# Cardiovascular risk assessments at occupational health services: employee experiences

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**Abstract**

**Background:** Across England in the United Kingdom, population screening for cardiovascular disease primarily takes place within general practice in the form of the National Health Service Health Check. Additional screening sites such as occupational health are advocated to improve the population impact.

**Aims:** To investigate participant experiences with cardiovascular and type 2 diabetes risk assessment (RA) at occupational health and subsequent support-seeking at general practice.

**Methods:** Face-to-face interviews were conducted for this qualitative study. Participants were recruited at three workplaces; a steel works and 2 hospital sites. Using interpretive phenomenological analyses, themes were drawn from salient narratives and categorically organised.

**Results:** There were 29 participants. Themes ($n$ = 16) were organised into two domains; factors that facilitated ($n$ = 9) or thwarted ($n$ = 7) participant engagement with the RA and general practice. All participants described the RA as worthwhile and strongly valued RA at occupational health. Those with obesity and high cardiovascular disease risk highlighted their difficulties in making lifestyle changes. Participants reported confusion and anxiety when GP advice about medication appeared to contradict what participants had interpreted during RA at occupational health.

**Conclusions:** This study highlights factors that facilitate or thwart engagement in cardiovascular risk assessment at occupational health services and general practice follow-up. Stakeholders can integrate these factors into standard operating procedures to enhance participant engagement and enable safe guards that minimise potential harm to participants.

**Key words:** Cardiovascular; diabetes; occupational health provision; primary health care; risk assessment; obesity stigma; qualitative study.

## Introduction

Cardiovascular disease (CVD) is a leading cause of mortality [1]. In recent decades, following the influential Framingham study, [2] efforts to co-ordinate population wide cardiovascular risk assessment (RA) have been implemented. Across England in the United Kingdom (UK), the National Health Service (NHS) health check, a form of RA, is primarily delivered via general practice [3]. To enhance targeted RA, various additional operational sites (AOS) have been utilised, for example, community pharmacy and occupational health [4] [5]. Such AOS are reported to be effective in recruitment and the modification of risk factors in controlled studies [6]. RA at occupational health also identifies individuals at low risk and provides the necessary brief intervention without burdening general practice [4] [7]. In cases with increased risk where hypertension, hyperlipideamia, and impaired glucose regulation are established, AOS refer individuals into general practice to seek guidance on pharmacological treatment and longer-term management [8] [9].

In the use of AOS such as occupational health, there are at least two 'interventions' where high-risk patients will have their risk communicated to them: with the health care practitioner at occupational health, and during the general practice visit with the physician when medical intervention is required. This process increases the risk of inconsistent messages with patients, potentially leading to confusion, anxiety and disengagement with treatment pathways [10]. For effective care management, standard operating procedures and referral pathways are often established in collaboration between AOS and general practitioners (GPs). [11] These communications are designed to enhance patient understanding, improve collaboration in treatment decisions and consequently, enable patients to manage their health risk factors. Thus, in order to investigate the care-coordination process and identify factors that can facilitate long-term self-care, the purpose of this study

was to evaluate participant experiences of RA of a multi-agency project at the workplace and their subsequent engagement process with general practice.

## Methods

A multi-agency project formulated a standard operating procedure for RA access at three workplaces (a steel works and two hospital sites) in West Wales, UK [4]. Each participant's GP was notified of RA outcomes via letter. The RA was designed to last approximately 30 minutes using finger prick and point of care equipment to provide instant feedback of HbA1c and blood cholesterol readings. To calculate employees' relative and absolute risk of CVD and type 2 diabetes (T2D) the validated QRISK2 and QDiabetes algorithms were used in the RA [12]. QRISK2 and QDiabetes are typically used in general practice across the UK so they were integrated into the project's standard operational policy. GPs were informed of all participants' results via letter and participants were instructed to visit their GP if they were high-risk cases (i.e., ≥20% QRISK2 and/or QDiabetes score) and/or if any one of the following isolated risk factors were identified: BP ≥140 systolic and/or ≥ 90 diastolic or irregular pulse of >120 beats/min or <40 beats/min, total cholesterol/HDL ratio ≥6, HbA1c ≥6.5% / 48 mmol/mol). In addition, participants were offered a dietitian-led lifestyle intervention programme if they were identified with obesity (i.e., ≥ 30kg/m$^2$), were a high-risk case or had an isolated risk factor(s) [4].

