple health targets (N=6)[6]	*P*
Feedback and monitoring (BCT8-14)	**50.6 (40)**	51.2 (21)	42.9 (3)	25.0 (2)	30.0 (3)	71.4 (5)	100 (6)	*0.051*
Regulation (BCT4-7)	**44.3 (35)**	75.6 (31)[a]	0 (0)[b]	0 (0)[b]	20.0 (2)[b]	14.3 (1)[b]	16.7 (1)[a,b]	*>0.001*
Comparison of behaviour (BCT88-90)	**35.4 (28)**	36.6 (15)	14.3 (1)	37.5 (3)	30.0 (3)	42.9 (3)	50.0 (3)	*0.812*
Self-beliefs (BCT40-43)	**34.2 (27)**	43.9 (18)	14.3 (1)	25.0 (2)	30.0 (3)	42.9 (3)	0 (0)	*0.245*
Reward and threat (BCT54-64)	**32.9 (26)**	41.5 (17)	0 (0)	50.0 (4)	10.0 (1)	28.6 (2)	33.3 (2)	*0.141*
Repetition and substitution (BCT23-29)	**31.6 (25)**	41.5 (17)	14.3 (1)	12.5 (1)	20.0 (2)	42.9 (3)	16.7 (1)	*0.325*
Associations (BCT15-22)	**29.1 (23)**	34.1 (14)	14.3 (1)	12.5 (1)	40.0 (4)	0 (0)	50.0 (3)	*0.218*
Identity (BCT77-81)	**17.7 (14)**	12.2 (5)	0 (0)	12.5 (1)	40.0 (4)	42.9 (3)	16.7 (1)	*0.111*
Scheduled consequences (BCT44-53)	**3.8 (3)**	7.3 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	*0.717*
Covert learning (BCT91-93)	**2.5 (2)**	4.9 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	*0.863*
				Mean (Range)				
Number of BCT clusters	**6.8 (1-15)**	8.0 (2-15)[a]	3.7 (2-6)[b]	5.8 (3-9)[a,b]	5.0 (1-11)[a,b]	6.1 (2-11)[a,b]	7.3 (6-9)[a,b]	*0.012*

[1]From 6 economic reports; [2]From 4 economic reports; [3]From 4 economic reports; [4]From 2 economic reports; [5]From 3 economic reports; [6]From 4 economic reports;*Significant overall differences are in italics; [a,b] Different letters indicate significant difference at $p<0.05$

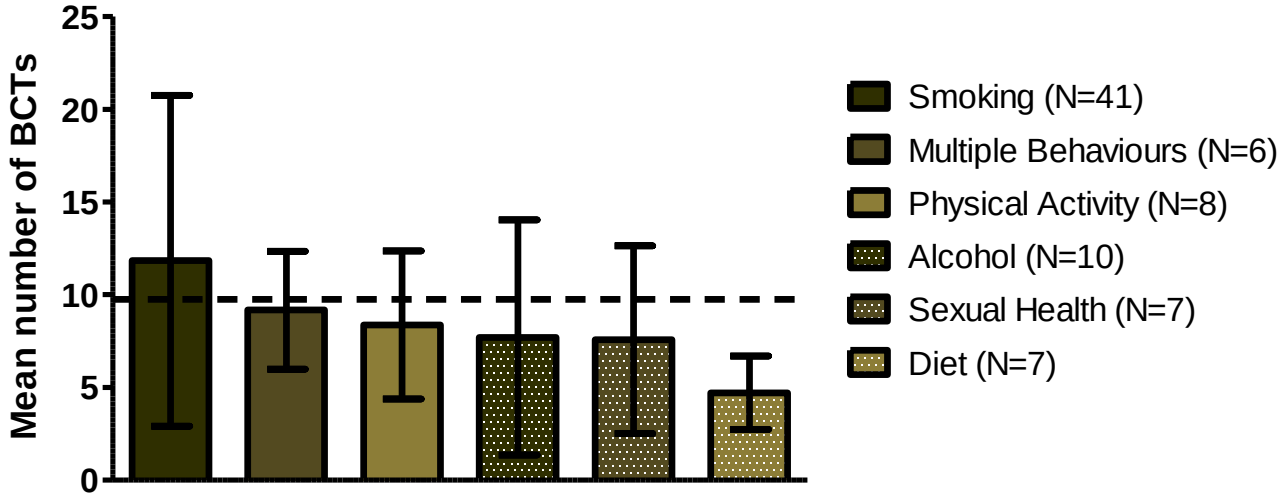
The prevalence of BCT clusters differed between interventions, particularly for BCT clusters that were most common. In agreement with the finding that alcohol interventions compared with other interventions did not primarily function as an education intervention (Table 4), BCTs to shape knowledge were comparatively rare in alcohol interventions (Table 5). Diet interventions contained relatively few BCTs relating to the formation of goals and planning which were prevalent in other interventions. Diet interventions also contained little evidence of social support BCTs such as practical or emotional help provided by others (but post-hoc analysis revealed no significant differences between interventions). Moreover, relatively few interventions to improve diet or sexual health included BCTs on natural consequences (e.g. discussing health or social implications of engaging in the behaviour) which was particularly common to interventions targeting multiple behaviours (but again there were no differences in post-hoc analysis). By contrast, diet intervention significantly differed from smoking

cessation intervention in terms of comparison of outcomes (e.g. discussing pros and cons), which was absent from diet interventions. The last BCT cluster evidencing significant overall differences between interventions was regulation (Table 5). Compared with all other health behaviour interventions, this was particular common in smoking cessation interventions, possibly reflecting the greater use of pharmacological support in these interventions (see Table 3). Overall, smoking cessation interventions covered most BCT clusters, around eight on average, significantly more than the three to four clusters covered in individual diet interventions ($F(5, 73)=3.2$, $p<0.012$; see Table 5). Indeed, BCTs relating to two BCT clusters (the use of scheduled consequences and covert learning) were only coded in smoking cessation and no other health behaviour interventions.

5.4 Prevalence of individual BCTs across all interventions

Out of the total of 93 possible BCTs, the average intervention contained nearly ten BCTs. There was a wide range across individual interventions with some containing only two behaviour change interventions and others evidencing 39 different BCTs.

FIGURE 2: NUMBER OF RECORDED BCTS BY HEALTH BEHAVIOUR

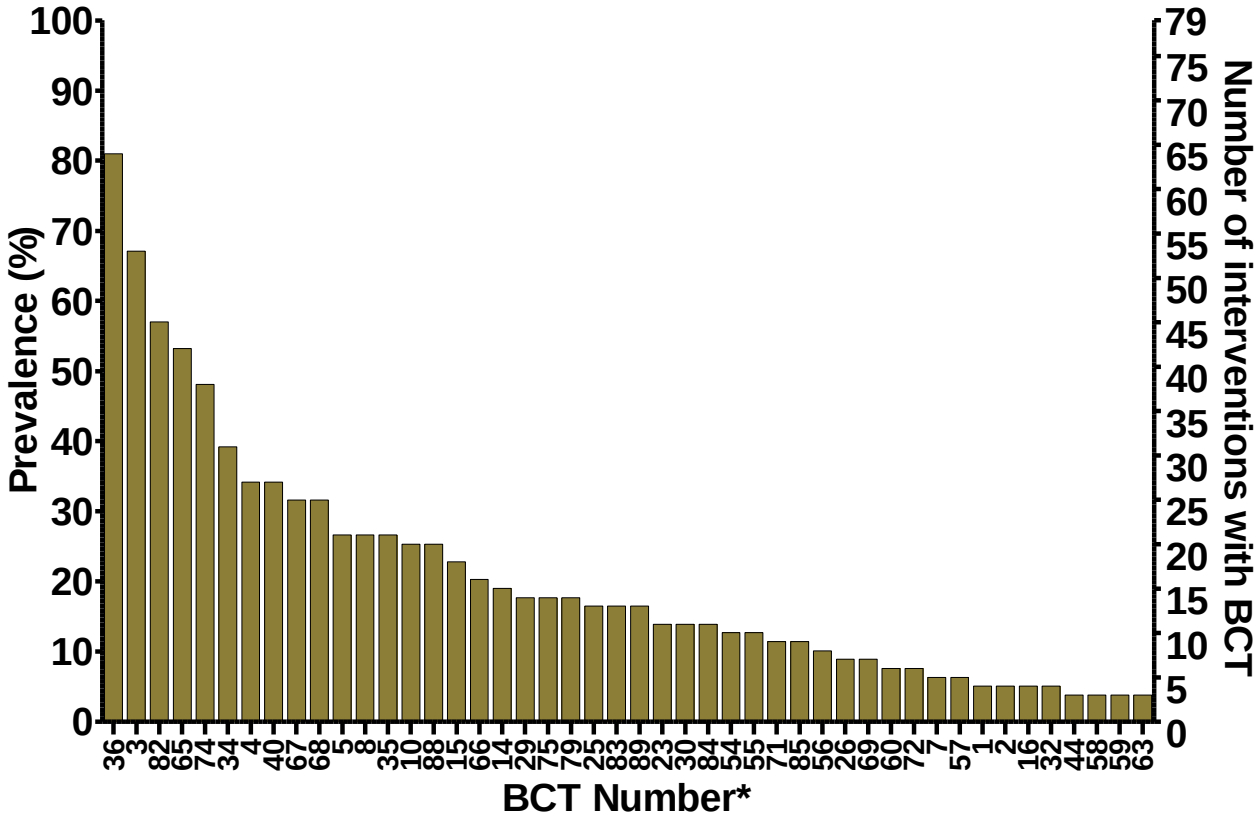


Dotted line indicates average across all interventions (N=79); Error bars are standard deviation

As can be seen in Figure 2, smoking cessation interventions included the largest number of BCTs on average (mean=11.8, median=8, mode=6) followed by interventions targeting multiple behaviours (mean=9.1, median=8, mode=7), physical activity interventions (mean=8.4, median=7.5, mode=4), alcohol interventions (mean=7.7, median=5.5, mode=3) and interventions to improve sexual health interventions (mean=7.6, median=5, mode=5), while diet interventions included the smallest number of BCTs (mean=4.7, median=5, mode=5). A total of 45 BCTs were coded for in at least three interventions across all 79 cost-effective interventions (presented in Figure 3). Forty-nine BCTs were coded in at least

two interventions, and 59 BCTs were included in at least one intervention, targeting one of the health behaviours.[9]

FIGURE 3: PREVALENCE OF INDIVIDUAL BCTS ACROSS ALL INTERVENTIONS[#]



[#]Only BCTs (N=45) described in at least 3 interventions are shown; *See Appendix 13 for details of BCTs

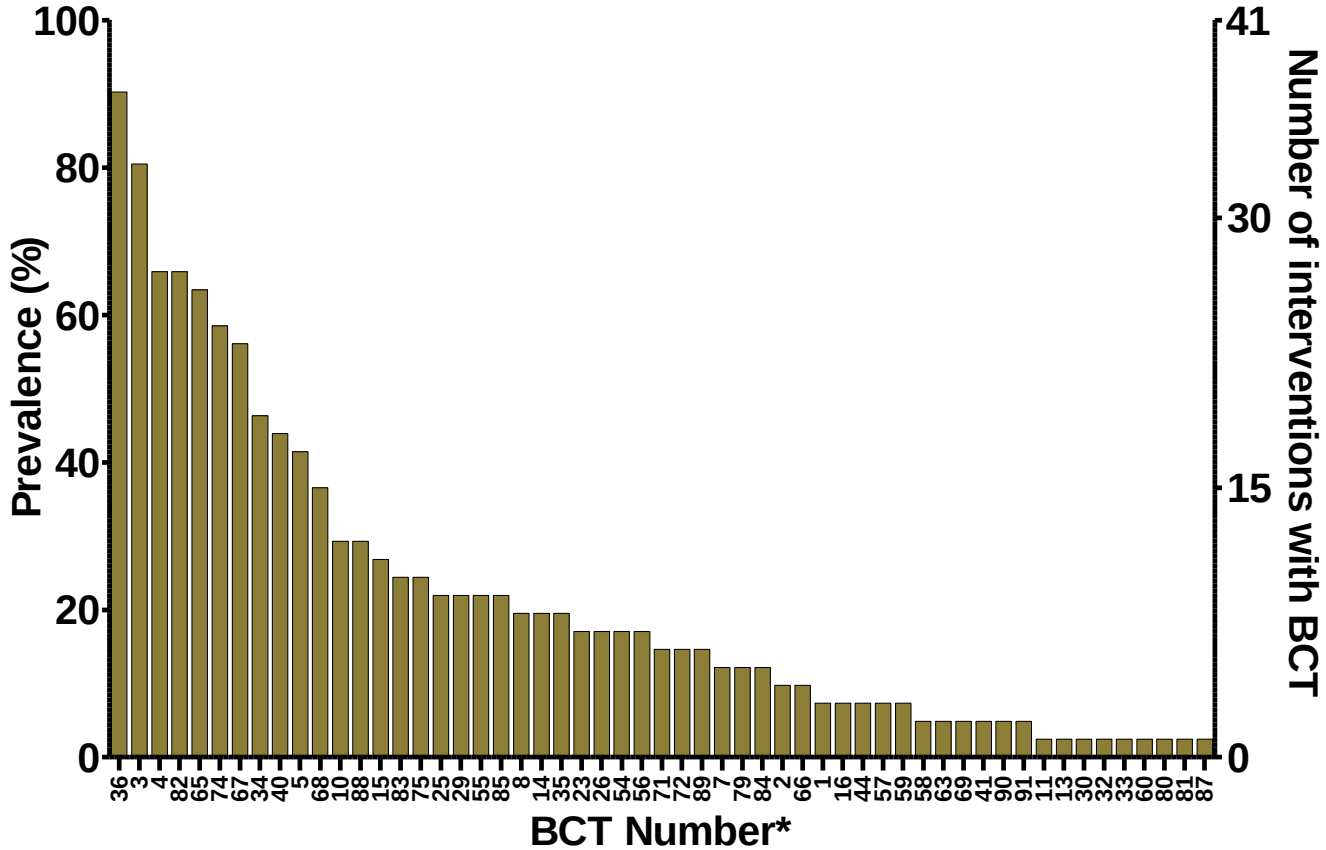
Instructions on how to perform a behaviour (BCT 36), unspecified social support (BCT 3), information about health consequences (BCT 82) and problem solving (BCT 65) were included in over half of all interventions analysed (Figure 3). The use of a persuasive source (BCT 74), adding objects to the environment (BCT 34), the provision of pharmacological support (BCT 4), the inclusion of verbal persuasion about one's capability (BCT 40), goal setting for an outcome (BCT 67) and action planning (BCT 68) were found in at least a third of all interventions. BCTs that were present in one in five interventions aimed to reduce negative emotions (BCT 5), provide feedback on behaviour (BCT 8), discuss body changes (BCT 35), address self-monitoring of behaviour (BCT 10), demonstrate behaviour (BCT 88), include prompts and cues (BCT 15) and set goals for behaviour (BCT 66; Figure 3).

[9] Four BCTs [41, 64, 90, 91] were mentioned in two interventions, ten BCTs [11, 13, 19, 20, 31, 33, 37, 80, 81, 87] were mentioned in only one intervention and 34 BCTs [6, 9, 12, 17, 18, 21, 22, 24, 27, 28, 38, 39, 42, 43, 45-53, 61, 62, 70, 73, 76-78, 86, 92, 93] were not mentioned at all.

5.5 Prevalence of individual BCTs in smoking cessation interventions

A total of 54 distinct BCTs, listed in Figure 4, were coded across the 41 cost-effective smoking cessation interventions. The most prevalent BCT (recorded in 90% of smoking cessation interventions) was the inclusion of instructions on how to perform a behaviour (BCT 36). Other BCTs specified in at least half of the smoking cessation interventions (N>21) were the provision of non-specific social support (BCT 3) or pharmacological support (BCT 4), information about health consequences (BCT 82), problem solving (BCT 65), the inclusion of a persuasive source (BCT 74) and goal setting for desired outcomes (BCT 67). At least one in three interventions also added an object (mostly nicotine replacement therapy, NRT)[10] to the environment (BCT 34), used verbal persuasion about capability to strengthen self-beliefs (BCT 40), reduced negative emotions (BCT 5) or included action planning (BCT 68; Figure 4).

FIGURE 4: OCCURRENCE OF INDIVIDUAL BCTS IN SMOKING CESSATION INTERVENTIONS[#]



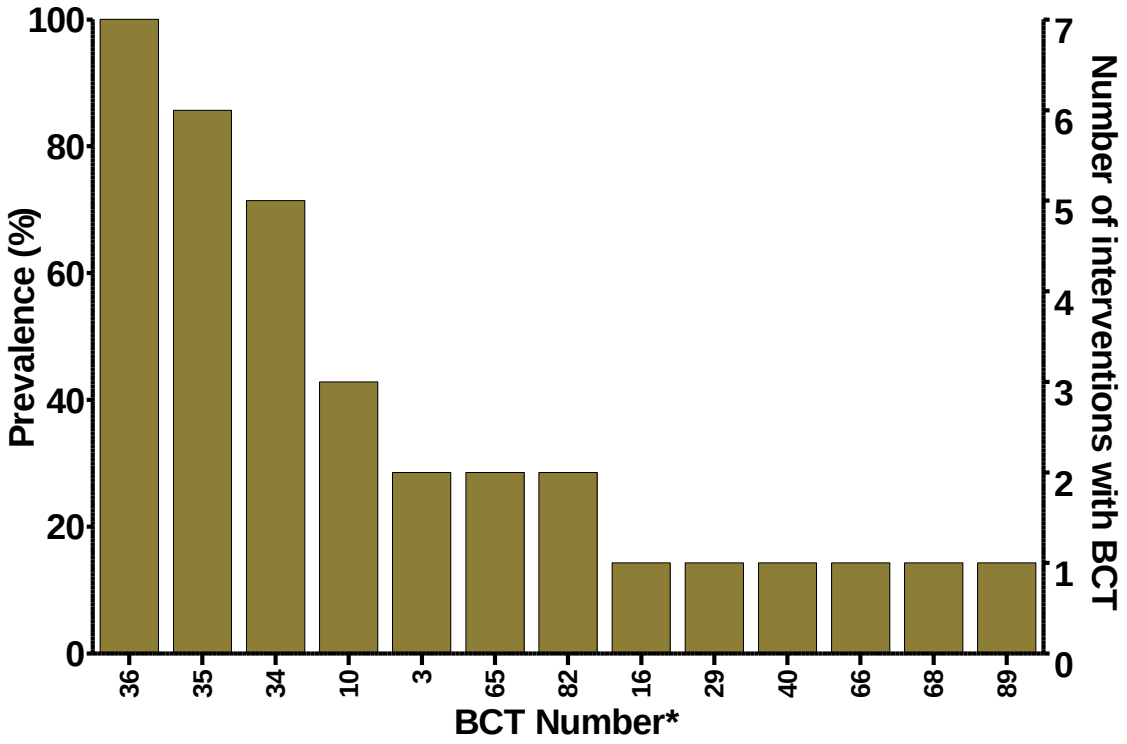
[#]BCTs (N=54) described in at least one smoking cessation intervention are shown; *See Appendix 13 for details of BCTs

[10] Note that we have coded NRT as both pharmacological support (BCT 4) and the addition of an object to the environment (BCT 34) because, in theory at least, there may be some forms of pharmacological support that may not involve the addition of an object to the environment of those receiving support (e.g. a hospital-administered pharmacological intervention). Our coding of both techniques in this instance also acknowledges the potential for NRT treatments to act as potential environmental cues or supports for continued smoking cessation.

5.6 Prevalence of individual BCTs in diet interventions

Of all the behaviour specific interventions, diet interventions detailed the fewest behaviour change techniques. Only 13 BCTs could be coded in the 7 cost-effective interventions (Figure 5). Instruction on how to perform a behaviour was the most common BCT (BCT 36), being present in all interventions. All but one intervention also discussed body changes (BCT 35) and over half of interventions (N=5) added objects to the environment (BCT 34). In at least two interventions, self-monitoring of behaviour was employed (BCT 10), unspecified social support was provided (BCT 3) and problem solving (BCT 65) as well as information about health consequences (BCT 82) were included (Figure 5).

FIGURE 5: OCCURRENCE OF INDIVIDUAL BCTS IN DIET INTERVENTIONS[#]

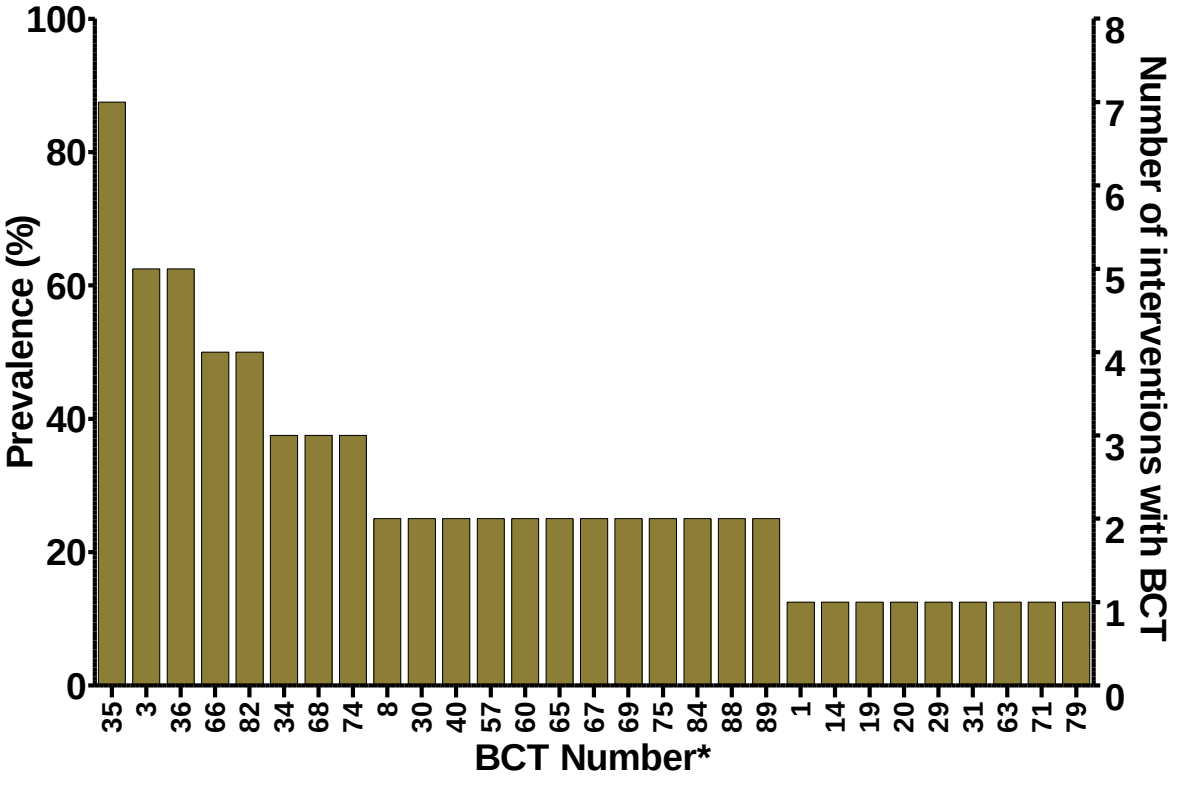


[#]BCTs (N=13) described in at least one diet intervention are shown; *See Appendix 13 for details of BCTs

5.7 Prevalence of individual BCTs in physical activity interventions

Physical activity interventions included the second largest number of BCTs. A total of 29 individual BCTs were coded across the 8 cost-effective physical activity interventions (Figure 6). Except for one intervention, all included a discussion of antecedent body changes (BCT 35). Over half of the interventions (N=5) also provided non-specific support (BCT 3) as well as instructions on how to perform a behaviour (BCT 36). Half of the interventions also included goal setting for behaviours (BCT 66) and giving information about health consequences (BCT 82). A third of interventions (N=3), added objects to the environment (BCT 34), included action planning (BCT 68) and a persuasive source (BCT 74; Figure 6).

