**Improving Cardiovascular Disease Risk Communication in the UK National Health Service Health Check Programme: A Pilot Study of a CVD Risk Communication Workshop**

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**Abstract**

*Objective:* To develop and test training to improve practitioners’ confidence and perceived understanding when communicating cardiovascular disease (CVD) risk using novel tools and metrics.

*Methods:* A CVD risk communication training workshop was developed through interviews with patients and practitioners delivering Health Checks, a literature review, NICE guidance and the UK Health Check competency framework. It was pilot-tested with practitioners delivering Health Checks in the UK. Perceived practitioner understanding and confidence were measured before and up to 10 weeks after the workshop, and changes were compared with those in a control group (who received no intervention). Perceived impact was also explored through semi-structured interviews.

*Results*: Sixty-two practitioners (34 intervention, 28 control) took part. Perceived practitioner understanding (p=.030) and perceived-patient understanding (p=.007) improved significantly for those delivering Health Checks in the training group compared with controls. Practitioner confidence also improved significantly more in practitioners who attended the training (p=.001). Findings were supported by interviews with a sub-sample of practitioners (n=13).

*Conclusion:* The training workshop improved practitioners’ confidence and perceived understanding of CVD risk in Health Checks.

*Practice Implications*: The training is an important step to improving practitioner understanding of CVD risk in Health Checks and should be implemented on a wider scale.

***Keywords:*** Health Checks, risk communication, practitioner training, cardiovascular disease, CVD risk.

**Highlights**

* A risk communication workshop improved practitioner confidence and perceived understanding
* Practitioners believed changes to practice had improved patient understanding
* Qualitative data confirmed benefits and reflected various changes to practice
* Our findings show the benefits of risk communication training for Health Checks

**Manuscript**

**1. Introduction**

The National Health Service (NHS) Health Check is designed to identify and manage cardiovascular disease (CVD) risk in England. All adults aged 40-74 not diagnosed with a chronic condition should be invited for a Health Check during which their CVD risk is estimated. This information is then used to determine if lifestyle management and/or medication is required, following NICE guidelines. In a Health Check, a patient’s risk of CVD is calculated using a prediction algorithm, QRISK2 [1], which uses traditional risk factors together with other factors such as body mass index, ethnicity and family history to provide a percentage 10-year risk score. However, QRISK2 carries a number of limitations. Firstly, the algorithm is dependent on age and gender resulting in an underestimation of CVD risk in younger adults [2]. This can lead to false reassurances [3–5] in younger patients categorised as low-medium risk with high modifiable risk factors including patients who smoke, are overweight and/or have elevated blood pressure or cholesterol [6]. Secondly, there is evidence to suggest that practitioners struggle to interpret CVD risk presented in percentage formats [7–12] leaving patients with unmet expectations and unanswered questions [13,14]. If risk communication is delivered effectively it can enhance knowledge, decision making about treatment and can empower and create autonomy [15]. As a result, alternative ways to explain absolute CVD risk may improve its use during assessment in practice [16].

Since the introduction of the NHS Health Check programme, new CVD risk measurement tools have been developed, with potential to simplify risk communication. For instance, compared with percentage 10-year risk, Heart Age appears to be easier to understand and has been linked with improvements in patient’s attitudes towards behaviour change [17–20]. Heart Age is a tool which has been developed in collaboration between NHS Choices, Public Health England, University College London and the British Heart Foundation, and informs people of their heart age compared with their real age. Heart Age, therefore, combines absolute and relative CVD risk in a format that is easier to communicate [21]. This is particularly important for patients with limited health literacy. In 2014, the Joint British Societies for the prevention of CVD released the JBS3 risk calculator aimed particularly at improving risk estimates in younger patients. This calculator includes Heart Age, percentage 10-year risk and lifetime risk, uses multiple visual displays and allows practitioners to demonstrate the effect of modifying CVD risk factors. JBS3 aims to “empower patients and the public to make appropriate decisions about their lifestyle and drug treatments based on a better understanding of their personal CVD risks” (Pg. 9) [2]. However, little is known about the implications of using this tool in practice.

