I do as I am: understanding and leveraging identity to promote smoking cessation and physical activity

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SUPPLEMENT 1 – PERFECT FIT DELIVERABLE 1

Guidelines for digital identification of smoking and physical inactivity risk situations for *Perfect Fit*

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Deliverable for the Perfect Fit project.

This work is part of the multidisciplinary research project *Perfect Fit.* This research received funding from the Netherlands Organisation for Scientific Research (NWO) program Commit2Data - Big Data & Health (project number 628.011.211). The program was funded by the following parties: NWO, the Netherlands Organisation for Health Research and Development (ZonMw), Hartstichting, Ministry of Health, Welfare and Sport (VWS), Health Holland, and the Netherlands eScience Center. The work reflects only the author's views.

BACKGROUND

As per the *Perfect Fit* research proposal and masterplan, work package 3 (WP3) is responsible for providing guidelines for the recognition and assessment of smoking and physical inactivity high risk situations (HRS). In this deliverable, WP3 presents ways to identify HRS in which there are strong urges to smoke/high temptations to be non-active, common HRS as well as ways to cope with these HRS. This deliverable includes a visual summary of the guidelines as well as a detailed report of how these guidelines were generated[4]. The guidelines can be used by smokers themselves, scientists and healthcare professionals.

METHODS

Mixed methods including empirical research and a rapid literature review generated interdisciplinarily were employed to answer the research questions. Statistical testing and in-depth analysis of qualitative data were triangulated to generate the final guidelines.

4 In this supplement, only the visual summary is presented. The full report contains confidential information preventing its public dissemination.

VISUAL SUMMARY OF FINDINGS

SUPPLEMENT 2 – PERFECT FIT DELIVERABLE 2

Additional study conducted with the aim to identify preferred coaching techniques to support smoking cessation and physical activity

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Deliverable for the Perfect Fit project.
This work is part of the multidisciplinary research project *Perfect Fit.* This research received funding from the Netherlands Organisation for Scientific Research (NWO) program Commit2Data - Big Data & Health (project number 628.011.211). The program was funded by the following parties: NWO, the Netherlands Organisation for Health Research and Development (ZonMw), Hartstichting, Ministry of Health, Welfare and Sport (VWS), Health Holland, and the Netherlands eScience Center. The report reflects only the author's views.

BACKGROUND

As per the *Perfect Fit* research proposal and masterplan, work package 3 (WP3) is responsible for providing guidelines for preferred coaching techniques to support smoking cessation and physical activity (PA) promotion. This report presents coaching techniques preferred and commonly employed by experts who coach individuals in quitting smoking and/or increasing their PA. This report includes a table summary of these techniques as well as a description of the constitution, duration, format and content of coaching programs for smoking cessation and PA-promotion used by experts in practice. With this report, the WP3 team provides an overview of how and where the preferred coaching techniques are integrated in the *Perfect Fit* intervention.

RESEARCH QUESTIONS

In order to create the final guidelines, the following research questions were answered:

RQ1: Which coaching techniques are commonly used when coaching individuals to quit smoking and/or increase their PA?

RQ2: Which coaching techniques are most useful when coaching individuals to quit smoking and/or increase their PA?

RQ3: To what extent do experts tailor employed coaching techniques to their coachees?

RQ4: What recommendations, suggestions and warnings do experts in coaching for smoking cessation/PA-promotion have for the development of the *Perfect Fit* intervention?

METHODS

A literature review of 26 published systematic reviews and meta-analyses (see Appendix 1) was conducted (by TV) to identify the most commonly used and most effective behavioral change techniques (BCTs - [1]) employed in smoking cessation and PA promotion interventions. BCTs are non-reducible, observable and replicable components used to change behavior. They can be used individually or in combination with other BCTs to achieve behavior change. Twelve BCTs were extracted as most commonly used (RQ1), and fourteen BCTs were extracted as most effective (RQ2). Most commonly used and most effective BCTs were combined into one list for smoking and one list for PA. Definitions of BCTs can be found in Appendix 2 this report.