FIGURE 6: OCCURRENCE OF INDIVIDUAL BCTS IN PHYSICAL ACTIVITY INTERVENTIONS[#]

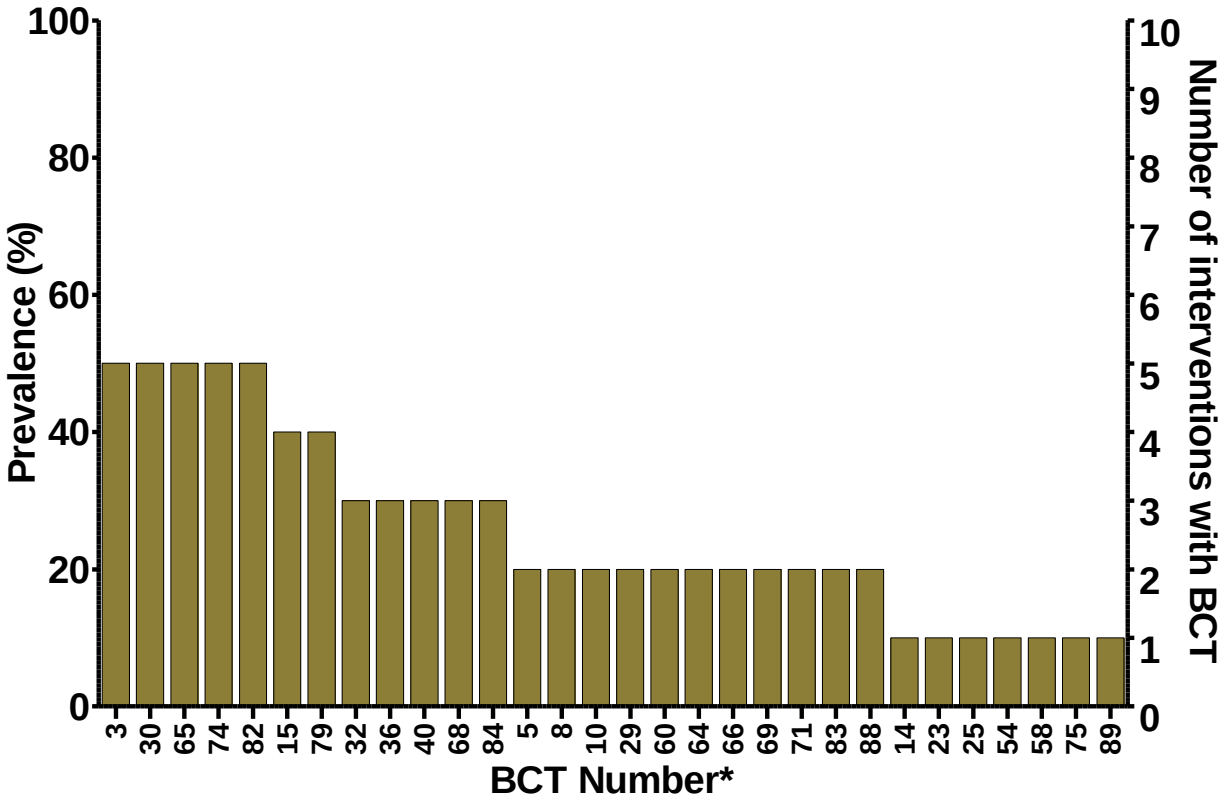


[#]BCTs (N=29) described in at least one physical activity intervention are shown; *See Appendix 13 for details of BCTs

5.8 Prevalence of individual BCTs in alcohol interventions

Alcohol interventions included the second largest number of BCTs. A total of 30 BCTs were found at least once in the 10 cost-effective alcohol interventions (Figure 7). However, these interventions appeared relatively heterogeneous as shown by the fact that the most prevalent BCTs [unspecified social support (BCT 3), restructuring the physical environment (BCT 30), problem solving (BCT 65), inclusion of persuasive source (BCT 74) and providing information about health consequences (BCT 82)] were only present in half of the interventions. Over a third (N=4) also provided prompts and cues (BCT 15) and used framing/reframing techniques (BCT 79; Figure 7).

FIGURE 7: OCCURRENCE OF INDIVIDUAL BCTS IN ALCOHOL INTERVENTIONS[#]

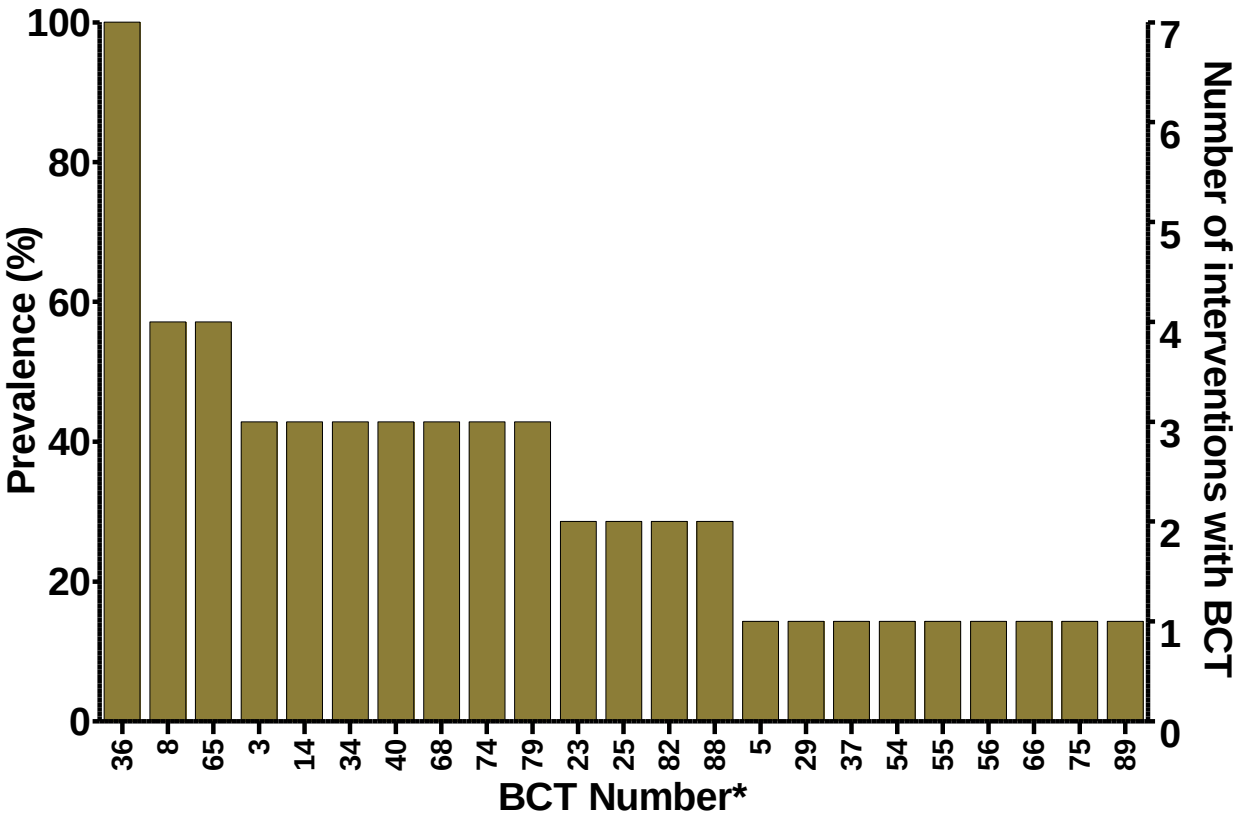


[#]BCTs (N=30) described in at least one alcohol intervention are shown; *See Appendix 13 for details of BCTs

5.9 Prevalence of individual BCTs in sexual health interventions

Twenty-three BCTs were coded across the 7 cost-effective interventions to improve sexual health (Figure 8). All interventions included instructions on how to perform a desired behaviour (BCT 36) and over half (N=4) also provided feedback on behaviour (BCT 8) and included problem solving techniques (BCT 65). In addition, around a third of interventions (N=3) provided non-specific support (BCT 3) and biomarker feedback (BCT 14), added objects to the environment (BCT 34), used verbal persuasion to increase capability (BCT 40) and action planning (BCT 68) as well as including a persuasive source (BCT 74) and employing framing and reframing (BCT 79; Figure 8).

FIGURE 8: OCCURRENCE OF INDIVIDUAL BCTS IN SEXUAL HEALTH INTERVENTIONS[#]

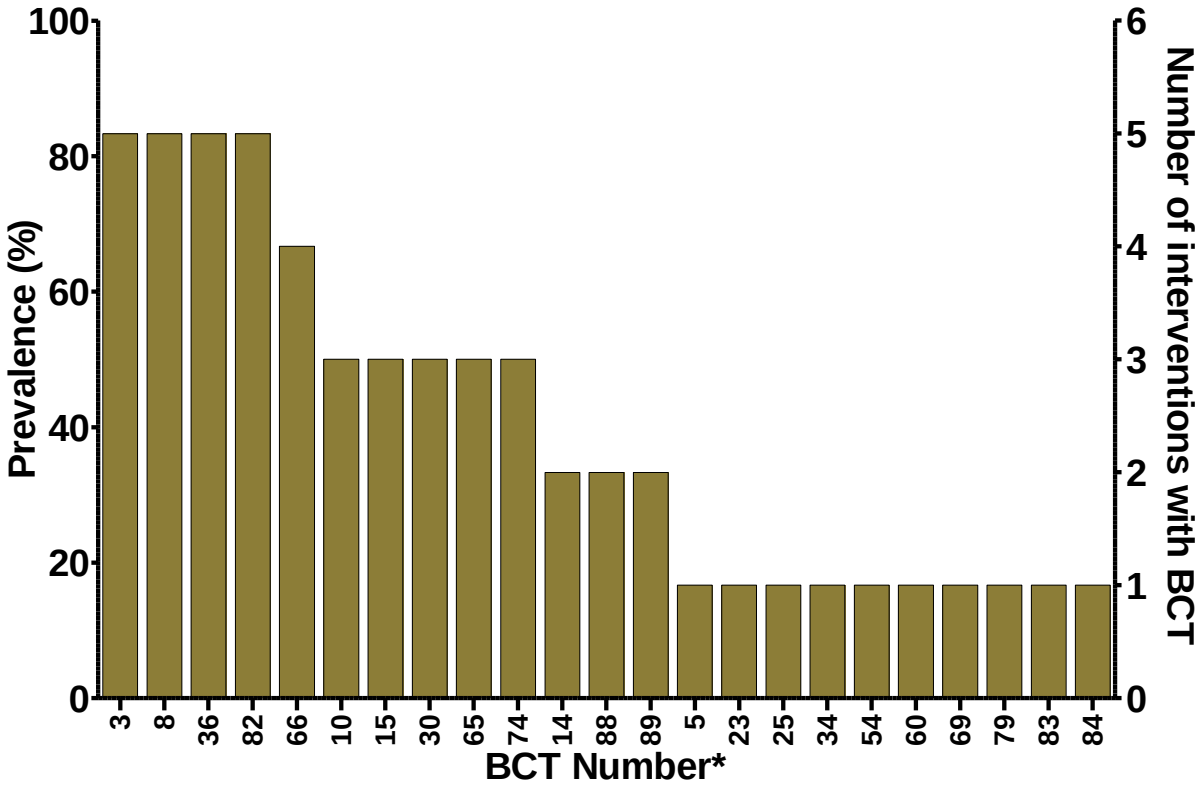


[#]BCTs (N=23) described in at least one sexual health intervention are shown; *See Appendix 13 for details of BCTs

5.10 Prevalence of individual BCTs in interventions targeting multiple behaviours

Across the 6 cost-effective interventions targeting multiple behaviours, 23 BCTs were identified (Figure 9). Over half (N≥4) of interventions provided some social support (BCT 3), feedback (BCT 8) and instructions on how to perform a behaviour (BCT 36), information about health consequences (BCT 82) and set behavioural goals (BCT 66). Fifty percent of interventions also addressed self-monitoring of behaviour (BCT 10) and prompts/cues (BCT 15), restructured the physical environment (BCT 30), taught problem solving (BCT 65) and included a persuasive source (BCT 74). In addition, a third (N=2) offered biofeedback (BCT 14), demonstration of behaviour (BCT 88) and featured social comparison (BCT 89; Figure 9).

FIGURE 9: OCCURRENCE OF INDIVIDUAL BCTS IN INTERVENTIONS TO CHANGE MULTIPLE BEHAVIOURS[#]

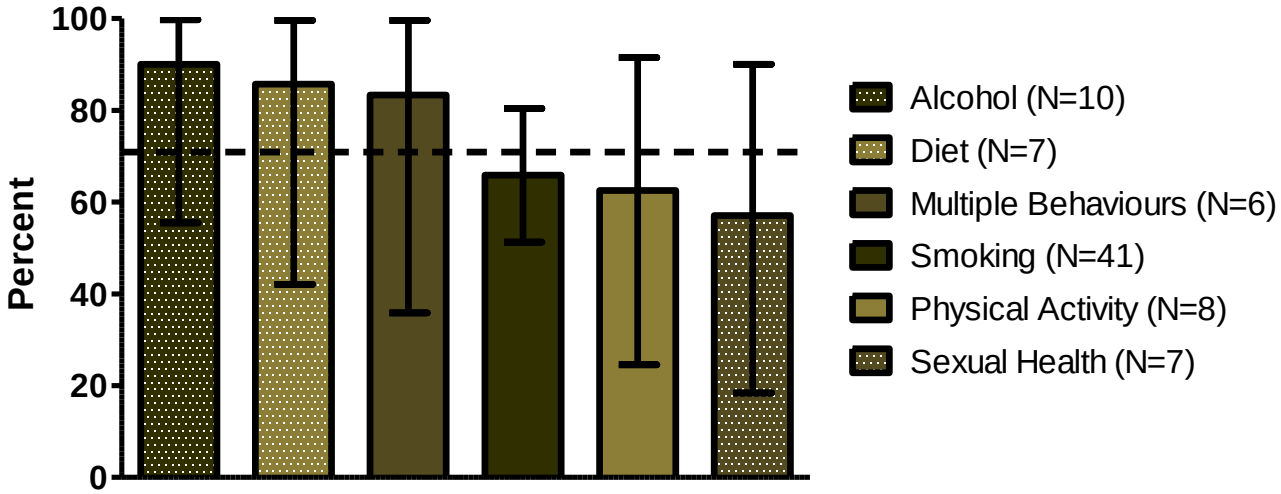


[#]BCTs (N=23) described in at least one multiple behaviour intervention are shown; *See Appendix 13 for details of BCTs

5.11 Prevalence of 'choice architecture' in cost-effective interventions

The use of 'choice architecture' as defined in this report was common among all cost-effective interventions. Overall 70.9% (95%CI 60.9-80.9) out of the 79 interventions (N=56) included a BCT which reflected the use of some environmental tool or element designed to alters people's behaviour "in a predictable way without forbidding any options or significantly changing their economic incentives". As can be seen in Figure 10, 'choice architecture' was present in at least 50% of interventions irrespective of the behaviour that interventions aimed to change. Although, the prevalence of these 'choice architecture' elements varied as a function of the behaviour targeted, being most prevalent in cost-effective alcohol interventions (9 out of 10) and least prevalent in cost-effective interventions aimed to improve sexual health (4 out of 7), there were no significant differences between intervention types.

FIGURE 10: PREVALENCE OF CHOICE ARCHITECTURE BY HEALTH BEHAVIOUR



Dotted line indicates average across all interventions (N=79); Error bars are 95% confidence intervals

As shown in Table 6, the only BCTs included in the definition of 'choice architecture' that were significantly correlated across all interventions were prompts/cues (BCT 15), restructuring the physical environment (BCT 30) and avoidance/reducing the exposure to cues for the behaviour (BCT 32) In sensitivity analysis, the presence of 'choice architecture' was therefore reduced to these three BCTs being coded in interventions, on the assumption that these BCTs reflected a common underlying construct.

Using this more restrictive definition, there was an unsurprising reduction in the prevalence of 'choice architecture'. Just under a third of interventions (N=23) contained BCTs relevant to this construct defined by BCT 15, BCT 30 and BCT 32 alone (29.1%, 95%CI 19.1-39.1). There

were also significant differences in the presence of these BCTs, and thus 'choice architecture', as a function of the health behaviours targeted by interventions (Likelihood ratio χ^2 (5)=18.1, p=0.003; see Figure 11). However, post-hoc analyses revealed no significant differences between specific intervention types.

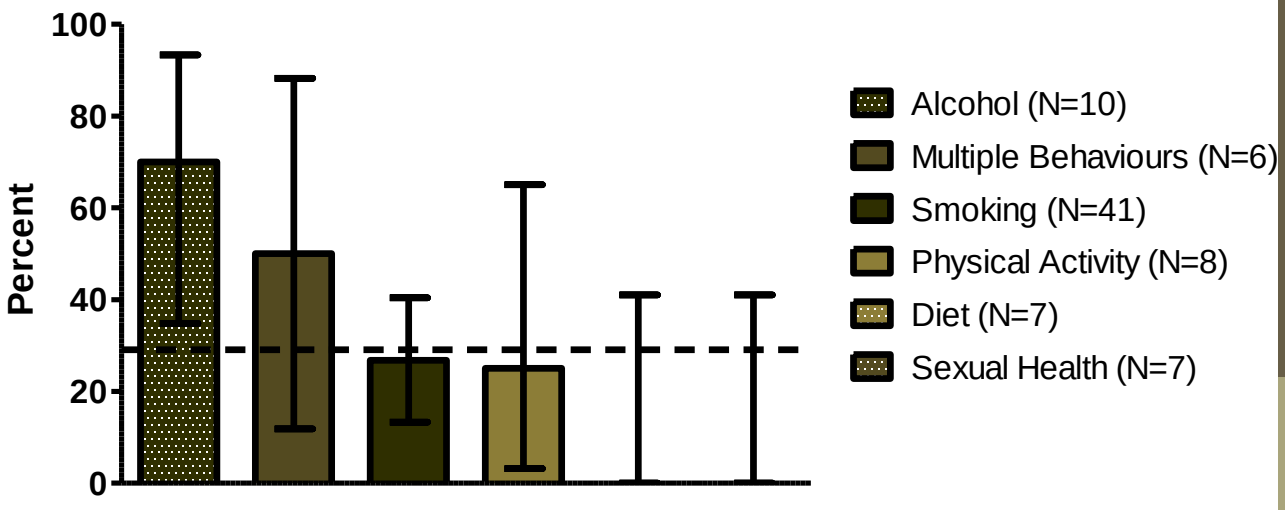
Table 6: Correlations[#] among choice architecture BCTs

BCT Number	15	16	30	31	32	34	79
16	-.125						
30	.305**	-.093					
31	-.062	-.026	-.046				
32	.287*	-.053	.574*	-.026			
34	-.128	.169	-.173	.141	-.067		
79	.143	-.107	-.091	-.053	.044	-.101	

[#]Reports Spearman's rho; *Significant at p <.05; Significant at p<.01

Notably, neither diet nor sexual health interventions contained evidence of 'choice architecture' using the stricter definition. Alcohol interventions had the highest prevalence (7 out of 10), followed by interventions targeting multiple health behaviours (3 out of 6), smoking cessation interventions (11 out of 30) and physical activity interventions (2 out of 8).

Figure 11: Prevalence of choice architecture by health behaviour



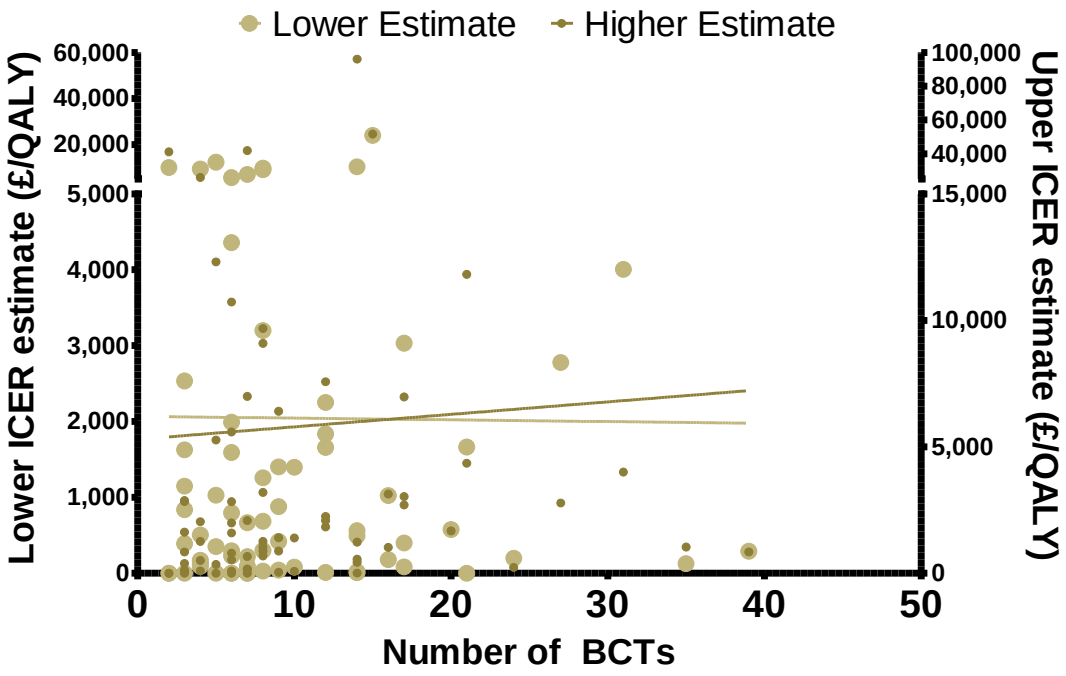
Dotted line indicates average across all interventions (N=79); Error bars are 95% confidence intervals

5.12 Factors associated with cost-effectiveness[11]

Given the large number of predictor variables and small number of interventions considered, only those variables that were associated with cost-effectiveness estimates in univariate analysis were included in the multiple regression analysis (detailed below).

- *Target health behaviour* (see Table 3): Sexual health interventions were less cost-effective (both lower and upper estimate) than interventions targeting other health behaviours.
- *Intervention characteristics* (see Table 3): Interventions that included incentives were more cost-effective (for the lower estimate only) than those which did not ($t(69)=3.5$, $p=0.001$) but none of the other intervention characteristics were associated with cost-effectiveness.
- *Intervention functions* (see Table 4): There were no significant associations with cost-effectiveness.
- *BCTs / BCT clusters* (see Table 5): As there was no association between the number of BCTs recorded and cost-effectiveness (see Figure 12) and given large differences in the prevalence of individual BCTs, only BCT clusters were included in univariate analysis. This revealed that interventions in which the BCT cluster 'shaping knowledge' was coded were less cost-effective (for the lower estimate only) than those interventions that did not include this cluster ($t(69)=3.5$, $p=0.001$).

FIGURE 12: COST-EFFECTIVENESS BY BCT PREVALENCE[#]



[#]Lines are linear regressions (non-significant)

[11] Note that because only cost-effective interventions are included in this report, the limited variance in cost-effectiveness estimates greatly restricts the ability to detect significant associations (see also Section 6.1)

- *Choice Architecture* (see Table 2): There was also no difference in the cost-effectiveness estimates of interventions that did or did not include BCTs relevant to 'choice architecture'. However, interventions that included 'choice architecture' elements as defined in the sensitivity analysis were marginally more cost-effective (for the lower estimate only) than those that did not ($t(70)=2.2$, $p=0.032$).

Since all significant univariate associations with intervention cost-effectiveness were for the lower estimate (with the exception of the target behaviour of interventions), multivariate linear regression was conducted using the lower cost-effectiveness estimate only. The forced entry linear regression model showed that the intervention type (sexual health intervention) was the only variable reliably and significantly associated with lower cost-effectiveness ($\beta=0.554$, $t=4.2$, $p<0.001$) after controlling for the other variables. This was confirmed by backward and forward entry linear regression models.

6. Summary

Seventy-nine cost-effective interventions across six different behaviour targets (smoking cessation, diet, physical activity, alcohol, sexual health and multiple behaviour targets) were identified from a total of 23 economic modelling reports or cost-effectiveness reviews. Over half of these focused on smoking cessation. Interventions were mainly of high intensity (i.e. involved several face-to-face or other direct contacts), set in primary care or the community and delivered by health professionals. Interventions were mostly aimed at individuals from the general population and involved pharmacological or other forms of support. Compared with other interventions, smoking cessation interventions were more likely to involve pharmacological support, diet interventions were most likely to be community-based and sexual health interventions to be based in primary care, alcohol interventions to be implemented by the state rather than individuals and interventions targeting multiple behaviours to be aimed at the population level.

In terms of the main function of interventions, education, enablement, training and persuasion was the focus of the majority of these, and incentivisation and coercion were only rarely used (in less than 10% of interventions). Differences in intervention functions were primarily apparent between smoking cessation and alcohol interventions, with the former more likely to focus on education, enablement, training and persuasion and the latter on restrictions and environmental restructuring; the latter function being also prevalent in diet, physical activity and multiple health behaviour interventions.

Shaping knowledge, discussing goals and planning, providing social support, addressing antecedents and natural consequences of behaviour, comparing outcomes as well as arranging for feedback and monitoring were among the most common BCT clusters, found in the majority of interventions. Whilst this pattern was true for most interventions, there were some exceptions: alcohol interventions focused less on shaping knowledge and diet interventions focused less on goals and planning, social support, natural consequences or comparison of outcomes. In addition, very few interventions, irrespective of the health behaviour addressed, involved scheduled consequences or covert learning. Altogether, smoking cessation interventions covered the largest and diet interventions the smallest number of BCT clusters.

This finding was mirrored when considering individual BCTs coded in intervention. Smoking cessation interventions included an average of 12 (out of a potential 92) BCTs and diet interventions only 5. Overall, cost-effective interventions included an average of nearly 10 BCTs and 59 BCTs were coded in at least one intervention. By far the most prevalent BCT was instruction on how to perform a behaviour (included in 81% of interventions), followed by unspecified social support (67%), information about health consequences (57%) and problem solving (53%). In addition, there were some BCTs particularly common to specific health behaviour interventions. The use of pharmacological support, the use of a persuasive

source and goal setting were all prevalent in smoking cessation interventions. Discussing body changes featured commonly in diet and physical activity interventions, restructuring the physical environment in alcohol interventions and providing feedback on behaviour in sexual health interventions and interventions targeting multiple behaviours.

These use of 'choice architecture' was common across all cost-effective interventions, being identified in over two thirds (71%) of interventions. 'Choice architecture' was most prevalent in alcohol interventions but did not vary significantly as a function of the target behaviour. However, using more restrictive criteria to define 'choice architecture' based on the inclusion of particular, correlated BCTs in sensitivity analysis greatly reduced prevalence estimates with just under a third (29%) of interventions showing evidence of 'choice architecture'. This also resulted in greater divergence between specific health behaviour interventions. Notably, none of the sexual health or diet interventions appeared to include BCTs relevant to this more stringent operationalization of 'choice architecture'.

