Title: Development and usability testing of a very brief intervention for personalized cancer risk assessment to promote behaviour change in primary care using normalisation process theory.

Running title: Development of a personalised cancer risk intervention to promote behaviour change

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ABSTRACT

Background: Cancer is the second leading cause of death worldwide. Lifestyle choices play an important role in the aetiology of cancer with up to four in ten cases potentially preventable. Interventions delivered by healthcare professionals (HCPs) that incorporate risk information have the potential to promote behaviour change. Our aim was to develop a very brief intervention incorporating cancer risk, which could be implemented within primary care.

Methods: Guided by normalisation process theory (NPT), we developed a prototype intervention using literature reviews, consultation with patient and public representatives and pilot work with patients and HCPs. We conducted focus groups and interviews with 65 HCPs involved in delivering prevention activities. Findings were used to refine the intervention before 22 HCPs completed an online usability test and
provided further feedback via a questionnaire incorporating a modified version of the NoMAD checklist.

Results: The intervention included a website where individuals could provide information on lifestyle risk factors view their estimated 10-year risk of developing one or more of the five most common preventable cancers and access lifestyle advice incorporating behaviour change techniques. Changes incorporated from feedback from the focus groups and interviews included signposting to local services and websites, simplified wording and labelling of risk information. In the usability testing all participants felt it would be easy to collect the risk information. 91% felt the intervention would enable discussion about cancer risk and believed it had potential to be easily integrated into NHS Health Checks. However, only 36% agreed it could be delivered within 5 minutes.

Conclusions: With the use of NPT we developed a very brief intervention that is acceptable to HCPs in primary care and could be potentially integrated into NHS Health Checks. However, further work is needed to assess its feasibility and potential effectiveness.

Keywords: intervention development, cancer risk, behaviour change, primary care

BACKGROUND
Cancer is now the second leading cause of death worldwide (World Health Organisation, 2018). Approximately four in ten cases are thought to be preventable through lifestyle change. The importance of prevention has been highlighted in both the Academy of Medical Sciences “Improving the health of the public by 2040” report (Sciences, 2016) and in the NHS ‘Five Year Forward View’, in which the sustainability of the health system is described as being dependent on ‘radical upgrade in prevention and public health’ (NHS, 2014).

As described in those reports, achieving this change is likely to require interventions targeted at both the population and individual level. Primary care provides an ideal platform from which to deliver individual-level interventions. Not only does primary care provide over 300 million patient consultations each year in England alone (NHS, 2014), but it is also the site in which many other prevention programmes, including the NHS Health Check and Diabetes Prevention programmes in England (NHS Diabetes Prevention Programme, no date; Public Health England, 2014), are already delivered.

A common component of many prevention programmes is the estimation and communication of risk of disease. The evidence for behaviour change following provision of risk information in general is limited (Usher-Smith et al., 2015; Hollands et al., 2016; French et al., 2017). However, a recent systematic review of randomised trials showed that interventions incorporating personalised non-genetic cancer risk information were associated with increased odds of remaining a former
smoker in those who had recently quit smoking and increased sun protection habits, skin self-examination and breast examination (Juliet A Usher-Smith et al., 2018).

Behaviour change interventions incorporated within breast and colorectal cancer screening programmes have also achieved significant reductions in multiple risk factors (Emmons et al., 2005; Anderson, Craigie, et al., 2014; Anderson, Macleod, et al., 2014). Provision of cancer-specific risk information alongside lifestyle advice at an individual level within the context of primary care may therefore support population level interventions to promote behaviour change.

As with all healthcare professional led interventions, success depends on the engagement of those delivering the intervention. While studies have confirmed that healthcare professionals in primary care consider prevention an important part of their role, delivering prevention activities is considered difficult for many and is not routinely conducted (Brotons et al., 2005; Noordman, Verhaak and van Dulmen, 2010; McIlfatrick et al., 2013; Usher-smith et al., 2017). Barriers identified include lack of time (Brotons et al., 2005; McIlfatrick et al., 2013; Usher-smith et al., 2017), training (McIlfatrick et al., 2014; Usher-smith et al., 2017) and availability of clear resources for patients (Usher-smith et al., 2017). To address these barriers and other factors contributing to the ‘implementation gap’ between research and practice (Olswang and Prelock, 2015), a number of theories have been developed. One is normalisation process theory (NPT), which provides a framework for understanding how and whether complex interventions become routinely embedded in health care practice (May et al., 2009). It focuses on the work that individuals and groups do to enable an intervention to become normalised and
includes four components: coherence (sense-making), cognitive participation (engagement), collective action (enactment), and reflective monitoring (appraisal). It has been widely used to successfully retrospectively analyse the implementation of interventions (McEvoy et al., 2014; May et al., 2018) and has also been proposed as a tool to be applied prospectively to raise awareness about facilitators and barriers to successful implementation (Murray et al., 2010). Used in this way it can act as a ‘sensitising tool’ (Murray et al., 2010) to encourage thinking through issues around implementation when designing interventions.

The MRC guidance for development and evaluation of complex interventions (Craig et al., 2008) and NICE Public Health guidance for behaviour change interventions (National Institute for Health and Care Excellence., no date) also emphasize the importance of the early phases of intervention development and the need to ensure that interventions build on the skills, talents and capacity of healthcare professionals and are consistent with other local and national interventions and programmes (National Institute for Health and Care Excellence., no date).

We aimed to use NPT alongside healthcare professionals currently working within primary care to guide the development of a very brief risk-based intervention that could be used within primary care to support patients to make lifestyle changes to prevent cancer.

METHODS
The overall process for developing and testing the intervention is summarised in Figure 1.

**Figure 1: Development and testing process of the prototype intervention**

**Stage 1: Development of a prototype intervention**

To guide the initial format of the prototype and how it might fit within the primary care context we began by considering the four components within each of the core constructs within normalisation process theory: coherence; cognitive participation; collective action; and reflexive monitoring. Coherence refers to the sense-making by participants either individually or collectively when faced with the implementation of a new set of practices; cognitive participation relates to participant understanding and engagement with the new set of practices within their current roles; collective action considers the capacity and support needed for the incorporation of the new practices into existing procedures; and reflexive monitoring describes participant appraisal, evaluation and monitoring of the impact of the new practices on themselves and their working roles. Guided by the questions within the NPT toolkit we considered the application of each of these constructs to the intervention in turn.

To be consistent with the overall structure of other local and national risk communication based interventions currently in use in primary care, such as NHS
Health Checks (Public Health England, 2016), we considered the intervention in three parts:

i) Risk assessment- a risk assessment tool to enable collection of diet and other lifestyle risk factors for cancer, either independently or with a healthcare professional.

ii) Risk communication- a web-based tool to display the estimated risk of developing one or more cancers based on potentially modifiable lifestyle risk factors.

iii) Risk management advice- the opportunity to discuss behaviour change using evidence-based information on diet and lifestyle risk factors and signposting to existing services.

i) Development of risk assessment

To facilitate implementation, we chose to develop an online lifestyle based risk assessment with an integrated data collection tool that required only simple data on lifestyle factors that could be collected by healthcare professionals in a few minutes or self-completed by patients either in the waiting room or online prior to their appointment. To enable individuals to see the effect of lifestyle on multiple cancers, we chose to estimate the 10-year risk of developing one of the five commonest preventable cancers among men and women in the UK. These are lung, colorectal,
bladder, kidney and oesophageal cancer for men; and breast, lung, colorectal, endometrial and kidney cancer for women.