The Health Check competence framework states “staff must also be able to communicate appropriately with people particularly around risk” [22]. It is, therefore, a concern that many Health Check patients do not understand CVD risk when it is explained to them [14]. With different algorithms and methods of communicating risk showing variation in effectiveness and ease of understanding [17–20], there is national interest in understanding how risk communication can be improved in the NHS Health Check programme. We set out to develop and test the effectiveness of training that could use a range of tools, including Heart Age and JBS3, to improve practitioners' confidence and understanding in communication of CVD risk in a Health Check.

**2. Methods**

**2.1 Study Participants and Settings**

The training workshops took place in Oldham, Greater Manchester. Health Check practitioners who were currently delivering, or were due to deliver Health Checks in general practice and pharmacies were invited to attend the training via email. Practitioners interviewed during the process of training development were also invited to attend the training. Three training dates were made available, each on a different day of the week (Monday, Tuesday and Wednesday), during the afternoon. Attendance was free of charge and offered on a first-come-first-serve basis, with a maximum of 15 attendees per date.

**2.2 Study Design**

We used a quasi-experimental design, with quantitative and qualitative methods. Practitioners were invited to attend the training via email through Oldham Council. Practitioners who expressed an interest during training development were also invited. Those who responded to the invitation and booked to attend were allocated to the intervention group. Intervention group participants were asked to complete a questionnaire to determine their confidence and perceived understanding of communicating CVD risk upon arrival for the training and two weeks post-training. At this point, practitioners were also invited to participate in a follow-up interview. Practitioners who were invited and did not attend one of the training workshops were used as a control group and did not receive any form of training. Control group participants were invited to complete the same questionnaire via email (two weeks between completed questionnaires as with the intervention group). To encourage engagement from control group participants, those who completed both questionnaires were entered into a prize draw to win retail vouchers (1st prize £50). To boost the number of control group participants, Stockport Metropolitan Borough Council were also approached and agreed to invite practitioners delivering Health Checks to complete the online questionnaire.

**2.3 Sample Size Calculation**

Sample size calculations were based on practitioner (confidence and perceived understanding of CVD risk) and perceived-patient (understanding) outcomes, and on providing 80% power (5% significance levels) to detect a large effect size using an ANCOVA. The effect size was based on a previous study which looked at the effects of a training tool on practitioner confidence and perceived understanding pre-post intervention (p<0.001) [23]. Our sample size requirements were for 25 practitioners per group (n=50 total).

**2.4 Training Development**

The training was developed from a review of risk communication literature, NICE guidance (CG181 and CG138) [24,25], Health Check best practice guidance and competence framework [26], and interviews conducted with patients and practitioners delivering Health Checks (n=31). Analysis of interviews with practitioners identified a number of challenges to communicating CVD risk which resulted in a series of recommendations for training content. Interviews with patients gave insight in to patient understanding of CVD risk and which methods might be most effective for communicating risk. The Perceived Effectiveness of Training (PET) framework and TIC (Training intervention Components) taxonomy [27] were also used to help design and plan the training. Items within the taxonomy (included in pre-training, training delivery and post training) were used to inform the most appropriate method to maximise the training’s effectiveness (i.e., tailored training, interactive presentations, role play).

**2.5 Training Intervention**

Practitioners attended one four-hour workshop that included interactive presentations, training exercises and activities (intervention details are described in table one following the TIDieR checklist[28]).