Regressing cost-effectiveness estimates on interventions characteristics, intervention functions, the presence of particular BCT clusters (as a proxy for individual BCTs) and choice architecture revealed few significant associations. This likely reflects the limited range of cost-effectiveness estimates for individual interventions, given the upper threshold of cost-effectiveness applied by NICE to which all interventions that were included in this analysis adhered. The only reliable factor independently associated with specific cost-effectiveness estimates among all cost-effective interventions was the health behaviour targeted: sexual health interventions were less cost-effective than other health behaviour interventions.

6.1 Caveats

There are some caveats and limitations that need to be acknowledged when interpreting the findings of this report. First, BCTs were coded from published/available information rather than from intervention protocols. As most papers provide only limited information on intervention content, this is likely to have resulted in some discrepancy between actual intervention content and coded content.

Second, the BCT taxonomy approach is conservative: one of the principles of coding for BCTs using the taxonomy is to only code the presence of a technique where there is unequivocal evidence from written material that that technique has been used. Thus, one of the advantages of the taxonomy, its specificity and precision in identifying BCTs, also makes it difficult to extract BCTs, because many intervention reports are poorly specified. So, it may be that other techniques have been used in many of these interventions but were not adequately reported, so we could not detect them. This is a frequent observation among those who use the BCT taxonomy to code intervention reports. Reports need to be better specified to allow for BCT coding.

Third, this report is limited by the quality and time-frame of the economic analyses which provided the evidence-based for interventions included in this BCT analysis. As indicated in

Section 4.2, economic modelling itself is open to a number of limitations, such as uncertainty about temporal discounting, adjustment for quality of life and the use of disparate methodologies (e.g. assumptions) across reports. In addition, more recent interventions (most economic analyses were carried out before 2010) will not have been included.

Fourth, given the relative vague definition of 'choice architecture' in the literature, it is possible that the analyses in this report either over- or underestimate its prevalence in cost-effective interventions, depending on whether the operationalization of 'choice architecture' in this report is too inclusive or too restrictive. A fact which is underlined by the rather disparate results obtained in this report when using differing ways of estimating the presence of 'choice architecture'. In addition, the same limitations that apply to the association of BCTs with cost-effectiveness (outlined below) apply to 'choice architecture', given that this construct was operationalized based on BCTs.

Fifth, and most importantly, it is not possible to infer that, because certain BCTs have been used frequently in (cost-)effective interventions, that these BCTs will always result in behaviour change. Whilst we attempted to address this issue in part by evaluating the association of BCTs with cost-effectiveness estimates, the range of these estimates was limited as all interventions fell below the NICE threshold of cost-effectiveness thus reducing the likelihood of detecting effects given limited variance in the outcome measure of interest. Such an analysis would therefore also need to look at (cost-)ineffective interventions, to establish whether some BCTs are equally frequently used in ineffective interventions as it is possible that some BCTs are simply used more often than other, or better reported, rather than being linked to (cost-)effectiveness. Notwithstanding this point, it is also not possible to reliably isolate the contribution of each BCT/intervention characteristic to effectiveness because many BCTs are used in conjunction with others, and meta-analysis/meta-regression would be more suitable to discern these effects but this is outside of remit of the current project.

7. References

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8. Appendices

APPENDIX 1: COST-EFFECTIVE INTERVENTIONS DERIVED FROM ECONOMIC ANALYSES

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Smoking	PH1 Brief interventions and referral for smoking cessation	Economic modelling report (Cost-effectiveness of brief intervention and referral for smoking cessation; Parrot, Godfrey, Kind, 20th January, 2006)	GP opportunistic advice	£577-£1,677	(Lancaster and Stead, 2004)
			GP opportunistic advice+NRT	£1,664-£4,352	(Silagy et al., 2004)
			GP opportunistic advice+ referral to telephone helpline	£302-£878	(Lancaster and Stead, 2005)
			GP opportunistic advice + self-help material	£292-£847	(Ossip-Klein et al., 1991)
			Nurse-led brief intervention in primary care	£400-£6,974	(Rice and Stead, 2005)
			Nurse-led brief intervention in hospital setting	£180-£3,132	(Molyneux et al., 2003;Hajek et al., 2002;Pelletier and Moisan, 1998;Bolman et al., 2002;Hennrikus et al., 2005;Nagle et al., 2005)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Smoking	PH5 Workplace interventions to promote smoking cessation	Economic modelling report (Cost-effectiveness of interventions for smoking cessation; Flack, Taylor, Trueman, January, 2007)	Brief advice+self-help material+NRT	£2,778	(Parrott et al., 1998)
			Brief advice+self-help material+NRT+specialist clinic	£1,025	(Parrott et al., 1998)
			Less intensive counselling + bupropion	£392	(Javitz et al., 2004)
			More intensive counselling +bupropion	£353	(Javitz et al., 2004)
	PH10 Smoking cessation services	Economic modelling report (Cost-effectiveness of interventions for smoking cessation; Flack, Taylor, Trueman, January, 2007)	NRT 5 weeks + 5 clinic visits	£840	(McGhan and Smith, 1996)
			NRT 5 weeks + 5 group visits	£796	(McGhan and Smith, 1996)
			NRT 5 weeks	£506	(McGhan and Smith, 1996)
			NRT 5 weeks + 5 pharmacy consultations	£1,403	(McGhan and Smith, 1996)
			NRT 5 weeks + 5 pharmacy consultations+ 5 clinic visits	£1,259	(McGhan and Smith, 1996)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Smoking	PH15 Identifying and supporting people most at risk of dying prematurely	Economic analysis of interventions to improve the use of smoking cessation interventions in disadvantaged populations (08th May, 2008)	Client-centred social marketing interventions	£420-£6,412	(Boyd et al., 1998;Schorling et al., 1997;Stevens et al., 2002)
			Workplace intervention to improve access	£1,399	(Barbeau et al., 2006)
			Brief advice for pregnant smokers	£1,593	(Dornelas et al., 2006)
			Proactive telephone support for pregnant smokers	£5,992	(Solomon et al., 2000)
			NRT prescription incentives	£1,627	(Copeland et al., 2005)
			NHSSS identifying and reaching smokers	£2,535-£2,837	(Lowey et al., 2003)
			Paediatric unit identifying and reaching smokers	£1,837	(Curry et al., 2003)
			Pharmacy-based recruitment	£1,030-£5,272	(Bauld et al., 2006)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Smoking		Economic analysis of interventions to improve the use of smoking cessation interventions in the general population (08th May, 2008)	Recruiting smokers from community	£10	(Harding et al., 2004)
			Social marketing to deliver client centred approaches to smoking cessation	£42	(Turner et al., 2001)
			Free mobile phones for use in smoking cessation counselling	£35-£175	(Lazev et al., 2004;Vidrine et al., 2006)
			Cervical screening recruitment	£0-£86	(Hall et al., 2003;Hall et al., 2007)
			Nurse run clinics	£92	(Campbell et al., 1998)
			Proactive telephone counselling	£127-£1,041/dominated	(Lichtenstein et al., 1996)
			Quit and win recruitment	£84-£2,701/dominated	(Tillgren et al., 2000;Bains et al., 1998)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Smoking			Identifying smokers through other means	£11-£2,089	(Bentz et al., 2006;Prochaska et al., 2001;Milch et al., 2004)
			Dentist-based interventions to improve access	£200-£234/dominated	(Carr and Ebbert, 2006)
			Drop-in/rolling community based sessions to improve access	£667	(Owens and Sprigetti, 2006)
			Pharmacy-based interventions to improve access	£229-£553	(Blenkinsopp et al., 2003)
			Free NRT incentives	£29-£1,038	(An et al., 2006;Bauer et al., 2006)
			Workplace smoking cessation and incentives	£95-£153	(Hennrikus et al., 2002)
	PH26 Quitting smoking in pregnancy and following	Economic Analysis of interventions for smoking cessation aimed at pregnant women (Taylor,	Cognitive behaviour strategies	£4,005	(Lumley et al., 2009)
			Stages of change	£3,033	
			Feedback	£1,992	

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
	childbirth	September, 2009)	Rewards	£0 (dominant)	
			Pharmacotherapy	£2,253	
Diet	PH11 Maternal and child nutrition	Modelling the cost effectiveness of interventions to promote breastfeeding (Jacklin, Retsa, Dougherty, Kwan, September 2007)	Peer support	N/A (cost-effective under most scenarios)	(Battersby et al., 2004)
		Rapid economic review of public health interventions designed to improve the nutrition of pre-conceptual, pregnant and post-partum women (Jacklin, Retsa, Kwan, July 2006)	Folic acid supplementation	£1,150-£2,880	(Postma et al., 2002)
			Women, infants and children (WIC) programme	£0 (dominant)	(Avruch and Cackley, 1995)
	PH27 Weight management before, during and after	Weight management in Pregnancy: Economic Modelling (Madan,	Diet	£174-£2,039	(Wood et al., 1991)
			Behavioural treatment	£4,360-£10,729	(Wadden et al., 1989)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Diet	pregnancy	Chilcott, 2010)[4]	Exercise	£9,971-£41,149	(Pritchard et al., 1997)
		The cost-effectiveness of weight management interventions following pregnancy (ScHARR, 2010)	Diet and exercise	£9,096	(Lovelady et al., 2006;Lovelady et al., 2001)
Physical Activity	PH2 Four commonly used methods to increase physical activity	Modelling the cost-effectiveness of physical activity interventions (Matrix, 2006)	Brief interventions	£20.19-£437.11	(Elley et al., 2003;Harland et al., 1999;Hillsdon et al., 2002;Petrella et al., 2003;Smith et al., 2000;Swinburn et al., 1998)
			Exercise referral	£80.96	(Lamb et al., 2002)
	PH8 Physical activity and the environment	An economic analysis of environmental interventions that promote physical activity (Beale, Bending, Trueman, 2007)	Urban planning and design	£130-£1,260	(Gordon et al., 2004)
			Transport	£298-£2,831[5]	(Cope et al., 2003)
			Building design	£219-£2,087[5]	(Leslie et al., 2000)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Physical Activity	PH13 Promoting physical activity in the work place	An economic analysis of workplace interventions that promote physical activity (Bending, Beale, Hutton, 2008)	Physical activity counselling	£495.5-£1,234.11	(Aittasalo et al., 2004;Purath et al., 2004)
			Physical activity programme	£686.34	(Chyou et al., 2006)
	PH17 Promoting physical activity for children and young people	A rapid review of the economic literature related to the promotion of physical activity, play and sport for pre-school and school age children in family, pre-school, school and community settings (Buchanan, Wolstenholme, Foster, 2008)	Family-based behavioural treatment	N/A (treatment more effective in group format than in combination with individualised treatment)	(Goldfield et al., 2001)
Alcohol	PH7 School-based interventions on alcohol	A review of the effectiveness and cost-effectiveness of interventions delivered in primary and secondary	STARS for families brief intervention	N/A (£540.25 per case averted, cost-effective if QUALY gained per averted case >0.027)	(Werch et al., 2001;Werch et al., 2000;Werch et al., 2003)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Alcohol		schools to prevent/reduce alcohol use by young people under 18 years old (Jones, James, Jefferson, Lushy, Morleo et al, 2007) + Economic addendum (Jones, Stokes, Bellis, 2007)	The School Health and Harm Reduction programme (SHAHRP)	N/A (£284.54 per case averted, cost-effective if QUALY gained per averted case >0.0142)	(McBride et al., 2003;McBride et al., 2004;McBride et al., 2000)
			Lion's Quest 'Skills for Adolescence' programme	N/A (£34,254.7 per case averted, cost-effective if QUALY gained per averted case >1.7127)	(Eisen et al., 2003;Eisen et al., 2002)
	PH24 Alcohol use disorders: preventing harmful drinking	Modelling to assess the effectiveness and cost-effectiveness of public health related strategies and interventions to reduce alchohol attributable harm in England using the Sheffield Alcohol Policy	Brief intervention & screening in Primary Care[6]	£0 (dominant) - £11,823	(Kaner et al., 2007;Chisholm et al., 2004;Mortimer and Segal, 2005;Solberg et al., 2008)
			Brief intervention & screening in Emergency Care	£9,681	(Crawford et al., 2004)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Alcohol		model version 2.0 (ScHARR, 2009)	Pricing and price-based promotion policies (increase in minimum price per unit alcohol/general price increase across alcoholic beverages/ban off-trade discounting)[7]	£0 (dominant)	(Chisholm et al., 2004;Gallet, 2007;Gruenewald et al., 2006;Wagenaar et al., 2009)
			Reduction in Outlet Density	N/A (cost-effective)	(Blake and Nied, 1997;Gruenewald et al., 1993;Hoadley et al., 1984;Schonlau et al., 2008;Xie et al., 2000)
			Reduction in licensing hours[7]	£0 (dominant) - £100	(Chisholm et al., 2004;Norstrom and Skog, 2003;Carpenter and Eisenberg, 2009)
			Advertising ban[7]	£0 (dominant) - £123	(Chisholm et al., 2004;Saffer and Dave, 2002)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Alchohol			Reinforcing driver/server laws[7]	£0 (dominant)	(Mansdotter et al., 2007;Levy and Miller, 1995)
Sexual Health	PH3 Prevention of sexually transmitted infections and under 18 conceptions	Economic modelling of interventions to reduce the transmission of chlamydia and other sexually transmitted infections and to reduce the rate under eighteen conceptions (NERA, Sept 2006)	Accelerated Partner Therapy	£9,350-£25,900	(Golden et al., 2005;Schillinger et al., 2003)
			Patient referral at GP	£0 (dominant)	(Low et al., 2006)
			Brief counselling	£12,308	(Bolu et al., 2004;Kamb et al., 1998)
			Enhanced/intensive counselling	£24,000-£51,613	(Bolu et al., 2004;Kamb et al., 1998;Maher et al., 2003)
			Tailored skills session	£3,200	(James et al., 1998)
			Behaviour skills counselling	£10,286-£96,000	(Boyer et al., 1997;Kalichman et al., 2005)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Sexual Health	PH33 Increasing the uptake of HIV testing among black Africans in England	Review of effectiveness and cost effectiveness: Increasing the uptake of HIV testing to reduce undiagnosed infection and prevent transmission among black African communities living in England (Fakoya, Evans, Baio, Burns, Morris, Hart, 2010)	N/A – no interventions were identified that were included in the cost-effectiveness review	N/A	N/A
	PH34 Increasing the uptake of HIV testing among men who have sex with men	Preventing and reducing HIV transmission among men who have sex with men (MSM): interventions to increase the uptake of HIV testing: Systematic reviews of effectiveness, cost-effectiveness and qualitative evidence (Matrix, 2010)	Peer education and recruitment	N/A (£2670 per new case identified)	(Golden et al., 2006)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Multiple health behaviours	PH6 Behaviour change	The cost-effectiveness of behaviour change interventions designed to reduce Coronary Heart Disease: A thorough review of existing literature (Fox-Rushby, Griffith, Vitsou, Buxton, 2007	Multiple component CHD prevention programme	£1,660 - £7,574	(Finkelstein et al., 2002;Lindholm et al., 1996;Lindgren et al., 2003)
	PH25 Prevention of cardiovascular disease	Prevention of cardiovascular disease at population level: Modelling strategies for primary prevention of cardiovascular disease (WMHTAC, 2009)	Population-wide multifactor intervention	£7,000	(Tosteson et al., 1997)

Health Behaviour	NICE Guidance	Economic modelling / cost-effectiveness report[1]	Intervention type[2]	Cost-effectiveness (£/QALY/DALY saved/gained)[3]	Effectiveness source material
Multiple health behaviours		Prevention of cardiovascular disease at population level (Question 1; cost-effectiveness) (WMHTAC, 2009)	Multi-component intervention	£0 (dominant) - £41,800	(Wonderling et al., 1996b;Wonderling et al., 1996a;Baxter et al., 1997;Rasmussen et al., 2007;Langham et al., 1996)
	PH35 Preventing Type 2 diabetes	Prevention of type 2 diabetes: preventing pre-diabetes among adults in high-risk groups: Report on Use of Evidence from Effectiveness Reviews and Cost-effectiveness Modelling (ScHARR, 2010)	Dietary, nutritional and educational	£878	(Wrieden et al., 2007;McKellar et al., 2007)
			Multi-component	£562	(Gray et al., 2009)
			Large-scale, region-wide multi-component	£0 (dominant)	(Schuit et al., 2006)

[1]Only focused on those aged 16 years or above; [2]Interventions are listed in order of appearance across economic modelling reports; if the same intervention is included in different economic modelling reports, it is listed only the first time it appears; [3]Unless otherwise specified, comparator is "no intervention" – data are derived directly or calculated from figures in reports (reported costs of interventions and incremental QALY), representing costs for the average intervention user at time of analysis;[4] These data rely on general population, not pregnant population, outcomes reported in NICE guidance CG43 Obesity (Section 6 - health economics: evidence statements and reviews; cost-effectiveness of non-pharmacological interventions in the clinical management of obesity) reported in the economic modelling in PH27; [5]Given that these environmental interventions could be seen as positive externalities (accidental cost/benefit for physical activity from economic transaction not directly linked to purpose of the transaction), the attributable cost is modelled as minimal (5%) here; [6]Additional evidence comes from the Screening and Brief Interventions for Alcohol Use Disorders Cost Effectiveness review (ScHARR, 2010) associated with PH24; [7]Additional evidence comes from the Macro-level interventions for Alcohol Use Disorders Cost Effectiveness review (ScHARR, 2010) associated with PH24

APPENDIX 2: BEHAVIOUR CHANGE TECHNIQUES CLASSIFIED IN INTERVENTIONS FOR SMOKING CESSATION (1)

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
Social support								
1	Social support (practical)	X[1,16]			X[16,22]	X[6]		*
2	Social support (emotional)	X[16]				X[6]		*
3	Social support (unspecified)	X[12,17]	X[4,7,9,18,19,35]	X	X[2,5,7-10,15,23,29,30]	X[1,2]	X[2,4,5]	*
Regulation								
4	Pharmacological support	X[14,17]	X[1-35]		X[2,9,31]	X[1,5]	X[1,5,6]	*
5	Reduce negative emotions	X[17]		X	X[2,3,5,7,13,24,31]	X[3]	X[4]	*

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
6	Conserving mental resources							
7	Paradoxical instructions	X[17]						*
Feedback and monitoring								
8	Feedback on behaviour				X[2,4,14]	X[1]		*
9	Feedback on outcome(s) of behaviour							
10	Self-monitoring of behaviour	X[17]			X[13,18,24,29]			*
11	Self-monitoring of outcome(s) of behaviour				X[20,29]			*

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
12	Monitoring of behaviour by others without feedback							
13	Monitoring outcome(s) of behaviour by others without feedback							
14	Biofeedback				X[6,30]		X[2]	*
Associations								
15	Prompts/cues			X	X[1,28]			*
16	Reduce prompts/cues							
17	Cue signalling reward							

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
18	Remove access to the reward							
19	Remove aversive stimulus							
20	Satiation							
21	Exposure							
22	Associative learning							
Repetition and substitution								
23	Behavioural practice/rehearsal		X[8,23,30,31]					*
24	Habit formation							

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
25	Behaviour substitution				X[2,7,14,18,29,30]			*
26	Habit reversal		X[9]		X[11]			*
27	Overcorrection							
28	Generalisation of a target behaviour							
29	Graded tasks				X[19,20]			*
Antecedents								
30	Restructuring the physical environment				X[20]			*

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
31	Restructuring the social environment							
32	Avoidance/reducing exposure to cues for the behaviour				X[15]			*
33	Distraction				X[18]			*
34	Adding objects to the environment		X[1-35]		X[21]			*
35	Body changes	X[17]		X	X[2,7,24,31]	X[3]		*
Shaping knowledge								
36	Instruction on how to perform a behaviour	X[1,3,6,14-17]	X[2, 4-10,11,16,18-21,23,26,27,32,35]	X	X[1,2,4,6,7,12,14-20,22,24-26,29,31]	X[1,3,5]	X[1,5]	*

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
37	Information about antecedents							
38	Re-attribution							
39	Behavioural experiments							
Self-beliefs								
40	Verbal persuasion about capability	X[6]	X[21]		X[2-4,9,11,20,24]	X[3]	X[4,5]	*
41	Mental rehearsal of successful performance		X[31]					*
42	Focus on past success							
43	Self-talk							

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
Scheduled consequences								
44	Punishment		X[19]		X[23]			*
45	Behaviour cost							
46	Remove reward							
47	Reward approximation							
48	Rewarding completion							
49	Situation-specific reward							
50	Reward incompatible behaviour							
51	Reward alternative behaviour							

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
52	Reduce reward frequency							
53	Remove punishment							
Reward and threat								
54	Material reward (behaviour)		X[6,8]	X	X[5,18,29]			*
55	Material reward (outcome)	X[4]	X[6]		X[18,20,25]			*
56	Social reward							
57	Non-specific reward				X[3]			*
58	Self-reward				X[7,24,31]	X[3]		*

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
59	Future punishment	X[5,12]	X[18]					*
60	Material incentive (behaviour)				X[3]			*
61	Material incentive (outcome)							
62	Social incentive							
63	Non-specific incentive							
64	Self-incentive							
Goals and planning								
65	Problem solving	X[3,6,13,16]	X[8,9,20,21,30,31]	X	X[2-5,7,9,11-14,15,17-20,24,29,31]	X[3,6]	X[2,4,5]	*

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
66	Goal setting (behaviour)		X[8,35]		X[7,11,13,29]			*
67	Goal setting (outcome)	X[1]	X[7,9,10,11,19,22,23,35]		X[14,16,22,24,29.30,31]	X[4]	X[4,5]	*
68	Action planning		X[31]		X[2,9,12,20,30]		X[5]	*
69	Review behaviour goal(s)							
70	Review outcome goal(s)							
71	Behavioural contract				X[13,20,24]	X[4]	X[2]	*
72	Commitment							
73	Discrepancy between current							

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
	behaviour and goal							
74	Persuasive source	X[1-17]	X[1-35]	X	X[1-31]	X[1-6]	X[1-6]	*
75	Pros and cons				X[9,20]		X[4,5]	*
76	Comparative imaging of future outcomes							
Identity								
77	Identification of self as role model							
78	Valued self-identity							
79	Framing/reframing				X[28]		X[2]	*

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
80	Incompatible beliefs							
81	Identity associated with changed behaviour							
Natural consequences								
82	Information about health consequences	X[1,3,6,10,14,16,17]	X[2,5,8,9,21,27,32,35]		X[1-7,9,11-14,16,17,20,21,22,24-26,28-31]	X[1,3,5,6]	X[2,4-6]	*
83	Information about emotional consequences	X[14]	X[8,9]		X[2-5,7,11,29]		X[4]	*
84	Information about social and environmental consequences	X[5]			X[3,4,17]			*

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
85	Salience of consequences	X[5,6,8]			X[2,3,5,9,11,28,31]	X[5]	X[6]	*
86	Monitoring of emotional consequences							
87	Anticipated regret				X[2]			*
Comparison of behaviour								
88	Demonstration of behaviour	X[14]	X[31]		X[2,7,9,20]			*
89	Social comparison		X[21]					*
90	Information about others' approval							
Covert learning								

SMOKING		Intervention type (PH1 Brief interventions and referral for smoking cessation)						
BCT category code and BCT		GP opportunistic advice[a]	GP opportunistic advice + NRT[b]	GP opportunistic advice +referral to telephone helpline[c]	GP opportunistic advice + self-help material[d]	Nurse-led brief intervention in primary care[e]	Nurse-led brief intervention in hospital setting[f]	Overall (found in 1+ intervention in PH1)
91	Imaginary punishment							
92	Imaginary reward							
93	Vicarious consequences							

[a]GP opportunistic advice: Papers identified from Lancaster T, Stead L. Physician advice for smoking cessation. *Cochrane Database Syst Review* 2004(4):CD000165 [1.Betson 1997€π; 2.Demers 1990∑; 3.Haug 1994 Ω; 4.Higashi 1995€; 5.Jamrozik 1994Ωβ; 6.Janz 1987Ω; 7.McDowell 1985Ω; 8.Nebot 1989€; 9.Page 1986Ω; 10.Porter 1972∑; 11.Russell 1979Ω; 12.Russell 1983Ω; 13.Slama 1990Ω£; 14.Slama 1995Ω; 15.Stewart 1982Ω; 16.Vetter 1990Ω; 17.Wilson 1990Ω].

[b]GP opportunistic advice+NRT: Papers identified from Silagy C, Lancaster T, Stead L, Mant D, Fowler G. Nicotine replacement therapy for smoking cessation. *Cochrane Database Syst Rev* 2004(3):CD000146 [1.Areechon 1988∑; 2.Br Thor SocietyΩ; 3.Campbell 1987∑; 4. Clavel-Chapel 1985Ω; 5.Fagerstrom 1984Ω; 6.Fortmann 1995Ω; 7.Gilbert 1989∑; 8.Harackiewicz 1988Ω; 9.Hughes 1989Ω; 10.Hughes 1990Ω; 11.Jamrozik 1984Ω; 12.Jarvik 1984Ω; 13.Livina 1988€; 14.Mori 1992€; 15. Nebot 1992∑; 16. Page 1986Ω; 17.Roto 1987€; 18.Russel 1983Ω; 19.Schneider 1985Ω; 20. Sutton 1987Ω; 21.Sutton 1988Ω; 22.Abelin 1989Ω; 23.CEASE 1999Ω; 24.Daughton 1991€; 25.Daughton 1998Ω; 26.Davidson 1998Ω; 27.Glavas 2003aΩ; 28.Glavas 2003b€;; 29.Hays 1999Ω; 30.Killen 1997Ω; 31.Killen 1997 (video)Ω; 32.Paoletti 1996Ω; 33.Perng 1998€;; 34.Sonderskov 1997Ω; 35.Tonnesen 1991Ω].