Following the literature review, semi-structured interviews were conducted with 8 experts recruited within the professional network of the *Perfect Fit* research team. These experts were recruited for their experience in coaching individuals to quit smoking and/or increase their PA. Experts were first asked about their background, experience with coaching smoking and PA behavior change, and the constitution of their coaching programs. Subsequently, experts were asked to describe, in their own words, which coaching techniques they typically employ (RQ1) and which ones are the most effective (RQ2) in their opinion. Afterwards, experts were presented with the two tables summarizing the most commonly used/most effective BCTs – translated to Dutch – for smoking cessation and PA-promotion. Experts were asked to read over the BCTs and to indicate 1) to what extent they were familiar with the BCT and 2) with what intensity they used (never/rarely, sometimes, often) these BCTs in their respective coaching programs. In order to answer RQ3 and RQ4, experts were asked to what extent they tailor their coaching to the coachee (RQ3) and whether they had recommendations/suggestions/warnings for the *Perfect Fit* intervention based on their expertise (RQ4). Findings of the literature review and interviews with experts are reported in the following section of this report.

FINDINGS AND CONCLUSIONS

1. Behavioral Change Techniques employed by interviewed experts in smoking cessation coaching

The table below summarizes the frequency of usage by experts of the 12 most commonly used/most effective BCTs employed in smoking cessation interventions identified in the literature. Next to these 12 BCTs identified in the literature, experts also mentioned making use of 5 other BCTs in their coaching (identified with an asterisk in the table). Frequency of usage of these 5 BCTs can also be found in Table 1. All key BCTs for smoking cessation that emerged from the literature review are integrated in *Perfect Fit,* as well as additional BCTs mentioned by experts. The table below specifies how each BCT is integrated in the *Perfect Fit* intervention.

The 17 identified BCTs represent the preferred coaching techniques for smoking cessation.

Table 1. Smoking cessation: BCTs most mentioned in the literature and used by the interviewed experts

	Mentions in literature	**Usage by experts**			**Integration in *Perfect Fit***
BCT		*Often*	*Sometimes*	*Rarely/ Never*	
1.2 – Problem solving (barrier identification)	5	5			C1.9, C1.11, C2.8
3.1 – Social support (including MI)	6	3			Entire intervention
5.1/5.3/5.6 – Information about consequences of the behavior	6	2	1	1	C2.5
15.1 – Verbal persuasion about capability	6	2	1	1	Entire intervention
1.1/1.3 – Goal setting	5	3			C1.9
10.9/10.7 – Self-reward / Self-incentive	4	3	1		C2.11, C3.9
1.4 – Action planning	3	3			C1.9
2.2/2.7 Feedback on (outcomes of) behavior	2	2			Trackers, C1.17
9.2 – Pros and cons	1	3			C2.7
2.3/2.4 – (Self-)monitor behavior	2	2			Trackers
8.2 – Behavior substitution*		4			C1.9, C1.11, C2.2
13.5 – Identity associated with changed behavior	2	1			C1.11, C3.1, C3.5, C3.10
15.3 – Focus on past success*		2			C2.4
8.7 – Graded tasks*		1	1		C1.17
8.1 – Behavioral practice/rehearsal*		1			Entire intervention

Table 1. Smoking cessation: BCTs most mentioned in the literature and used by the interviewed experts (*continued*)

	Mentions in literature	Usage by experts	Integration in Perfect Fit
8.4 – Habit reversal*		1	Entire intervention
1.9 – Commitment	1	2	C2.6

Notes. *BCT was mentioned by experts. BCT exists in the taxonomy but was not mentioned in literature as commonly used/effective in changing smoking behavior.
Cx.x refers to the associated dialog/resource in the *Perfect Fit* intervention overview.
Blank cells = not applicable.
MI = Motivational Interviewing.

2. Behavioral Change Techniques employed by interviewed experts in physical activity coaching

The table below summarizes the frequency of usage by experts of the 14 most commonly used/most effective BCTs employed in PA-promotion interventions identified in the literature. Next to these 14 BCTs identified in the literature, experts also mentioned making use of 6 other BCTs in their coaching (identified with an asterisk in the table). Frequency of usage of these 6 BCTs can also be found in Table 2. All key BCTs for PA that emerged from the literature review are integrated in *Perfect Fit,* as well as additional BCTs mentioned by experts. Table 2 shows how each BCT is integrated in the *Perfect Fit* intervention. BCT '6.3 Information about others' approval' was not integrated in the *Perfect Fit* intervention because it seemed inappropriate to the expert psychologists within the research team.

The 20 identified BCTs represent the preferred coaching techniques for PA-promotion.