During the RA attendees gave informed consent to be contacted for research purposes related to the study. Before approaching potential participants, purposive sampling was undertaken by reviewing RA records and seeking contrasting cases between low, moderate and high-risk groups during discussions between the first author and RA practitioners (Table 2). Purposive sampling seeks 'information rich'

cases to provide relevant and detailed manifestations of the phenomenon of interest [13]. Consequently, in order to enable investigation of the 'journey' with behavioural changes and general practice, potential participants were invited to interview only if their initial RA had taken place at least one year earlier.

RA attendees not identified as high-risk were approached for the study in order to investigate preferences regarding the location of RA and to assess if individuals accessed general practice, regardless of recommendations. Potential participants were initially approached informally via telephone or during face-to-face discussions at the workplace, provided with study information, and invited to interview at a convenient time. Following ethical approval from the Institution Research Ethics Committee and Wales Research Ethics Committee 7 (reference number: 11/WA/0101) a pilot interview was conducted in February 2013 (and included in the study). The remaining 28 interviews took place between February 2013 and June 2013.

The interview guide was developed following systematic qualitative analyses of RA's at the workplace [14] and was semi-structured to allow expression of experiences. All interviews were conducted face-to-face by the first author in a confidential environment at the workplace, and recorded with a digital audio recorder. Time duration of interviews was between 26 and 70 minutes (mean = 44). The first author was also the dietitian involved in the original project under study. Fifteen participants had previously attended the dietitian-led lifestyle intervention and the remaining participants ($n$ = 14) were approached for the first time for the purposes of this study.

An interpretivist epistemological stance [13] was adopted during the study and a reflexive journal was maintained to enable the researcher to be attentive to their mindset and emotional state and minimize biases. The interpretivist accepts that

social phenomena (e.g., health related behaviour) are different to natural phenomena (e.g., metabolic and biological processes). In the study evaluation, interpretivism was adopted as the belief that reality is socially constructed and inter-related, and therefore values pluralism, understanding, and contextualism of personal experiences (Denzin & Lincoln, 2000).

Interviews were transcribed verbatim by the first author. To assist data analysis, two 'real life' RA appointments at occupational health were observed by the researcher and notes taken to help guide study interpretations and improve the credibility of the investigation [13]. To support theme development, improve data authenticity and control for bias, two participant 'member checks' were conducted [15]. This involved providing participants with the researcher's completed transcripts and discussing the formulation of themes comprised from the narrative. For the narrative synthesis, the principles of interpretive phenomenological analyses (IPA) were employed. IPA is commonly utilised in health care research to provide insights from a certain population (i.e., employees over 40 years old), in a particular context (i.e., occupational setting), to understand specific phenomena [15]. In the analysis, descriptive themes were identified inductively using IPA with the phenomena of interest identified as: *participant experiences with cardiovascular risk assessment at occupational health and subsequent support seeking at general practice*. Themes were generated using inductive analysis and categories formulated deductively using the constant comparison method to provide a summative account of participant experiences.