[c]GP opportunisitc advice + referral to telephone helpline: Ossip-Klein, D. J., Giovino, G. A., Megahed, N., Black, P.M., Emont, S.L., Stiggins, J., Shulman, E., & Moore, L. (1991). Effects of a smoker's hotline: results of a 10-county self-help trial. *J Consult Clin Psychol*, *59(2),* 325-332.

[d]GP opportunisitc advice + self-help matieral: Papers identified from Lancaster T, Stead LF. Self-help interventions for smoking cessation. *Cochrane Database Syst Rev* 2005(3):CD001118 [1.Cuckle 1984Ω; 2.Curry 1995Ω; 3.Dijkstra 1998aΩ∞; 4.Dijkstra 1999Ω; 5.Gritz 1992Ω©; 6.Humerfelt 1998Ω; 7.Lando 1991Ω; 8.Ledwith 1984∑; 9.Lennox 2001Ω; 10.Pallonen 1994Ω; 11.Schofield 1999Ω; 12.Cummings 1988∑; 13.Davis 1984Ω; 14.Lichtenstein 2000Ω±; 15. Orleans 1991Ω; 16.Betson 1998€π; 17.Campbell 1986Ω; 18.Fortmann 1995Ω; 19.Prue 1983Ω; 20.Resnicow 1997Ω; 21.BTS 1983Ω; 22.Betson€π; 23.Davies 1992∑; 24.Janz 1987Ω; 25.Kottke 1989Ω; 26.Pederson 1983∑; 27.Rice 1994∑; 28.Thompson 1988Ω; 29.Harackiewcz 1988Ω; 30.Hollis 1993Ω; 31.Lando 1988Ω].

[e]Nurse-led brief intervention in primary care: Papers identified from Rice, V. H., & Stead, L. F. (2005). Nursing interventions for smoking cessation. *Cochrane Database of Systematic Reviews* (1) [1.Aveyard 2003Ω; 2.Davies 1992∑; 3.Janz 1987Ω; 4.Nebot 1992∑; 5.Tonnesen 1996Ω; 6.Vetter 1990Ω].

[f]Nures-led brief intervention in hospital settings [Ω1.Molyneux, A., Lewis, S., Leivers, U., Anderton, A., Antoniak, M., Brackenridge, A., Nilsson, F., McNeill, A., West, R., Moxham, J., & Britton, J. (2003). Clinical trial comparing nicotine replacement therapy (NRT) plus brief counselling, brief counselling alone, and minimal intervention on smoking cessation in hospital inpatients. *Thorax*, *58(6),*484-488; Ω2.Hajek, P., Taylor, T. Z., & Mills, P. (2002). Brief intervention during hospital admission to help patients to give up smoking after myocardial infarction and bypass surgery: randomised controlled trial. *BMJ*, *324(7329),* 87-89; ∑3.Pelletier, J. G., & Moisan, J. T. (1998) [Smoking cessation for hospitalized patients: a quasi-experimental study in Quebec]. *Can J Public Health*, *89(4),* 264-269; Ω4.Bolman, C., de, V. H., & van, B. G. (2002). Evaluation of a nurse-managed minimal-contact smoking cessation intervention for cardiac inpatients. *Health Educ Res*, *17(1),* 99-116; Ω5.Hennrikus, D. J., Lando, H. A., McCarty, M. C., Klevan, D., Holtan, N., Huebsch, J. A., Jestus, S., Pelyntel, P. R., Pine, D., Sullivan, S., Swenson, K., Vessey, J. (2005). The TEAM project: the effectiveness of smoking cessation intervention with hospital patients. *Prev Med* 2005, *40(3),* 249-258; ∑6.Nagle, A. L., Hensley, M. J., Schofield, M. J., & Koschel, A. J. (2005). A randomised controlled trial to evaluate the efficacy of a nurse-provided intervention for hospitalised smokers. *Aust N Z J Public Health*, *29(3),* 285-291.

Ω Coded from orginal paper

€ Coded from information in review paper (poster abstract, dissertation or no written in English)

∑ Coded from infromation in review paper and abstract (fulltext version not available)

£ Used additional information from Russell 1979.

π Used additional information on '4As' [Glynn, T. J., & Manley, M. W. (1989). How to help your patients to stop smoking: a National Cancer Institute manual for physicians. Rockville, MD: U.S. Department of Health and Human Services; NIH Publication No. 90-3064] 1) Ask patients about smoking status and assess their motivation to stop; 2) Advise patients on the benefits of stopping; 3) Assist patients in stopping by helping them plan and prepare for cessation; 4) Arrange for them to use professional help and advice from the smoking cessation service.

∞ Used additional information from Dijkstra, A., de Vries H., Roijackers, J., & Van Breukelen, G. (1998). Tailored interventions to communicate stage-matched information to smokers in different motivational stages. *Journal of Consulting and Clinical Psychology,* 66(3), 549-57.

¥ Used additional information from Dijkstra, A., De Vries, H., Roijackers, J., & van Breukelen, G. (1998). Tailoring information to enhance qutting in smokers with low motivation to quit: Three basic efficacy questions. *Health Psychology, 17(6),* 513-519

± Used additional information from Lee, M. E., Lichtenstein, E., Andrews, J. A., Glasgow, R. E., & Hampson, S. E. (1999). Radon-smoking synergy: A population-based behavioral risk reduction approach. *Preventive Medicine, 29*, 222-7

© Used additional information from Hudmon, K. S., Gritz, E. R., Clayton, S., & Nisenbaum, R. (1999). Eating orientation, postcessation weight gain, and continued abstinence among female smokers receiving an unsolicited smoking cessation intervention. *Health Psychology*, *18*, 29-36.

β Used additional information on 'Give up smoking' leaflet from Tones, K., & Tilford, S. (eds.) (2001). Health Promotion: Effciency and Equality. UK: Nelson Thornes.

≠ Used additional information from Lichtenstein, E.., Andrews, J. A., Lee, M. E., Glasgow, R. E., & Hampson, S. E. (2000). Using radon risk to motivate smoking reduction: evaluation of written materials and brief telephone counselling. *Tobacco Control, 9,* 320-6.

÷ Used additional information from Schoenbach, V. J., Orleans, C. T., Wagner, E. H., Quade, D., Salmon, M. A. P., & Porter, C. Q. (1992). Characteristics of smokers who enroll and quit in self-help programs. *Health Education Research*, 7, 369-80.

APPENDIX 3: BEHAVIOUR CHANGE TECHNIQUES CLASSIFIED IN INTERVENTIONS FOR SMOKING CESSATION (2)

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
Social support												
1	Social support (practical)											
2	Social support (emotional)	X[2]										
3	Social support (unspecified)	X[6,10,12,16,23,25]	X[2-4]		X	*				X	X	*
Regulation												
4	Pharmacological	X[1-26]	X[1-7]	X	X	*	X[1]	X[1]	X[1]	X	X	*

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
	support											
5	Reduce negative emotions	X[12]	X[2]			*						
6	Conserving mental resources											
7	Paradoxical instructions	X[11,12,20]	X[2]			*						
Feedback and monitoring												
8	Feedback on behaviour	X[20]				*						

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
9	Feedback on outcome(s) of behaviour											
10	Self-monitoring of behaviour	X[15,20,25]	X[5,6]			*				X	X	*
11	Self-monitoring of outcome(s) of behaviour											
12	Monitoring of behaviour by others without feedback											
13	Monitoring outcome(s) of behaviour by others											

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
	without feedback											
14	Biofeedback											
Associations												
15	Prompts/cues	X[7,8]				*						
16	Reduce prompts/cues									X	X	*
17	Cue signalling reward											
18	Remove access to the reward											

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
19	Remove aversive stimulus											
20	Satiation											
21	Exposure											
22	Associative learning											
Repetition and substitution												
23	Behavioural practice/rehearsal	X[13,19,20]				*		X[1]				*
24	Habit formation											

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
25	Behaviour substitution									X	X	*
26	Habit reversal	X[16]				*						
27	Overcorrection											
28	Generalisation of a target behaviour											
29	Graded tasks											
Antecedents												
30	Restructuring the physical											

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
	environment											
31	Restructuring the social environment											
32	Avoidance/reducing exposure to cues for the behaviour											
33	Distraction											
34	Adding objects to the environment	X[1-26]	X[1-7]	X	X	*	X[1]	X[1]	X[1]	X	X	*
35	Body changes											

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
Shaping knowledge												
36	Instruction on how to perform a behaviour	X[2-5,9-11,13, 15-17,19,20,21,23,24, 25]	X[2,4-6]	X	X	*	X[1]	X[1]	X[1]	X	X	*
37	Information about antecedents											
38	Re-attribution											
39	Behavioural experiments											
Self-beliefs												

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
40	Verbal persuasion about capability	X[23]	X[2]		X	*						
41	Mental rehearsal of successful performance											
42	Focus on past success											
43	Self-talk											
Scheduled consequences												
44	Punishment	X[11,12]				*						

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
45	Behaviour cost											
46	Remove reward											
47	Reward approximation											
48	Rewarding completion											
49	Situation-specific reward											
50	Reward incompatible behaviour											

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
51	Reward alternative behaviour											
52	Reduce reward frequency											
53	Remove punishment											
Reward and threat												
54	Material reward (behaviour)	X[13,19,20]				*						
55	Material reward (outcome)											

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
56	Social reward		X^2			*						
57	Non-specific reward											
58	Self-reward											
59	Future punishment	X^{14}				*						
60	Material incentive (behaviour)											
61	Material incentive (outcome)											
62	Social incentive											

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
63	Non-specific incentive											
64	Self-incentive											
Goals and planning												
65	Problem solving	X[5,11-13,19,20,23,25]	X[2,7]		X	*				X		*
66	Goal setting (behaviour)											
67	Goal setting (outcome)	X[2,7,8,10,13,14,20, 25]	X[2,5,7]			*			X[1]			*

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
68	Action planning	X[19,23]				*						
69	Review behaviour goal(s)	X[7,8]				*		X[1]				*
70	Review outcome goal(s)											
71	Behavioural contract		X[2]			*						
72	Commitment	X[12,23]				*						
73	Discrepancy between current behaviour and goal											

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
74	Persuasive source	X[1,3,4-10,13,15-18,20,22-25]	X[1-7]			*						
75	Pros and cons											
76	Comparative imaging of future outcomes											
Identity												
77	Identification of self as role model											
78	Valued self-identity											

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
79	Framing/reframing											
80	Incompatible beliefs											
81	Identity associated with changed behaviour											
Natural consequences												
82	Information about health consequences	X[3,7,8-13,14,16,23]	X[1,2,4]			*				X	X	*
83	Information about emotional	X[14,20]				*						

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
	consequences											
84	Information about social and environmental consequences	X[13]				*						
85	Salience of consequences	X[7,23]				*						
86	Monitoring of emotional consequences											
87	Anticipated regret											
Comparison of behaviour												

SMOKING		Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT		Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
88	Demonstration of behaviour	X[20,25]	X[3]			*						
89	Social comparison											
90	Information about others' approval							X[1]				*
Covert learning												
91	Imaginary punishment	X[20]	X[2]			*						
92	Imaginary reward											
93	Vicarious											

SMOKING	Intervention type (PH5 workplace interventions to promote smoking cessation)					Intervention type (PH10 smoking cessations services)					
BCT category code and BCT	Brief advice + self-help material + NRT[a]	Brief advice + self-help material + NRT + specialist clinic[b]	Less intensive counselling plus bupropion[c]	More intensive counselling plus bupropion[d]	Overall (found in 1+ inter-vention in PH5)	NRT 5 weeks + 5 clinic visits[e]	NRT 5 weeks + 5 group visits[f]	NRT 5 weeks[g]	NRT 5 weeks + 5 pharmacy consul-tations[h]	NRT 5 weeks + 5 pharmacy consul-tations + 5 clinic visits[i]	Overall (found in 1+ inter-vention in PH10)
consequences											

[a]Brief advice + self-help material + NRT: Papers identified from three reviews [1.Oster, G., Huse, D. M., Delea, T. E., & Colditz, G. A. (1986). Cost effectiveness of nicotine gum as an adjunct to physicians' advice against cigarette smoking. *JAMA, 256*, 1315–18; 2.Warner KE. (1997) Cost effectiveness of smoking cessation therapies: interpretation of the evidence and implications for coverage. *Pharmacoeconomics, 11*, 538–49; 3.Fiscella, K., & Franks, P. (1996). Cost effectiveness of the transdermal nicotine patch as an adjunct to physicians smoking cessation counselling. *JAMA, 275*, 1247–51] [1.Areechon 1988∑; 2.Blondal 1989Ω**;** 3. BTS 1983Ω; 4.Campbell 1987Ω**;** 5.Christen 1984Ω**;** 6.Clavel 1985Ω; 7.Cohen 1989aΩ**;** 8.Cohen 1989bΩ; 9.Fagerstrom 1984Ω; 10.Gilbert 1989∑; 11.Hall 1987Ω; 12.Hall 1985Ω; 13.Harackiewicz 1988Ω; 14.Huber 1988∑; 15.Hughes 1989aΩ; 16.Hughes 1989bΩ; 17.Jamrozik 1984Ω; 18.Jarvik 1984Ω**;** 19.Killen 1990Ω; 20.Killen 1984Ω; 21.Malcolm 1980Ω; 22.Moore 1986€; 23.Ockene 1991Ω; 24.Page 1986Ω; 25.Tonnesen 1988Ω; 26.Zelman 1989€;].

[b]Brief advice + self-help material + NRT + specialist clinic: Papers identified from three reviews 1.Oster, G., Huse, D. M., Delea, T. E., & Colditz, G. A. (1986). Cost effectiveness of nicotine gum as an adjunct to physicians' advice against cigarette smoking. *JAMA, 256*, 1315–18; 2.Warner KE. (1997) Cost effectiveness of smoking cessation therapies: interpretation of the evidence and implications for coverage. *Pharmacoeconomics, 11*, 538–49.; 3.Fiscella, K., & Franks, P. (1996). Cost effectiveness of the transdermal nicotine patch as an adjunct to physicians smoking cessation counselling. *JAMA, 275*, 1247–51. [1.Brantmark 1973Ω; 2.Fagerstrom 1983Ω; 3.Fee 1982Ω; 4.Hjalmarson 1984Ω**;** 5.Jarvis 1982Ω; 6.Puska 1979Ω; 7.Schneider 1983Ω].

[c]Less intensive counselling + bupropion: One paper coded [Ω1.Jarvitz, H. S., Swan, G. E., Zbikowski, S. M., Curry, S. J., McAfee, T. A., Decker, D., Patterson, R., & Jack, L. M. (2004). Return on investment of different combinations of bupropion SR dose and behavioral treatment for smoking cessation in a health care setting: an employer's perspective. *Value Health, 7(5),* 535-54]

[d]More intensive counselling + bupropion: One paper coded [Ω1.Jarvitz, H. S., Swan, G. E., Zbikowski, S. M., Curry, S. J., McAfee, T. A., Decker, D., Patterson, R., & Jack, L. M. (2004). Return on investment of different combinations of bupropion SR dose and behavioral treatment for smoking cessation in a health care setting: an employer's perspective. *Value Health, 7(5),* 535-54]

[e]NRT 5 weeks + 5 clinic visits: Papers coded from McGhan, E. F., & Smith, M. D. (1996). Pharmacoeconomic analysis of smoking-cessation interventions. *American Journal of Health System Pharmacy, 53(1),* 45-52 [Ω1.Tonnesen, P., Norregard, J., Simonsen, K., & Säwe, U. (1991). A double-bind trial of a 16-hur transdermal nicotine patch in smoking cessation. *New England Journal of Medicine, 325.* 311-315].

[f]NRT 5 weeks + 5 group visits: Papers coded from McGhan, E. F., & Smith, M. D. (1996). Pharmacoeconomic analysis of smoking-cessation interventions. *American Journal of Health System Pharmacy, 53(1),* 45-52 [Ω1.Viswesvaran, C., & Schmidt, F. L. (1992). A meta-analytic comparison of the effectiveness of smoking cessation methods. *Journal of Applied Psychology,* 77, 554-61]

[g]NRT 5 weeks: Papers coded from McGhan, E. F., & Smith, M. D. (1996). Pharmacoeconomic analysis of smoking-cessation interventions. *American Journal of Health System Pharmacy, 53(1),* 45-52 [1.Muller, P., Abelin, T., Ehrsa, R., Imhof, P., Howald, H., & Mauli, D. (1990). The use of transdermal nicotine in smoking cessation. *Lung, 168*,445-53; Ω3.Tonnesen, P., Norregard, J., Simonsen, K., & Säwe, U. (1991). A double-bind trial of a 16-hour transdermal nicotine patch in smoking cessation. *New England Journal of Medicine, 325.* 311-315].

[h]NRT 5 weeks + 5 pharmacy consultations: Papers coded from McGhan, E. F., & Smith, M. D. (1996). Pharmacoeconomic analysis of smoking-cessation interventions. *American Journal of Health System Pharmacy, 53(1),* 45-52 [∑1.Smith, M. D., McGhan, W. F., & Lauger, G. (1995). Pharmacist counseling and outcomes of smoking cessation. *Am Pharm, NS35(8),* 20-9].

[i]NRT 5 weeks + 5 clinic visits + 5 pharmacy consultations: Papers coded from McGhan, E. F., & Smith, M. D. (1996). Pharmacoeconomic analysis of smoking-cessation interventions. *American Journal of Health System Pharmacy, 53(1),* 45-52 [∑1.Smith, M. D., McGhan, W. F., & Lauger, G. (1995). Pharmacist counseling and outcomes of smoking cessation. *Am Pharm, NS35(8),* 20-9].

Ω Coded from orginal paper

€ Coded from information in review paper (poster abstract, dissertation or no written in English)

∑ Coded from infromation in review paper and abstract (fulltext version not available)

APPENDIX 4: BEHAVIOUR CHANGE TECHNIQUES CLASSIFIED IN INTERVENTIONS FOR SMOKING CESSATION (3)

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
Social support										
1	Social support (practical)									
2	Social support (emotional)									
3	Social support (unspecified)	X[1,2]	X	X	X		X	X	X	X
Regulation										
4	Pharmacological support		X			X			X	X

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
5	Reduce negative emotions		X	X						X
6	Conserving mental resources									
7	Paradoxical instructions									
Feedback and monitoring										
8	Feedback on behaviour							X		
9	Feedback on outcome(s) of behaviour									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
10	Self-monitoring of behaviour									X
11	Self-monitoring of outcome(s) of behaviour									
12	Monitoring of behaviour by others without feedback									
13	Monitoring outcome(s) of behaviour by others without feedback									
14	Biofeedback									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
Associations										
15	Prompts/cues	X[1,2,3]	X					X		
16	Reduce prompts/cues									
17	Cue signalling reward									
18	Remove access to the reward									
19	Remove aversive stimulus									
20	Satiation									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
21	Exposure									
22	Associative learning									
Repetition and substitution										
23	Behavioural practice/rehearsal									X
24	Habit formation									
25	Behaviour substitution									
26	Habit reversal									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
27	Overcorrection									
28	Generalisation of a target behaviour									
29	Graded tasks	X^2								
Antecedents										
30	Restructuring the physical environment									
31	Restructuring the social environment									
32	Avoidance/reducing									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
	exposure to cues for the behaviour									
33	Distraction									
34	Adding objects to the environment		X			X				
35	Body changes			X						
Shaping knowledge										
36	Instruction on how to perform a behaviour		X		X		X	X	X	X
37	Information about									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
	antecedents									
38	Re-attribution									
39	Behavioural experiments									
Self-beliefs										
40	Verbal persuasion about capability							X		
41	Mental rehearsal of successful performance									
42	Focus on past									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
	success									
43	Self-talk									
Scheduled consequences										
44	Punishment									
45	Behaviour cost									
46	Remove reward									
47	Reward approximation									
48	Rewarding									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
	completion									
49	Situation-specific reward									
50	Reward incompatible behaviour									
51	Reward alternative behaviour									
52	Reduce reward frequency									
53	Remove punishment									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
Reward and threat										
54	Material reward (behaviour)									
55	Material reward (outcome)							X		
56	Social reward				X					X
57	Non-specific reward									
58	Self-reward									
59	Future punishment									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
60	Material incentive (behaviour)									
61	Material incentive (outcome)									
62	Social incentive									
63	Non-specific incentive									
64	Self-incentive									
Goals and planning										
65	Problem solving	X[1,2]	X	X				X		X

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
66	Goal setting (behaviour)									
67	Goal setting (outcome)	X[2]		X	X		X			X
68	Action planning							X	X	X
69	Review behaviour goal(s)									
70	Review outcome goal(s)									
71	Behavioural contract									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
72	Commitment									X
73	Discrepancy between current behaviour and goal									
74	Persuasive source		X		X	X		X	X	X
75	Pros and cons	X[2]	X							
76	Comparative imaging of future outcomes									
Identity										
77	Identification of self									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
	as role model									
78	Valued self-identity									
79	Framing/reframing	X[1,3]								
80	Incompatible beliefs									
81	Identity associated with changed behaviour									
Natural consequences										
82	Information about health consequences	X[2,3]	X		X			X		X

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
83	Information about emotional consequences			X						
84	Information about social and environmental consequences									
85	Salience of consequences									
86	Monitoring of emotional consequences									
87	Anticipated regret									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
Comparison of behaviour										
88	Demonstration of behaviour	X[3]						X		
89	Social comparison							X		X
90	Information about others' approval									
Covert learning										
91	Imaginary punishment									
92	Imaginary reward									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Client-centred social marketing intervention[a]	Workplace intervention to improve access[b]	Brief advice for pregnant smokers[c]	Proactive telephone support for pregnant smokers[d]	NRT prescription incentives[e]	NHSSS identifying and reaching smokers[f]	Paediatric unit identifying and reaching smokers[g]	Pharmacy based recruitment[h]	Recruiting smokers from community[i]
93	Vicarious consequences									

[a]Clinet-centred social marketing interventions: Coded from three papers [Ω1.Boyd, N. R., Sutton, C., Orleans, C. T., McClatchey, M. W., Bingler, R., Fleisher, L., Heller, D., Baum, S., Graves, C., & Ward, J. A. (1998). Quit Today! A targeted communications campaign to increase use of the cancer information service by African American smokers. *Preventive Medicine, 27*, S50-S60; Ω2.Schorling, J. B., Roach, J., Siegel, M., Baturka, N., Hunt, D. E., Guterbock, T.M., & Stewart, H. L. (1997). A trial of church-based smoking cessation interventions for rural African Americans. *Preventive Medicine, 26(1),*92-101; Ω3.Stevens, W., Thorogood, M., & Kayikki, S. (2002). Cost-effectiveness of a community anti-smoking campaign targeted at a high risk group in London. *Health Promot Int*, *17(1),* 43-50.

[b]Workplace intervention to improve access: One paper coded [Ω1.Barbeau, E. M., Li, Y., Calderon, P., Hartman, C., Quinn, M., Markkanen, P., Roelofs, C., Frazier, L., Levenstein, C. (2006). Results of a union-based smoking cessation intervention for apprentice iron workers (United States). *Cancer Causes Control*, *17(1),*53-61]

[c]Brief advice for pregnant smoker: One paper coded [Ω1.Dornelas, E. A., Magnavita, J., Beazoglou, T., Fischer, E. H., Oncken, C., Lando, H., Greene, J., Barbagallo, J., Stepnowski, R., & Gregonis, E. (2006). Efficacy and cost-effectiveness of a clinic-based counseling intervention tested in an ethnically diverse sample of pregnant smokers. *Patient Educ Couns*, 64(1-3), 342-349.

[d]Proactive telephone support for pregnant smokers: One paper coded [Ω1.Solomon, L. J., Secker-Walker, R. H., Flynn, B. S., Skelly, J. M., & Capeless, E. L. (2000). Proactive telephone peer support to help pregnant women stop smoking. *Tob Control*, *9*, III72-III74].

[e]NRTprescription incentives: One paper coded [Ω1.Copeland, L., Robertson, R., Elton, R. (2005). What happens when GPs proactively prescribe NRT patches in a disadvantaged community. *Scott Med J*, 50(2), 64-68.

[f]NHSSS identifying and reaching smoker: One paper coded [Ω1.Lowey, H., Tocque, K., Bellis, M. A., & Fullard, B. (2003). Smoking cessation services are reducing inequalities. *J Epidemiol Community Health*, *57(8),* 579-580.

[g]Paediatric unit identifying and reaching smokers: One paper coded [Ω1.Curry, S. J., Ludman, E. J., Graham, E., Stout, J., Grothaus, L., & Lozano, P. (2003). Pediatric-based smoking cessation intervention for low-income women: a randomized trial. *Arch Pediatr Adolesc Med* 2003, *157(3)*, 295-302]

[h]Pharmacy-based recruitment: One paper coded [Ω1.Bauld, L., Ferguson, J., Lawson, L., Chesterman, J., & Judge, K. (2006). Tackling smoking in Glasgow: Final report. In: http://www.gcph.co.uk/assets/0000/0441/Tackling_Smoking_in_Glasgow_Final_report.pdf.

[i]Recruiting smokers from commnunity: One paper coded [Ω1.Harding, R., Bensley, J., & Corrigan, N. (2004). Targeting smoking cessation to high prevalence communities: outcomes from a pilot intervention for gay men. *BMC Public Health*, 4, 43].