Table 2. Physical activity: BCTs most mentioned in the literature and used by the interviewed experts

	Mentions in literature	**Usage by experts**			**Integrated in *Perfect Fit?***
BCT		*Often*	*Sometimes*	*Never/ Rarely*	
1.1/1.3 – Goal setting	10	4			C1.9
3.1 – Social support (including MI)	9	4			Entire intervention
4.1 – Instruction on how to perform the behavior	10	2	2		C2.5, C3.8, C2.9
2.3/2.4 – (Self-)monitor behavior	6	3			Trackers
7.1 – Prompts and cues	8	2	1	1	Notifications, C2.10
1.2 – Problem solving (barrier identification)	4	3			C1.9, C1.11, C2.8**
2.2/2.7/2.6 – Feedback on (outcomes of) behavior (including biofeedback)	5	3			Trackers, C1.17
5.1/5.3/5.6 – Information about consequences of the behavior	4	4	2		C2.5
10.9/10.7 – Self-reward / Self-incentive	2	4			C2.11, C3.9
8.7 – Graded tasks	1	4	1		C1.17
1.4 – Action planning	1	4			C1.9
8.1 – Behavioral practice/rehearsal	3	2			Entire intervention
8.2 – Behavior substitution*		3	1		C1.9, C1.11, C2.2
15.1 – Verbal persuasion about capability*		3	1		Entire intervention
15.3 – Focus on past success*		2			C2.4
1.6 – Discrepancy between current behavior and goal*		1			C1.11, C1.17, C1.19
9.2 – Pros and Cons*		1			C2.7
12.1/12.2 – Environmental restructuring	2		2		C2.10
6.3 – Information about others' approval	3		1	4	No
1.9 – Commitment*				1	C2.6

Notes. *BCT was mentioned by experts. BCT exists in the taxonomy but was not mentioned in literature as commonly used/effective in changing smoking behavior.
Cx.x refers to the associated dialog/resource in the *Perfect Fit* intervention overview.
Blank cells = not applicable.
MI = Motivational Interviewing.

3. Other coaching techniques used by interviewed experts

Next to BCTs, experts also mentioned making use of other coaching techniques when trying to change smoking and/or PA-behavior.

1. **Functional imagery training (FIT) [2]** – Mental imagery training in which the coachee learns to envision their desired and undesired future-self, reflect on these with a coach, formulate goals and an action plan around these future-selves. Mental imagery is used in all steps of the training, repeated during several sessions and individually practiced at home by the coachee.
2. **Buddy system** – Coachees get assigned a buddy – with similar goals - or friend/relative who provides support in achieving their goals.
3. **Incentive/reward system (often combined with buddy system)** – Coachees deposit money on an online platform and are given the money back if they succeed in achieving their goals. They lose the money if they do not succeed in achieving their goals. When paired with the buddy system, the buddy earns his and his buddy's money if the other does not succeed in achieving their goals.
4. **A letter from your past of future self** – Coachees write a letter to their to their past self about what they wish they had known about their current self and/or write a letter to their future ideal self. The letter is opened after a certain time has lapsed and used for mental contrasting against the current self.
5. **Solution-focused coaching** – The coach focuses on the positive (e.g., where did you succeed? What went well?) and does not pay much attention to what has gone wrong.
6. **Prepare coachee for reactions of social environment on decision to change behavior/ lifestyle** – The coachee learns to anticipate reactions from their social network with regards to their new behaviors (e.g., learns to respond to a smoking friend making a comment about the coachee refusing a cigarette).
7. **Walking therapy** – primarily for patients with very limited mobility due to disease. Goal is to gradually increase the capacity to walk from two minutes to fifteen minutes.
8. **Risk assessment** – Baseline measurement of capacities (e.g., mobility) before formulating goals. This allows to formulate goals tailored to the coachee.
9. **Positive Psychology** – The coach focuses on what gives life meaning, purpose, what brings happiness and joy and focuses on resilience, compassion and gratitude.
10. **Gratitude jar** – Write down what you are grateful for, what you are proud of. In difficult times, re-read as many notes as often as necessary.
11. **Write down goals and action plan and hang them in a visible place** – Serves as a reminder of what goal the coachee is working to achieve.
12. **Machteld Huber's positive health spider web** – Visualization of one's current position regarding six health/life domains (e.g., mental wellbeing, daily functioning, meaningfulness) which can help to start conversations with healthcare professionals and coaches.