*Table 1. – Description of the intervention’s characteristics following the TIDieR checklist*

|  |  |
| --- | --- |
| Intervention Characteristic | Description |
| Name |  |
|  | Face-to-face CVD Risk Communication Workshop |
| Why |  |
|  | There is evidence to suggest that practitioners and patients have a limited understanding of CVD risk [7-14]. The workshop was developed to improve practitioner confidence and understanding when communicating CVD risk to patients in NHS Health Check. |
| What |  |
|  | * A four-hour workshop - comprised three interactive presentations featuring all training content along with ice breakers, large/small group exercises and discussions, a quiz, demonstration of new tools, role play and skills practice. * Training resource pack - included all training slides and six supporting resources referred to throughout the workshop. Supporting resources were developed following suggestions from patients and practitioners interviewed pre-training and included guidelines from risk communication research, a risk results sheet, top tips for communicating CVD risk to patients, JBS3 case studies, online tool checklists and a statin decision support aid (to receive the resources please contact the first author). |
| Who provided |  |
|  | Training was delivered by an experienced female researcher with expertise in NHS Health Check and a background in Health Psychology. Support was provided by a female Registered Nurse with 10 years’ practice nursing experience and four years’ experience as a nurse lead involved in the delivery, training and management of NHS Health Check. |
| How, Where, When and How Much |  |
|  | The workshop was delivered face-to-face in a group format (no more than 15 participants per group) to practitioners based in Oldham, Manchester and Stockport. The training was delivered at Oldham Council on three separate occasions in July 2017. Each session lasted four-hours (inclusive of refreshment breaks – a 15-minute comfort and 20-minute tea break). |
| Tailoring |  |
|  | Training was informed by:   * Interviews with practitioners delivering NHS Health Checks in the local area and patients who had received an NHS Health Check * A review of the risk communication literature, NICE guidance (CG181 and CG138) [24,25], and the Health Check best practice guidance and competence framework [26] * The PET framework and TIC taxonomy to maximise training effectiveness [27]. |
| Modifications |  |
|  | Minor changes were made to the training following feedback from the fourth author after observation of the first pilot session. Changes included additions of group discussions and feedback. |
| Training Fidelity |  |
|  | Time for the facilitators to familiarise themselves with the training content prior to the first pilot session was provided. Unexpectedly, several intervention participants were not delivering NHS Health Check at the time of attending the training (which affected their ability to accurately complete some of the training outcomes measures). The intervention was delivered by facilitators as planned in all three pilot sessions. |

The training content included the following:

* A background to CVD to explain the purpose of Health Checks.
* A background to the literature on risk communication and ways in which Health Checks are currently delivered in practice.
* Practitioners were given information about QRISK2 before being introduced to other calculators (Heart Age and JBS3). For each, the tool was described, before information on how it could be used to communicate CVD risk with a demonstration on how to use it with patients. Time was then given for skills practice.
* Barriers to effective risk communication with patients were explored and discussed in small groups.
* Attendees were introduced to methods for promoting lifestyle change with patients.

Throughout the workshop, practitioners were encouraged to engage with the content by asking questions, stimulating discussion, and were given time to share and learn from others’ experiences.

**2.6 Outcome Measurements**

The primary outcome was practitioner confidence, which was measured using a self-efficacy tool [29–31] that has been used in communication skills training elsewhere [32]. The scale comprised 16 statements about a practitioner’s confidence in communication skills (on a scale of 0-100). For the purposes of this study, the statements were modified to include reference to the CVD risk score to accurately measure confidence in relation to the CVD risk section of the Health Check (e.g., initiate a discussion with a patient about their risk score and questions/concerns they may have; ask a patient directly how they are feeling about the result of their risk score; summarise the risk score you have discussed to check that they fully understand it). Reliability analysis revealed that the sixteen items had strong internal consistency (Cronbach’s .977; Guttman’s λ2 = .988).

Practitioners were also asked to rate their perceived understanding of CVD risk (How well do you feel you understand CVD Risk? From 0-100) as well as their perceptions of patients’ understanding of CVD risk (How well do you think your patients understand their risk of CVD as a result of their Health Check? From 0-100). Higher scores indicates a higher level of confidence or understanding of CVD risk. The scales were administered before commencement of the training workshop (baseline) and two weeks post-training (follow-up). Those in the control group were asked to complete the questionnaire on two occasions (the second being two weeks after they completed the first, as with the intervention group).

