International Journal of Workplace Health Management (2014)

Evaluation of occupational health checks for hospital employees Blake H¹, Bennett E², Batt ME³.

¹School of Health Sciences, University of Nottingham.

²Human Resources, Nottingham University Hospitals NHS Trust.

³Centre for Sports Medicine, Nottingham University Hospitals NHS Trust.

Abstract

PURPOSE: To ascertain which employees choose to access occupational health checks (OHC's), their perceptions of the usefulness of information received and whether they choose to act on tailored advice provided.

METHODS: 253 hospital employees attended workplace OHC then completed online questionnaire survey.

FINDINGS: Participants included new cases (80%) and those who had accessed the service previously (20%), all age categories (23-69 years) and all occupational groups, although the vast majority were in office-based sedentary job roles, nursing or allied health professions (78.3%). Almost half were overweight or obese (46.7%); many reported existing health problems or family history of chronic disease. Participants perceived occupational health checks to be convenient, informative and useful for raising their awareness of health issues, reassurance and monitoring, early identification of potential health problems and signposting to appropriate services. Participants reported post-check dietary

changes (41%) and increases in physical activity (30%); smokers reported quitting or cutting down (44%) and those exceeding alcohol limits reported cutting frequency or units of consumption (48%). More than half those advised to visit their GP complied (53%).

IMPLICATIONS: Future studies should investigate the efficacy of OHCs and whether reported lifestyle changes are sustained in the long-term.

ORIGINALITY/VALUE: General health checks can be feasibly delivered in a multi-site hospital workplace setting with diverse appeal. Provision of tailored health information can help to raise health awareness and motivate health behaviour change or maintenance amongst hospital employees, including those reporting risk factors for chronic disease. Employees value the investment of healthcare organisations in the health and wellbeing of their workforce.

Introduction

Workplaces are advocated as an important setting for health promotion in the UK and globally (WHO, 2010; DH, 2004; 2009). For the organisation, the role of employee wellness programmes is increasingly recognised in improving business performance, reducing sickness absenteeism, increasing productivity, retaining staff, helping to create a safe and healthy workforce and improving employee engagement and morale (Baicker et al, 2010; Lee et al, 2008; Blake and Lloyd, 2008). Promoting employee health and wellbeing is now considered to be a fundamental component of corporate social responsibility models (Blake and Lloyd, 2008). In the UK, public health policy has advocated a need to support the health and wellbeing of healthcare professionals working within the National Health Service (NHS) (DH, 2009) and in response to this, workplace wellness programmes have already been successfully implemented for NHS employees in hospital settings (Blake et al, 2013). Multifaceted employee wellness programmes are offered in public and private sector organisations worldwide, frequently including an element of preventative screening, often in the form of employee general health checks, which provide individualised health profiles and personal advice on health behaviour change. There is no universal definition of what constitutes a general health check although occupational health checks (OHCs) often include measures with known screening efficacy as risk factors for chronic disease, such as blood pressure (BP), blood glucose, cholesterol, weight, waist circumference and body mass index (BMI). Delivery of free, confidential OHCs within the workplace setting is perceived to

further increase public accessibility to personal health advice by providing employees with opportunities to attend a health check which fits flexibly around their working day.

Although OHCs are becoming more commonplace in private and public sector workplaces across the world, there is a dearth of published evidence for their effectiveness and acceptability. The available research evidence for the clinical effectiveness of general health checks to date has been mixed (Boulware et al, 2007;Krøgsboll, 2012; Lim, 2013; Si et al, 2014), although studies are heterogeneous and based in different settings, which makes direct comparison difficult. In line with the principles of health screening developed by the World Health Organisation (Wilson and Jungner, 2008), the overarching aim of general health checks is to detect disease, and risk factors, with the objective of reducing morbidity and mortality. This has potential for significant cost-benefit since it has been suggested that preventative health screening methods, such as BP screening, can decrease the risk of cardiovascular disease, the benefits of which can outweigh the harms (US Preventative Services Task Force (USPSTF), 2003). Previous research had indicated that the available evidence did not reveal harms associated with health evaluations (Boulware et al, 2007). A Cochrane review identified that studies of general health checks have found small beneficial improvements in self-reported health, but increases in the number of diagnoses (Krøgsboll, 2012); the authors indicate that increased diagnoses may lead to an increased use of diagnostic and therapeutic interventions, which has the potential to be harmful as well as beneficial (Krøgsboll, 2012). A recent meta-analysis has also suggested that general health checks which are delivered in primary care or community settings do not reduce all-cause,