13. **Mobilizing the social network** – The coachee's system, i.e., social network, is involved in the coaching program. Stems from the idea that no individual functions in isolation and behavior is the result of a multitude of systemic factors.
14. **Psycho-education** - e.g., using flyers, testimonials or websites such as www .ikstopnu.nl.

4. Tailoring

- The overall constitution of programs and approaches are the same regardless of the coachee. Tailoring happens in the communication style and assignments or examples given by the experts.
- Tailored approach based on the coachee's life circumstances (e.g. health status, financial situation, personal behavioral change skills, coping mechanisms, potential physical symptoms, stress levels, life events, health literacy, education level, needs). The expert adapts exercises and examples to fit the person's reality (e.g. metaphors referring to cars or soccer when coaching a person with a clear interest in these topics as these are then likely to resonate with the coachee).
- Tailored approach based on the goal. An individual wanting to lose weight will be coached differently than an individual wanting to reduce muscle pain or be in better shape.
- Real-time adaptation of the coaching based on the coachee's reactions.

5. Recommendations, suggestions and warnings for the *Perfect Fit* intervention

Experts were asked for recommendations, suggestions and warnings for the *Perfect Fit* intervention based on their expertise and experience. Below table summarizes these recommendations, suggestions and warnings and details how each is addressed in the *Perfect Fit* intervention.

Table 3. Summary of recommendation, suggestions and warming by experts for the *Perfect Fit* intervention

By x experts	Recommendation, suggestion, warning	Integration in *Perfect Fit*
5	Autonomy / shared-decision making – let the user decide what they want, how often and how fast. Do not decide for them	.Goals are set and planning-schemes made by the user – guided by the virtual coach – with respect for their capabilities and wishes
4	Use positive motivational messages and compliments	.All dialogs and resources contain positive and motivational messages
4	Use an accessible language level that all users can understand	.All content is written in B1 level Dutch
3	(Short) baseline screening to assess starting point	.App records smoking and PA-behavior for the first 9 days (C1.7) in order to make tailored, realistic predictions
3	Make things visual (e.g. overview of steps), especially for lower educated people	.Overview of steps in sensor app .Overview of personal risk situations .Multiple videos used to deliver content .Use of emojis in conversations
2	Quitting completely on a specific quit day more effective than quitting gradually	.Explained in the goal-setting dialog (C1.9) and medication video (C1.6)
2	Give users feedback on their progress (e.g., activity tracker, improved physical condition (using the BORG-scale) or ask them to keep a diary)	.Notifications will be sent regularly to update user on their personal step count .Users can monitor their (non)smoking behavior using a dedicated tracker. .Recurring reflection on the progress made towards the desired self through a future-self exercise.
2	No spamming – overloading people with information can have negative consequences (e.g., drop-out)	.After the preparation phase, 'mandatory' contact (initiated by the virtual coach) is limited to once per week. .After each dialog, the virtual coach checks with the user whether they want to move on to the next to continue at a later time.
2	There is no failure, do no punish mistakes or setbacks.	.This is emphasized in multiple dialogs but especially in the (re)lapse dialog (C1.19)
1	Include (psycho)education in the app (e.g., tips about nutrition and diet, tips for reducing cigarette cravings)	.There are 6 different (psycho)educational resources (C2.5, 1-6) .Dialogs also contain lots of educational facts about smoking and PA
1	Propose adequate alternatives to the current, undesired behavior	.The virtual coach assists the user in finding appropriate alternative behaviors, also in risk situations (C1.17) .There is dedicated content which helps users determine personal alternative behaviors (C1.9, C1.11, C2.2)
1	Tell the user to keep in mind that an app is less personalized than human coaching, not all answers and activities will be adequate.	.The introduction video explains that the coach is not human in order to manage expectations, and facilitate a bond between user and virtual coach .When users type words outside of dialogs, a notification is sent that the virtual coach does not understand what is said, with a suggestion for the user for how to proceed

Table 3. Summary of recommendation, suggestions and warming by experts for the *Perfect Fit* intervention (*continued*)