Ω Coded from orginal paper

€ Coded from information in review paper (poster abstract, dissertation or no written in English)

∑ Coded from infromation in review paper and abstract (fulltext version not available)

APPENDIX 5: BEHAVIOUR CHANGE TECHNIQUES CLASSIFIED IN INTERVENTIONS FOR SMOKING CESSATION (4)

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
Social support										
1	Social support (practical)									
2	Social support (emotional)									
3	Social support (unspecified)	X	X[1,2]	X[1,2]		X[1-5,7-9,11]	X[1,3,8]	X[1,3]	X[1,4-7]	
Regulation										
4	Pharmacological support		X[2]	X[2]		X[2,5,7,11,12,13]		X[1,3]	X[2,4-8]	X

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
5	Reduce negative emotions	X				X[1,2,8,10,12]	X[3,8,17]		X[2]	
6	Conserving mental resources									
7	Paradoxical instructions						X[4]			
Feedback and monitoring										
8	Feedback on behaviour				X	X[1,2,9,10,11]		X[2]	X[2]	
9	Feedback on outcome(s) of behaviour									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
10	Self-monitoring of behaviour					X[2,7]	X[3,8]			
11	Self-monitoring of outcome(s) of behaviour									
12	Monitoring of behaviour by others without feedback									
13	Monitoring outcome(s) of behaviour by others without feedback									
14	Biofeedback					X[12]			X[2,35]	X

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
Associations										
15	Prompts/cues	X				X[9,11,12]	X[3,11]			
16	Reduce prompts/cues									
17	Cue signalling reward									
18	Remove access to the reward									
19	Remove aversive stimulus									
20	Satiation									
21	Exposure									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
22	Associative learning									
Repetition and substitution										
23	Behavioural practice/rehearsal					X[12]			X[2]	
24	Habit formation									
25	Behaviour substitution					X[1,11]	X[3,17]		X[3]	
26	Habit reversal					X[11]				
27	Overcorrection									
28	Generalisation of a									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
	target behaviour									
29	Graded tasks					X[3,9,11]	X[3]	X[2]	X[6]	
Antecedents										
30	Restructuring the physical environment									
31	Restructuring the social environment									
32	Avoidance/reducing exposure to cues for the behaviour									
33	Distraction									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
34	Adding objects to the environment					X[7,12]			X[8]	X
35	Body changes	X				X[10,12]				
Shaping knowledge										
36	Instruction on how to perform a behaviour	X	X[1,2]	X[2]	X	X[3,5,7,9-13]	X[1,3,8,11,12,17]	X[1]	X[1-4,7,8]	X
37	Information about antecedents									
38	Re-attribution									
39	Behavioural experiments									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
Self-beliefs										
40	Verbal persuasion about capability	X				X[1,2,9,10,11]	X[1]	X[1,2]	X[1]	
41	Mental rehearsal of successful performance								X[2]	
42	Focus on past success									
43	Self-talk									
Scheduled consequences										
44	Punishment									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
45	Behaviour cost									
46	Remove reward									
47	Reward approximation									
48	Rewarding completion									
49	Situation-specific reward									
50	Reward incompatible behaviour									
51	Reward alternative behaviour									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
52	Reduce reward frequency									
53	Remove punishment									
Reward and threat										
54	Material reward (behaviour)						X[4,17]			
55	Material reward (outcome)					X[1]	X[1-17]			
56	Social reward					X[3,9,10]			X[2]	
57	Non-specific reward					X[11]			X[2]	

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
58	Self-reward									
59	Future punishment									
60	Material incentive (behaviour)									
61	Material incentive (outcome)									
62	Social incentive									
63	Non-specific incentive					X^2			X^2	
64	Self-incentive									
Goals and planning										

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
65	Problem solving	X	X[2]	X[2]		X[1-3,6,8-13]	X[1,3,8,17]	X[2]	X[1,2,8]	
66	Goal setting (behaviour)					X[2,9,7]				
67	Goal setting (outcome)	X	X[1,2]			X[3,7,9,11,12]	X[3,8,11]	X[3]	X[1-3,5-8]	X
68	Action planning		X[2]		X	X[7,9,11,12]	X[3]	X[1]	X[1,2,6]	X
69	Review behaviour goal(s)									
70	Review outcome goal(s)									
71	Behavioural contract					X[7,12]				

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
72	Commitment					X[11]	X[8]			
73	Discrepancy between current behaviour and goal									
74	Persuasive source			X[1,2]	X	X[7,8]		X[1]	X[1-8]	
75	Pros and cons					X[10,12]		X[2]	X[1]	
76	Comparative imaging of future outcomes									
Identity										
77	Identification of self as role model									

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
78	Valued self-identity									
79	Framing/reframing					X[10]				
80	Incompatible beliefs									
81	Identity associated with changed behaviour					X[10]				
Natural consequences										
82	Information about health consequences	X	X[2]	X[1,2]		X[1-3,7,8,10-13]	X[1,8,15]		X[1-5,7]	X
83	Information about emotional consequences					X[1,9]			X[2]	

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
84	Information about social and environmental consequences					X[9,10]			X[2]	
85	Salience of consequences					X[1,7,11]			X[2,5]	
86	Monitoring of emotional consequences									
87	Anticipated regret									
Comparison of behaviour										
88	Demonstration of behaviour	X				X[12]	X[11]			

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)								
BCT category code and BCT		Social marketing to deliver client centred approaches to smoking cessation[a]	Free mobile phones for use in smoking cessation counselling[b]	Cervical screening recruitment[c]	Nurse run clinics[d]	Proactive telephone counselling[e]	Quit and win recruitment[f]	Identifying smokers through other means[g]	Dentist-based interventions to improve access[h]	Drop-in/rolling community based sessions to improve access[i]
89	Social comparison					X[1,10,11]		X[2]		
90	Information about others' approval									
Covert learning										
91	Imaginary punishment									
92	Imaginary reward									
93	Vicarious consequences									

[a]Social marketing to deliver client centred approaches to smoking cessation: One paper coded [Ω1.Turner, L. R., Morera, O. F., Johnson, T. P., Crittenden, K. S., Freels, S., Parsons, J., Flay, B., & Warnecke, R.B. (2001). Examining the effectiveness of a community-based self-help program to increase women's readiness for smoking cessation. *Am J Community Psychol*, 29(3), 465-491]

[b]Free mobile phones for use in smoking cessation couselling: Two papers coded [Ω1.Lazev, A., Vidrine, D., Arduino, R., & Gritz, E. (2004). Increasing access to smoking cessation treatment in a low-income, HIV-positive population: the feasibility of using cellular telephones. *Nicotine Tob Res*, *6(2),* 281-286; Ω2.Vidrine, D. J., Arduino, R. C., Lazev, A. B., & Gritz, E. R. (2006). A randomized trial of a proactive cellular telephone intervention for smokers living with HIV/AIDS. *AIDS*, 20(2), 253-260].

[c]Cervical screening recruitment: Two papers coded [Ω1.Hall, S., Bishop, A. J., & Marteau, T. M. (2003). Increasing readiness to stop smoking in women undergoing cervical screening: evaluation of two leaflets. *Nicotine Tob Res*, *5(6)*, 821-826; Ω2.Hall, S., Reid, E., Ukoumunne, O. C., Weinman, J., & Marteau, T. M. (2007). Brief smoking cessation advice from practice nurses during routine cervical smear tests appointments: a cluster randomised controlled trial assessing feasibility, acceptability and potential effectiveness. *Br J Cancer*, 96(7), 1057-1061].

[d]Nurse run clinics: One paper coded [Ω1.Campbell, N. C., Ritchie, L. D., Thain, J., Deans, H. G., Rawles, J. M., & Squair, J. L. (1998). Secondary prevention in coronary heart disease: a randomised trial of nurse led clinics in primary care. *Heart*, *80(5),* 447-452].

[e]Proactive telephone counselling: One review coded Lichtenstein, E., Glasgow, R. E., Lando, H. A., Ossip-Klein, D. J., & Boles, S. M. (1996). Telephone couselling for smoking cessation: rationales and meta-analytic review of evidence. *Health Education Research, 11(2),* 243-257 [Ω1.Curry 1996; Ω2.DeBusk 1994; Ω3.Lando 1992; €4.Lando 1994a; €5.Lando 1994b; €6.Mermelstein 1994; Ω7.Ockene 1991/1994; Ω8.Ockene et al 1992; Ω9.Orleans 1991; Ω10.Prochaska 1993; Ω11.Rimer 1994; Ω12.Taylor 1990; 13.Zhu 1996].

[f]Quit and win recruitment: Coded from one paper and one review Ω1.Tillgren, P., Eriksson, L., Guldbrandsson, K., & Spiik, M. (2000). Impact of direct mail as a method to recruit smoking mothers into a ''quit and win'' contest. *Journal of Health Commun, 5(4),* 293-303; Ω2.Bains, N., Pickett, W., & Hoey, J. (1998). The use and impact of incentives in population-based smoking cessation programs: a review. *American Journal of Health Promotion, 12(5),* 307-320 [Ω2.Glasgow 1985; Ω3.Altman 1987; Ω4.Elder 1987; Ω5.King 1987; ∑6.Cummings 1990; Ω7.Lando 1990; Ω8.Lefebvre 1990; ∑9.Elder 1991; ∑10.Lando 1991; Ω11.Korhonen 1992; Ω12.Tillgren 1992; Ω13.Champman 1993; ∑14.Korhonen 1993; Ω15.Roberts 1993; ∑16.Leinweber 1994; Ω17.Fortman 1995]

[g]Identifying smokers through other means: Three papers coded [Ω1.Bentz, C. J., Bayley, K. B., Bonin, K. E., Fleming, L., Hollis, J. F., & McAfee, T. (2006). The feasibility of connecting physician offices to a state-level tobacco quit line. *Am J Prev Med*, *30(1),* 31-37; Ω2.Prochaska, J. O., Velicer, W. F., Fava, J. L., Rossi, J. S., & Tsoh, J. Y. (2001). Evaluating a population-based recruitment approach and a stage-based expert system intervention for smoking cessation. *Addict Behav*, *26(4),* 583-602; Ω3.Milch, C. E., Edmunson, J. M., Beshansky, J. R., Griffith, J. L., & Selker, H. P. (2004). Smoking cessation in primary care: a clinical effectiveness trial of two simple interventions. *Prev Med*, 38(3), 284-294]

[h]Dentist-based interventions to improve access: Papers identified from Carr, A. B., & Ebbert, J. O. (2006). Interventions for tobacco cessation in the dental setting. *Cochrane Database Syst Rev*, *(1),* CD005084 [Ω1.Lando 2007; Ω2.Ebbert 2007; Ω3.Severson 1998; €4.Binnie 2007π; Ω5.Gordon 2010a; Ω6.Nohlert 2009; Ω7.Gordon 2010b; Ω8.Hanioka 2010].

[i]Drop in/rolling community based sessions to improve access: Coded frm one paper [Ω1.Owens, C., & Sprigetti, J. (2006). The Roy Castle fag ends stop smoking service: a successful cliend-led approach to smoking cessation. *J Smok Cess*, 1(1), 1-6].

Ω Coded from orginal paper

€ Coded from information in review paper (poster abstract, dissertation or no written in English)

∑ Coded from infromation in review paper and abstract (fulltext version not available)

π Used additional information on '4As' [Glynn, T. J., & Manley, M. W. (1989). How to help your patients to stop smoking: a National Cancer Institute manual for physicians. Rockville, MD: U.S. Department of Health and Human Services; NIH Publication No. 90-3064] 1) Ask patients about smoking status and assess their motivation to stop; 2) Advise patients on the benefits of stopping; 3) Assist patients in stopping by helping them plan and prepare for cessation; 4) Arrange for them to use professional help and advice from the smoking cessation service.

APPENDIX 6: BEHAVIOUR CHANGE TECHNIQUES CLASSIFIED IN INTERVENTIONS FOR SMOKING CESSATION (5)

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
Social support											
1	Social support (practical)										
2	Social support (emotional)				*	X[4]					
3	Social support (unspecified)	X[2]	X[1]	X	*	X[1,3,7,8,10,11,13,14,17,18,19]	X[2,3,7]		X[1,2]	X[1,2]	*
Regulation											
4	Pharmacological support	X[1,2]	X[1,2]		*	X[17]				X[1-3]	*

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
5	Reduce negative emotions				*	X[2,6,10,11,13,16,18]	X[2,3]			X[1]	*
6	Conserving mental resources										
7	Paradoxical instructions				*	X[11,18]					
Feedback and monitoring											
8	Feedback on behaviour				*						
9	Feedback on outcome(s) of behaviour										

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
10	Self-monitoring of behaviour				*	X[2,5,9]			X[2]	X[1]	*
11	Self-monitoring of outcome(s) of behaviour										
12	Monitoring of behaviour by others without feedback										
13	Monitoring outcome(s) of behaviour by others without feedback				*	X[5]					

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
14	Biofeedback				*		X[7]	X[1-3]	X[1]		*
Associations											
15	Prompts/cues				*	X[11]					
16	Reduce prompts/cues		X[1]		*						
17	Cue signalling reward										
18	Remove access to the reward										
19	Remove aversive stimulus										

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
20	Satiation										
21	Exposure										
22	Associative learning										
Repetition and substitution											
23	Behavioural practice/rehearsal				*	X[1]					
24	Habit formation										
25	Behaviour substitution		X[2]		*	X[10]	X[2]				*

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
26	Habit reversal			X	*	X[9]				X[1]	*
27	Overcorrection										
28	Generalisation of a target behaviour										
29	Graded tasks				*	X[6,11,14]	X[3]			X[1]	*
Antecedents											
30	Restructuring the physical environment										
31	Restructuring the social										

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
	environment										
32	Avoidance/reducing exposure to cues for the behaviour										
33	Distraction										
34	Adding objects to the environment	X[1,2]	X[1,2]		*	X[6,17]				X[1,2]	*
35	Body changes				*	X[6,13,16,18]					
Shaping knowledge											
36	Instruction on how to perform a	X[1,2]	X[1]		*	X[1,2,4,8,11,15,17-	X[2,5]	X[2]	X[1,2]	X[1-3]	*

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
	behaviour					[20]					
37	Information about antecedents										
38	Re-attribution										
39	Behavioural experiments										
Self-beliefs											
40	Verbal persuasion about capability	X[1,2]	X[1]		*	X[1]	X[6]				*

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
41	Mental rehearsal of successful performance				*						
42	Focus on past success										
43	Self-talk										
Scheduled consequences											
44	Punishment										
45	Behaviour cost										
46	Remove reward										

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
47	Reward approximation										
48	Rewarding completion										
49	Situation-specific reward										
50	Reward incompatible behaviour										
51	Reward alternative behaviour										
52	Reduce reward										

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
	frequency										
53	Remove punishment										
Reward and threat											
54	Material reward (behaviour)			X	*	X[1]					
55	Material reward (outcome)			X	*	X[17]			X[1,2]		*
56	Social reward				*	X[4,5,10,13]	X[3]				*
57	Non-specific reward				*						

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
58	Self-reward										
59	Future punishment										
60	Material incentive (behaviour)										
61	Material incentive (outcome)										
62	Social incentive										
63	Non-specific incentive				*						

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
64	Self-incentive										
Goals and planning											
65	Problem solving		X[1]	X	*	X[1-4,6,10,12,14,16-20]	X[2,3,5]				*
66	Goal setting (behaviour)				*			X[2]			
67	Goal setting (outcome)				*	X[2,5,8-10,12,14,16-20]	X[2,3,5]			X[3]	*
68	Action planning				*	X[2,9,20]					
69	Review behaviour goal(s)						X[5]				*

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
70	Review outcome goal(s)										
71	Behavioural contract				*	X[7,9,11,18,20]					
72	Commitment			X	*	X[3,14]					
73	Discrepancy between current behaviour and goal										
74	Persuasive source	X[1,2]			*	X[1-9,11-20]	X[1-7]	X[1,2]	X[2]	X[1,3]	*
75	Pros and cons				*	X[3,12]	X[2]				*

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
76	Comparative imaging of future outcomes										
Identity											
77	Identification of self as role model										
78	Valued self-identity										
79	Framing/reframing				*		X^2				*
80	Incompatible beliefs						X^2				*

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
81	Identity associated with changed behaviour										
Natural consequences											
82	Information about health consequences			X	*	$X^{1-4,6-11-13,15-20}$	X^{2-7}	X^{1-3}	$X^{1,2}$	$X^{1,3}$	*
83	Information about emotional consequences				*	$X^{7,12}$				X^{3}	*
84	Information about social and environmental				*						

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
	consequences										
85	Salience of consequences				*	X[3,12]	X[2]				*
86	Monitoring of emotional consequences										
87	Anticipated regret										
Comparison of behaviour											
88	Demonstration of behaviour				*	X[1,2,5,19,20]		X[1]			*

SMOKING		Intervention type (PH15 identifying and supporting people most at risk from dying)				Intervention type (PH26 Quitting smoking in pregnancy and following childbirth)					
BCT category code and category		Pharmacy-based interventions to improve access[a]	Free NRT incen-tives[b]	Workplace smoking cessation and incentives[c]	Overall (found in 1+ intervention in PH15)	Cognitive behaviour strategies[d]	Stages of change[e]	Feedback[f]	Rewards[g]	Pharmaco-therapy[h]	Overall (found in 1+ intervention in PH26)
89	Social comparison				*	X[1,10,20]					
90	Information about others' approval				*	X[1]					
Covert learning											
91	Imaginary punishment										
92	Imaginary reward										
93	Vicarious consequences										

[a]Pharmacy-based interventions to improve access: Papers coded from Blenkinsopp, A., Anderson, C., & Armstrong, M. (2003). Systematic review of the effectiveness of community pharmacy-based interventions to reduce risk behaviours and risk factors for coronary heart disease. *J Public Health Med* 2003, *25(2)*, 144-153 [Ω1.Maguire 2001; Ω2.Sinclair 1998].

[b]Free NRT incentives: Two papers coded [Ω1.An, L. C., Schillo, B. A., Kavanaugh, A. M., Lachter, R. B., Luxenberg, M. G., Wendling, A. H., & Joseph, A. M. (2006). Increased reach and effectiveness of a statewide tobacco quitline after the addition of access to free nicotine replacement therapy. *Tob Control*, *15(4)*, 286-293; Ω2.Bauer, J. E., Carlin-Menter, S. M., Celestino, P. B., Hyland, A., & Cummings, K. M. (2006). Giving away free nicotine medications and a cigarette substitute (Better Quit) to promote calls to a quitline. *J Public Health Manag Pract*, *12(1),* 60-67].

[c]Workplace smoking cessation incentives: One paper coded [Ω1.Hennrikus, D. J., Jeffery, R. W., Lando, H. A., Murray, D. M., Brelje, K., Davidann, B., Baxter, J. S., Thai, D., Vessey, J., & Liu, J. (2002). The SUCCESS project: the effect of program format and incentives on participation and cessation in worksite smoking cessation programs. *Am J Public Health*, 92(2), 274-279∞].

[d]Cognitive behaviour startegies: Articles indentified from Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L., & Watson, L. (2009). Interventions for promoting smoking cessation during pregnancy. *Cochrane Database Syst Rev*, *3,* CD001055 [1.Albrecht 1998Ω; 2.Cinciripini 2000Ω; 3.Ershoff 1989Ω; 4.Gielen 1997Ω; 5.Hartmann 1996Ω; 6.Hjalmarson 1991Ω; 7.Lowe 1998a∑; 8.Malchodi 2003Ω; 9.Mayer 1990Ω; 10.McBride 1999Ω; 11.O'Connor 1992Ω; 12.Panjari 1999Ω; 13.Petersen 1992Ω; 14.Secker-Walker 1994Ω; 15.Valbo 1991Ω; 16.Valbo 1994Ω; 17.Walsh 1997Ω; 18.Windsor 1985Ω; 19.Windsor 1993Ω; 20.Windsor 200aΩ].

[e]Stages of change: Articles indentified from Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L., & Watson, L. (2009). Interventions for promoting smoking cessation during pregnancy. *Cochrane Database Syst Rev*, *3,* CD001055 [Ω1.Dunkley 1997; Ω2.Ershoff 1999; Ω3.Solomon 2000; Ω4.Stotts 2000; Ω5.Strecher 2000; Ω6.Tappin 2000; ∑7.Thornton 1997]

[f]Feedback: Articles indentified from Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L., & Watson, L. (2009). Interventions for promoting smoking cessation during pregnancy. *Cochrane Database Syst Rev*, *3,* CD001055 [Ω1.Bauman 1983; Ω2.Burling 1991; Ω3.Reading 1982].

[g]Rewards@ Articles indentified from Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L., & Watson, L. (2009). Interventions for promoting smoking cessation during pregnancy. *Cochrane Database Syst Rev*, *3,* CD001055 [Ω1.Donatelle 2000; Ω2.Sexton 1984].

[h]Pharmacotherapy: Articles indentified from Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L., & Watson, L. (2009). Interventions for promoting smoking cessation during pregnancy. *Cochrane Database Syst Rev*, *3,* CD001055 [Ω1.Hegaard 2003; Ω2.Kapur 2001; Ω3.Wisborg 2000]

Ω Coded from orginal paper

€ Coded from information in review paper (poster abstract, dissertation or no written in English)

∑ Coded from infromation in review paper and abstract (fulltext version not available)

∞ Additional information attained from 1.Strecher, V. J., & Rimer, B. (1993). *Freedom From Smoking*. New York, NY, American Lung Association; 2. Lando, H. A., McGovern, P. G., Barrios, F. X., & Etringer,B. D. (1990). Comparative evaluation of American Cancer Society and American Lung Association smoking cessation clinics. *Am J Public Health, 80,* 554–559.

APPENDIX 7: BEHAVIOUR CHANGE TECHNIQUES CLASSIFIED IN INTERVENTIONS FOR DIET

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
Social support										
1	Social support (practical)									
2	Social support (emotional)									
3	Social support (unspecified)	X		X	*					
Regulation										
4	Pharmacological support									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
5	Reduce negative emotions									
6	Conserving mental resources									
7	Paradoxical instructions									
Feedback and monitoring										
8	Feedback on behaviour									
9	Feedback on outcome(s) of behaviour									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
10	Self-monitoring of behaviour					X	X		X[1]	*
11	Self-monitoring of outcome(s) of behaviour									
12	Monitoring of behaviour by others without feedback									
13	Monitoring outcome(s) of behaviour by others without feedback									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
14	Biofeedback									
Associations										
15	Prompts/cues									
16	Reduce prompts/cues						X			*
17	Cue signalling reward									
18	Remove access to the reward									
19	Remove aversive stimulus									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
20	Satiation									
21	Exposure									
22	Associative learning									
Repetition and substitution										
23	Behavioural practice/rehearsal									
24	Habit formation									
25	Behaviour substitution									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
26	Habit reversal									
27	Overcorrection									
28	Generalisation of a target behaviour									
29	Graded tasks								X[1]	
Antecedents										
30	Restructuring the physical environment									
31	Restructuring the social environment									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
32	Avoidance/reducing exposure to cues for the behaviour									
33	Distraction									
34	Adding objects to the environment	X	X	X	*	X			X[1,2]	*
35	Body changes		X	X	*	X	X	X	X[1,2]	*
Shaping knowledge										
36	Instruction on how to perform a behaviour	X	X	X	*	X	X	X	X[1]	*

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
37	Information about antecedents									
38	Re-attribution									
39	Behavioural experiments									
Self-beliefs										
40	Verbal persuasion about capability						X			*
41	Mental rehearsal of successful performance									
42	Focus on past									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
	success									
43	Self-talk									
Scheduled consequences										
44	Punishment									
45	Behaviour cost									
46	Remove reward									
47	Reward approximation									
48	Rewarding completion									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
49	Situation-specific reward									
50	Reward incompatible behaviour									
51	Reward alternative behaviour									
52	Reduce reward frequency									
53	Remove punishment									
Reward and threat										

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
54	Material reward (behaviour)									
55	Material reward (outcome)									
56	Social reward									
57	Non-specific reward									
58	Self-reward									
59	Future punishment									
60	Material incentive (behaviour)									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
61	Material incentive (outcome)									
62	Social incentive									
63	Non-specific incentive									
64	Self-incentive									
Goals and planning										
65	Problem solving						X		X[1]	*
66	Goal setting (behaviour)								X[1,2]	*

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
67	Goal setting (outcome)									
68	Action planning								X[1]	*
69	Review behaviour goal(s)									
70	Review outcome goal(s)									
71	Behavioural contract									
72	Commitment									
73	Discrepancy between current									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
	behaviour and goal									
74	Persuasive source									
75	Pros and cons									
76	Comparative imaging of future outcomes									
Identity										
77	Identification of self as role model									
78	Valued self-identity									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
79	Framing/reframing									
80	Incompatible beliefs									
81	Identity associated with changed behaviour									
Natural consequences										
82	Information about health consequences	X		X	*					
83	Information about emotional consequences									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
84	Information about social and environmental consequences									
85	Salience of consequences									
86	Monitoring of emotional consequences									
87	Anticipated regret									
Comparison of behaviour										
88	Demonstration of behaviour									

DIET		Intervention type (PH11 maternal and child nutrition)				Intervention type (PH27 weight management before, during and after pregnancy)				
BCT category code and BCT		Peer support[a]	Folic acid supplement[b]	Women, infants and children (WIC) programme[c]	Overall (found in 1+ intervention in PH11)	Diet[d]	Behavioural treatment[e]	Exercise[f]	Diet and exercise[g]	Overall (found in 1+ intervention in PH27)
89	Social comparison	X			*					
90	Information about others' approval									
Covert learning										
91	Imaginary punishment									
92	Imaginary reward									
93	Vicarious consequences									

[a]Peer support: One paper identified [Ω1.Battersby, S., Aziz, M., Bennett, K., & Sabin, K. (2004). The cost effectiveness of breastfeeding peer support. *British Journal of Midwifery*, *12(4),* 201-205]

[b]Folic acid supplementation: One paper coded [Ω1.Postma, M. J., Londeman, J., Veenstra, M., de Walle, H. E., & de Jong-van den Berg, L. T. (2002). Cost-effectiveness of periconceptional supplementation of folic acid. *Pharm World Sci*, *24(1)*, 8-11]

[c]Women, infants and children (WIC) programme: Papers coded from one review (all papers involved the same intervention): ΩAvruch, S., & Cackley, A. P. (1995). Savings achieved by giving WIC benefits to women prenatally. *Public Health Rep*, 110(1), 27-34 [∑1.Siverman 1981; ∑2.Kennedy 1982; Ω3.Kennedy 1984; Ω4.Kotelchuck 1984; Ω5.Bailey 1983; Ω6.Metcoff 1985; ∑7.Stockbauer 1986; Ω8.Stockbauer 1987; Ω9.Schramm 1985; Ω10.Schramm 1986; Ω11.Rush 1988; ∑12.Mathematica 1980/1990; Ω13.Buescher 1991].