## Results

All 790 staff who attended the RA at the three workplaces (hospital sites $n$ = 562, steel works $n$ = 228) were eligible to take part in the study [4]. Following 29

interviews consisting of low (*n* = 13), moderate (*n* = 10) and high-risk (*n* = 6) cases data saturation occurred and no further participants were recruited [13]. All participants had undergone a RA at the workplace, of whom, nine were male (Tables 1–2). Fourteen participants reported attending general practice, the majority female (*n* = 9). Themes (*n* = 16) that describe the RA process (*n* = 7) and general practice attendance (*n* = 9) were organised into two domains: those that facilitated (*n* = 9) and those that thwarted participant engagement (*n* = 7) with the occupational health RA (Tables 3–4). The following paragraphs describe the results with regard to the phenomena of interest, with details of themes and accompanying participant narrative (in Tables 3–4) to facilitate meaning in context [13].

Participants were asked how they would describe their experience to a colleague. All participants stated that the RA was worthwhile and that they would recommend the RA. In comparison to general practice, participants reported RA was more convenient at occupational health, located in their workplace. Participants also highlighted the efficiency of the RA results which they felt gave them quick feedback to improve their understanding of health risks (Table 3; theme: Instant feedback of blood biochemistry results i.e., blood lipids and HbA1c).

Of the sample, 13 participants accessed general practice regarding their CVD risk factors following RA at the workplace (Table 1). Participants indicated accessing their GP for advice with pharmacological intervention for hypertension and/or cholesterol. Regarding experiences of the RA process, there were notable contradictory perspectives between the groups observed: those with and without obesity. Those without obesity and identified as ‘low-medium’ risk with no isolated risk factors (i.e., hypertension, hyperlipidaemia and/or impaired glucose regulation), described the process of RA as ‘reassuring’ or a ‘relief’. Participants with obesity expressed positive experiences, but compared to employees without obesity, reported

increased sensitivity to receiving lifestyle advice at RA. Their experiences were reported as ‘pressure to lose weight’ rather than making lifestyle changes to improve health and reduce CVD risk (Table 4; theme: A perceived expectation or pressure to lose weight).

On occasion, encouragement during the RA was interpreted as ‘you can do better, you can do more’ which, appeared to have adverse effects on motivation even when lifestyle changes had been made (Table 4; theme: A lack of appraisal for efforts with behavioural changes/weight loss efforts).

Thirteen participants (45% of the sample) accessed general practice regarding their CVD risk factors following RA at the workplace. Participants primarily accessed their GP for advice with pharmacological intervention for hypertension and/or cholesterol. When discussing CVD risk, participants focused on isolated risk factors (e.g., blood pressure, obesity etc.) rather than their CVD risk percentage score. Often, individuals with higher job status (e.g., nursing) described discussion of isolated risk factors as understandable. Others (e.g., catering) gave vague reports of their risk factors and stated that ‘clearer’ descriptions would have helped them to interpret the information. Confusions regarding risks were increased further when participants visited GP’s who expressed opposing views to what participants interpreted at RA (Table 4; theme: Inconsistent messages regarding risk from RA practitioners and GP’s)

The majority of the sample ($n$ = 11) who visited their GP following RA did so to discuss pharmacotherapy and/or lifestyle changes for raised cholesterol. Of the 13 participants who reported to meet with their GP, 9 described positive experiences that facilitated engagement with the workplace cardiovascular disease prevention project (Table 3). However, 4 expressed a lack of confidence in the GP’s decision regarding medication prescriptions. This occurred when the GP’s advice contradicted

what the nurse explained during the initial RA, and when participants were given medications but had then discontinued after complaining of side effects. Interestingly, 3 of the 4 participants reported making lifestyle changes, particularly dietary, to help 'manage' their risk when the GP did not prescribe medications. Some participants expressed disappointment even when improvements in risk factors were observed and encouragement was given by the GP. This occurred when participants considered improvements in risk factors to be 'minor', in comparison to the 'major' efforts of making lifestyle changes (Table 4; theme: A lack of appraisal regarding behavioural changes/weight loss efforts).