**2.7 Follow-up Interviews**

All participants in the intervention group were also invited by email to participate in a follow-up, semi-structured interview. All those who responded to the invitation were interviewed. As measures taken after the training were completed using a pseudonym, the participants’ answers to the questionnaire were not known to the researcher. Interviews were conducted between two and nine weeks post-training. An interview schedule was developed to provide a degree of structure whilst allowing flexibility for the participant to direct the discussion. Example questions includes: “What did you hope to achieve by attending the training?”, “Has the training changed the way you deliver NHS Health Checks? If yes, in what way(s)? If no, why do you think not?”, and “Are there any areas of the training that you would improve/change? Please explain why?” The interview questions did not make assumptions about the participant’s perceptions and experiences of the risk communication training. All interviews were audio-recorded and transcribed verbatim.

**2.8 Data Processing and Analysis**

Sixty-two participants (34 intervention and 28 control) completed the questionnaires at baseline. This reduced to 51 at follow-up (82.26%). Due to annual leave and time restrictions, there was some variation in completion of the follow-up questionnaire, resulting in some responses being retrieved up to 10 weeks (mean 6 weeks) post-training. Missing values analysis (MVA) was conducted to understand the nature of missing data. Little’s Missing Completely At Random (MCAR) [33] test was significant indicating that data were not MCAR. Therefore, intention to treat (ITT) analysis was conducted to reduce bias in the sample and deal with missing data (missing data at follow-up were replaced with the baseline value (last observation carried forward, LOCF). For four values, on two DVs missing at baseline (perceived-patient and practitioner understanding), multiple imputation was conducted to reduce the likelihood of a Type I error. Multiple imputation produced 20 additional datasets which were compared with the original data set during analysis.

Further primary data analysis included screening for sensible values; univariate and multivariate outliers; normal distribution of DVs in each intervention condition; homogeneity of variance in each DV; linear relationships between DVs and covariates in each intervention condition; and homogeneity of regression slops in each DV. One analysis was found to have heterogeneity of regression slope and so a one-way, between subjects ANCOHET was conducted to control for the lack of homogeneity [34,35]. The outcomes (DVs) practitioner confidence, perceived practitioner and perceived-patient understanding, were then assessed using one-way, between subjects ANCOVAs/ANCOHET including 20 multiple imputed data sets. The analysis was set up to look for differences in outcome measures (DVs) between practitioners who attended risk communication training and practitioners in the control group (IV), whilst controlling for baseline values (Covariate).

Analysis of qualitative data from follow-up interviews was conducted by the first author before being reviewed by subsequent authors. Transcripts were analysed using inductive Thematic Analysis following the processes set out by Braun and Clarke [36]. Extensive reading was conducted for familiarisation of data and preliminary codes and themes were identified. Themes were then reviewed to ensure that they were data driven. The process enabled the development of themes generated from participant opinion. All preliminary codes were reviewed by the 1st Author and verified by the 3rd Author, before agreement of initial themes and their relationships. They were then discussed between authors before being finalised.

**2.9 Ethical Considerations**

Ethical approval was received from (name excluded until published) Ethics Committee and R&D approval from received from Burton Hospitals NHS Foundation trust (IRAS Project Number 194601).

**3. Results**

**3.1 Participant Characteristics**

Forty-two practitioners, 41 females and one male, booked to attend a training session, and 34 (81%) attended (32 female, 2 male). As a female practitioner was unable to attend the training session, a male practitioner was sent as their replacement, resulting in two male attendees. Most attendees were aged 30 or below compared to those in the control group (Table 2). Of the practitioners who attended the training, the majority were Health Care Assistants (53%) from Oldham (85%) and currently delivered Health Checks (74%). The majority of the control group participants were Practice Nurses (61%) from Stockport (79%); and all delivered Health Checks. A higher proportion of control group participants reported that they did communicate CVD risk scores in Health Checks compared with the control group (Yes/Sometimes; 86% vs. 56%). This was largely due to baseline differences in practitioner experiences of delivering Health Checks to patients and the responsibility of communicating the score being left to a Practice Nurse or GP in some practices. The CVD risk score was most commonly communicated face-to-face, using the QRISK2 calculator in both groups. Compared with JBS3, more practitioners were aware of Heart Age and used the calculator in practice. More practitioners in the intervention group had not received risk communication training.