By x experts	Recommendation, suggestion, warning	Integration in *Perfect Fit*
1	Integrate a mindfulness exercise	.Resource 2.3 includes the possibility to do a mindfulness exercise amongst other relaxation techniques
1	Integrate a mental imagery exercise in which they envision the achievement and themselves once the goal has been reached.	.Dialog C1.11 integrates a mental imagery future-self exercise.
1	Make sure the app functions as it should. Technical problems leads to drop-out.	.A period of 3 months is planned to get rid of bugs .The app will be tested by our advisory board with potential end-users before being tested in the trial
1	Prioritize. Don't try to change everything at once, choose what to focus on.	.Each user only has two primary points of focus: quitting smoking and a certain number of steps per day.
1	Explain why the users are asked for input or to perform certain activities which can help reduce resistance.	.Integrated in each dialog and resource which require input (e.g., C1.17, C2.8)
1	Make sure goals are realistic.	.Virtual coach assists user in choosing a realistic quit date. .PA goals are step goals which are adapted daily based on the user's own past performance by an algorithm.
1	Regularly checking-in to monitor how the user is doing.	.This is the exact purpose of the weekly reflection dialog (C1.17)
1	Important to ask whether users want to use NVM/medication and to create a plan around that.	.This is the exact purpose of the medication video (C1.6), and users can flexibly set their quit date for smoking cessation to allow them to arrange medication (if applicable)
1	When users decide to use medication, help them gradually decrease so that they learn to go on without.	.Not part of the *Perfect Fit* intervention at the moment. Users who want to use medication are also referred to a healthcare professional, who can support them in this.
1	Coach in such a way that the new behavior becomes second nature.	.Every aspect of the *Perfect Fit* intervention aims at achieving this
1	Let the user register the advantages and disadvantages of changing their behavior.	.This is the exercise users complete in resources C2.7 and C2.8
1	React on what the user says (e.g. 'what do you mean by …?' or 'how does that make you feel?') as a way to monitor change.	.Technical limitations of coaching through an app restrict this, but the virtual coach reflects on what the user says as much as possible in every dialog (e.g., C1.17, C1.9, C1.19)
1	Older lower SEP is the most difficult target group. They usually have been smoking for a long time and have ample life experience. There could be lots of resistance and it may take time to have them change their behavior and lifestyle.	.The *Perfect Fit* application targets this group especially. The entire intervention has been developed with them in mind, and in collaboration with members of this population group (through scientific studies and our advisory board).
1	It is important to build rapport with the individual.	.The virtual coach starts by introducing themselves and asking who the user is as a way to get acquainted. Expertise on how to build rapport between virtual coach and user is integrated throughout the app.

Table 3. Summary of recommendation, suggestions and warming by experts for the *Perfect Fit* intervention (*continued*)

By x experts	**Recommendation, suggestion, warning**	**Integration in *Perfect Fit***
1	Assess reasons underlying current behavior (i.e., why is someone behaving the way they are?)	.Questions such as this one are part of the goal-setting dialog (C1.9), the future-self exercise (C1.11) the weekly reflection dialog (C1.17).
1	Consider using blended care	.The *Perfect Fit* consortium has opted for a stand-alone eHealth intervention in the early stage of development. Blended care might be an option depending on the first evaluations of the current intervention.
1	Be prepared for drop-out. An app is not for everyone.	.We are aware of the risk for drop-out. We mainly aim to add an intervention that is suitable for lower SEP users, but it is not intended to fit with everyone's needs and/or replace other interventions. .TU Delft works on algorithms to persuade people to complete certain activities in order to limit drop-out.
1	No using the word 'trying'. Agree that the user will 'do'.	.None of the dialogs or resources prompt the user to 'try', they always ask users to take action.
1	Inform user that their social environment plays an important role in their behavior change and let them think of how to involve them.	.Users are encouraged to tell their social network that they will be quitting smoking and increasing their PA. The app integrates exercises to help users think of ways to cope with possible negative reactions from their social environment. . Users are encouraged to speak to a friend, family member or GP if necessary.
1	Include resources and contact details that users can refer to in case of questions	.Participants in the trial will be given the contact details of the research team, and are motivated to contact their GP or another healthcare professional if necessary.

ADDITIONAL INFORMATION FROM THE INTERVIEWS WITH EXPERTS

1. Coaching for quitting smoking and promoting physical activity (PA)

Findings presented below presents additional information provided by the experts during the interview.