When GPs did not prescribe medication some employees reported making lifestyle changes to manage their risk factors. In contrast, those who were unable to implement lifestyle changes and/or lose weight continued to feel anxious that they were not prescribed medication (Table 4; theme: Confusion in the requirement for medication between participants and GP's)

## Discussion

This study highlights factors that facilitate or thwart engagement with cardiovascular risk assessment at occupational health services and general practice follow-up. In the majority of cases ($n$ = 25) participants reported positive experiences during and following the RA, which facilitated lifestyle changes. However, participants who experienced disputes with GPs regarding pharmacotherapy ($n$ = 4) were susceptible to anxiety following CVD risk screening.

To the authors' knowledge, this is the first study to investigate UK participants' experiences of RA at occupational health and general practice engagement. All participants in the study were White British. This study is limited by the number of participants and the various groups interviewed (i.e., low, medium

and high-risk groups). This compromises generalisability of the findings for high-risk groups. However, the rational for including all groups was to investigate participant confidence in RA. Our study addresses this research question, to a degree, as low-medium risk groups stated they valued the service and reported that they did not seek a general practice second opinion. Despite participants' reports of lifestyle changes we chose to focus our analyses on the holistic experience, as reported lifestyle changes do not necessarily translate into actual change. Participants were recruited for interview having undergone RA 1-2 years earlier. While this may compromise participant recall regarding communications at RA and GP consults, the investigation into long term experiences following the RA improves understanding of the patient's 'journey'. Consequently, we were able to identify a variety of factors that patients felt facilitated or thwarted their cardiovascular risk management.

In the current study the RA experience was described as reassuring (where no risk factors were identified) and a 'worthwhile shock' (in the high-risk group), which spurred a commitment to make behavioural changes [16] [17]. Previous investigation of the psychological impact of cardiovascular risk assessment on wellbeing has noted participants feel generally empowered to improve their health rather than becoming anxious about their risk factors [18]. Contrary to these findings, the current study reports participants' doubts or disagreements with GP decisions regarding medications, and on these few reported occasions ($n$ = 4), conveyed confusion, frustration, and anxiety.

Lorenzetti and colleagues propose three factors that contribute toward a difficult consultation; the physician, patient and situational factors [19]. The current study provides insight into participants' experiences of occupational health RA and subsequent access to general practice, including the averse situational factors that can occur (see Table 4). These factors are likely to undermine GPs' confidence to

communicate risk and elicit medication [9]. Kirkegaard and colleagues described physician doubts in epistemology (scientific knowledge) and situational uncertainties between the patient and GP, which influence the decision to prescribe medication [9]. In the current study, some participants reported that their experiences at RA led to beliefs that medication was required, but GPs disagreed. Such circumstances augment participant and situational uncertainties for the GP, creating a more challenging consult, and potentially a discouraged patient [20]. These descriptions of difficult encounters reinforce the importance of the patient-centered approach in medical consultations [21] [22]. In relation to the factors described by Lorenzetti et al. RA practitioners in the current study were in a position to 'prepare' patients for the GP consultation and ease patient and situational factors, which may be why participants generally reported strong satisfaction during and following the RA [19].

With regard to discussing and managing obesity, it is understood that a lack of confidence exists among GPs and health care practitioners [23]. For example, in a qualitative study of experiences with obesity, participants report feeling colluded into weight loss, which the authors believed was associated with obesity stigma [24]. In the current study, participants with obesity differed to our other groups, with more defensive perspectives toward lifestyle changes during RA. Specifically, participants with obesity reported frustration on being told they should be a 'healthy weight' as this often translated to losing 20-30% of their current body weight, which they believed was not achievable. Recommended messages for obesity are the clinical benefits of reducing body weight by 5-10% rather than the use of BMI to describe a 'healthy weight' [21]. These conversations can be challenging and training in behaviour change communication skills, such as motivational interviewing, are advocated [22].