The development and assessment of the performance of these lifestyle based risk assessments is discussed in detail in a separate paper (Juliet A. Usher-Smith et al., 2018). In summary, established lifestyle risk factors from the European Code against Cancer (Leitzmann, Boutron-Ruault, et al., 2015; Leitzmann, Powers, et al., 2015; Leon M, Peruga A, McNeill A, Kralikova E, Guha N, Minozzi S, 2015; Norat et al., 2015; Scoccianti et al., 2015) and estimates of relative risks from meta-analyses of observational studies were used to calculate an individuals’ risks of developing one or more of the five cancers relative to a recommended lifestyle. Mean values for risk factors from the Health Survey for England (HSE) 2005 (available from: https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england) and the National Diet and Nutrition survey (NDNS) years 1-4 (2008/12) (available from: https://discover.ukdataservice.ac.uk/catalogue/?sn=6533) and mean 10-year estimated absolute risks from routinely available sources (Statistics, 2015a, 2015b) were then used to calculate the estimated absolute risk of developing one or more of the cancers over a 10-year period. The performance of the risk assessment was then validated using data from 23,768 participants (12,828 women and 10,940 men) in the EPIC-Norfolk cohort (N Day, S Oakes, R Luben, KT Khaw, S Bingham, A Welch, 1999) who had at least 10-year follow-up and data for all risk factors and no previous history of diagnosis or any of the chosen cancers at baseline.

ii) Development of risk communication
To enable communication of the risk to participants we developed a web-based tool integrated within the Gorilla.sc research platform (www.gorilla.sc/about). In order to choose the format(s) in which to present the risk we conducted several steps. This included: looking back at pilot work with members of the public in which they had been presented with their risk of individual cancers in four different ways and focus groups with healthcare professionals within primary care which have been reported separately (Usher-smith et al., 2017; Usher-Smith et al., 2017); a scoping review of literature published up to February 2017 that reported on the effectiveness and patient preferences of different risk presentation formats used in cardiovascular disease and cancer (Fortin et al., 2001; Julian-Reynier et al., 2003; Kirby and Machen, 2009; Sheridan et al., 2009; Hill et al., 2010; Waldron et al., 2011; Dorval et al., 2013); reference to best practice guidance for communication of risk (Lipkus, 2007; Trevena et al., 2013; Zipkin et al., 2014); and discussions with patient and public representatives and experts in the field.

iii) Development of risk management advice

Given the known challenges to achieving behaviour change and the evidence from systematic reviews of the limitations of risk provision alone (Brindle et al., 2006; Usher-Smith et al., 2015; French et al., 2017), we set out to incorporate established behaviour change techniques (BCTs) into the intervention, within the consultation with the healthcare professional, on the website and as a leaflet to be given to patients after the consultation. We began with the BCTs within the BCT Taxonomy (v1) (Michie et al., 2013) which were judged appropriate by a consensus of experts in behaviour change and most frequently used for enablement and education.
From that list we then used the following three criteria to select which to include in the intervention:

1. Evidence for effectiveness of BCTs in this context
2. Relevance to the context i.e. BCTs that could be used within face-to-face interventions within primary care to promote lifestyle change to reduce future risk of cancer
3. Feasibility i.e. can be delivered by nurses/Health care assistants within 5 minutes in primary care

To identify evidence for the first of these criteria, we performed a scoping review of the literature. This included searching online bibliographic databases in May 2017 to identify systematic reviews and meta-analyses published in English and reporting the effectiveness of the inclusion of individual BCTs on behaviour change. We then also screened the reference lists of identified papers for other relevant reviews.

**Stage 2: Refinement and testing of prototype intervention**

**Focus groups and interviews with healthcare professionals**

To enable us to demonstrate the prototype intervention and receive direct feedback from key stakeholders, we conducted focus groups and face-to-face interviews with healthcare professionals involved in delivering preventive healthcare across the East of England and London between June-August 2017. Approvals were obtained from
the University of Cambridge Psychology ethics committee (Ref: PRE.2017.043) and
the Health Research Authority (HRA) (Ref: 17/HRA/1948).

Participants and recruitment

To recruit healthcare professionals currently working within general practice, letters of invitation and the study information leaflet were emailed to all GPs, practice nurses and healthcare assistants across Cambridge and Peterborough by the local Clinical Lead for the NHS Health Check programme. Those interested in taking part were invited to contact the research team directly. Healthcare professionals working within three health service commissioned providers of lifestyle advice were similarly emailed a letter of invitation along with the study information leaflet by their manager and invited to attend one of several planned focus groups. The local NIHR Clinical Research Network also provided assistance in the recruitment of healthcare professionals from local general practices.

Data collection

All focus groups and interviews were held at the participants’ place of work and were led by a non-clinical researcher experienced in qualitative research (KM). Each lasted between 20 and 60 minutes. Written consent was obtained from all participants. Each focus group began with a presentation showing screen shots of the questions used to collect the risk factor information, presentation of risk and web-based lifestyle advice. Copies of the behaviour change leaflet were then handed out for participants to read. The discussions that followed were informed by a topic
schedule (Appendix 1) which incorporated the first three NPT constructs (coherence, cognitive participation and collective action). We chose not to include the fourth construct, reflexive monitoring, as this relates to how individuals and groups assess how the intervention affects them in practice, and we felt that this would be difficult for participants at this stage to consider. Within focus groups we also explored views of the participants on the overall format, content and length of the prototype intervention, as well as any barriers and facilitators to its incorporation into practice.

Analysis

The focus groups and interviews were audio-recorded and then transcribed verbatim and analysed using an iterative process which started near the beginning of data collection. Throughout this process the qualitative data was fine-coded by one researcher (KM) with the aid of NVivo software (QSR International, version 11). Emergent themes were identified using thematic analysis (Braun and Clarke, 2006) and then discussed among the wider research team and used to refine the prototype intervention.

Usability testing and feedback from healthcare professionals

After further refinement of the intervention based on the findings from the focus groups and interviews, we developed the web-based intervention and invited healthcare professionals to trial the website and provide feedback on its usability and the intervention as a whole.

Participants and recruitment
All participants who had taken part in a focus group or interview and who had provided a valid email address were sent an email with a link to the intervention website. A unique study ID was included in each email that enabled the participants to log in and work through the entire intervention as if they were delivering it in practice. This included collection of information about lifestyle risk factors, presentation of the estimated risk, setting target values and seeing the impact of those changes on the estimated risk, and then viewing all the pages of the behaviour change leaflet. They were then automatically directed to an electronic questionnaire.

Data collection

The electronic questionnaire was in two parts, Appendix 2. The first asked participants about the usability of the website and the clarity of the information provided. The second focused on the potential for the intervention to be incorporated into practice with questions covering the first three components of NPT adapted from the NoMAD checklist (Finch et al., 2013) in line with guidance from the NPT website (Normalisation process theory, no date). In the second section we also included specific questions about the anticipated duration of the intervention and the potential for it to be incorporated within NHS Health Checks, routine consultations, chronic disease reviews and lifestyle advice consultations.

Analysis

Data from the questionnaire were analysed descriptively and are presented as frequencies and means (± standard deviation, SD). Agreement with statements from
the NoMAD checklist was converted into a 5-point scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). Those selecting the option ‘Not applicable to my role’ were treated as missing data for that question.

RESULTS

Stage 1: Development of a prototype intervention

Table 1 shows how each of the four components of the four core constructs within normalisation process theory were used to inform decisions about the overall concept, content and delivery of the intervention. Particular considerations included making the intervention simple to describe to patients; ensuring intuitive navigation to minimise training requirements; and designing it to fit within current prevention activities within primary care such as NHS Health Checks.

Insert Table 1 here

ii) Development of risk communication

Table 2 details the key findings which we considered when choosing the format in which to communicate the risk. In addition to the previously published pilot work (Usher-Smith et al., 2017) and best practice guidance (Fortin et al., 2001; Lipkus, 2007; Waldron et al., 2011), we identified seven studies [13–18]. Key considerations included: the appropriate use of a colour scale to demonstrate the level of risk;
inclusion of relative risk to promote behaviour change; a 10-year risk estimate to align with current cardiovascular disease risk estimates; and the ability to change modifiable risk factors and view their effect on overall risk estimate. The chosen format for risk presentation was a bar graph displaying a 10-year risk estimate. This included colour shading to communicate the level of risk on a scale from green to red. The graph axis described an individual’s risk level as the number of times higher than that of a person following all of the recommended lifestyle guidance. The risk presentation displays this as an additional bar for reference. To aid interpretation, the percentage value of the risk level can also be viewed. On setting new target values for lifestyle changes, the bar graphs displays an additional level of risk to visualise the consequent potential risk reduction. On completion, the bar graph communicates three levels of risk: 1) current, 2) potential future risk after making lifestyle improvements and 3) the risk if following all of the recommended lifestyle guidance.