[d]Diet: One paper coded [Ω1.Wood, P. D., Stefanick, M. L., Williams, P. T., & Haskell, W. L. (1991). The effects on plasma lipoproteins of a prudent weight-reducing diet, with or without exercise, in overweight men and women. *N Engl J Med*, *325(7),* 461-466].

[e]Behavioural treatment: One paper coded [Ω1.Wadden, T. A., Sternberg, J. A., Letizia, K. A., Stunkard, A. J., & Foster, G. D. (1989). Treatment of obesity by very low calorie diet, behavior therapy, and their combination: a five-year perspective. *Int J Obes*, *13,* 39-46]

[f]Exercise: One paper coded [Ω1.Pritchard, J. E., Nowson, C. A., & Wark, J. D. (1997). A worksite program for overweight middle-aged men achieves lesser weight loss with exercise than with dietary change. *J Am Diet Assoc*, *97(1),* 37-42]

[g]Diet and Exercise: Two papers were coded [1.Lovelady, C. A., Stephenson, K. G., Kuppler, K. M., & Williams, J. P. (2006). The effects of dieting on food and nutrient intake of lactating women. *J Am Diet Assoc*, *106(6),* 908-912; 2.Lovelady, C. A., Williams, J. P., Garner, K. E., Moreno, K. L., Taylor, M. L., & Leklem, J. E. (2001). Effect of energy restriction and exercise on vitamin B-6 status of women during lactation. *Med Sci Sports Exerc*, *33(4),* 512-518]

Ω Coded from orginal paper

€ Coded from information in review paper (poster abstract, dissertation or no written in English)

∑ Coded from infromation in review paper and abstract (fulltext version not available)

APPENDIX 8: BEHAVIOUR CHANGE TECHNIQUES CLASSIFIED IN INTERVENTIONS FOR PHYSICAL ACTIVITY

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
Social support													
1	Social support (practical)			*			X	*					
2	Social support (emotional)												
3	Social support (unspecified)	X[1,3]	X	*	X	X		*	X[1]				
Regulation													

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
4	Pharmacologic al support												
5	Reduce negative emotions												
6	Conserving mental resources												
7	Paradoxical instructions												
Feedback and													

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
monitoring													
8	Feedback on behaviour	X[1,2,3]		*					X[1]		*		
9	Feedback on outcome(s) of behaviour												
10	Self-monitoring of behaviour												
11	Self-monitoring of outcome(s) of												

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
	behaviour												
12	Monitoring of behaviour by others without feedback												
13	Monitoring outcome(s) of behaviour by others without feedback												
14	Biofeedback									X	*		

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
Associations													
15	Prompts/cues												
16	Reduce prompts/cues												
17	Cue signalling reward												
18	Remove access to the reward												
19	Remove aversive											X	*

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
	stimulus												
20	Satiation											X	*
21	Exposure												
22	Associative learning												
Repetition and substitution													
23	Behavioural practice/rehearsal												

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
24	Habit formation												
25	Behaviour substitution												
26	Habit reversal												
27	Overcorrection												
28	Generalisation of a target behaviour												

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
29	Graded tasks									X	*		
Antecedents													
30	Restructuring the physical environment					X	X	*					
31	Restructuring the social environment		X										
32	Avoidance/reducing exposure to cues for the												

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
	behaviour												
33	Distraction												
34	Adding objects to the environment		X	*	X	X		*					
35	Body changes		X	*	X	X	X	*	X[1]	X	*	X	*
Shaping knowledge													
36	Instruction on how to perform a	X[2,4,6]	X	*			X	*	X[1]	X	*		

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
	behaviour												
37	Information about antecedents												
38	Re-attribution												
39	Behavioural experiments												
Self-beliefs													
40	Verbal persuasion	X[1,2]		*					X[1]		*		

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
	about capability												
41	Mental rehearsal of successful performance												
42	Focus on past success												
43	Self-talk												
Scheduled consequences													

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
44	Punishment												
45	Behaviour cost												
46	Remove reward												
47	Reward approximation												
48	Rewarding completion												
49	Situation-specific reward												

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
50	Reward incompatible behaviour												
51	Reward alternative behaviour												
52	Reduce reward frequency												
53	Remove punishment												
Reward and threat													

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
54	Material reward (behaviour)												
55	Material reward (outcome)												
56	Social reward												
57	Non-specific reward									X	*	X	*
58	Self-reward												

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
59	Future punishment												
60	Material incentive (behaviour)	X[2]		*			X	*					
61	Material incentive (outcome)												
62	Social incentive												
63	Non-specific incentive									X	*		

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		**Brief inter-ventions[a]**	**Exercise referral[b]**	**Overall (found in 1+ inter-vention in PH2)**	**Urban planning and design[c]**	**Trans-port[d]**	**Building design[e]**	**Overall (found in 1+ intervention in PH8)**	**Physical activity counsel-ing[f]**	**Physical activity program[g]**	**Overall (found in 1+ inter-vention in PH13)**	**Family-based behavioural treatment[h]**	**Overall (found in 1+ inter-vention in PH17)**
64	Self-incentive												
Goals and planning													
65	Problem solving	X[3]		*	X			*					
66	Goal setting (behaviour)	X[3,4,6]		*		X		*	X[1,2]	X	*		
67	Goal setting (outcome)	X[1,2,5]	X	*									
68	Action planning		X						X[1]	X	*		

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
69	Review behaviour goal(s)	X[2]		*					X[1]		*		
70	Review outcome goal(s)												
71	Behavioural contract								X[2]		*		
72	Commitment												
73	Discrepancy between current												

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
	behaviour and goal												
74	Persuasive source	X[1,4-6]	X	*					X[1]		*		
75	Pros and cons	X[3]		*					X[1]				
76	Comparative imaging of future outcomes												
Identity													

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
77	Identification of self as role model												
78	Valued self-identity												
79	Framing/refra ming	X[3]		*				*					
80	Incompatible beliefs												
81	Identity associated with changed												

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
	behaviour												
Natural consequences													
82	Information about health consequences	X[2-4]	X	*			X	*	X[1,2]		*		
83	Information about emotional consequences												
84	Information about social and		X			X		*					

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		**Brief inter-ventions[a]**	**Exercise referral[b]**	**Overall (found in 1+ inter-vention in PH2)**	**Urban planning and design[c]**	**Trans-port[d]**	**Building design[e]**	**Overall (found in 1+ intervention in PH8)**	**Physical activity counsel-ing[f]**	**Physical activity program[g]**	**Overall (found in 1+ inter-vention in PH13)**	**Family-based behavioural treatment[h]**	**Overall (found in 1+ inter-vention in PH17)**
	environmental consequences												
85	Salience of consequences												
86	Monitoring of emotional consequences												
87	Anticipated regret												
Comparison of behaviour													

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
88	Demonstration of behaviour						X	*	X[1]		*		
89	Social comparison	X[1]		*					X[1]				
90	Information about others' approval												
Covert learning													
91	Imaginary punishment												

PHYSICAL ACTIVITY		Intervention type (PH2 four commonly used methods to increase physical activity)			Intervention type (PH8 Physical activity and the environment)				Intervention type (PH13 promoting physical activity in the work place)			Intervention type (PH17 promoting physical activity for children and young people)	
BCT category code and BCT		Brief inter-ventions[a]	Exercise referral[b]	Overall (found in 1+ inter-vention in PH2)	Urban planning and design[c]	Trans-port[d]	Building design[e]	Overall (found in 1+ intervention in PH8)	Physical activity counsel-ing[f]	Physical activity program[g]	Overall (found in 1+ inter-vention in PH13)	Family-based behavioural treatment[h]	Overall (found in 1+ inter-vention in PH17)
92	Imaginary reward												
93	Vicarious consequences												

[a]Brief interventions: Six papers coded [Ω1.Elley, C. R., Kerse, N., Arroll, B., & Robinson, E. (2003). Effectiveness of counselling patients on physical activity in general practice: cluster randomised controlled trial. *BMJ*, *326(7393)*, 793; Ω2.Harland, J., White, M., Drinkwater, C., Chinn, D., Farr, L., & Howel, D. (1999). The Newcastle exercise project: a randomised controlled trial of methods to promote physical activity in primary care. *BMJ*, *319(7213)*, 828-832; Ω3.Hillsdon, M., Thorogood, M., White, I., & Foster, C. (2002). Advising people to take more exercise is ineffective: a randomized controlled trial of physical activity promotion in primary care. *Int J Epidemiol*, 31(4), 808-815; Ω4.Petrella, R. J., Koval, J. J., Cunningham, D. A., & Paterson, D. H. (2003). Can primary care doctors prescribe exercise to improve fitness? The Step Test Exercise Prescription (STEP) project. *Am J Prev Med*, *24(4)*, 316-322; Ω5.Smith, B. J., Bauman, A. E., Bull, F. C., Booth, M. L., & Harris, M. F. (2000). Promoting physical activity in general practice: a controlled trial of written advice and information materials. *Br J Sports Med*, *34(4)*, 262-267; Ω6.Swinburn, B. A., Walter, L. G., Arroll, B., Tilyard, M. W., & Russell, D. G. The green prescription study: a randomized controlled trial of written exercise advice provided by general practitioners. *Am J Public Health*, *88(2),* 288-291]

[b]Exercise referral: One paper coded [Ω1.Lamb, S. E., Bartlett, H. P., Ashley, A., & Bird, W. (2002). Can lay-led walking programmes increase physical activity in middle aged adults? A randomised controlled trial. *J Epidemiol Community Health*, *56(4),* 246-252]

[c]Urban planning and design: One paper coded [Ω1.Gordon, P. M., Zizzi, S. J., & Pauline, J. (2004). Use of a community trail among new and habitual exercisers: a preliminary assessment. *Prev Chronic Dis*, *1(4),* A11]

[d]Transport: One paper coded [Ω1.Cope, A., Cairns, S., Fox, K., Lawlor, D., Lockie, M., Lumsdon, L., Riddoch, C., & Rosen, P. (2003). *et al.* The UK National Cycle Network: an assessment of the benefits of a sustainable transport infrastructure. *World Transport Policy & Practice*, *9(1),* 6-17]

[e]Building desgn: One paper coded [Ω1.Leslie, E., Fotheringham, M., Owen, N., & Veitch, J. A. (2000). University campus physical activity promotion program. *Health Promotion Journal of Australia*, *10(1),* 51-54]

[f]Physical activity and counselling: Two papers coded [Ω1.Aittasalo, M., Miilunpalo, S., & Suni, J. (2004). The effectiveness of physical activity counseling in a work-site setting. A randomized, controlled trial. *Patient Educ Couns*, *55(2),* 193-202; Ω2.Purath, J., Miller, A. M., McCabe, G., & Wilbur, J. (2004). A brief intervention to increase physical activity in sedentary working women. *Can J Nurs Res*, *36(1),* 76-91]

[g]Physical activity programme: One paper coded [Ω1.Chyou, P. H., Scheuer, D., & Linneman, J. G. (2006). Assessment of female participation in an employee 20-week walking incentive program at Marshfield Clinic: a large multispecialty group practice. *Clin Med Res*, *4(4)*, 256-265]

[h]Family-based beahvioual treatment: One paper coded [∑1.Goldfield, G. S., Epstein, L. H., Kilanowski, C. K., Paluch, R. A., & Kogut-Bossler, B. (2001). Cost-effectiveness of group and mixed family-based treatment for childhood obesity. *Int J Obes Relat Metab Disord*, *25(12),* 1843-1849]

Ω Coded from orginal paper

€ Coded from information in review paper (poster abstract, dissertation or no written in English)

∑ Coded from infromation in review paper and abstract (fulltext version not available)

APPENDIX 9: BEHAVIOUR CHANGE TECHNIQUES CLASSIFIED IN INTERVENTIONS FOR ALCOHOL

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
Social support													
1	Social support (practical)												
2	Social support (emotional)												
3	Social support (unspecified)	X[2,3]	X[1-3]	X[1,2]	*	X[2,3-5,12,18]	X						*
Regulation													
4	Pharmacological support												

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
5	Reduce negative emotions	X[2,3]		X[1,2]	*								
6	Conserving mental resources												
7	Paradoxical instructions												
Feedback and monitoring													
8	Feedback on behaviour					X[4,5,7,9-14,18,20,21,24]	X						*
9	Feedback on												

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
	outcome(s) of behaviour												
10	Self-monitoring of behaviour	X[2,3]			*	X[1,2,6,7,10,14,16,21]							*
11	Self-monitoring of outcome(s) of behaviour												
12	Monitoring of behaviour by others without feedback												
13	Monitoring outcome(s) of behaviour by others without												

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
	feedback												
14	Biofeedback					X[4,9,14,16,18,22,24]							*
Associations													
15	Prompts/cues	X[2,3]			*	X[7,12]							*
16	Reduce prompts/cues									X[1-4]	X[1-2]		*
17	Cue signalling reward												
18	Remove access to the reward												

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
19	Remove aversive stimulus												
20	Satiation												
21	Exposure												
22	Associative learning												
Repetition and substitution													
23	Behavioural practice/rehearsal		X[1,3]		*								

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
24	Habit formation												
25	Behaviour substitution					X[10]							*
26	Habit reversal												
27	Overcorrection												
28	Generalisation of a target behaviour												
29	Graded tasks		X[3]		*	X[9,16]							*
Antecedents													

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
30	Restructuring the physical environment							X^{1-4}	X^{1-5}	X^{1-4}	X^{1-2}	X^{1-2}	*
31	Restructuring the social environment												
32	Avoidance/reducing exposure to cues for the behaviour									X^{1-4}	X^{1-2}	X^{1-2}	*
33	Distraction												
34	Adding objects to the environment												

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
35	Body changes												
Shaping knowledge													
36	Instruction on how to perform a behaviour		X[3]		*	X[1,4-6,10,11,13,18]	X						*
37	Information about antecedents												
38	Re-attribution												
39	Behavioural experiments												

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
Self-beliefs													
40	Verbal persuasion about capability	X[2,3]		X[1,2]	*	X[3,4,13]							*
41	Mental rehearsal of successful performance												
42	Focus on past success												
43	Self-talk												
Scheduled													

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
consequences													
44	Punishment												
45	Behaviour cost												
46	Remove reward												
47	Reward approximation												
48	Rewarding completion												
49	Situation-specific reward												

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
50	Reward incompatible behaviour												
51	Reward alternative behaviour												
52	Reduce reward frequency												
53	Remove punishment												
Reward and threat													
54	Material reward	X[3]			*								

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
	(behaviour)												
55	Material reward (outcome)												
56	Social reward												
57	Non-specific reward												
58	Self-reward	X[2,3]			*								
59	Future punishment												
60	Material incentive							X[1-4]	X[1-5]				*

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
	(behaviour)												
61	Material incentive (outcome)												
62	Social incentive												
63	Non-specific incentive												
64	Self-incentive												
Goals and planning													
65	Problem solving	X[3]	X[1-3]	X[1,2]	*	X[3,10,18,24]	X						*

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
66	Goal setting (behaviour)		X[3]		*	X[1,2,9,10,13,16,20]							*
67	Goal setting (outcome)												
68	Action planning		X[3]		*	X[1,13,16,19]	X						*
69	Review behaviour goal(s)	X[2,3]			*	X[1,3,10,16]							*
70	Review outcome goal(s)												
71	Behavioural	X[3]			*	X[2,7,12,21]							*

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
	contract												
72	Commitment												
73	Discrepancy between current behaviour and goal												
74	Persuasive source	X[1-3]	X[1-3]	X[1,2]	*	X[1-24]	X						*
75	Pros and cons					X[10]							*
76	Comparative imaging of future												

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
	outcomes												
Identity													
77	Identification of self as role model												
78	Valued self-identity												
79	Framing/reframing	X[2,3]	X[3]		*	X[5]	X						*
80	Incompatible beliefs												

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
81	Identity associated with changed behaviour												
Natural consequences													
82	Information about health consequences	X[1-3]	X[2,3]	X[1,2]	*	X[1-5,7,9-14,18-21]	X						*
83	Information about emotional consequences			X[1,2]	*	X[3]							*
84	Information about social and	X[2,3]		X[1,2]	*	X[3,4,18]							*

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
	environmental consequences												
85	Salience of consequences												
86	Monitoring of emotional consequences												
87	Anticipated regret												
Comparison of behaviour													
88	Demonstration of behaviour	X[2,3]	X[2,3]		*								

ALCOHOL		Intervention type (PH7 school-based interventions on alcohol)				Intervention type (PH24 Alcohol use disorders: preventing harmful drinking)							
BCT category code and BCT		STARS for families brief intervention[a]	The School Health and Harm Reduction Programme (SHAHRP)[b]	Lion's Quest 'Skills for Adolescence' programme[c]	Overall (found in 1+ intervention in PH7)	Brief intervention & Screening (primary care)[d]	Brief intervention & screening (emergency care)[e]	Pricing and price-based promotion policies[f]	Reduction in outlet density[g]	Reduction in licensing hours[h]	Advertis-ing ban[i]	Reinforcing driver / server laws[j]	Overall (found in 1+ intervention in PH24)
89	Social comparison					X[4,9-11,13,14,18]							*
90	Information about others' approval												
Covert learning													
91	Imaginary punishment												
92	Imaginary reward												
93	Vicarious consequences												

[a]STARS for families brief intervention: Three papers coded [∑1.Werch, C. E., Carlson, J. M., Owen, D. M., DiClemente, C. C., & Carbonari, J. P. (2001). Effects of a stage-based alcohol preventive intervention for inner-city youth. *J Drug Educ*, *31(2),* 123-138; Ω2.Werch, C. E., Carlson, J. M., Pappas, D. M., Edgemon, P., & DiClemente, C. C. (2000). Effects of a brief alcohol preventive intervention for youth attending school sports physical examinations. *Subst Use Misuse*, *35(3),* 421-432; Ω3.Werch, C. E., Owen, D. M., Carlson, J. M., DiClemente, C. C., Edgemon, P., & Moore, M. (2003). One-year follow-up results of the STARS for Families alcohol prevention program. *Health Educ Res*, *18(1),* 74-87]

[b]The School Health and Harm Reduction Programme (SHAHRP): Three papers coded [Ω1.McBride, N., Farringdon, F., Midford, R., Meuleners, L., & Phillips, M. (2003). Early unsupervised drinking--reducing the risks. The School Health and Alcohol Harm Reduction Project. *Drug Alcohol Rev*, *22(3),* 263-276; Ω2.McBride, N., Farringdon, F., Midford, R., Meuleners, L., & Phillips, M. (2004). Harm minimization in school drug education: final results of the School Health and Alcohol Harm Reduction Project (SHAHRP). *Addiction*, *99(3),* 278-291; Ω3.McBride, N., Midford, R., Farringdon, F., & Phillips, M. (2000). Early results from a school alcohol harm minimization study: the School Health and Alcohol Harm Reduction Project. *Addiction*, *95(7),* 1021-1042]

[c]Lion's Question 'Skills for Adolescence programme: Two papers coded [Ω1.Eisen, M., Zellman, G. L., & Murray, D. M. (2003). Evaluating the Lions-Quest "Skills for Adolescence" drug education program. Second-year behavior outcomes. *Addict Behav*, *28(5),* 883-897; Ω2.Eisen, M., Zellman, G. L., Massett, H. A., & Murray, D. M. (2002). Evaluating the Lions-Quest "Skills for Adolescence" drug education program: first-year behavior outcomes. *Addict Behav*, *27(4)*, 619-632]

[d]Brief intervention & screening in primary care: Studies indentified from four reviews: Ω1.Kaner, E. F., Beyer, F., Dickinson, H. O., Pienaar, E., Campbell, F., Schlesinger, C., Heather, N., Saunders, J. B., Burnard, B., & Pienaar, E. D. (2007). Effectiveness of brief alcohol interventions in primary care populations. *Cochrane Database Syst Rev*, *(2),* CD004148; Ω2.Chisholm, D., Rehm, J., Van, O. M., & Monteiro, M. (2005). Reducing the global burden of hazardous alcohol use: a comparative cost-effectiveness analysis. *J Stud Alcohol*, *65(6),* 782-793; Ω3.Mortimer, D., & Segal, L. (2005). Economic evaluation of interventions for problem drinking and alcohol dependence: cost per QALY estimates. *Alcohol Alcohol*, *40(6),* 549-555; Ω4.Solberg, L. I., Maciosek, M. V., & Edwards, N. M. (2008). Primary care intervention to reduce alcohol misuse ranking its health impact and cost effectiveness. *Am J Prev Med*, *34(2),* 143-152 [Ω1.Lock 2006; Ω2.Cordoba 1998; Ω3.Ockene 1999; Ω4.Aalto 2000; Ω5.Crawford 2004; €6.Diez 2002**;** ∑7.Fleming 1997; €8.Huas 2002; Ω9.Scott 1991; Ω10.Richmond 1995; Ω11.Curry 2003; Ω12.Fleming 1999; 13.Senft 1997; Ω14.Wallace 1988; €15.Altisent 1997; Ω16.Heather 1987; €17.Fernandez 1997; Ω18.Gentillelo 1999; ∑19.Kunz 2004; ∑20.Maisto 2001; ∑21.Fleming 2004; ∑22.Romelsjo 1989; €23.Saunders 1991; €24.Babor 1992]

[e]Brief intervention & screening in emergency care: One paper coded [Ω1. Crawford, M. J, Patton, R., Touquet, R., Drummond, C., Byford, S., Barrett, B., Reece, B., Brown, A., & Henry, J. A. (2004). Screening and referral for brief intervention of alcohol-misusing patients in an emergency department: a pragmatic randomised controlled trial. *Lancet*, *364(9442),* 1334-1339]

[f]Pricing and price-based promotion policies: Four reviews coded [Ω1.Chisholm, D., Rehm, J., Van, O. M., & Monteiro, M. (2005). Reducing the global burden of hazardous alcohol use: a comparative cost-effectiveness analysis. *J Stud Alcohol*, *65(6),* 782-793; Ω2.Gallet, C. A. (2007). The demand for alcohol: a meta-analysis of elasticities. *Australian Journal of Agricultural and Resource Economics*, *51(2),* 121-135; Ω3.Gruenewald, P. J., Ponicki, W. R., Holder, H. D., & Romelsjo, A. (2006). Alcohol prices, beverage quality, and the demand for alcohol: quality substitutions and price elasticities. *Alcohol Clin Exp Res*, *30(1),* 96-105; Ω4.Wagenaar, A. C., Salois, M. J., Komro, K. A. (2009). Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies. *Addiction*, *104(2),* 179-190]

[g]Reduction in outlet density: Five papers coded [Ω1.Blake, D., & Nied, A. (1997). The demand for alcohol in the United Kingdom. *Applied Economics*, *29(12),* 1655-1672; Ω2.Gruenewald, P. J., Ponicki, W. R., & Holder, H. D. (1993). The relationship of outlet densities to alcohol consumption: a time series cross-sectional analysis. *Alcohol Clin Exp Res*, *17(1),* 38-47; Ω3.Hoadley, J. F., Fuchs, B. C., & Holder, H. D. (1984). The effect of alcohol beverage restrictions on consumption: a 25-year longitudinal analysis. *Am J Drug Alcohol Abuse*, *10(3),* 375-401; Ω4.Schonlau, M., Scribner, R., Farley, T. A., Theall, K., Bluthenthal, R. N., Scott, M., & Cohen, D. A. (208). Alcohol outlet density and alcohol consumption in Los Angeles county and southern Louisiana. *Geospat Health*, *3(1),* 91-101; ∑5.Xie, X., Mann, R. E., & Smart, R. G. (2000). The direct and indirect relationships between alcohol prevention measures and alcoholic liver cirrhosis mortality. *J Stud Alcohol*, *61(4),* 499-506]

[h]Reduction in licensing hours: Four papers identified [∑1.Norstrom, T., & Skog, O. J. (2003). Saturday opening of alcohol retail shops in Sweden: an impact analysis. *J Stud Alcohol*, *64(3),* 393-401; Ω2.Carpenter, C. S., & Eisenberg, D. (2009). Effects of Sunday sales restrictions on overall and day-specific alcohol consumption: evidence from Canada. *J Stud Alcohol Drugs*, *70(1),* 126-133]; Two from one review Ω1.Chisholm, D., Rehm, J., Van, O. M., & Monteiro, M. (2005). Reducing the global burden of hazardous alcohol use: a comparative cost-effectiveness analysis. *J Stud Alcohol*, *65(6),* 782-793 [3.Leppanen 1979; 4.Nordlund 1984]

[i]Advertising ban: Two reviews coded [Ω1.Chisholm, D., Rehm, J., Van, O. M., & Monteiro, M. (2005). Reducing the global burden of hazardous alcohol use: a comparative cost-effectiveness analysis. *J Stud Alcohol*, *65(6),* 782-793; Ω2.Saffer, H., & Dave, D. (2002). Alcohol consumption and alcohol advertising bans. *Applied Economics*, *34(11),* 1325-1334.