1.1 Coaching programs and methods

2.1.1 Numerous existing coaching programs

Multiple quit smoking and PA-promotion programs exist and are known and used by the experts. Most experts are certified in administering one specific smoking cessation and/or PA-promotion program.

Existing programs employed by the interviewed experts include:

- Quit smoking programs (e.g. Sinefuma)
- Quit smoking and PA-promoting programs (e.g. Rookvrij en Fitter)
- Physical therapy treatment

Coaching, i.e. a series of conversational sessions with the coach with the aim to change behavior, is generally the fundament of the program (e.g. Sinefuma, Rookvrij en Fitter, own lifestyle coaching program). However, sometimes it was offered on the side, for example to people calling the Stoplijn by Trimbos while attempting to quit on their own.

Some programs have been (i.e., Sinefuma) or are currently being scientifically tested (i.e. Rookvrij en Fitter) to assess their effectiveness in achieving smoking cessation and/or increased PA.

2.1.2 Duration coaching programs

The intensity and duration of quit smoking and PA-promotion programs offered by the experts strongly varies and depends on whether lifestyle change is part of a medical treatment (e.g. following injury or disease) or the end goal in itself. Lifestyle change within the scope of a medical treatment includes more intensive coaching, especially in the beginning (e.g., 3-4 sessions of 30-60 minutes per week and gradually less frequently) and can last up to 12 months. Coaching programs for lifestyle change outside of a medical treatment generally consist of 1 to 3 sessions of 20-60 minutes spread over a period of 1 to 4 months. In certain programs (Rookvrij en Fitter), brief support from the coach is available beyond the fixed number of coaching sessions.

2.1.3 Various communication media are used

The interviewed experts reported using several media to communicate with their coachees:

- Face-to-face (8/8 experts)
- Telephone coaching (done more frequently during the COVID pandemic) (3/6 experts)
- Web-based coaching (e.g. Zoom, Whatsapp) (2/6 experts)
- Sometimes webinars (1/8 experts)
- Combination of the above (3/6 experts)

The preferred communication medium is face-to-face because it makes the conversation more personal and easier to take body language into account.

2.1.4 Various coaching formats are used

The interviewed experts reported several formats within their employed coaching programs:

- Group sessions – groups can influence each other negatively or positively (2/8 experts)
- Individual sessions (4/8 experts)
- A combination of group sessions and individual sessions (1/8 experts)

Experts do not notice a significant difference in effectiveness between individual and group sessions. Some people prefer being coached individually, others prefer group coaching.

2.1.7 Recruitment and referral

Individuals coached by the interviews experts were sometimes referred to them by, for example, the lifestyle polyclinic of their hospital or the GP practice nurse (POH).

Sometimes experts refer coachees to other experts/healthcare professionals occupational physician, personal trainer

- Sometimes refer to websites (e.g. ikstopnu.nl)
- Sometimes refer to community houses and community coaches
- Recruitment coaches through: personal website, POH
- One expert views the *Perfect Fit* app as a good addition to their own coaching. Oftentimes when people come to this expert with the goal to quit smoking or become more physically active, multiple barriers need to be removed first. It occurs that once these barriers have been tackled, there is no more time left to work on the quitting smoking or becoming more active part. In those cases, this expert would find it very useful to refer her coachees to the *Perfect Fit* application.

None of the experts structurally work in a multidisciplinary context. They do however refer to other experts or resources, for example those mentioned above.

2.1.6 Diverse coachee population

Based on their descriptions of the individuals they coach, the experts coach a diverse and rather representative sample of the Dutch adult population. Older individuals with lower

to middle socioeconomic position which is especially targeted within *Perfect Fit* are well represented within the strata of the population the experts coach. Sometimes, experts also get to coach adolescents, but that is more rare. Two experts also works with specific subgroups of the population, namely patient with peripheral artery disease (PAD), cancer patients and/or athletes.

2.1.7 Motivation coachee

Generally speaking, coachees are already motivated when they are seen by the expert which is positive because lifestyle change occurs faster if coaches are motivated. One of the primary tasks of the experts is to increase motivation for behavioral/lifestyle change when motivation is low.

For individuals with a medical condition, motivation varies strongly. Some view the coaching program as a necessary step imposed upon them by their doctor. Some experience their condition as a wake-up call and are very motivated to change.

2.1.8 Goal coachee

For smoking, the goal is to lead a nicotine-free life (i.e. abstinence from smoking, as well as from nicotine replacement therapy and e-cigarettes).