*iij) Development of risk management advice*

From the 93 BCTs within the BCT Taxonomy (v1) (Michie *et al.*, 2013), 58 were judged appropriate by a consensus of experts in behaviour change and most frequently used for enablement and education interventions (Michie, Atkins and West, 2014). We then identified four systematic reviews (Michie *et al.*, 2009; Lara *et al.*, 2014; McDermott *et al.*, 2016; Samdal *et al.*, 2017) addressing which of these BCTs are
most effective in the context of changes in physical activity and diet. To our
knowledge, no systematic reviews have reported the effectiveness of BCTs in the
context of alcohol consumption and smoking. Overall, the evidence for effectiveness
of the BCTs was mixed. However, the reviews did identify a number of BCTs
associated with intention and behaviour change. In the study by Lara et al, 2014, the
BCTs “plan for social support” and “goal setting (outcome)” were reported to make
clinically important improvements in fruit and vegetable consumption (Lara et al.,
2014). McDermott et al, 2016 reported that no BCTs were associated with
significant positive effects on behaviour. However, they did identify that there was a
significant positive association of intention with the BCT “provide information on the
consequences of behaviour in general” (McDermott et al., 2016). Michie et al, 2009
reported that interventions designed to promote physical activity and healthy eating
appear to be more effective if the BCT “self-monitoring” and at least one of the four
other self-regulatory techniques derived from control theory (Carver and Scheier,
1982) (“prompt intention formation”, “prompt specific goal setting”, “provide
feedback on performance”, “prompt review of behavioural goals”) were
included (Michie et al., 2009). Similarly, a more recent study by Samdal et al, 2017
described “self-monitoring of behaviour” and “goal setting of behaviour” as
associated with a positive intention effect for both short and long-term
changes (Samdal et al., 2017).

The reviews also identified BCTs negatively associated with change. For example,
“exploring the pros and cons of behaviour change” was reported as negatively
associated with changes in diet and physical activity in overweight and obese adults
(Samdal et al., 2017), “relapse prevention/coping planning” was associated with a negative change in intention (McDermott et al., 2016), and “provide feedback on performance” was reported to have a significant negative effect on behaviour (McDermott et al., 2016). We, therefore, excluded these BCTs from our selection.

After assessing each of the remaining BCTs against our additional criteria of relevance to the context of primary care and practicability to deliver within a five-minute consultation, we selected 13 to include in the intervention (Table 3). These include social support (unspecified); goal setting (behaviour); goal setting (outcome); and self-monitoring of behaviour and, as described in Table 3, are incorporated within both the consultation itself and the written information provided as part of the intervention. For example, the website allows demonstration of the estimated cancer risk and impact of lifestyle change, and the behaviour change leaflet (appendix 3) includes generic advice on goal setting and support with signposting to local services and information on each of the lifestyle risk factors with details on their association with cancer, suggestions for lifestyle improvements and space to write goals. The prototype intervention therefore consisted of a website where on completion of a questionnaire on lifestyle cancer risk factors, a 10-year risk estimate is presented as a coloured graded bar graph. Lifestyle improvements discussed supported by weblinks and paper copy of a behaviour change leaflet including signposting to local services, target values set for lifestyle risk factors entered onto the website and a target level of risk calculated to visualise potential risk reduction.
Stage 2: Refinement and testing of prototype intervention

Focus groups and interviews with healthcare professionals

Sixty-five healthcare professionals who deliver prevention services within primary care took part across nine focus groups and two interviews to provide feedback on the prototype intervention. The characteristics of participants are shown in Table 4. Participants included general practitioners, practice nurses, healthcare assistants, health trainers and managers. Forty-one provided services working for a lifestyle provider and 24 in general practice. The sample included 14 men and 51 women, with varying years of experience in their current working roles. The index of multiple deprivation (IMD) scores for each of the six general practices were collected (median 12.3, range 9-20.3), five of which were in the highest quintile in the distribution for England. Each of the practices reported that at least 80% (range 79.9-90.7%) of their patient population were of White ethnic origin, followed by at least 6% from Asian ethnic origin (range 6-13.9%). A small proportion were from other ethnic groups, Black (range 1-2.3%), Mixed (range 1.6-3.5%) and other Non-White (range 0-1.7%).

Overall participants were enthusiastic and supportive about the intervention and felt that it showed promise for use within primary care consultations and potential to benefit patients and the NHS system as a whole.
“I think it would help motivate people and actually help them see the bigger picture but also help them take ownership themselves and have that motivation, and seeing where it all connects and what they can do themselves with the right education and support and help.”

Focus group 3, Lifestyle provider

“I would have thought so because obviously anybody that we can prevent or lower their risk of is less work for us and less work for secondary care and less cost to the NHS, and at very little cost to ourselves.” Focus group 9, General practice

We have reported below in turn the results within each of the three constructs of NPT incorporated into the focus group discussions: coherence; cognitive participation; and collective action.

Coherence

Within the construct of coherence, which is defined as sense making, there were several components discussed by participants in each of the focus groups/interviews. All participants could see the importance and benefits of the intervention and the potential value it could have within primary care consultations, especially within the current prevention activities they perform as part of their role. Particular reference was made to the intervention’s potential to act as an additional motivator to behaviour change within other existing conversations about disease risk including cardiovascular disease.
“If someone has got high cardiovascular risk and they’ve got a high cancer risk as well…I think if they get all the information in one lump sum they’re more prone to be open to the suggestion of change.” Focus group 1, Lifestyle provider

“I suppose it’s an additional motivator to reinforce the lifestyle message that you’re trying to give, because you’re not giving them any different advice, you’re still saying, do all the same things in terms of diet and lifestyle.” Focus group 5, General Practice

Many participants were also able to build on their shared experiences of delivered risk information and show understanding of the aims and objectives of the intervention. Visualisation of the change in risk level after a discussion on goal setting for behaviour change was particularly recognised as of value.

“Definitely think seeing that change, so looking at the risk now, then actually how it can almost be halved if it was going with like the target values that it’s easier for them to visualise that, rather than just being told, “Ah it could reduce”. Focus group 4, Lifestyle provider

“I think something interactive is always helpful than just kind of giving information, so something like goal setting…that can definitely help” Focus group 2, Lifestyle provider

This extended to consideration of its delivery, which included the content required to discuss effectively the risk assessment and lifestyle advice with patients.
“If we only delivered the figure (risk score) to the client, it still remains very abstract to them, so what we need to focus the discussion on is exactly what’s going on and what’s participating to that risk and how we can work with it” Focus group 4, Lifestyle provider.

Cognitive participation

As part of the discussion, themes related to cognitive participation, defined broadly as engagement, were considered. Discussion around this focused on the delivery and incorporation of the intervention. Most participants reported how the delivery of the intervention had the potential to be part of their existing role, and suggested specific procedures that would enable implementation.

“If a template (electronic) was designed for this then that would be a reminder to us to discuss it. And for the patient it would mean that a lot more information is given and advised and they can take action on their lifestyle and make them aware of it” Focus group 10, General Practice

To ensure that the intervention had the potential to fit within existing practice, discussion also focused on how healthcare professionals could work together to incorporate ways of delivery. Many participants showed willingness to be involved in the delivery of the intervention as part of their role and could see how this could extend to other members of the healthcare team. Most participants recruited from general practice agreed that, after training, practice nurses or healthcare assistants, could deliver the intervention.

“I think if some training is given I’m sure they’d (Healthcare assistants) be fine, and with our
Participants discussed several aspects of collective action, defined as support for delivery, with specific emphasis on the operationalisation of the intervention. Many described availability of resources and integration into existing work within primary care as of importance to its effectiveness.

Within the discussions around resources, most participants agreed that having time available within the consultation was essential to the success of intervention delivery. This included time to explain the risk presentation, discuss lifestyle changes, offer support, and answer questions. The time required for completion was felt to be dependent on the individual patients’ personality and level of risk.

“It depends on the patient. Some people may get really anxious and spend another 10 minutes discussing that, and others will be less anxious and go home. It’s hard to predict.”

Alongside time availability, sufficient practitioner training and practical resources were considered by some participants to be important to patient understanding and acceptance of the risk and lifestyle information.

“We need to have the sufficient training to do that because I know it’s all very well that we sit and we give the information but for them (patients) to fully understand the risks, we need
proper training and showing they can reduce the risk but also how we put it across to them.

Because it’s got to be a very diplomatic, calm way for them to understand and process the information” Focus group 2, Lifestyle provider

“Practical problems that we don’t have colour printers and that is very much geared towards the colour.” Focus group 7, General practice

During discussion, many participants went further and evaluated the potential integration of the intervention into their existing work. NHS Health Checks were highlighted as an ideal opportunity for integration as conversations of disease prevention and lifestyle behaviour change are already taking place with patients.

“If it’s associated with NHS health checks you already get a BMI, the smoking, alcohol and the physical activity as well. And as part of the diet I ask them and normally I type up what they say about diet, if they’re having their five a day (fruit and vegetables) or not at all, and the same with the alcohol. So it’s quite simple and it’s all the questions you’re already asking for the NHS health checks” Focus group 10, General practice

One participant also felt that integration into NHS Health Checks would be received favourably by patients, as many wish to receive comprehensive healthcare from their general practice at each consultation.