[j]Reinforcing driver/server laws: Two papers coded [Ω1.Mansdotter, A. M., Rydberg, M. K., Wallin, E., Lindholm, L. A., & Andreasson, S. (2007). A cost-effectiveness analysis of alcohol prevention targeting licensed premises. *Eur J Public Health*, *17(6),* 618-623; ∑2.Levy, D. T., & Miller, T. R. (1995). A cost-benefit analysis of enforcement efforts to reduce serving intoxicated patrons. *J Stud Alcohol*, *56(2),* 240-247].

Ω Coded from orginal paper

€ Coded from information in review paper (poster abstract, dissertation or no written in English)

∑ Coded from infromation in review paper and abstract (fulltext version not available)

APPENDIX 10: BEHAVIOUR CHANGE TECHNIQUES CLASSIFIED IN INTERVENTIONS FOR SEXUAL HEALTH

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
Social support										
1	Social support (practical)									
2	Social support (emotional)									
3	Social support (unspecified)	X[1,2]			X[3]		X[1,2]	*		
Regulation										

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
4	Pharmacological support	X[1,2]						*		
5	Reduce negative emotions				X[3]			*		
6	Conserving mental resources									
7	Paradoxical instructions									
Feedback and monitoring										
8	Feedback on behaviour			X[1,2]	X[3]	X	X[1,2]	*		

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
9	Feedback on outcome(s) of behaviour									
10	Self-monitoring of behaviour									
11	Self-monitoring of outcome(s) of behaviour									
12	Monitoring of behaviour by others without feedback									
13	Monitoring outcome(s) of									

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
	behaviour by others without feedback									
14	Biofeedback			X[1,2]	X[1,2]			*	X	*
Associations										
15	Prompts/cues									
16	Reduce prompts/cues									
17	Cue signalling reward									
18	Remove access to the reward									

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
19	Remove aversive stimulus									
20	Satiation									
21	Exposure									
22	Associative learning									
Repetition and substitution										
23	Behavioural practice/rehearsal					X	X[1,2]	*		
24	Habit formation									

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
25	Behaviour substitution				X^3		X^2	*		
26	Habit reversal									
27	Overcorrection									
28	Generalisation of a target behaviour									
29	Graded tasks				X^2			*		
Antecedents										
30	Restructuring the									

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
	physical environment									
31	Restructuring the social environment									
32	Avoidance/reducing exposure to cues for the behaviour									
33	Distraction									
34	Adding objects to the environment	X[1,2]				X	X[1]	*		
35	Body changes									

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
Shaping knowledge										
36	Instruction on how to perform a behaviour	X[1,2]	X	X[1,2]	X[3]	X	X[1,2]	*	X	*
37	Information about antecedents						X[1]			
38	Re-attribution									
39	Behavioural experiments									
Self-beliefs										

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
40	Verbal persuasion about capability				X[1,2,3]	X	X[1]	*		
41	Mental rehearsal of successful performance									
42	Focus on past success									
43	Self-talk									
Scheduled consequences										
44	Punishment									

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
45	Behaviour cost									
46	Remove reward									
47	Reward approximation									
48	Rewarding completion									
49	Situation-specific reward									
50	Reward incompatible behaviour									

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
51	Reward alternative behaviour									
52	Reduce reward frequency									
53	Remove punishment									
Reward and threat										
54	Material reward (behaviour)								X	*
55	Material reward (outcome)								X	*

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
56	Social reward				X[3]			*		
57	Non-specific reward									
58	Self-reward									
59	Future punishment									
60	Material incentive (behaviour)									
61	Material incentive (outcome)									
62	Social incentive									

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
63	Non-specific incentive									
64	Self-incentive									
Goals and planning										
65	Problem solving				X[3]	X	X[1,2]	*	X	*
66	Goal setting (behaviour)				X[3]			*		
67	Goal setting (outcome)									
68	Action planning			X[1,2]	X[1,2]		X[1]	*		

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
69	Review behaviour goal(s)									
70	Review outcome goal(s)									
71	Behavioural contract									
72	Commitment									
73	Discrepancy between current behaviour and goal									
74	Persuasive source	X[1,2]	X	X[2]				*		

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
75	Pros and cons						X[1]	*		
76	Comparative imaging of future outcomes									
Identity										
77	Identification of self as role model									
78	Valued self-identity									
79	Framing/reframing				X[1]	X	X[1,2]	*		
80	Incompatible beliefs									

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
81	Identity associated with changed behaviour									
Natural consequences										
82	Information about health consequences				X[3]		X[1,2]	*		
83	Information about emotional consequences									
84	Information about social and environmental									

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
	consequences									
85	Salience of consequences									
86	Monitoring of emotional consequences									
87	Anticipated regret									
Comparison of behaviour										
88	Demonstration of behaviour					X	X[1,2]	*		

SEXUAL HEALTH		Intervention type (PH3 prevention of sexually transmitted infections and under 18 conceptions)							Intervention type (PH34 increasing the uptake of HIV testing among men who have sex with men)	
BCT category code and BCT		Accelerated partner therapy[a]	Patient referral at GP[b]	Brief counselling[c]	Enhanced/ intensive counselling[d]	Tailored skills session[e]	Behaviour skills counselling[f]	Overall (found in 1+ intervention in PH18)	Peer education and recruitment[g]	Overall (found in 1+ intervention in PH34)
89	Social comparison				X[1,2]			*		
90	Information about others' approval									
Covert learning										
91	Imaginary punishment									
92	Imaginary reward									
93	Vicarious consequences									

[a]Accelerated partner therapy: Two papers coded [Ω1.Golden, M. R., Whittington, W. L., Handsfield, H. H., Hughes, J. P., Stamm, W. E., Hogben, M., Clark, A., Malinski, C., Helmers, J. R. L., Thomas, K. K., & Holmes, K. K. (2005). Effect of expedited treatment of sex partners on recurrent or persistent gonorrhea or chlamydial infection. *N Engl J Med*, *352(7),* 676-685; Ω2.Schillinger, J. A., Kissinger, P., Calvet, H., Whittington, W. L., Ransom, R. L., Sternberg, M. R., Berman, S. M., Kent, C. K., Martin, D. H., OH, M. K., Handsfield, H. H., Bolan, G., Markowitz, L. E., & Fortenberry, J. D. (2003). Patient-delivered partner treatment with azithromycin to prevent repeated Chlamydia trachomatis infection among women: a randomized, controlled trial. *Sex Transm Dis*, 30(1), 49-56].

[b]Patient referral at GP: One paper coded [Ω1.Low, N., McCarthy, A., Roberts, T. E., Huengsberg, M., Sanford, E., Sterne, J. A., Macleod, J., Salisbury, C., Pye, K., Holloway, A., Morcom, A., Patel, R., Robinson, S. M., Horner, P., Barton, P. M., Egger, M. (2006). Partner notification of chlamydia infection in primary care: randomised controlled trial and analysis of resource use. *BMJ*, 332(7532), 14-19]

[c]Brief counselling: Two papers coded [Ω1.Bolu, O. O., Lindsey, C., Kamb, M. L., Kent, C., Zenilman, J., Douglas, J. M., Malotte, C. K., Rogers, J., & Peterman, T. A. (2004). Is HIV/sexually transmitted disease prevention counseling effective among vulnerable populations?: a subset analysis of data collected for a randomized, controlled trial evaluating counseling efficacy (Project RESPECT). *Sex Transm Dis*, *31(8),* 469-474; Ω2.Kamb, M. L., Fishbein, M., Douglas, J. M., Rhodes, F., Rogers, J., Bolan, G., Zenilman, J., Hoxworth, T., Nalotte, K., Iatesta, M., Kent, C., Lentz, A., Graziano, S., Byers, R., & Peterman, T. A. (1998). Efficacy of risk-reduction counseling to prevent human immunodeficiency virus and sexually transmitted diseases: a randomized controlled trial. Project RESPECT Study Group. *JAMA*, *280(13),* 1161-1167].

[d]Enhanced/intensive counselling: Three papers coded [Ω1.Bolu, O. O., Lindsey, C., Kamb, M. L., Kent, C., Zenilman, J., Douglas, J. M., Malotte, C. K., Rogers, J., & Peterman, T. A. (2004). Is HIV/sexually transmitted disease prevention counseling effective among vulnerable populations?: a subset analysis of data collected for a randomized, controlled trial evaluating counseling efficacy (Project RESPECT). *Sex Transm Dis*, *31(8),* 469-474; Ω2.Kamb, M. L., Fishbein, M., Douglas, J. M., Rhodes, F., Rogers, J., Bolan, G., Zenilman, J., Hoxworth, T., Nalotte, K., Iatesta, M., Kent, C., Lentz, A., Graziano, S., Byers, R., & Peterman, T. A. (1998). Efficacy of risk-reduction counseling to prevent human immunodeficiency virus and sexually transmitted diseases: a randomized controlled trial. Project RESPECT Study Group. *JAMA*, *280(13),* 1161-1167; Ω3.Maher, J. E., Peterman, T. A., Osewe, P. L., Odusanya, S., & Scerba, J. R. (2003). Evaluation of a community-based organization's intervention to reduce the incidence of sexually transmitted diseases: a randomized, controlled trial. *South Med J*, *96(3),* 248-253].

[e]Tailored skills session: One paper coded [Ω1.James, N. J., Gillies, P. A., & Bignell, C. J. (1998). Evaluation of a randomized controlled trial of HIV and sexually transmitted disease prevention in a genitourinary medicine clinic setting. *AIDS*, *12(10),* 1235-1242].

[f]Behaviour skills conselling: Two papers coded [Ω1.Boyer, C. B., Barrett, D. C., Peterman, T. A., & Bolan, G. (1997). Sexually transmitted disease (STD) and HIV risk in heterosexual adults attending a public STD clinic: evaluation of a randomized controlled behavioral risk-reduction intervention trial. *AIDS*, *11(3),* 359-367; Ω2.Kalichman, S. C., Cain, D., Weinhardt, L., Benotsch, E., Presser, K., Zweben, A., Bjodstrup, B., & Swain, G. R. (2005). Experimental components analysis of brief theory-based HIV/AIDS risk-reduction counseling for sexually transmitted infection patients. *Health Psychol*, *24(2),* 198-208].

[g]Peer reduction and recruitment: One paper coded [Ω1.Golden, M. R., Gift, T. L., Brewer, D. D., Fleming, M., Hogben, M., St Lawrence, J. S., Thiede, H., & Handsfield, H. (2006). Peer referral for HIV case-finding among men who have sex with men. *AIDS*, *20(15),* 1961-1968]

Ω Coded from orginal paper

€ Coded from information in review paper (poster abstract, dissertation or no written in English)

∑ Coded from infromation in review paper and abstract (fulltext version not available)

APPENDIX 11: BEHAVIOUR CHANGE TECHNIQUES CLASSIFIED IN INTERVENTIONS FOR MULTIPLE BEHAVIOURS

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
Social support										
1	Social support (practical)									
2	Social support (emotional)									
3	Social support (unspecified)	X[1,3]	*	X[2]		*	X[1]	X	X	*
Regulation										
4	Pharmacological support									

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
5	Reduce negative emotions	X[1]	*							
6	Conserving mental resources									
7	Paradoxical instructions									
Feedback and monitoring										
8	Feedback on behaviour	X[1-3]	*	X[3]	X[1-5]	*		X	X	*
9	Feedback on outcome(s) of behaviour									

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
10	Self-monitoring of behaviour	X[3]	*				X[1]	X		*
11	Self-monitoring of outcome(s) of behaviour									
12	Monitoring of behaviour by others without feedback									
13	Monitoring outcome(s) of behaviour by others without feedback									
14	Biofeedback	X[1-3]	*					X		*
Associations										

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
15	Prompts/cues			X[1,3]		*			X	*
16	Reduce prompts/cues									
17	Cue signalling reward									
18	Remove access to the reward									
19	Remove aversive stimulus									
20	Satiation									
21	Exposure									
22	Associative learning									

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
Repetition and substitution										
23	Behavioural practice/rehearsal						X[1,2]			*
24	Habit formation									
25	Behaviour substitution						X[2]			*
26	Habit reversal									
27	Overcorrection									
28	Generalisation of a target behaviour									
29	Graded tasks									

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
Antecedents										
30	Restructuring the physical environment			X[2]		*			X	*
31	Restructuring the social environment									
32	Avoidance/reducing exposure to cues for the behaviour									
33	Distraction									
34	Adding objects to the environment						X[1]			*
35	Body changes									

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
Shaping knowledge										
36	Instruction on how to perform a behaviour	X[1]	*	X[3]		*	X[1,2]	X	X	*
37	Information about antecedents									
38	Re-attribution									
39	Behavioural experiments									
Self-beliefs										
40	Verbal persuasion about capability									

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
41	Mental rehearsal of successful performance									
42	Focus on past success									
43	Self-talk									
Scheduled consequences										
44	Punishment									
45	Behaviour cost									
46	Remove reward									
47	Reward approximation									

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
48	Rewarding completion									
49	Situation-specific reward									
50	Reward incompatible behaviour									
51	Reward alternative behaviour									
52	Reduce reward frequency									
53	Remove punishment									
Reward and threat										

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
54	Material reward (behaviour)						X[1]			*
55	Material reward (outcome)									
56	Social reward									
57	Non-specific reward									
58	Self-reward									
59	Future punishment									
60	Material incentive (behaviour)							X		*
61	Material incentive									

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
	(outcome)									
62	Social incentive									
63	Non-specific incentive									
64	Self-incentive									
Goals and planning										
65	Problem solving	X[1]	*	X[2]		*		X		*
66	Goal setting (behaviour)	X[3]	*		X[4]	*	X[1]	X		*
67	Goal setting (outcome)									

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
68	Action planning									
69	Review behaviour goal(s)	X[3]	*							
70	Review outcome goal(s)									
71	Behavioural contract									
72	Commitment									
73	Discrepancy between current behaviour and goal									
74	Persuasive source	X[1-3]	*		X[4,5]	*		X		*

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
75	Pros and cons									
76	Comparative imaging of future outcomes									
Identity										
77	Identification of self as role model									
78	Valued self-identity									
79	Framing/reframing							X		*
80	Incompatible beliefs									
81	Identity associated with changed									

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
	behaviour									
Natural consequences										
82	Information about health consequences	X[1]	*	X[1]	X[4]	*	X[1,2]	X		*
83	Information about emotional consequences							X		*
84	Information about social and environmental consequences	X[1]	*							
85	Salience of consequences									

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
86	Monitoring of emotional consequences									
87	Anticipated regret									
Comparison of behaviour										
88	Demonstration of behaviour							X	X	*
89	Social comparison				X[1]	*		X		*
90	Information about others' approval									
Covert learning										

MULTIPLE BEHAVIOURS		Intervention type (PH6 behaviour change)		Intervention type (PH25 prevention of cardiovascular disease)			Intervention type (PH35 preventing type 2 diabetes)			
BCT category code and BCT		Multiple component CHD prevention programme[a]	Overall (found in 1+ intervention in PH6)	Population-wide multifactor intervention[b]	Multi-component intervention[c]	Overall (found in 1+ intervention in PH25)	Dietary, nutritional and educational[d]	Multi-component[e]	Large-scale, region-wide multi-component[f]	Overall (found in 1+ intervention in PH35)
91	Imaginary punishment									
92	Imaginary reward									
93	Vicarious consequences									

[a]Multiple component CHD prevention programme: Three papers coded [≠∑1.Finkelstein, E. A., Troped, P. J., Will, J. C., & Palombo, R. (2002). Cost-effectiveness of a cardiovascular disease risk reduction program aimed at financially vulnerable women: the Massachusetts WISEWOMAN project. *J Womens Health Gend Based Med, 11(6),* 519-526; Ω2.Lindholm, L., Rosen, M., Weinehall, L., & Asplund, K. (1996). Cost effectiveness and equity of a community based cardiovascular disease prevention programme in Norsjo, Sweden. *J Epidemiol Community Health, 50(2),* 190-195; Ω3.Lindgren, P., Fahlstadius, P., Hellenius, M. L., Jonsson, B., de, F. U. (2003). Cost-effectiveness of primary prevention of coronary heart disease through risk factor intervention in 60-year-old men from the county of Stockholm--a stochastic model of exercise and dietary advice. *Prev Med, 36(4),* 403-409].

[b]Population-wide multifactor intervention: Three papers identified from Ω1.Tosteson, A. N., Weinstein, M. C., Hunink, M. G., Mittleman, M. A., Williams, L. W., Goldman, P. A., & Goldman, L. (1997). Cost-effectiveness of populationwide educational approaches to reduce serum cholesterol levels. *Circulation, 95(1),* 24-30 [∑1.Farquhar 1990; Ω2.Taskanen 1983; Ω3.Fortmann 1981].

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[e]Multi-component: One paper coded [Ω1.Gray, C. M., Anderson, A. S., Clarke, A. M., Dalziel, A., Hunt, K., Leishman, J., & Wyke, S. (2009). Addressing male obesity: an evaluation of a group-based weight management intervention for Scottish men. *Journal of Mens Health, 6(1),* 70-81].

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Ω Coded from orginal paper

€ Coded from information in review paper (poster abstract, dissertation or no written in English)

∑ Coded from infromation in review paper and abstract (fulltext version not available)

≠ Used additional information from Stoddard, A. M., Palombo, R., Troped, P. J., Sorensen, G., & Will, J. C. (2004). Cardiovascular disease risk reduction: The Massachusetts WISEWOMEN project. *Journal of Women's Health, 13(5),* 539-546.

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APPENDIX 12: STUDIES/REVIEWS INCLUDED IN BCT ANALYSIS

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APPENDIX 13: BCT CODES, CLUSTERS AND DEFINITIONS

No.	Label	Definition	Examples
Social support			
1.	***Social support (practical)***	Advise on, arrange, or provide practical help (beyond adding objects to the environment) for performance of the behaviour *Note: if emotional, code **2, Social support (emotional)**; if general or unspecified, code **3, Social support (unspecified)** If only restructuring the physical environment or adding objects to the environment, code **30, Restructuring the physical environment** or **34, Adding objects to the environment***	Ask the partner of the patient to put their tablet on the breakfast tray so that the patient remembers to take it
2.	***Social support (emotional)***	Advise on, arrange, or provide emotional social support for performance of the behaviour *Note: if practical, code **1, Social support (practical)**; if unspecified, code **3, Social support (unspecified)***	Ask the patient to take a partner or friend with them to their colonoscopy appointment
3.	***Social support (unspecified)***	Advise on, arrange or provide social support *(e.g. friends, relatives, colleagues,' buddies' or staff)* or non-contingent praise or reward for performance of the behaviour. It includes encouragement and counselling, but only when it is directed at the **behaviour** *Note: attending a group class does not necessarily apply this BCT, support must be explicitly mentioned; if practical, code **1, Social support (practical)**; if emotional, code **2, Social support (emotional)***	Advise the person to call a 'buddy' when they experience an urge to smoke Arrange for a housemate to encourage continuation with the behaviour change programme Give information about a self-help group that offers support for the behaviour

No.	Label	Definition	Examples
Regulation			
4.	***Pharmacological support***	Provide, or encourage the use of or adherence to, drugs to facilitate behaviour change	Suggest the patient asks the family physician for nicotine replacement therapy to facilitate smoking cessation
5.	***Reduce negative emotions***	Advise on ways of reducing negative emotions to facilitate performance of the behaviour (includes '***Stress Management***')	Advise on the use of stress management skills, e.g. to reduce anxiety about joining Alcoholics Anonymous
6.	***Conserving mental resources***	Advise on ways of minimising demands on mental resources to facilitate behaviour change	Advise smokers on how to minimise work-related stress during the first weeks of quitting
7.	***Paradoxical instructions***	Advise to engage in some form of the unwanted behaviour with the aim of reducing motivation to engage in that behaviour	Advise a smoker to smoke twice as many cigarettes a day as they usually do Tell the person to stay awake as long as possible in order to reduce insomnia
Feedback and monitoring			
8.	***Feedback on behaviour***	Monitor and provide feedback on performance of the behaviour *(e.g. form, frequency, duration, intensity)* *Note: if Biofeedback, code only* ***14, Biofeedback***	Inform the person of how many steps they walked each day (as recorded on a pedometer) or how

No.	Label	Definition	Examples
		*and not **8, Feedback on behaviour**; if feedback is on **outcome(s)** of behaviour, code **9, Feedback on outcome(s) of behaviour**; if there is no clear evidence that feedback was given, code **12, Monitoring of behaviour by others without feedback***	many calories they ate each day (based on a food consumption questionnaire)
9.	***Feedback on outcome(s) of behaviour***	Monitor and provide feedback on the outcome of performance of the behaviour *Note: if Biofeedback, code only **14, Biofeedback** and not **9, Feedback on outcome(s) of behaviour**; if feedback is on **behaviour** code **8, Feedback on behaviour**; if there is no clear evidence that feedback was given code **13, Monitoring outcome(s) of behaviour by others without feedback***	Inform the person of how much weight they have lost following the implementation of a new exercise regime
10.	***Self-monitoring of behaviour***	Establish a method for the person to monitor and record their behaviour(s) as part of a behaviour change strategy Note: if monitoring is part of a data collection procedure rather than a strategy aimed at changing behaviour, do not code; if monitoring of outcome of behaviour, code 11, Self-monitoring of outcome(s) of behaviour; if monitoring is by someone else (without feedback), code 12, Monitoring of behaviour by others without feedback	Ask the person to record daily, in a diary, whether they have brushed their teeth for at least two minutes before going to bed Give patient a pedometer and a form for recording daily total number of steps
11.	***Self-monitoring of outcome(s) of behaviour***	Establish a method for the person to monitor and record the outcome(s) of their behaviour as part of a behaviour change strategy Note: Only code if monitoring is aimed at changing behaviour rather than part of data ; if monitoring behaviour, code 10, Self-monitoring of behaviour; if monitoring is by someone else (without feedback), code 13, Monitoring	Ask the person to weigh themselves at the end of each day, over a two week period, and record their daily weight on a graph to increase exercise behaviours

No.	Label	Definition	Examples
		outcome(s) of behaviour by others without feedback	
12.	***Monitoring of behaviour by others without feedback***	Observe or record behaviour with the person's knowledge as part of a behaviour change strategy Note: if monitoring is part of a data collection procedure rather than a strategy aimed at changing behaviour, do not code; if feedback given, code only 8, Feedback on behaviour, and not 12, Monitoring of behaviour by others without feedback; if monitoring outcome(s) code 13, Monitoring outcome(s) of behaviour by others without feedback; if self-monitoring behaviour, code 10, Self-monitoring of behaviour	Watch hand washing behaviours among health care staff and make notes on context, frequency and technique used
13.	***Monitoring outcome(s) of behaviour by others without feedback***	Observe or record outcomes of behaviour with the person's knowledge as part of a behaviour change strategy Note: if monitoring is part of a data collection procedure rather than a strategy aimed at changing behaviour, do not code; if feedback given, code only 9, Feedback on outcome(s) of behaviour; if monitoring behaviour code 12, Monitoring of behaviour by others without feedback; if self-monitoring outcome(s), code 11, Self-monitoring of outcome(s) of behaviour	Record blood pressure, blood glucose, weight loss, or physical fitness
14.	***Biofeedback***	Provide feedback about the body (e.g. physiological or biochemical state) using an external monitoring device as part of a behaviour change strategy Note: if Biofeedback, code only 14, Biofeedback and not 8, Feedback on behaviour or 9, Feedback	Inform the person of their blood pressure reading to improve adoption of health behaviours

No.	Label	Definition	Examples
		on outcome(s) of behaviour	
Associations			
15.	***Prompts/cues***	Introduce or define environmental or social stimulus with the purpose of prompting or cueing the behaviour. The prompt or cue would normally occur at the time or place of performance *Note: when a stimulus is linked to a specific action in an if-then plan, code also* ***64, Action planning****,*	Put a sticker on the bathroom mirror to remind people to brush their teeth
16.	***Reduce prompts/cues***	Withdraw gradually prompts to perform the behaviour (includes ***'Fading'***)	Reduce gradually the number of reminders used to take medication
17.	***Cue signalling reward***	Identify an environmental stimulus that reliably predicts that reward will follow the behaviour (includes ***'Discriminative cue'***)	Advise that a fee will be paid to dentists for a particular dental treatment of 6-8 year old children to encourage delivery of that treatment (the 6-8 year old children are the environmental stimulus)
18.	***Remove access to the reward***	Advise or arrange for the person to be separated from situations in which unwanted behaviour can be rewarded in order to reduce the behaviour (includes ***'Time out'***)	Arrange for cupboard containing high calorie snacks to be locked for a specified period to reduce the consumption of sugary foods in between meals

No.	Label	Definition	Examples
19.	***Remove aversive stimulus***	Advise or arrange for the removal of an aversive stimulus to facilitate behaviour change (includes ***'Escape learning'***)	Arrange for a gym-buddy to stop nagging the person to do more exercise in order to increase the desired exercise behaviour
20.	***Satiation***	Advise or arrange repeated exposure to a stimulus that reduces or extinguishes a drive for the unwanted behaviour	Arrange for the person to eat large quantities of chocolate, in order to reduce the person's appetite for sweet foods
21.	***Exposure***	Provide systematic confrontation with a feared stimulus to reduce the response to a later encounter	Agree a schedule by which the person will e.g. make a telephone call to their boss, spend an evening without snacking
22.	***Associative learning***	Present a neutral stimulus jointly with a stimulus that already elicits the behaviour repeatedly until the neutral stimulus elicits that behaviour (includes 'Classical/Pavlovian Conditioning') Note: when a BCT involves reward or punishment, do not code 22, Associative learning	Present repeatedly fatty foods with a disliked flavoured sauce to discourage the consumption of fatty foods
Repetition and substitution			
23.	***Behavioural practice/ rehearsal***	Prompt practice or rehearsal of the performance of the behaviour one or more times in a context or at a time when the performance may not be necessary, in order to increase habit and skill *Note: if aiming to associate performance with the*	Prompt asthma patients to measure their peak flow regularly