*Table 2. Intervention and Control Group Participant Characteristics*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Characteristic | Response | Intervention (n=34) | | Control  (n=28) | | |
|  |  | n | % | n | % | |
| Gender |  |  |  |  |  | |
|  | Male | 2 | 6 | 1 | 4 | |
|  | Female | 32 | 94 | 27 | 96 | |
| *Age* | | | | | | |
|  | ≤30 | 10 | 28 | 1 | 4 | |
|  | 31-40 | 8 | 24 | 7 | 25 | |
|  | 41-50 | 8 | 24 | 11 | 39 | |
|  | 51-60 | 7 | 21 | 9 | 32 | |
|  | 60+ | 1 | 3 | 0 | 0 | |
| *Occupation* | | | | | | |
|  | Practice Nurse | 8 | 23 | 17 | 61 | |
|  | Health Care Assistant | 18 | 53 | 8 | 28 | |
|  | Pharmacist | 4 | 12 | 0 | 0 | |
|  | Assistant Practitioner | 2 | 6 | 1 | 4 | |
|  | Nurse Practitioner | 1 | 3 | 2 | 7 | |
|  | Dispenser | 1 | 3 | 0 | 0 | |
| *Area of Employment* | | | | | | |
|  | Oldham | 29 | 85 | 6 | 21 | |
|  | Manchester | 4 | 12 | 0 | 0 | |
|  | Stockport | 1 | 3 | 22 | 79 | |
| *Deliver Health Checks* | | | | | | |
|  | Yes | 25 | 74 | 28 | 100 | |
|  | I will be | 9 | 26 | 0 | 0 | |
| *Retrieval of blood sample* | | | | | | |
|  | Before | 14 | 56 | 7 | 25 | |
|  | During | 14 | 56 | 18 | 64 | |
|  | After | 1 | 4 | 4 | 14 | |
|  | Depends | 3 | 12 | 3 | 11 | |
| *Communicate CVD risk to patients* | | | | | |
|  | Yes | 15 | 44 | 22 | 79 | |
|  | No | 15 | 44 | 4 | 14 | |
|  | Sometimes | 4 | 12 | 2 | 7 | |
| *Risk Calculators Used in Health Checks* | | | | | |
|  | Framingham | 1 | 5 | 0 | 0 | |
|  | QRISK2 | 18 | 95 | 24 | 100 | |
|  | JBS3 | 1 | 5 | 0 | 0 | |
|  | Heart Age | 2 | 10 | 0 | 0 | |
| *Communicating risk to patients* | | | | | |
|  | Face-to-face | 18 | 95 | 21 | 89 | |
|  | Letter | 0 | 0 | 2 | 8 | |
|  | Telephone | 5 | 26 | 5 | 21 | |
|  | Email | 0 | 0 | 2 | 8 | |
| *Aware of JBS3* | | | | | |
|  | Yes… | 11 | 32 | 13 | 46 | |
|  | *...and used in practice* | 1 | 9 | 2 | 15 | |
|  | No | 23 | 68 | 15 | 54 | |
| *Aware of Heart Age* | | | | | |
|  | Yes… | 18 | 53 | 17 | 61 | |
|  | *…and used in practice* | 6 | 33 | 3 | 18 | |
|  | No | 16 | 47 | 11 | 39 | |
| *Risk Communication training* | | | | | |
|  | Yes | 12 | 35 | 13 | 46 | |
|  | No | 22 | 65 | 15 | 54 | |
| *Would you like to receive training in risk communication?* | | | | | |
|  | Yes | - | - | 18 | 64 | |
|  | No | - | - | 6 | 22 | |
|  | Don't know | - | - | 4 | 14 | |

**3.2 Training Outcomes**

The analysis showed a significant difference in change in confidence between the intervention and control group (Table 3). Although the mean scores in perceived practitioner understanding and perceived-patient understanding increased after the intervention, no significant differences were found between the two groups. The same results were produced by all imputed data sets for practitioner confidence (n=20; p=.001), perceived practitioner understanding (n=20; p=.097-.148), and all but two multiple imputed data sets (n=18) for perceived patient understanding (p=.049-.126).