“I think that would be great actually...some patients expect more when they come for their health checks, especially like between 40s and 60s when they work and they find it difficult to come for an appointment, they want everything squeezed in that appointment and they
would really want to talk more, not just the blood pressure and weight.” Focus group 10, 
General Practice

However, this was not a universal view with another participant wondering if 
inclusion into NHS health checks would be too much information for the patient to 
receive in one consultation.

“I think we just need to be mindful that it may be a little bit heavy for the patient to handle all 
(CVD, cancer, diabetes, dementia) in one conversation perhaps.” Focus group 4, Lifestyle 
provider

Key feedback and suggestions for improvement

Participants also provided specific feedback and suggestions to improve the 
intervention. Changes made in response to this included: amendment of the risk 
presentation to simplify the wording; the option to display risk percentages to 
enhance interpretation; provision for participants to return to the website to view 
the risk score and behaviour change advice at a later date; portion sizes chart 
available to help collection of risk factor information; and inclusion of additional 
information for signposting to local services and websites. Suggestions that we 
chose not to incorporate included the possibility to view the risk factor information 
of the average person rather than the recommended lifestyle guidance, text 
message reminders of the goals set during the intervention delivery, and the option 
to print in colour. After consideration, it was felt that including additional 
information about the average person alongside a person of their same age and sex
with the recommended lifestyle could be potentially confusing and that adding text
message reminders would substantially complicate the delivery, and therefore
implementation. It was also not feasible to provide colour printing in practices.

Usability testing and feedback from healthcare professionals

Sixty out of the 66 focus group/interview participants agreed to be contacted for
participation in the usability testing. Of the 60 invited, 57 provided valid email
addresses. 22 of those completed the usability testing and feedback questionnaire
(Table 4).

Over 95% felt that collecting the risk factor information and using the website was
very easy or easy and that the risk presentation and lifestyle information were very
clear or clear. 95% also stated that they could use the website in its current form
with only seven of the 22 participants indicating that they would probably or
definitely need training. Of those seven, five preferred face-to-face training with a
member of the study team, one an online module and one a step-by-step written
guide. However, 27% of participants responded that they were unaware of the
option of set targets and 5% that they had been unable to set targets.

Overall, participants felt the intervention had the potential to become a normal part
of their work (mean score 8.0 (SD 1.5, n=21) on a scale from 1 (not at all) to 10
(completely)). Figure 2 shows a summary of the mean responses to individual
questions addressing coherence, cognitive participation and collective action. The
highest scores reported (mean score 4.45 (SD 0.49), n=21) on a scale from 1 (strongly
disagree) to 5 (strongly agree)) indicated participants agreed/strongly agreed that they could see the potential value of the intervention and more specifically its use in the primary care setting (mean score 4.33 (SD 0.89), n=20). In contrast, lower scores were reported by participants when on considering if the intervention differed from usual ways of working (mean score 3.63 (SD 0.56), n=22). Confidence in others to deliver the intervention (mean score 3.90 (SD 0.41), n=22) and belief that the intervention could easily integrate into existing work (mean score 3.94 (SD 0.75), n=19) were also reported with moderate agreement by participants.

When asked specifically whether they believed the intervention could easily be integrated into practice, over 90% (n=21) of respondents strongly agreed or agreed that it could easily integrate into NHS Health Checks, chronic disease reviews or lifestyle advice sessions. Fewer (74%, n=19), however, strongly agreed or agreed that it could easily integrate into routine practice, with five (26%, n=19) neither agreeing nor disagreeing. Consistent with the lower scores in the collective action domains regarding sufficient resources (mean score 3.52 (SD 0.58)) and potential for management to adequately support the delivery of the intervention (mean score 3.57 (SD 0.59)), only eight (38%, n=21) agreed that the intervention could be delivered within five minutes, with five (24%, n=21) neither agreeing nor disagreeing and eight (38%, n=21) either disagreeing or strongly disagreeing.

Figure 2: Usability testing results

Key feedback and suggestions for improvements
In response to the difficulties some healthcare professionals had setting targets we changed the layout and some of the text on the website to make this step clearer. Participants also provided further suggestions for refinement of the intervention in the free text questions following the usability testing. These included changes to the units of measurement for calculation of alcohol consumption and body mass index and the option to print individual pages of the lifestyle leaflet to support specific goals.

In response to the feedback gathered from the healthcare professionals on aspects of training, we also devised a face-to-face training package, which could be delivered by the study team and included the opportunity to simulate delivery of the intervention on the website to gain familiarity.

**DISCUSSION**

**Key findings**

In this paper we have described the development of a very brief intervention to deliver personalised cancer risk information in primary care and demonstrated the value of integrating theory- and evidence-based approaches with primary data collection in that process. By using the NPT framework prospectively to guide the overall format of the intervention and behaviour change theory and published literature to guide the content, we were able to systematically identify key implementation considerations at the design stage and select risk presentation formats and behaviour change techniques associated with changes in the target behaviours, increasing the potential both for future incorporation of the intervention
into practice and intervention effectiveness (Baker et al., 2010; Glanz and Bishop, 2010). Including qualitative data collection with healthcare professionals involved in delivering prevention activities within primary care throughout the process further allowed us to rehearse the prototype intervention with those who will be delivering it and refine the intervention in response to their comments. Feedback on the initial prototype suggested support and enthusiasm for its use, highlighting its potential benefit to patients, especially acting as an additional motivator to behaviour change within other current conversations of risk in primary care, namely in NHS Health Checks. Feedback on the intervention and the results of usability testing indicated that healthcare professionals found the intervention to be acceptable, understood its purpose, and believed that it had the potential for implementation into primary care consultations. They could also see the potential value of the intervention and its ability to promote lifestyle changes. However, they remained concerned about whether sufficient time, resources and support would be available.

A particular strength and novel aspect of our approach is the use of NPT prospectively as a framework when considering the overall format of the intervention. In a recent systematic review of the use of NPT in feasibility studies and process evaluations (May et al., 2018), only one published study has used NPT prospectively in the intervention development phase of a study (Brooks et al., 2015). We chose NPT because it focuses on understanding how and whether complex interventions become routinely embedded in health care practice (May et al., 2009). This includes components relevant to both the individual and the context in which the intervention will be delivered. This was important as we had identified from
previous research with healthcare professionals that the main barriers to discussing
cancer risk in practice included individual concerns about understanding and
communicating risk and context specific needs for time and resources (May et al.,
2009). While there are other approaches we could have applied, such as
intervention mapping (Bartholomew, Parcel and Kok, 1998) and the consolidation
framework for implementation research (CFIR) (Damschroder et al., 2009), the
accompanying NoMAD checklist also provided key questions through which we could
obtain feedback from healthcare professionals across the first three domains of NPT.

This feedback was important. At a time when both workload is increasing and
funding is decreasing, the engagement of those working within primary care is more
important than ever. Complexity science has also shown that in complex adaptive
systems, such as healthcare (Braithwaite et al., 2018), professionals tend to accept
new ideas based on their own logic rather than the views of others, and are more
likely to accept change when they are involved in the process than when change is
imposed on them by others (Braithwaite, 2018). Engaging with healthcare
professionals at an early stage in the intervention development process therefore
allowed us to incorporate the views of professionals who would ultimately deliver
the intervention and maximise the likelihood of future incorporation in practice.

Consistent with the concept of intervention plasticity within NPT, and analogous to
the distinction between the ‘core components’ and the ‘adaptable periphery’
described with the Consolidated Framework For Implementation Research
(CFIR) (Damschroder et al., 2009), we also did not attempt to develop a standardised
process for the delivery of the intervention. Instead we consider the intervention as
a set of tools which healthcare professionals can adapt to different consultations and patient groups. For example, in an NHS Health Check the healthcare professionals may choose to complete the risk assessment and risk communication elements alongside the assessment and communication of CVD risk and then discuss the risk management advice for both cancer and CVD together, or may choose to separate discussions about CVD and cancer within the consultation.