No.	Label	Definition	Examples
		*context, also code **24, Habit formation***	
24.	***Habit formation***	Prompt rehearsal and repetition of the behaviour in the same context repeatedly so that the context elicits the behaviour *Note: also code **23, Behavioural practice/rehearsal***	Prompt patients to always take their statin tablet before brushing their teeth in the evening
25.	***Behaviour substitution***	Prompt substitution of the unwanted behaviour with a wanted or neutral behaviour *Note: if this occurs regularly, also code **26, Habit reversal***	Suggest that the person carries a piece of fruit to eat instead of biscuits or cake if they are offered them
26.	***Habit reversal***	Prompt rehearsal and repetition of an alternative behaviour to **replace** an unwanted habitual behaviour *Note: also code **25, Behaviour substitution***	Ask the person to walk up stairs every time they consider taking a lift or escalator
27.	***Overcorrection***	Ask to repeat the wanted behaviour in an exaggerated way following an unwanted behaviour	Ask to eat only fruit and vegetables the day after a poor diet
28.	***Generalisation of a target behaviour***	Advise to perform the wanted behaviour already performed in a particular situation, in another situation	Advise to repeat toning exercises learned in the gym when at home
29.	***Graded tasks***	Set easy-to-perform tasks, making them increasingly difficult, but achievable, until behaviour is performed	Ask the person to walk for 100 yards a day for the first week, then half a mile a day after they have successfully achieved 100 yards, then two miles a day

No.	Label	Definition	Examples
			after they have successfully achieved one mile
Antecedents			
30.	***Restructuring the physical environment***	Change, or advise to change the environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour (other than prompts/cues, rewards and punishments) *Note: this may also involve* ***32, Avoidance/reducing exposure to cues for the behaviour****; if restructuring of the social environment code* ***31, Restructuring the social environment*** *if only adding objects to the environment, code* ***34, Adding objects to the environment***	Advise to keep biscuits and snacks in a cupboard that is inconvenient to get to Arrange to move vending machine out of the school
31.	***Restructuring the social environment***	Change, or advise to change the social environment in order to facilitate performance of the wanted behaviour or create barriers to the unwanted behaviour (other than prompts/cues, rewards and punishments) *Note: this may also involve* ***32, Avoidance/reducing exposure to cues for the behaviour****; if restructuring of the physical environment code* ***30, Restructuring the physical environment***	Advise to minimise time spent with friends who drink heavily to reduce alcohol consumption
32.	***Avoidance/reducing exposure to cues for the behaviour***	Advise on how to avoid exposure to specific social and contextual/physical cues for the behaviour, including changing daily or weekly routines *Note: this may also involve* ***30, Restructuring the physical environment*** and/or ***31, Restructuring***	Suggest to a person who wants to quit smoking that their social life focus on activities other than pubs and bars which

No.	Label	Definition	Examples
		the social environment; if the BCT includes analysing the behavioural problem, only code ***61, Problem solving***	have been associated with smoking
33.	***Distraction***	Advise or arrange to use an alternative focus for attention to avoid triggers for unwanted behaviour	Suggest to a person who is trying to avoid between-meal snacking to focus on a topic they enjoy (e.g. holiday plans) instead of focusing on food when they are feeling hungry
34.	***Adding objects to the environment***	Add objects to the environment in order to facilitate performance of the behaviour *Note: if this is accompanied by social support, also code* ***1, Social support (practical)****; if the environment is changed beyond the addition of objects, also code* ***30, Restructuring the physical environment***	Provide free condoms to facilitate safe sex Provide attractive toothbrush to improve tooth brushing technique
35.	***Body changes***	Alter body structure, functioning or support directly to facilitate behaviour change	Prompt strength training, relaxation training or provide assistive aids
Shaping knowledge			
36.	***Instruction on how to perform a behaviour***	Advise or agree on how to perform the behaviour (includes '***Skills training***') *Note: when the person attends classes such as exercise or cookery, code* ***36, Instruction on how to perform the behaviour, 23, Behavioural practice/rehearsal*** *and* ***84, Demonstration of the behaviour***	Advise the person how to put a condom on a model of a penis correctly

No.	Label	Definition	Examples
37.	***Information about antecedents***	Provide information about antecedents (*e.g. social and environmental situations and events, emotions, cognitions)* that reliably predict performance of the behaviour	Advise to keep a record of snacking and of situations or events occurring prior to snacking
38.	***Re-attribution***	Elicit perceived causes of behaviour and suggest alternative explanations *(e.g. external or internal and stable or unstable)*	If the person attributes their over-eating to the frequent presence of delicious food, suggest that the 'real' cause may be the person's inattention to bodily signals of hunger and satiety
39.	***Behavioural experiments***	Advise on how to identify and test hypotheses about the behaviour, its causes and consequences, by collecting and interpreting data	Ask a family physician to give evidence-based advice rather than prescribe antibiotics and to note whether the patient is grateful or annoyed
Self-belief			
40.	***Verbal persuasion about capability***	Tell the person that they can successfully perform the wanted behaviour, arguing against self-doubts and asserting that they can and will succeed *Note: distinction between **89, Vicarious consequences,** and **40, Verbal persuasion about capability**, i.e. 40 is not about the consequences of performing the behaviour*	Tell the person that they can successfully increase their frequency of physical activity, arguing against self-doubts and asserting that they can and will succeed
41.	***Mental rehearsal of successful***	Advise to practise imagining performing the behaviour successfully in relevant contexts	Advise to imagine eating a salad in a work

No.	Label	Definition	Examples
	performance		canteen
42.	***Focus on past success***	Advise to think about or list previous successes in performing the behaviour (or parts of it)	Advise to describe or list the occasions on which a doctor advised a patient with acute low back pain to stay active to manage this condition
43.	***Self-talk***	Prompt positive self-talk (aloud or silently) before and during the behaviour	Prompt the person to tell themselves that a walk will be energising
Scheduled consequences			
44.	***Punishment***	Identify and provide aversive consequence contingent on the performance of the unwanted behaviour	Arrange for the person to wear unattractive clothes following consumption of fatty foods
45.	***Behaviour cost***	Withdraw something valued (not a contingent reward) if and only if an unwanted behaviour is performed (includes '***Response cost'***)	Subtract money from a prepaid refundable deposit when a cigarette is smoked
46.	***Remove reward***	Discontinue contingent reward for performing the unwanted behaviour (includes ***'Extinction'***)	Arrange for the other people in the household to ignore the person every time they eat chocolate (rather than attending to them by criticising or persuading)

No.	Label	Definition	Examples
47.	***Reward approximation***	Reward any approximation to the target behaviour, gradually rewarding only performance closer to the wanted behaviour (includes ***'Shaping'***) *Note: also code one of 54-57*	Arrange for or reward the person for any reduction in daily calories, gradually requiring the daily calorie count to become closer to the planned calorie intake
48.	***Rewarding completion***	Build up behaviour by rewarding final component of the behaviour; gradually add the components of the behaviour that occur earlier in the behavioural sequence (includes ***'Backward chaining'***) *Note: also code one of 54-57*	Reward eating a supplied low calorie meal; then make reward contingent on cooking and eating the meal; then make reward contingent on purchasing, cooking and eating the meal
49.	***Situation-specific reward***	Reward the behaviour in one situation but not in another. *Note: also code one of* ***54-57*** **(**includes ***'Discrimination training'***)	Arrange for or reward eating sweet foods at mealtimes but not between meals
50.	***Reward incompatible behaviour***	Reward for responding to a stimulus in a manner that is incompatible with a previous response to that stimulus (includes ***'Counter-conditioning'***) *Note: also code one of 54-57*	Arrange for or reward the person for ordering a soft drink at the bar rather than an alcoholic beverage
51.	***Reward alternative behaviour***	Arrange reward for performance of an alternative to the unwanted behaviour (includes ***'Differential reinforcement'***) *Note: also code one of* ***54-57;*** *consider also coding* ***61, Problem solving***	Reward for consumption of low fat foods but not consumption of high fat foods

No.	Label	Definition	Examples
52.	***Reduce reward frequency***	Arrange for rewards to be made contingent on increasing duration or frequency of the behaviour (includes 'Thinning') Note: also code one of 54-57	Arrange for or reward for each day without smoking, then each week, then each month, then every 2 months and so on
53.	***Remove punishment***	Arrange for removal of an unpleasant consequence contingent on performance of the wanted behaviour (includes 'Negative reinforcement')	Arrange for someone else to do housecleaning only if the person has adhered to the medication regimen for a week
Reward and threat			
54.	***Material reward (behaviour)***	Arrange for the delivery of money, vouchers or other valued objects if and only if there has been effort and/or progress made towards performing the behaviour (includes '***Positive reinforcement***') *Note: if reward is social, code **56, Social reward**, if unspecified code **57, Non-specific reward**, and not **54, Material reward (behaviour)**; if reward is for **outcome**, code **55, Material reward (outcome)***	Arrange for the person to receive money that would have been spent on cigarettes if and only if the smoker has not smoked for one month
55.	***Material reward (outcome)***	Arrange for the delivery of a reward if and only if there has been effort and/or progress made towards achieving the behavioural **outcome** (includes '***Positive reinforcement***') *Note: this includes social, material, self- and non-specific rewards for outcome; if reward is for the **behaviour** code **56**,**Social reward**, **54 Material reward (behaviour)**, **57 Non-specific reward** or **58**, **Self-reward** and not **55, Material reward (outcome)***	Arrange for the person to receive money if and only if a certain amount of weight is lost

No.	Label	Definition	Examples
56.	***Social reward***	Arrange verbal or non-verbal reward if and only if there has been effort and/or progress made towards performing the behaviour (includes '***Positive reinforcement***') *Note: if reward is material, code **54, Material reward (behaviour)**, if unspecified code **57, Non-specific reward**, and not **56, Social reward**; if reward is for **outcome** code **55, Material reward (outcome)***	Congratulate the person for each day they eat a reduced fat diet
57.	***Non-specific reward***	Arrange delivery of a reward if and only if there has been effort and/or progress made towards performing the behaviour (includes 'Positive reinforcement') Note: if reward is material, code 54, Material reward (behaviour), if social, code 56, Social reward, and not 57, Non-specific reward; if reward is for outcome code 55, Material reward (outcome)	Identify something (e.g. an activity such as a visit to the cinema) that the person values and arrange for this to be delivered if and only if they attend for health screening
58.	***Self-reward***	Prompt self-praise or self-reward if and only if there has been effort and/or progress made towards the behaviour Note: if self-reward is material, also code 54, Material reward (behaviour), if social, also code 56, Social reward, if unspecified, also code 57, Non-specific reward; if reward is for outcome code 55, Material reward (outcome)	Encourage to reward self with material (e.g., new clothes) or other valued objects if and only if they have adhered to a healthy diet
59.	***Future punishment***	Inform that future punishment or removal of reward will be a consequence of performance of an unwanted behaviour (may include fear arousal) (includes 'Threat')	Inform that continuing to consume 30 units of alcohol per day is likely to result in liver disease and early death

No.	Label	Definition	Examples
60.	***Material incentive (behaviour)***	Inform that money, vouchers or other valued objects will be delivered if and only if there has been effort and/or progress made towards performing the behaviour (includes 'Positive reinforcement') Note: if incentive is social, code 62, Social incentive if unspecified code 63, Non-specific incentive, and not 60, Material incentive (behaviour); if incentive is for outcome, code 61, Material incentive (outcome)	Inform that a financial payment will be made each month in pregnancy that the woman has not smoked
61.	***Material incentive (outcome)***	Inform that a reward will be delivered if and only if there has been effort and/or progress made towards achieving the behavioural outcome (includes 'Positive reinforcement') Note: this includes social, material, self- and non-specific incentives for outcome; if incentive is for the behaviour code 62,Social incentive, 60 Material incentive (behaviour), 63 Non-specific incentive or 64, Self-incentive and not 61, Material incentive (outcome)	Inform the person that they will receive money if and only if a certain amount of weight is lost
62.	***Social incentive***	Inform that a verbal or non-verbal reward will be delivered if and only if there has been effort and/or progress made towards performing the behaviour (includes 'Positive reinforcement') Note: if incentive is material, code 60, Material incentive (behaviour), if unspecified code 63, Non-specific incentive, and not 62, Social incentive; if incentive is for outcome code 61, Material incentive (outcome)	Inform that they will be congratulated for each day they eat a reduced fat diet

No.	Label	Definition	Examples
63.	***Non-specific incentive***	Inform that a reward will be delivered if and only if there has been effort and/or progress made towards performing the behaviour (includes 'Positive reinforcement') Note: if reward is material, code 54, Material reward (behaviour), if social, code 56, Social reward, and not 57, Non-specific reward; if reward is for outcome code 55, Material reward (outcome)	Identify something (e.g. an activity such as a visit to the cinema) that the person values and inform them that this will be delivered if and only if they attend for health screening
64.	***Self-incentive***	Prompt self-incentive if and only if there has been effort and/or progress made towards the behaviour Note: if self-reward is material, also code 60, Material incentive (behaviour), if social, also code 62, Social incentive, if unspecified, also code 63, Non-specific incentive; if incentive is for outcome code 61, Material incentive (outcome)	Encourage to provide self with material (e.g., new clothes) or other valued objects if and only if they have adhered to a healthy diet
Goals and planning			
65.	***Problem solving***	Analyse factors influencing the behaviour and generate or select strategies that include overcoming barriers and/or increasing facilitators (includes '***Relapse Prevention***' *and* '***Coping Planning***') *Note: barrier identification without solutions is not sufficient. If the BCT does not include analysing the behavioural problem, consider* ***32, Avoidance/changing exposure to cues for the behaviour, 30, Restructuring the physical environment, 31, Restructuring the social environment,*** *or* ***5, Reduce negative emotions***	Identify specific triggers (e.g. being in a pub, feeling anxious) that generate the urge/want/need to drink and develop strategies for avoiding environmental triggers or for managing negative emotions, such as anxiety, that motivate drinking

No.	Label	Definition	Examples
66.	***Goal setting (behaviour)***	Set or agree a goal defined in terms of the behaviour to be achieved Note: only code goal-setting if there is sufficient evidence that goal set as part of intervention; if goal unspecified or a behavioural outcome, code 63, Goal setting (outcome); if the goal defines a specific context, frequency, duration or intensity for the behaviour, also code 64, Action planning	Invite the person to propose a daily walking goal (e.g. to walk for at least 30 minutes every day) and reach agreement about the goal Set the goal of eating 5 pieces of fruit per day as specified in public health guidelines
67.	***Goal setting (outcome)***	Set or agree a goal defined in terms of a positive outcome of wanted behaviour Note: only code guidelines if set as a goal in an intervention context; if goal is a behaviour, code 62, Goal setting (behaviour); if goal unspecified code 63, Goal setting (outcome)	Invite the person to set a weight loss goal (e.g. 0.5 kilogram over one week) as an outcome of changed eating patterns
68.	***Action planning***	Prompt detailed planning of performance of the behaviour (must include at least one of context, frequency, duration and intensity). Context may be environmental (physical or social) or internal (physical, emotional or cognitive) (includes 'Implementation Intentions') Note: evidence of action planning does not necessarily imply goal setting, only code latter if sufficient evidence	Encourage a plan to carry condoms when going out socially at weekends Prompt planning the performance of a particular physical activity (e.g. running) at a particular time (e.g. before work) on certain days of the week

No.	Label	Definition	Examples
69.	***Review behaviour goal(s)***	Review behaviour goal(s) jointly with the person and consider modifying goal(s) or behaviour change strategy in light of achievement. This may lead to re-setting the same goal, a small change in that goal or setting a new goal instead of, or in addition to, the first Note: if goal specified in terms of behaviour, code 65, Review behaviour goal(s), if goal unspecified, code 66, Review outcome goal(s); if discrepancy created consider also 69, Discrepancy between current behaviour and goal	Examine how well a person's performance corresponds to agreed goals e.g. whether they consumed less than one unit of alcohol per day, and consider modifying future behavioural goals accordingly e.g. by increasing or decreasing alcohol target or changing type of alcohol consumed
70.	***Review outcome goal(s)***	Review outcome goal(s) jointly with the person and modify goal(s) or behaviour change strategy in light of achievement. This may lead to re-setting the same goal, a small change in that goal or setting a new goal instead of, or in addition to the first Note: if goal specified in terms of behaviour, code 65, Review behaviour goal(s), if goal unspecified, code 66, Review outcome goal(s); if discrepancy created consider also 69, Discrepancy between current behaviour and goal	Examine how much weight has been lost and consider modifying outcome goal(s) accordingly e.g., by increasing or decreasing subsequent weight loss targets
71.	***Behavioural contract***	Create a written specification of the behaviour to be performed, agreed by the person, and witnessed by another Note: also code 62, Goal setting (behaviour)	Sign a contract with the person e.g. specifying that they will not drink alcohol for one week

No.	Label	Definition	Examples
72.	***Commitment***	Ask the person to make statements indicating strong commitment to change the behaviour Note: if defined in terms of the behaviour to be achieved also code 62, Goal setting (behaviour)	Ask the person to use an "I will" statement to affirm or reaffirm a strong commitment (i.e. using the words 'strongly', 'committed' or 'high priority') to start, continue or restart the attempt to reduce alcohol use
73.	***Discrepancy between current behaviour and goal***	Draw attention to discrepancies between a person's current behaviour (in terms of the form, frequency, duration, or intensity of that behaviour) and the person's previously set outcome goals, behavioural goals or action plans (goes beyond self-monitoring of behaviour) Note: if discomfort is created only code 76, Incompatible beliefs and not 69, Discrepancy between current behaviour and goal; if goals are modified, also code 65, Review behaviour goal(s) and/or 66, Review outcome goal(s); if feedback is provided, also code 8, Feedback on behaviour	Point out that the recorded exercise fell short of the goal set
Comparison of outcomes			
74.	***Persuasive source***	Present verbal or visual communication from a **credible source** in favour of or against the behaviour *Note: code this BCT if source generally agreed on as credible e.g., health professionals, celebrities or words used to indicate expertise or leader in field; if information about health consequences, also code **78, Information about health consequences**, if about emotional consequences, also code **79, Information about emotional consequences**; if about social, environmental or unspecified*	Present a speech given by a high status professional to emphasise the importance of not exposing patients to unnecessary radiation by ordering x-rays for back pain

No.	Label	Definition	Examples
		*consequences also code **80, Information about social and environmental consequences***	
75.	***Pros and cons***	Advise the person to identify and compare reasons for wanting (pros) and not wanting to (cons) change the behaviour (includes '***Decisional balance'***) *Note: if information about health consequences, also code **78, Information about health consequences**; if about emotional consequences, also code **79, Information about emotional consequences**; if about social, environmental or unspecified consequences also code **80, Information about social and environmental consequences***	Advise the person to list and compare the advantages and disadvantages of prescribing antibiotics for upper respiratory tract infections
76.	***Comparative imagining of future outcomes***	Prompt or advise the imagining and comparing of future outcomes of changed versus unchanged behaviour	Prompt the person to imagine and compare likely or possible outcomes following attending versus not attending a screening appointment
Identity			
77.	***Identification of self as role model***	Inform that one's own behaviour may be an example to others	Inform the person that healthy eating may be a good example for their children

No.	Label	Definition	Examples
78.	***Valued self-identity***	Advise the person to write or complete rating scales about a cherished value or personal strength as a means of affirming the person's identity as part of a behaviour change strategy (includes ***'Self-affirmation'***)	Advise the person to write about their personal strengths before they receive a message advocating the behaviour change
79.	***Framing/reframing***	Suggest the deliberate adoption of a perspective or new perspective on behaviour (e.g. its purpose) in order to change cognitions or emotions about performing the behaviour (includes 'Cognitive structuring')	Suggest that the person might think of the tasks as reducing sedentary behaviour (rather than increasing activity)
80.	***Incompatible beliefs***	Draw attention to discrepancies between current or past behaviour and self-image, in order to create discomfort (includes 'Cognitive dissonance')	Draw attention to a critical care consultant's liberal use of blood transfusion and their self-identification as a proponent of evidence-based medical practice
81.	***Identity associated with changed behaviour***	Advise the person to construct a new self-identity as someone who 'used to engage with the unwanted behaviour'	Ask the person to articulate their new identity as an 'ex-smoker'
Natural consequences			
82.	***Information about health consequences***	Provide information about health consequences of performing the behaviour *Note: consequences can be for any target, not just the recipient(s) of the intervention; if information about emotional consequences, code* ***79, Information about emotional consequences****; if about social, environmental or unspecified consequences code* ***80, Information about social***	Explain that not finishing a course of antibiotics can increase susceptibility to future infection Present the likelihood of contracting a sexually transmitted infection

No.	Label	Definition	Examples
		and environmental consequences	following unprotected sexual behaviour
83.	***Information about emotional consequences***	Provide information about emotional consequences of performing the behaviour *Note: not including **83, Anticipated regret**; consequences can be for any target, not just the recipient(s) of the intervention; if information about health consequences code **78, Information about health consequences**; if about social, environmental or unspecified code **80, Information about social and environmental consequences***	Explain that quitting smoking increases happiness and life satisfaction
84.	***Information about social and environmental consequences***	Provide information about social and environmental consequences of performing the behaviour Note: consequences can be for any target, not just the recipient(s) of the intervention; if information about health or consequences, code 78, Information about health consequences; if about emotional consequences, code 79, Information about emotional consequences; if unspecified, code 80, Information about social and environmental consequences	Tell family physician about financial remuneration for conducting health screening
85.	***Salience of consequences***	Use methods to emphasise (make more memorable) the consequences of changing the behaviour (goes beyond informing about consequences)	Produce cigarette packets showing pictures of health consequences e.g. diseased lungs

No.	Label	Definition	Examples
86.	***Monitoring of emotional consequences***	Prompt assessment of feelings after attempts at performing the behaviour	Agree that the person will record how they feel after e.g., taking their daily walk
87.	***Anticipated regret***	Induce expectations of future regret about performance of the unwanted behaviour Note: not including 79, Information about emotional consequences	Ask the person to assess the degree of regret they will feel if they do not quit smoking (e.g. on a 5 point scale)
Comparison of behaviour			
88.	***Demonstration of the behaviour***	Provide an example of the behaviour being performed for the person to aspire to or imitate (includes '***Modelling***')	Demonstrate to nurses how to raise the issue of excessive drinking with patients via a role-play exercise
89.	***Social comparison***	Draw attention to others' performance to explicitly elicit comparisons *Note: being in a group setting does not necessarily mean that social comparison is actually taking place*	Show the general practitioner the proportion of patients who were prescribed antibiotics for a common cold by themselves and by their colleagues
90.	***Information about others' approval***	Provide information about what other people think about the behaviour. The information clarifies whether others will like, approve or disapprove of what the person is doing or will do	Tell the staff at the hospital ward that staff at all other wards approve of washing their hands according to the guidelines

No.	Label	Definition	Examples
Covert learning			
91.	***Imaginary punishment***	Advise to imagine performing the **unwanted** behaviour in a real-life situation followed by imagining an unpleasant consequence (includes ***'Covert sensitisation'***)	Advise to imagine overeating and then vomiting
92.	***Imaginary reward***	Advise to imagine performing the **wanted** behaviour in a real-life situation followed by imagining a pleasant consequence (includes ***'Covert conditioning'***)	Advise the health professional to imagine giving dietary advice followed by the patient losing weight and no longer being diabetic
93.	***Vicarious consequences***	Prompt observation of the consequences (including rewards and punishments) for others when they perform the behaviour Note: if observation of health consequences, also code 78, Information about health consequences; if of emotional consequences, also code 79, Information about emotional consequences, if of social, environmental or unspecified consequences, also code 80, Information about social and environmental consequences	Draw attention to the positive comments other staff get when they disinfect their hands regularly

Appendix 14: Prevalence of cost-effective interventions as a function of NICE threshold and lower/upper cost-effectiveness estimates

	All (N=72)	Smoking (N=41)	Diet (N=6)	Physical Activity (N=7)	Alcohol (N=6)	Sexual health (N=6)	Multiple health targets (N=6)
				% (N) below £20,000 threshold			
Lower estimate^	**98.6** (71)	100.0 (41)	100.0 (6)	100.0 (7)	100.0 (6)	83.3 (5)	100.0 (6)
Higher Estimate^	**93.1** (67)	100.0 (41)	83.3 (5)	100.0 (7)	100.0 (6)	50.0 (3)	83.3 (5)
				% (N) below £30,000 threshold			
Lower estimate^	**100.0** (72)	100.0 (41)	100.0 (6)	100.0 (7)	100.0 (6)	100.0 (6)	100.0 (6)
Higher Estimate^	**94.4** (68)	100.0 (41)	83.3 (5)	100.0 (7)	100.0 (6)	66.7 (4)	83.3 (5)

^As some of the economic analyses carried out sensitivity analysis, varying cost-effectiveness estimates based on varies factors such as user characteristics, both lower (most optimistic) and upper (most pessimistic) limits of CEA estimates were recorded where available and cost-effectiveness determined according to NICE guidelines In cases where no such sensitivity analysis was carried out, the single CEA estimate was included as both the lower and upper limit