*Table 3 – Results of individual ANCOVA/ANCOHET analyses for each DV with the baseline value treated as the covariate.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Training Intervention | | | | Control Group | | | | | ANCOVA/ANCOHET | | | |
|  | N | Base-line Mean | Follow-up Adjusted Mean | CI (95%) | N | | Base-line Mean | Follow-up Adjusted Mean | CI (95%) | *F* | *df* (error)a | *p* | *2* |
| *Measure* |  | | | | |
| Perceived practitioner understanding | 33 | 54.18 | 81.53 | 74.763-88.294 | 28 | | 78.36 | 73.38 | 65.974-80.779  (± 1.4) | 2.419 | 58 | .125 | 0.02 |
| Perceived Patient Understanding | 31 | 44.07 | 74.18 | 67.524-80.827 | 28 | | 62.29 | 64.70 | 57.677-71.720 (± 1.3) | 3.625 | 56 | .062 | 0.04 |
| Practitioner Confidence b | 34 | 61.34 | 85.23 | 80.852-89.611 | 28 | | 75.18 | 70.00 | 64.832-75.169 (± 0.96) | 13.267 | 58 | .001\* | 0.16 |

*b* = ANCOHET; \* = significant at .05 level

As a number of practitioners did not deliver Health Checks at the time of attending the training, additional analyses were conducted with these participants excluded. The sample reduced to 24, 23, and 25 for perceived practitioner understanding, perceived-patient understanding and practitioner confidence, respectively, in the intervention group. One analysis was found to have heterogeneity of regression slope and so a one-way, between subjects ANCOHET was conducted. ANCOVA and where appropriate, ANCOHET, were then performed on each dependent variable (with baseline value as the covariate), including 20 multiple imputed data sets (Table 4).

*Table 4 – Results of individual ANCOVA/ANCOHET analyses for each DV with the baseline value treated as the covariate.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Training Intervention | | | | Control Group | | | | | ANCOVA/ANCOHET | | | | |
|  | N | Base-line Mean | Follow-up Adjusted Mean | CI (95%) | N | | Base-line Mean | Follow-up Adjusted Mean | CI (95%) | *F* | *df* (error)a | *p* | *2* |
| *Measure* |  | | | | |
| Perceived practitioner understanding | 24 | 61.71 | 88.29 | 81.605-94.980 | 28 | | 78.36 | 77.89 | 71.731-84.054 | 4.970 | 49 | .030\* | 0.07 |
| Perceived Patient Understanding | 23 | 49.26 | 79.78 | 73.462-86.103 | 28 | | 62.29 | 67.607 | 61.900-73.314 | 7.960 | 48 | .007\* | 0.10 |
| Practitioner Confidence b | 25 | 63.20 | 88.08 | 83.404-92.761 | 28 | | 75.17 | 71.70 | 67.151-76.270 | 27.758 | 49 | <.001\* | 0.22 |

*b* = ANCOHET; \* = significant at .05 level

There was a significant difference in the change in perceived practitioner understanding, perceived-patient understanding and practitioner confidence (p=.030, .007, ˃.001 respectively) between the intervention and control group, also produced by all imputed data sets (n=20; p=.021-.032; .005-.041; ˃.001 respectively). Sensitivity analyses were conducted due to identification of multivariate outliers when screening the main data set and also for analysis conducted on those that delivered Health Checks at the time of attending the training only. After removal of multivariate outliers, the analyses were conducted again and results were unchanged. Therefore, all cases were included.

**3.3 Follow-up Interviews**

A master theme, specifically related to the pilot training’s impact on practitioners, was identified along with connecting themes of ‘practical changes post-training’, ‘perception of risk calculators’ and ‘perceived changes to patient understanding’.