The overall enthusiasm we found amongst these healthcare professionals for the intervention mirrors that seen in other studies which have found that primary care healthcare professionals consider prevention activities an important aspect of their role (Brotons et al., 2005; McIlfatrick et al., 2013, 2014; Usher-smith et al., 2017). As in this study, many also believed patients wanted to change and would follow their recommendations, although belief was higher amongst practice nurses (McIlfatrick et al., 2014) than GPs (McIlfatrick et al., 2013). The concerns about time and resources are also consistent with previous research (Brotons et al., 2005; McIlfatrick et al., 2013; Usher-smith et al., 2017). This is despite our aim to develop an intervention that would be very brief and limit the additional resources required, highlighting the challenges of developing interventions that are likely to be both effective and widely used.

Our use of behaviour change theory, reviews of existing evidence in the literature, and expert opinion to guide the development of the content of the intervention further enabled us to maximise the potential effectiveness. However, our approach has its limitations. Firstly, when assessing the effectiveness of BCTs we used
evidence from systematic reviews in which meta-regression had been used to identify which BCTs were more effective for achieving change in a given behaviour.

The use of meta-regression with study level information to make inferences about individual level change relies on indirect comparisons and so is at risk of ecological fallacy or aggregation bias. The relationships between BCTs and behaviour change seen in these reviews may therefore not reflect the relationships between individual BCTs and behaviour change in experimental studies. Most of the evidence on effectiveness of BCTs also relates to individual behaviours, such increasing physical activity while our intervention targets multiple behaviours.

Secondly, although we purposefully recruited a diverse range of healthcare professionals with different roles and years of experience from both general practice and lifestyle provider services, most general practices were from areas of low deprivation, with patients predominantly of white ethnic origin. The views of the healthcare professionals in this study may, therefore, not reflect the views of those working in areas of higher deprivation or different ethnic backgrounds where there may be additional pressures on healthcare professional time, language barriers, or differences in patient understanding and beliefs. We also acknowledge that the professionals who took part may have self-selected due to positive views about health promotion.

We also took examples of the components of the prototype intervention to the focus groups and interviews. While this provided a springboard for discussion and we were able to collect both positive and negative feedback on our prototype versions, it may
have made it harder for participants to consider what was really important to them
and they may have been more reluctant to voice contradictory opinions.

Thirdly, we chose to focus on the views of healthcare professionals rather than
patients. While this meant we did not include feedback directly from patients on the
intervention during this developmental stage, we did consider the patient
perspective throughout the process. This included working closely with our two
patient and public representatives, considering patient views within the wider
literature, and previous qualitative work with patients on the provision of risk-based
cancer information (Usher-Smith et al., 2017). Patient feedback will be a central
component of future work piloting the intervention.

Although not necessarily limitations, the iterative nature of the intervention
development also brought with it a number of challenges. Involving over 60
healthcare professionals in the process meant we heard multiple, and in some cases
conflicting, perspectives on the intervention and received a large number of
suggestions for changes. In some cases the decision to implement a change or not
was straightforward. These included changes that were limited by practical
constraints, such as the suggestion to print the patient information in colour within
the consultation, and features that the healthcare professionals consistently thought
would be difficult to implement, such as assessing daily rather than weekly alcohol
intake. At other times, however, it was a challenge to decide when to implement a
change based on their feedback and when not to. For example, we chose not to
include the possibility to view the risk factor information of the average person
rather than the recommended lifestyle guidance. In these cases we tried to balance what the majority of participants would benefit from as a reference point.

The potential time and cost of multiple iterations of changes to a digital intervention was also a challenge as we were working with a computer programming team to develop the website (Yardley et al., 2015). We addressed this by developing a close collaboration with the programmers from the start and arranged for them to train one of the research team to make minor alterations without needing to go back to them each time. We also took screen shots of potential pages from the intervention to the early focus groups and interviews rather than developing the website at that stage. Despite this though, the process was time-consuming and the potential risk of overspend significant so it is an important consideration for others developing digital interventions.

**Conclusions**

In conclusion, we have described how using NPT prospectively alongside behaviour change theory and reviews of the published literature can be successfully used to develop an evidence-based personalised cancer risk based intervention to provide information and promote behaviour change in primary care. Healthcare professionals involved in the delivery of prevention activities welcomed the intervention and provided essential feedback for its refinement. The next step is to pilot the intervention with patients and healthcare professionals within primary care consultations. Recognising that implementation is an on-going iterative process rather than a linear one (Damschroder et al., 2009), a key element of that evaluation
will be working with healthcare professionals to help them adapt the intervention to their practice. Central to supporting that process and preparing for the future scaling up of the intervention will also be an evaluation of the potential unintended consequences of the intervention and developing ways of working with healthcare professionals to support them to overcome implementation challenges (Paina and Peters, 2012).

**FIGURE LEGENDS**

Figure 1: Development and testing process of the prototype intervention

Figure 2: Usability testing results

**ABBREVIATIONS**

BCT- Behaviour Change Technique

CVD- Cardiovascular Disease

GP- General Practitioner

HCP- Healthcare Professional

MRC- Medical Research Council

NHS- National Health Service

NICE- The National Institute for Health and Care Excellence

NPT- Normalisation Process Theory

**DECLARATIONS**

Ethical approval and consent to participate
The study was approved by the Psychology Research Ethics committee of the University of Cambridge on 25th May 2017 (REF: PRE.2017.043) and the Health Research Authority (REF: 224443) on 15th May 2017. Written informed consent was obtained from each participant.

Consent to publish

Not applicable.

Availability of data and material

All the data will be stored in accordance with the Data Protection Act 1998 within the University of Cambridge data repository (https://www.repository.cam.ac.uk/) for at least 10 years from the last access. All anonymised data will be publicly available via that repository with links. Focus group and interview transcripts containing pseudo-anonymised data will be stored in the repository and formal requests for access will be considered via a data sharing agreement that indicates the criteria for data access and conditions for research use and will incorporate privacy and confidentiality standards to ensure data security.

Competing interests

None of the authors have competing interests.

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All researchers were independent of the funding body and the funder had no role in data collection, analysis and interpretation of data; in the writing of the report; or decision to submit the article for publication.

**Author contributions**

JUS, KM, SS and SG were involved in the design of the study. KM and JUS completed data collection. KM, JUS, SS and SG contributed to the analysis and interpretation of the data. KM and JUS wrote the first draft of the manuscript. All authors critically reviewed the manuscript and have approved the final version.

**Acknowledgements**

We thank our patient and public representatives, Kathryn Lawrence and Chris Girling, and our collaborators Fiona Walter, Debbie Beales, Ken Muir, David Speigelhalter, and Alexandra Freeman for their helpful comments in the development of this study. We would also like to thank the healthcare professionals who took part in the focus groups, interviews and usability testing and the NIHR Clinical Research Network: Eastern for their assistance in the recruitment of general practices.
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*NHS Diabetes Prevention Programme* (no date).


Normalisation process theory- NPT toolkit (no date).

Normalisation process theory (no date).

Normalisation process theory constructs (no date).


**Appendices:**

1. Focus group / interview schedule
2. Online feedback questionnaire including revised NOMAD checklist
3. One page of lifestyle questionnaire
Table 1. Applying Normalisation Process Theory to development of the intervention