For PA, experts and coachee work together to identify the goal(s) – i.e. getting in shape, losing weight, reducing pain, another goal? The coachee is the one determining their goal, the expert only assists in identifying the end-goal by asking the right questions.

Coachees have a combination of goals (e.g. quitting smoking and less stress, avoid burn-out and lose weight).

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APPENDIX 1 – REVIEWED SYSTEMATIC REVIEWS AND META-ANALYSES

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APPENDIX 2 – DEFINITION OF IDENTIFIED BCTS

The table below presents the name and official definition of the BCTs identified in the literature as most commonly used and most effective in smoking cessation and PA-promotion interventions [1]. In the present report, certain BCTs with lots of overlap in the definitions were grouped and coded together. Reasons behind this were that systematic reviews did not always specify which specific BCT was used but rather an overarching category. Also, grouping facilitated discussion with the experts who did not all have in-depth knowledge of the taxonomy and nuances between BCTs.

BCT	Definition
1.1/1.3 Goal-setting (behavior and outcome)	Set or agree on a goal defined in terms of the behavior to be achieved or of a positive outcome of wanted behavior..
1.4 Action planning	Prompt detailed planning of performance of the behavior.
1.6 Discrepancy between current behavior and goal	Draw attention to discrepancies between a person's current behavior (in terms of the *form, frequency, duration, or intensity* of that behavior) and the person's previously set outcome goals, behavioral goals or action plans (goes beyond self-monitoring of behavior)
1.9 Commitment	Ask the person to affirm or reaffirm statements indicating commitment to change the behavior.
2.2/2.7/2.6 (Bio)feedback on behavior	Monitor and provide informative or evaluative feedback on the body and performance of the behavior *(e.g. form, frequency, duration, intensity)* and/or on the outcome of performance of the behavior.
2.3/2.4 Self-monitoring of behavior	Establish a method for the person to monitor and record their behavior(s) and outcome(s) of their behavior as part of a behavior change strategy.
3.1 Social support (unspecified)	Advise on, arrange or provide social support *(e.g. from friends, relatives, colleagues,' buddies' or staff)* or noncontingent praise or reward for performance of the behavior. It includes encouragement and counselling, but only when it is directed at the behavior.
4.1 Instructions on how to perform the behavior	Provide information about antecedents (*e.g. social and environmental situations and events, emotions, cognitions)* that reliably predict performance of the behavior.
5.1/5.3/5.7 Information about health, social, environmental and emotional consequences	Provide information (e.g. written, verbal, visual) about health, social, environmental and emotional consequences of performing the behavior.
6.3 Information about others' approval	Provide information about what other people think about the behavior. The information clarifies whether others will like, approve or disapprove of what the person is doing or will do.
7.1 Prompts/cues	Introduce or define environmental or social stimulus with the purpose of prompting or cueing the behavior. The prompt or cue would normally occur at the time or place of performance.
8.1 Behavioral practice/rehearsal	Prompt practice or rehearsal of the performance of the behavior 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.
8.2 Behavior substitution	Prompt substitution of the unwanted behavior with a wanted or neutral behavior.
8.4 Habit reversal	Prompt rehearsal and repetition of an alternative behavior to replace an unwanted habitual behavior.
8.7 Graded tasks	Set easy-to-perform tasks, making them increasingly difficult, but achievable, until behavior is performed.

(*continued*)

BCT	Definition
9.2 Pros and cons	Advise the person to identify and compare reasons for wanting (pros) and not wanting to (cons) change the behavior.
10.7/10.9 Self-incentive/Self-reward	Plan to self-praise or self-reward in future if and only if there has been effort and/or progress in performing the behavior.
12.1/12.2 Restructuring the physical and social environment	Change, or advise to change the physical and social environment in order to facilitate performance of the wanted behavior or create barriers to the unwanted behavior (other than prompts/cues, rewards and punishments).
13.5 Identity associated with changed behavior	Advise the person to construct a new self-identity as someone who 'used to engage with the unwanted behavior'.
15.1 Verbal persuasion about capability	Tell the person that they can successfully perform the wanted behavior, arguing against self-doubts and asserting that they can and will succeed.
15.3 Focus on past success	Advise to think about or list previous successes in performing the behavior (or parts of it).