*Training Impact*

Qualitative analysis confirmed the apparent improvements in practitioner confidence; “I also feel a bit more confident just using the online calculator…and also explain to that patient what sort of risks it includes and what it doesn’t include” (P8, Pharmacist), perceived practitioner understanding; “the understanding has improved because before we didn’t have like the insight but now we have the insight…and you can explain to the patient better” (P10, HCA), and knowledge of CVD risk; “…it’s the knowledge really, it gives you a bit of a boost rather than sitting there going ‘well I’m not sure about this and I’m not sure about that’” (P11, HCA), suggesting the training had an impact on practitioners who attended. Practitioners also found the most useful section of the training was the introduction of other risk calculators to communicate risk to patients. Other areas included the resource sheets and supporting materials, a background to QRISK2 and CVD, and barriers to effective risk communication, whilst five attendees thought “everything” was useful.

*Practical Changes Post-Training*

As a result of the training, practitioners reported making changes to Health Check delivery including use of “Heart Age” (P1, HCA), “the smiley face diagram” in QRISK2 (P4, Practice Nurse), “BHF [British Heart Foundation] booklets… with patients” (P12, Practice Nurse), and workshop training materials including “the general top tips” (P5, HCA). Practical changes made to Health Check delivery helped practitioners to facilitate CVD risk discussion.

*Perception of Risk Calculators*

Practitioners were positive about the introduction of Heart Age and had seen a positive impact on patient’s behavioural intentions: “it opened his eyes and how he’s in the process of…stopping smoking” (P11, HCA). For this reason the practitioners suggested Heart Age “needs bringing in to general practice” (P11, HCA) to aid patient understanding. Practitioners also appreciated how JBS3 allowed them to “put it all in front of them and then they can visually see their risk being calculated” (P8, PH). However, as practitioners needed to input the patient’s information in to the calculator to retrieve a score, many were yet to engage with the calculator due to “time restrictions” (P1, HCA) during Health Checks.

*Perceived Changes to Patient Understanding*

Application of tools and resources suggested in the training led to perceived changes in patient understanding of CVD risk: “…it was just the delivery to make somebody else understand it… I think it was brilliant, because I’ve found other ways of doing it” (P5, HCA) as well as use of Heart Age to communicate CVD risk: “…they take that a lot more seriously than the QRISK score…” (P8, Pharmacist) supporting the need for risk communication training to improve Health Check outcomes.

**4. Discussion and Conclusion**

**4.1 Discussion**

We developed, ran and evaluated training in CVD risk communication for Health Check practitioners to address an explicit need. The 2015 Health Check competence framework recommends that Health Check practitioners “should be trained in communicating the risk score and results to the client” [22]. Yet, a recent synthesis of Health Check research concluded that many patients do not understand 10-year percentage CVD risk [14]. Given that NICE guidance (CG181) [24] recommends QRISK2 is used to communicate CVD risk in Health Checks, more needs to be done to improve practitioner and patient understanding of the risk score and improve the quality of risk communication in Health Checks. This quasi-experimental study provides quantitative and qualitative evidence that a brief, half-day training workshop providing knowledge and skill development, is feasible and can improve practitioner confidence and perceived understanding of CVD risk communication.

Analyses showed that, compared with control participants, there were significantly greater improvements in practitioner confidence (p<.001), perceived understanding (p=.030) and perceived-patient understanding (p=.007) for those currently delivering Health Checks. Qualitative data from a subsample of attendees supported these findings, reflecting benefits for their confidence, knowledge and understanding of CVD risk. A positive impact of training in oncogenetics and behavioural risk factors on practitioner and patient outcomes has been noted elsewhere [37,38]. Most specifically a study conducted in New Zealand found practitioners’ confidence in explaining risk and understanding of CVD risk improved following a video on how to use an electronic CVD risk visualisation tool [23]. However, evidence of improvements in practitioner and patient outcomes as a result of training in shared decision-making, risk communication, and use of patient decision aids has been inconsistent [39]. This demonstrates the need for more research that specifically details how training is delivered and what is included, as documented in this paper, to aid replication and application to practice.