<table>
<thead>
<tr>
<th>NPT construct and components</th>
<th>Description*</th>
<th>Considerations for prototype intervention design/delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coherence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Differentiation</td>
<td>Whether the intervention is easy to describe to participants and whether they can appreciate how it differs or is clearly distinct from current ways of working</td>
<td>Make the intervention simple to describe, with visual elements for ease of comprehension and completion. Host on a standalone website so not to interfere with current software in practice.</td>
</tr>
<tr>
<td>Communal specification</td>
<td>Whether participants have or are able to build a shared understanding of the aims, objectives, and expected outcomes of the proposed intervention</td>
<td>Align the aims, objectives and expected outcomes (i.e. to promote behaviour change to prevent disease) with those for NHS Health Checks and other prevention activities in primary care and make these clear in the training for the intervention.</td>
</tr>
<tr>
<td>Individual specification</td>
<td>Whether individual participants have or are able to make sense of the work – specific tasks and responsibilities – the proposed intervention would create for them</td>
<td>Provide clear guidance and training on delivery of the intervention. Limit the additional work delivery will create for individuals by developing a leaflet and website that patients can refer back to after the consultation.</td>
</tr>
<tr>
<td>Internalisation</td>
<td>Whether participants have or are able to easily grasp the potential value, benefits and importance of the intervention</td>
<td>Design to fit initially within current prevention activities within primary care, such as NHS Health Checks and chronic disease reviews.</td>
</tr>
<tr>
<td><strong>Cognitive participation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiation</td>
<td>Whether or not key individuals are able and willing to get others involved in the new practice</td>
<td>Engage with both those delivering the intervention and their managers/employers and include of clear justification for the importance of focusing on behaviour change for cancer prevention and parallels with other existing activities within the practice.</td>
</tr>
<tr>
<td>Legitimation</td>
<td>Whether or not participants believe it is right for them to be involved, and that they can make a contribution to the implementation work</td>
<td>Distinguish between the benefit of providing risk information and the role of face-to-face communication within the intervention to enable healthcare professionals to see the added value they provide.</td>
</tr>
<tr>
<td>Enrolment</td>
<td>The capacity and willingness or participants to organise themselves in order to collectively contribute to the work involved in the new practice</td>
<td>Structure the intervention to minimise the need for re-organisation or additional capacity and do not attempt to develop a standardised process for</td>
</tr>
<tr>
<td><strong>Activation</strong></td>
<td>The capacity and willingness of participants to collectively define the actions and procedures needs to keep the new practice going.</td>
<td>Work with healthcare professionals throughout the implementation stage to help them adapt the intervention to suit their local context and provide regular feedback.</td>
</tr>
<tr>
<td><strong>Collective action</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interactional workability</strong></td>
<td>Whether people are able to enact the intervention and operationalise its components in practice.</td>
<td>Consideration for the length of time needed to deliver the intervention to minimise impact on current consultation length.</td>
</tr>
<tr>
<td><strong>Relational integration</strong></td>
<td>Whether people maintain trust in the intervention and in each other.</td>
<td>Ensure it fits with the overall objectives and current prevention activities such as NHS Health Checks.</td>
</tr>
<tr>
<td><strong>Skill set workability</strong></td>
<td>Whether the work required by the intervention is seen to be parcelled out to participants with the right mix of skills and training to do it.</td>
<td>Design of the intervention to be simple and navigation intuitive to minimise staff requirement for training before use.</td>
</tr>
<tr>
<td><strong>Contextual integration</strong></td>
<td>Whether the intervention is supported by management and other stakeholders, policy, money and material resources.</td>
<td>Inclusion of managers in focus groups/interviews and usability testing, to obtain their views on aspects of the prototype design and its delivery to establish potential resource and support constraints.</td>
</tr>
<tr>
<td><strong>Reconfigurational analysis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Systematization</strong></td>
<td>The collection of information in a variety of ways to seek how effective and useful for participants in any set of practices may seek to determine how effective and useful it is for them and for others, and this involves the work of collecting information in a variety of ways.</td>
<td>Collection of data from key individuals in a variety of formats including both qualitative and quantitative methodologies.</td>
</tr>
<tr>
<td><strong>Communal appraisal</strong></td>
<td>Whether participants work together, formally or informally to evaluate a set of practices.</td>
<td>Provide participants with the opportunity to adapt the intervention collectively and evaluate the potential impact of the intervention in their own setting.</td>
</tr>
<tr>
<td><strong>Individual appraisal</strong></td>
<td>Whether participants in a new set of practices also work experimentally as individuals to appraise its effect on them and the contexts in which they are set. From this individuals express their personal relationships with the new set of practices.</td>
<td>Provide opportunities for key individuals to provide feedback in the planning and development of the intervention to facilitate design for incorporation into normal practices.</td>
</tr>
<tr>
<td><strong>Reconfiguration</strong></td>
<td>Appraisal work by individuals or in groups lead to attempts to modify practices.</td>
<td>For potential to adapt after initial usability testing.</td>
</tr>
</tbody>
</table>

*From Normalisation Process Theory Toolkit*
Table 2: Evidence used to inform choice of format of risk presentation

<table>
<thead>
<tr>
<th>Finding</th>
<th>Inclusion in prototype intervention design/delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pilot work with members of the public and healthcare professionals</strong></td>
<td></td>
</tr>
<tr>
<td>When presented in colour, the colour was often more important than the number and dominated their interpretation.[37]</td>
<td>Inclusion of colour in risk presentation while ensuring that the colour scheme reflects current evidence / expert opinion.</td>
</tr>
<tr>
<td>Being able to see the impact of changes in lifestyle on their risk was helpful. This included the effect of small changes (increasing fruit and vegetable consumption by one portion per day rather than meeting the requirement of 5 portions per day). Some also wanted to be able to see the benefits they were already achieving through their current lifestyle. [37]</td>
<td>Incorporation of ways to demonstrate continuous change, both positive and negative, for each modifiable factor.</td>
</tr>
<tr>
<td>The first reaction of almost all when presented with their 10-year risk of an individual cancer was that it was low and not concerning, with views on what constituted a high risk ranging widely, from 0.5 to 60%. As a result, reductions in risk were not always motivating - the risks were considered low and differences small. [37]</td>
<td>Provision of combined risk of multiple cancers.</td>
</tr>
<tr>
<td><strong>Review of published literature and best practice guidance</strong></td>
<td></td>
</tr>
<tr>
<td>Numerical presentation of risk as opposed to simple risk categories (moderate, high, low) appears to lead to more accurate risk perception[38] and when investigating only the patient’s preferences towards cancer risk communication, the majority of the British women and 50% of the Australian women expressed their preferences for quantitative risk information[39].</td>
<td>Inclusion of option to see risk as a percentage.</td>
</tr>
<tr>
<td>There were strong objections to the word ‘absolute’, which was seen as ambiguous. For many participants it conveyed that the risk score was ‘conclusive’, or in some way ‘definite’ that a person would suffer a cardiovascular event rather than a probability[40,41].</td>
<td>Avoidance of the term ‘absolute risk’ and clarity throughout that risks are estimates and apply to people with the same characteristics as the individual rather than the individual person.</td>
</tr>
<tr>
<td>People need comparisons between the probabilities of different risks in order to be able to interpret absolute risk information[39][41].</td>
<td>Provision of relative risk in addition to absolute risk information and comparison to individuals with a recommended lifestyle.</td>
</tr>
<tr>
<td>Presenting relative risk as number alone has been criticized as many participants did not know how to translate 2.3 times in absolute terms[42] or because it was “too alarming because the risks appeared bigger”[43]</td>
<td>Inclusion of option to see risk as an absolute percentage and comparison with individual with recommended lifestyle.</td>
</tr>
<tr>
<td>Treatment decisions are sensitive to the way a treatment’s effectiveness is presented. The relative risk reduction format appears to encourage the treatment the most and number needed to treat format leads to the least acceptance[38].</td>
<td>Presentation of relative risk to encourage behaviour change.</td>
</tr>
<tr>
<td>Shorter timeframes (less than 10 years) may lead to more accurate risk perceptions and increased intention to change behaviour, than 10-year risk or longer, especially for older patients[38]. Some participants thought 10 years was too remote[41].</td>
<td>Decision made to present 10-year risk to be consistent with cardiovascular disease within primary care.</td>
</tr>
</tbody>
</table>
Display of risk information visually can enhance understanding compared with written information alone, particularly amongst those with low numeracy [47].

<table>
<thead>
<tr>
<th>Display risk information with a simple visual for ease of understanding.</th>
</tr>
</thead>
</table>

Graphical formats are perceived as helpful[41] but one format does not fit all[42]. Several formats were reported as confusing, such as line graphs, and icons, particularly those with larger numbers[41].

<table>
<thead>
<tr>
<th>Inclusion of graphical presentation but avoid line graphs and icons.</th>
</tr>
</thead>
</table>

People found formats which combined information helpful, such as colour, effect of changing behaviour on risk, or comparison with a healthy older person[41].

<table>
<thead>
<tr>
<th>Inclusion of colour, effect of changing behaviour and comparison to individual with a recommended lifestyle.</th>
</tr>
</thead>
</table>

Provision of feedback from the consultation to the counselee appears to be welcomed and the interest in other tools that complement the consultation has been pointed out (e.g. leaflets, CDs and other media to promote self-help etc.) including the tailored print communication through a personal letter summarising the consultation for the counselee[44].

<table>
<thead>
<tr>
<th>Inclusion of option to print a tailored information sheet summarising the risk assessment.</th>
</tr>
</thead>
</table>

Several explained they might take their risk more seriously if they knew exactly what the calculation is based on and how the numbers affect the final percentage[44].

<table>
<thead>
<tr>
<th>Provision for individuals to change all the modifiable factors to see how that changes the final risk estimate and provided information on the development of the risk score as additional information.</th>
</tr>
</thead>
</table>

**Consultation with experts and PPI members**

To enable understanding of risk, incorporation of colour into the risk presentation. For this to be of use it must have meaning.