Honey and colleagues observed fatalism during their interviews with

participants whom they categorised as non-committed [17]. These individuals accepted their CVD risk but were not committed to behaviour change, adopting a 'what will be, will be' attitude. In our study, we observed fatalism in two forms – when individuals were not prepared to make lifestyle changes, and when individuals had implemented lifestyle changes, but did not obtain the reductions in risk factors that they expected. The latter conveyed feelings of hopelessness, lack of control, leaning toward fatalistic beliefs, such as 'it must be hereditary'. These findings describe participant ambivalence and suggest that expectations about lifestyle changes and CVD risk reduction are a challenge to manage [25]. Occupational health services providing cardiovascular risk assessment should therefore consider their communication methods and partner with GPs to use and/or develop tools that assist risk communication [26]. To alleviate confusion and minimise anxiety, standardised messages and decisional aids (e.g., pamphlets or computer programmes) should be utilised to clearly describe the treatment options with GPs. A Cochrane review in the use of decisional aids to facilitate patient and practitioner communication suggests their use can improve patient collaboration and understanding of screening results [27].

Despite the minority of reported disputes between participants and GPs policy makers should consider this study as further evidence that occupational health can support general practice in population screening approaches to cardiovascular diseases. To improve participant engagement and enable safeguards that minimise potential participant harm, stakeholders should consider the study findings when compiling standard operating procedures. Finally, future research should consider RA practitioners and GPs, as well as participants in RA. GPs' views about occupational health services referring patients at high-risk of CVD should also be

included together with the factors that can facilitate this process to improve patient outcomes.

**Key points**

- Employees with increased cardiovascular disease risk value risk assessment at occupational health as it acts as an access gateway to lifestyle intervention and general practice.
- Participants with obesity reported being more defensive during risk assessment as a result of practitioners communicating insensitively with them.
- Participants identified at medium-high risk of cardiovascular disease risk reported ongoing angst when expectations on pharmacological treatment were contradicted by their general practitioners.

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**Competing interests**

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Table 1. Demographics of Participants Categorised by Cardiovascular Risk and those with and without Obesi

| | | Cardiovascular risk of study sample | | | Study sample v |
|---|---|---|---|---|---|
| | | Low-risk (<10% QRISK2 Score) | Moderate-risk (≥10% & <20% QRISK2 Score) | High-risk (≥20% QRISK2 Score) | BMI ≥ 30kg/m (obesity group) |
| Gender | | | | | |
| | Male | 5 | 1 | 3 | 5 |
| | Female | 8 | 9 | 3 | 13 |
| Ethnicity | | | | | |
| | White British | 13 | 10 | 6 | 18 |
| Age | | | | | |
| | 40–49 | 10 | 3 | 1 | 10 |
| | 50–59 | 3 | 5 | 4 | 9 |
| | 60–69 | 0 | 2 | 1 | 0 |

Note: Data supported by findings from Gray *et al.* 2014 [4].

Table 2. Clinical Reason for Attending General Practice by Gender

| Clinical reason for general practice | Men | Women | Totals |
|---|---|---|---|
| Obesity alone | 0 | 2 | 2 |
| Blood pressure | 1 | 0 | 1 |
| Cholesterol | 4 | 2 | 6 |
| Impaired glucose regulation | 0 | 2 | 2 |
| Multiple isolated risk factors | 0 | 2 | 2 |
| High Cardiovascular Risk (i.e., ≥20% QRISK2 Score) | 3 | 3 | 6 |
| Number of participants that did not attend general practice | 4 | 11 | 15 |

Note: Participants reported more than one reason for attending general practice so reasons are not representative of overall general practice attendance