Practitioners who participated in follow-up interviews also suggested a number of changes to the way they delivered Health Checks as a result of the training, including use of Heart Age, visual aids, the supporting training resources and applications for behaviour change (i.e., British Heart Foundation leaflets and mobile applications). There is evidence to suggest that visual aids can accommodate a range of patients and facilitate practitioner communication [23,40,41], and Heart Age has shown to aid patient understanding [17–20]. At present, Heart Age is not currently recommended to be used for clinical decision making in the English NHS Health Check programme [24]. Recent research from Australia also advised against doing so due to the variability in clinical meaning of a higher heart age [42]. Given the availability of Heart Age through clinical systems and evidence that it can facilitate CVD risk communication, it would be useful to better understand its impact on clinical processes and patient advice.

**4.1.2 Strengths and limitations**

A strength of the training programme was the extensive development work, which included interviews with Health Check practitioners, a review of the risk communication literature, Health Check competence framework [22], NICE guidance (CG138, CG181) [24,25] and the PET framework and TIC taxonomy [27]. Inclusion of a control group allowed us to determine whether the training improved practitioner confidence and perceived understanding compared to practitioners who did not attend (internal validity). Collaboration with real-world practitioners in a training environment, typical of the type of training they would receive for Health Checks and other programmes, allowed us to test the impact in a real-life setting (ecological validity). Whilst the combination of quantitative and qualitative methods enabled us to verify our findings (data triangulation).

We recognise several limitations. First, pilot training workshops were offered free of charge, opening the training up to all practitioners (those due to deliver Health Checks as well as those who currently delivered Health Checks) was important to ensure equal opportunities. However, nine practitioners who were not delivering Health Checks at the time attended the training, which created difficulties in completing the training outcome questionnaires and may have caused a number of dropouts seen in the training group at follow-up (18%). Second, unfortunately it was not possible to randomise participants to condition due to lack of funding and very tight timescales, and difficulties were also experienced in recruitment to the control group. Therefore, the control survey was distributed to practitioners in another local authority. This resulted in over-representation of Practice Nurses in the control group compared to the intervention group which limits the overall findings. Third, we did not collect data on the number of Health Checks conducted following the training therefore cannot be certain how frequently participants implemented their new skills which would have had an impact on their confidence and understanding. Fourth, the questionnaires were sent after a relatively short time period (2 weeks) after the training session, and although we looked at the effect of the training on patient outcomes from the practitioners’ perspective, we cannot be certain if this improvement in practitioners translated to patients. Therefore, further research which takes these limitations into consideration and looks at the impact of the training over a longer period of time on patient outcomes is warranted.

**4.2 Conclusion**

Attendance of training for CVD risk communication in Health Checks had a significant impact on practitioner’s confidence and perceived understanding, and perceptions of patient understanding in those delivering the programme. Training apparently led to a number of changes to the way Health Checks were delivered, which was also confirmed during subsequent follow-up interviews with practitioners. Future research that tests the impact of the training on patient outcomes is warranted to further validate our findings.

**4.3 Practice Implications**

The NHS Health Check competence framework recommends that practitioners delivering Health Checks should be trained to communicate CVD risk, yet the majority of practitioners in this study had not received said training. This is likely to have implications for the quality of risk communication during a Health Check and associated practitioner and patient understanding of CVD risk. Given the encouraging findings regarding effectiveness of this training on practitioner confidence, perceived understanding and knowledge of CVD risk, we propose the training is trialled in other areas and, where possible, subject to controlled evaluation.

Our findings also indicated that practitioners perceived that the use of Heart Age to communicate CVD risk aided patient understanding. Interviews with practitioners during training development suggested practitioners find it difficult to communicate risk when patients do not understand, therefore application and impact of new tools such as Heart Age in primary care should be further investigated.

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**Conflicts of Interest**

None

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