<table>
<thead>
<tr>
<th>Inclusion of a colour scale from green to red to demonstrate level of risk where green corresponds to a relative risk of ≤1 and then the colour changes gradually to be orange at a relative risk of 2 and then to red at a relative risk of 4</th>
</tr>
</thead>
</table>

Use of relative risk is acceptable in the context of this study, however this must be made clear to the recipient.

<table>
<thead>
<tr>
<th>Clarity throughout that risks are estimates and apply to people with the same characteristics as the individual rather than the individual person.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behaviour change technique (BCT)*</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td><strong>Goal setting (behaviour)</strong></td>
</tr>
<tr>
<td><strong>Problem solving</strong></td>
</tr>
<tr>
<td><strong>Goal setting (outcome)</strong></td>
</tr>
<tr>
<td><strong>Action planning</strong></td>
</tr>
<tr>
<td><strong>Review behavioural goal(s)</strong></td>
</tr>
<tr>
<td><strong>Review outcome goal(s)</strong></td>
</tr>
<tr>
<td><strong>Feedback on behaviour</strong></td>
</tr>
<tr>
<td><strong>Self-monitoring of behaviour</strong></td>
</tr>
<tr>
<td><strong>Feedback on outcome(s) of behaviour</strong></td>
</tr>
<tr>
<td><strong>Social support (unspecified)</strong></td>
</tr>
<tr>
<td><strong>Social support (practical)</strong></td>
</tr>
<tr>
<td><strong>Information about health consequences</strong></td>
</tr>
</tbody>
</table>

Table 3. Selection of behaviour change techniques
<table>
<thead>
<tr>
<th><strong>Information about social and environmental consequences</strong></th>
<th>✓</th>
<th>✓</th>
<th>Statement on saving money on quitting smoking page of leaflet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social comparison</strong></td>
<td>Draw attention to others’ performance to allow comparison with the person’s own performance</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Prompts/cues</strong></td>
<td>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.</td>
<td>-</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Behavioural substitution</strong></td>
<td>Prompt substitution of the unwanted behaviour with a wanted or neutral behaviour</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td><strong>Habit formation</strong></td>
<td>Prompt rehearsal and repetition of the behaviour in the same context repeatedly so that the context elicits the behaviour</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Habit reversal</strong></td>
<td>Prompt rehearsal and repetition of an alternative behaviour to replace an unwanted habitual behaviour</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td><strong>Generalisation of a target behaviour</strong></td>
<td>Advise to perform the wanted behaviour, which is already performed in a particular situation, in another situation</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td><strong>Graded tasks</strong></td>
<td>Set easy-to-perform tasks, making them increasingly difficult, but achievable, until behaviour is performed.</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Credible source</strong></td>
<td>Present verbal or visual communication from a credible source in favour of or against the behaviour</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Pros and cons</strong></td>
<td>Advise the person to identify and compare reasons for wanting and not wanting to change the behaviour.</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Comparative imagining of future outcomes</strong></td>
<td>Prompt or advise the imagining and comparing of future outcomes of changed versus unchanged behaviour</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Restructuring of environment</strong></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Avoidance/reducing exposure to cues for the behaviour</strong></td>
<td>Advise on how to avoid exposure to specific social and contextual/physical cues for the behaviour, including changing daily or weekly routines</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td><strong>Adding objects to the environment</strong></td>
<td>✓</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

*Behaviour change techniques are ordered by the Taxonomy [7]. BCTs shown in bold are included in the intervention **Evidence for effectiveness. Each study reviewed is acknowledged by the following symbols: (✓) positive association; (-) no association; (X) negative association; (blank) BCT not included.*
<table>
<thead>
<tr>
<th>Participant characteristics</th>
<th>Focus groups/interviews ( (n=65) )</th>
<th>Usability testing/online questionnaire ( (n=22) )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>18</td>
</tr>
<tr>
<td><strong>Place of work</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifestyle provider</td>
<td>41</td>
<td>12</td>
</tr>
<tr>
<td>General Practice</td>
<td>24</td>
<td>10</td>
</tr>
<tr>
<td><strong>Job role</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Coach/Trainer</td>
<td>33</td>
<td>6</td>
</tr>
<tr>
<td>Practice nurse</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>General practitioner</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Manager</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Healthcare assistant</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Administrator</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Nutrition student</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Number of years’ experience in this role</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1 year</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>1-2 years</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>3-5 years</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>5+ years</td>
<td>13</td>
<td>7</td>
</tr>
</tbody>
</table>

I-CaPP Programme Intervention Development study- Focus Group NOMAD questionnaire  version 1 24Mar17
Figure 1: Development and testing process of the prototype intervention

Stage 1

- Previous work with patients and healthcare professionals
  - Focus groups and interviews with patients and healthcare professionals identified key components of the intervention.

- Consultation with experts and PPI members
  - Discussion with experts and PPI members to inform format of risk presentation and behaviour change advice.

- Review of published literature, best practice guidance
  - Evidence on formats of risk presentation and behaviour change techniques reviewed to identify potentially effective components.

Stage 2

- Risk assessment
- Risk communication
- Risk management advice

- Intervention prototype

- Primary qualitative research
  - Focus groups/interviews with 65 healthcare professionals highlighted issues to be addressed in further development.

- Usability testing
  - 22 healthcare professionals completed usability testing and feedback to assess the potential for implementation in practice.

- Refined intervention prototype for piloting
Figure 2: Usability testing results
Appendix 1: Focus group interview schedule

Introduction
Good morning/afternoon, everybody. My name is ..... and this is my colleague [Name of colleague]. We both work on the Cancer Research UK I-CaPP research programme the University of ...... The aim of this study is to develop very brief interventions incorporating cancer risk, which have the potential to help motivate people to change their lifestyle and their risk of cancer, which could be implemented within primary care. Thank you very much for helping us with this study. We're hoping to hear about your views and experiences regarding the sharing of cancer risk information and promoting behaviour change in the primary care setting. We have prototype brief interventions we would like to share with you. We'll invite you all to tell us your opinions or to share your experiences. There are no right or wrong answers. You might disagree with each other, or you might wish to change your minds in the course of the conversation. We would like you to feel comfortable telling us what you really think and how you really feel. It will be helpful if only one person talks at a time, as we're recording the conversation and when we listen to it afterwards it would be difficult to understand what people are saying if two or more people are speaking at once.

Anything that you want to say here can be said in confidence. We might quote some of the comments in our reports or publications, but if we do, we'll anonymise them so that people who aren't here today won't be able to identify who said what. We also ask you to maintain the confidentiality of what is said, so please don't talk about what anybody else has said after the meeting is over.

We expect the discussion to last around an hour. Please help yourselves to the refreshments and drinks at any time during the discussion.

I will be asking you the questions, and [Name of colleague] will be taking notes and making sure the recorder is working properly.

Before we start, can I ask you all to introduce yourselves? This introduction round will also be useful for us to check that our recorder can 'hear and record' everybody's voice. We'll check that and then we'll start the main discussion.

Prevention activities
I would first like to discuss with you the prevention activities that you are currently involved with, for example in NHS Health Checks or chronic disease reviews.
In these settings do you share risk information to patients? If so, would you be able to talk me through how you currently share this information…are there strategies that you use and have found work well or not so well?

When giving lifestyle advice are there also strategies that you use. 
(Prompts: taking the patient through the leaflet, signposting to websites)  
(Prompts: what you feel works well, not so well)  
Do you feel that Cancer risk information could also be included in these settings?  
(Prompts: if not, why not?)  
Are you doing this currently?

**Introduction to prototype interventions**

We would like to share with you ### very brief interventions that we have designed for sharing cancer risk information and lifestyle changes that could be promoted to reduce cancer risk.  
The first is….  
The second is a booklet which includes information on the risk factors related to cancer, and has sections for goal-setting, which would be completed with the patient.  
Please take some the time to look at these and consider their usability in your current workplace.

**Prototype Discussion**

If we could first talk about your overall thoughts on both interventions,  
Now that you have had the opportunity to look at these, how familiar do they feel to you?  
Do you feel either/both have the potential to become part of your normal work?