Table 3. Factors Reported by Participants that Facilitated Engagement with the Workplace Cardiovascular Di

| Themes associated with facilitating the risk assessment process | Examples of participant responses |
|---|---|
| Instant feedback of blood biochemistry results (i.e., blood lipids and HbA1c) | I thought she [risk assessment practitioner] was very go it was quick, I was really impressed with the chol immediate result, rather than going to your GP, having t of weeks to come back… you got an instant check, the (P21. Female, age 50-59) |
| The length and pace of the RA consult | They work out your risk, it was really good. It was a bit type in your details and you'd wait for your risk of hea thinking 'oh, please let it be low'. And then you get it a does give you reassurance as well that you're doing the 49) |
| RA results produced a value of greater insight into personal health (despite degree of risk identified) | They said 'Oh, that is what we [need to] look at that [w reduce your girth measurement'… So, I did exercise m exercise. (P7. Female, age 40-49) |
| Location of occupational health department | I think perhaps if it had been another site I probabl because it was so convenient it was easy to make the eff |
| <u>Themes associated with facilitating general practice attendance</u> | |
| Established rapport with general physician | You're not getting any continuity to start off with [if you practice] as you haven't got the rapport that you've built doctor. (P9. Male, age 50-59) |

| | |
|---|---|
| Convenient location of general practice | I'm happy to go [to general practice] because I live near practice]. (P3. Female, age 40-49) |
| GP eagerness to review participant's CVD risk (i.e., suggest on-going appointments) | I changed my doctor and he was really good the new one tests again and said 'Yeah, you are diabetic, you're type high' and started me on a proper [series of appointments (P2. Female, age 50-59) |
| Sustained behaviour changes and behaviour changes that resulted with weight loss | I went to see him [the GP] and I had this kind of breakdo send me to see her [the primary care nurse] so she can m was the one who kick started, she was amazing. Basicall me a favor, go for a walk'… and that's what started it. T yeah. In eighteen months I think it was. (P25. Female, ag |
| Advice from the RA practitioner to attend general practice to review risk factors | She [Risk Assessment Practitioner] wrote to my GP and That disturbed me a little and I didn't go on statins [af 50-59) |

Table 4. Factors Reported by Participants that Thwarted Engagement with the Workplace Cardiovascular Dis

| Themes associated with thwarting the risk assessment process | Examples of participant responses |
|---|---|
| A perceived expectation or pressure to lose weight | We were talking about weight at the time and it was jus five stone'… It was umm, 'It can be done, everybod understand it can be a bit hard but for the good of your try'. I think that would have had a more favourable rea age 50-59) |
| Difficulty understanding the cardiovascular risk results | Just saying, you know, you're about six-point-one [rega That's not too bad, it's not good but it's not too bad. It's an explanation as far as I'm concerned. I'd like 'Yes, it' There's that much of the population has got six-point-or |
| A lack of appraisal for efforts with behavioural changes/weight loss | Even though I lost weight, he [Risk Assessment Prac like… not intentionally, I'm sure. It was 'Oh, you've st bit of a downer. It was no sort of 'well done for getting 59) |
| Delayed or no RA review contrary to participant's expectations | The other thing, that I suppose is a little bit disappoint every so often. Say every twelve months or so. (P9. Mal |
| <u>Themes associated with thwarting general practice attendance</u> | |
| Confusion in the requirement for medication between participants and GP's | I went to see her [the GP] and when I told her it [my she said she had a lot of people who were seven point issues than you've got. "You're not overweight, you're |

| | |
|---|---|
| | still on my mind now about my high cholesterol. I s medication, or shouldn't I? Is it my GP's fault or is it mi |
| A lack of appraisal regarding behavioural changes/weight loss efforts | I went to my local GP and had my cholesterol checked a huge amount… I was a little bit disappointed. I expecting a huge change, a huge reduction… I'm begin perhaps I've always had high cholesterol'? (P13, Male, |
| Inconsistent messages regarding risk from RA practitioners and GP's | The nurse advised me to go to the doctor about my BP doctor didn't seem bothered… You feel it should be a so grey… You just feel that you're getting one thing message from somebody else. (P21. Female, age 50-59) |
| Inconvenient appointment process at the general practice | As I said, it's not easy to make appointments with you you are working. The appointment system, you kno morning and by the time you get through they are all go bit. So, it is easier, it's easier to come here [to occupat (P8. Male, age 50-59) |