*If we now look at the first intervention.*  
Do you feel you understand what delivering the intervention would involve?  
Are there aspects that would differs from usual ways of working?  
Is there potential value of the intervention?  
How do you feel about its ability to help people to make lifestyle changes?  
Does it have the potential to be part of your role?  
Would there be the possibility to work with colleagues to incorporate ways of delivering the intervention?  
Do you feel you would support the intervention being introduced into my workplace/role?  
Do you feel the intervention has the potential to be used within the primary care setting?  
**Prompts: NHS Health Checks, Chronic disease reviews, Routine consultations**
Do you think this intervention could be integrated into your existing work?  
How long do you think it would take to deliver the intervention?  
Do you feel confident in other people’s ability to deliver the intervention?  
Would there be sufficient resources available to support the intervention?  
If applicable, is there the potential for management to adequately support the delivery of the intervention within primary care  
Would you suggest any changes?  
*Please can we now move onto the next intervention.*  
*Repeat the previous section of question for the next intervention.*

**Follow-up**

We are interested to know about how patients are followed up after they have received risk information and lifestyle advice. Do you currently follow up patients? If Yes, how do you do this?  
If no, do you feel this is something that might be beneficial to the patients?  
Would text messaging be feasible for this?
Or perhaps a phone call from the practice?
Or a letter?

**Closure**

Short summary of the views: It appears that some of you think.... And others think..... and we also heard that.....

Is there any other information regarding your views on the provision of services for cancer lifestyle risk advice that you think would be useful for me to know?

If you later think of something that you would like the research team to take into consideration then please contact us on the email in your information leaflet.

Thank you very much for coming today. Your willingness to give up your time is very much appreciated and your comments have been very helpful.

What will happen now is that the tape-recorded file will be sent to an external transcriber who is working with us, they will transcribe it and send us the transcript back and then delete the audio files.
Appendix 2: Online feedback questionnaire including revised NOMAD checklist

I confirm that I read and understood the participant information leaflet (version 1, 24th March 2017) before participating in the focus group/interview. I have had the chance to think about the information and contact the study team to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

I understand that anonymous direct comments from this questionnaire may be published in journals or presented at conferences, but without my name or other identifying details used, I give permission for my comments to be used for that purpose.

By clicking 'I agree' below you are indicating that you have read and understood this consent form, and agree to participate in this research study.

I agree
This survey is designed to gain a better understanding of the most effective ways to discuss cancer risk and prevention in primary care.

We understand that people have different roles, and that people may have more than one role.

From the statements below please choose an option that best describes your main role in relation to the prevention services:

☐ I am involved in managing or overseeing prevention services e.g. NHS Health Checks
☐ I am involved in delivering prevention services e.g. NHS Health Checks
☐ I am involved in commissioning prevention services e.g. NHS Health Checks

For this survey, please answer all the statements from the perspective of this role. Depending on your role or responsibilities, some statements may be more relevant than others.

You will be prompted to look at each intervention in turn on the screen. This will remain open in another window while you complete the survey.

For each intervention you will complete 2 parts.

Part A includes two general questions about the intervention.

Part B contains a set of more detailed questions about the intervention. For each statement in Part C, there is the option to agree or disagree with what is being asked (Option A). However, if you feel that the statement is not relevant to you, there are also options to tell us why (Option B).

The final part to the survey, Part C asks some brief questions about yourself and your role.

There is also a comments box at the end of the questionnaire if you would like to share additional thoughts about any of the interventions.

Please take the time to decide which answer best suits your experience for each statement and tick the appropriate option.
**Part A: General questions about intervention 1**

1. Now that you have had the opportunity to view the intervention, how familiar does it feel?

<table>
<thead>
<tr>
<th>Still feels very new</th>
<th>Somewhat</th>
<th>Feels completely familiar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Do you feel the intervention has the potential to become a normal part of your work?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Somewhat</th>
<th>Completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
**Part B: Detailed questions about intervention 1**

For each statement please select an answer that best suits your initial thoughts.

<table>
<thead>
<tr>
<th>Section B1</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I understand what delivering the intervention would involve</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. I can see how the intervention differs from usual ways of working</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. I can see the potential value of the intervention</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4. I can see how the intervention might help people to make lifestyle changes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

For each statement please select an answer that best suits your initial thoughts using **Option A**. If the statement is **not** relevant to you please select **Option B**.

<table>
<thead>
<tr>
<th>Section B2</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>Option B Not relevant to my role</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I believe that the delivery of the intervention has the potential to be part of my role</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. I’m open to the idea of working with colleagues to incorporate ways of delivering the intervention</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. I would support the intervention being introduced into my workplace/role</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
For each statement please select an answer that best suits your initial thoughts using **Option A**. If the statement is **not** relevant to you please select **Option B**.

<table>
<thead>
<tr>
<th>Section B3</th>
<th>Option A</th>
<th>Option B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I believe the intervention has the potential to be used within the primary care setting</td>
<td>Strongly agree</td>
<td>Agree</td>
</tr>
<tr>
<td>2. I believe I could easily integrate the intervention into my existing work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe the intervention could easily integrate into...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3a) NHS Health Checks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3b) Chronic disease reviews</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3c) routine consultations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3d) [other to be defined after focus groups]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I believe the intervention could be delivered within 5 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I have confidence in other people’s ability to deliver the intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Sufficient resources would be available to support the intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. There is the potential for management to adequately support the delivery of the intervention within primary care</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NOW PLEASE LOOK AT INTERVENTION 2

Part A: General questions about intervention 2

1. Now that you have had the opportunity to view the intervention, how familiar does it feel?

   Still feels very new
   1
   2
   3
   4
   5
   6
   7
   8
   9
   10
   Feels completely familiar

2. Do you feel the intervention has the potential to become a normal part of your work?

   Not at all
   0
   1
   2
   3
   4
   5
   6
   7
   8
   9
   10
   Completely
## Part B: Detailed questions about intervention 2

For each statement please select an answer that best suits your initial thoughts.

### Section B1

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I understand what delivering the intervention would involve</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>2. I can see how the intervention differs from usual ways of working</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3. I can see the potential value of the intervention</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>4. I can see how the intervention might help people to make lifestyle changes</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

For each statement please select an answer that best suits your initial thoughts using Option A. If the statement is not relevant to you please select an answer from Option B.

### Section B2

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>Not relevant to my role</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I believe that the delivery of the intervention has the potential to be part of my role</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>2. I'm open to the idea of working with colleagues to incorporate ways of delivering the intervention</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>3. I would support the intervention being introduced into my workplace/role</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
</tbody>
</table>

For each statement please select an answer that best suits your experience using Option A. If the statement is not relevant to you please select an answer from Option B.
<table>
<thead>
<tr>
<th>Section B3</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>Not relevant to my role</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I believe the intervention has the potential to be used within the primary care setting</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>2. I believe I could easily integrate the intervention into my existing work</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>I believe the intervention could easily integrate into...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3a) NHS Health Checks</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3b) Chronic disease reviews</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3c) routine consultations</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>3d) [other to be defined after focus groups]</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>4. I believe the intervention could be delivered within 5 minutes</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>5. I have confidence in other people’s ability to deliver the intervention</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>6. Sufficient resources would be available to support the intervention</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>7. There is the potential for management to adequately support the delivery of the intervention within primary care</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
Part C: About yourself

1. How would you describe your professional job category?

☐ Health trainer
☐ GP
☐ Practice nurse
☐ Health care assistant
☐ Health coach
☐ Manager of lifestyle services
☐ Public Health professional
☐ Other, please specify

2. How many years have you worked in this role?

☐ Less than one year
☐ 1-2 years
☐ 2-3 years
☐ 3-5 years
☐ 6-10 years
☐ 11-15 year
☐ More than 15 years

Additional comments

Please include any additional thoughts about the intervention here.

Thank you for completing our survey.
**Eating more fruit & vegetables**

*Fruit and vegetables* contain lots of important nutrients, which are vital for a healthy diet. They are low in calories and are an excellent source of fibre so can help you to keep at a healthy weight. Eating more fruit and vegetables can particularly help to reduce your risk of mouth, throat, lung and bowel cancers.

**Experts** suggest we eat 5 or more portions of fruit and vegetables each day. A portion is the same as a medium-sized apple, a handful or small fruit, or 3 tablespoons of vegetables.

“*I try to eat 5 portions of colourful fruit and vegetables each day*”

What changes could you make to include more fruit and vegetables in your diet?

Some ways that have worked for others include:

- Add fruit to your breakfast cereal
- Chop raw vegetables carrots, peppers, cherry tomatoes, cucumber sticks to snack on during the day
- Try adding a side salad to your lunch/dinner

- Include an extra portion of vegetables to your dinner
- Have a piece of fruit as your dessert each day

Use this space to write down your goal and plan how and when you will do your new action.

........................................................................................................
........................................................................................................
........................................................................................................
........................................................................................................