cardiovascular or cancer mortality in adults (Lim, 2013); however, general health check studies are often not designed to assess mortality as outcome, and of the 14 randomised controlled trials included, only one was conducted in the workplace setting. Further meta-analysis has indicated statistically significant improvements in surrogate outcome control (eg., total cholesterol levels, blood pressure, body mass index and smoking status) for middle-aged patients following general practice-based health checks, especially high-risk patients (Si et al, 2014). Although there is an emerging evidence based evaluating the outcomes of general practice or community-based health checks, there may be differences in outcomes of interest for organisations providing health checks to their employees since it has been noted that commonly studied outcomes, such as cardiovascular disease and cancer, contribute less to overall sickness absence rates in working age adults compared with the more prevalent musculoskeletal and mental-health-related problems (Wynn, 2013). Furthermore, studies investigating the clinical outcomes of general health checks are often hampered by methodological weaknesses, and there is still a lack of information about the impact of health screening on referral to specialists, attendance at follow-up appointments, employee sickness absence and potential psychological effects.

The published evidence for the effectiveness of general health checks is therefore limited, not least because the majority of programmes are not formally evaluated, but also due to the fact that health check initiatives are heterogeneous with diversity in the settings for delivery, the nature of risk factors tested, testing procedures, methods of delivery and feedback, with few studies investigating participant perceptions of the process. Nevertheless, the strong business case for workplace health promotion means that organisations continue to offer this intervention, often as one element of a comprehensive employee wellness programme. Sickness absence in the public sector alone costs the UK economy around £4.5 billion per year, with absence rates one and half to twice that of the private sector (Black and Frost, 2011). Organisations accept that preventative measures have financial value and as such employee wellness programmes are becoming more commonplace; recent reviews have concluded that those workplace health promotion programmes which have the most success are those which include employee health risk screening (Steuljens et al, 2011; Cancelliere, 2011). OHCs are a method of supporting a healthy workforce which may benefit individual employees and also the employer, through identifying risk, raising awareness of potential health issues and providing employees with the tools required to take positive action towards their health. Even early studies have demonstrated the potential of OHCs for positively influencing health behaviours such as smoking and diet (Hanlon et al, 1995).

Despite the widespread delivery of OHCs in practice, little is known about the *demographic characteristics of those who access general health checks* delivered in the workplace, particularly in a hospital setting, and this is particularly pertinent in the UK where the health of NHS employees has been flagged as an area for improvement (DH, 2009). We know little about the reasons that motivate employees to engage with OHCs, employees' *perceptions of the process* of undertaking a health check in their place of work, and whether employees *act upon the information and feedback* that they receive within their health check appointment. The aim of this study was to: [1] ascertain who accesses general health checks in a UK hospital workplace; [2] understand participants' perceptions of general health checks delivered in the workplace setting, including motivators for taking part, attitudes and experiences and perceived usefulness of the information received; and, [3] ascertain whether employees advised to take health-related action during their health check follow this advice.

Methods

Occupational health checks (OHCs) were conducted with individual employees and evaluated using online survey. Web-based surveys have previously been used successfully in employee surveys (eg. Nilsson et al, 2013) including those undertaken in hospital workplaces (eg. Hess et al, 2011). The OHC and evaluation process are described.

[1] Occupational Health Checks: Assessments and Process

General, private and confidential OHC's were offered as part of a multifaceted, large-scale employee wellness programme at three hospital sites within the Trust (Lee et al, 2007; Blake et al, 2013). Incorporating OHCs within a wider initiative to support employee health and wellbeing has been recognised as the most beneficial course of action, in that those workplace wellness programmes which are most successful most often incorporate a number of core components; these include health risk identification tools (such as OHCs) in addition to other forms of support such as behaviour modification programmes, educational programs, and changes to the workplace environment and culture (Consensus Statement of the Health Enhancement Research Organization, American College of Occupational and Environmental Medicine, and Care Continuum Alliance, 2013). OHCs were conducted by an occupational health (OH) nurse in one-to-one appointments of approximately 15-20 minutes and included routine (non-fasting) cholesterol, blood glucose, BP checks, weight and height to calculate body mass index (BMI) and waist measurement. For those participants who had one or more health risk factors, appropriate tailored health advice was offered. Through tailored advice giving, those participants for whom health-related issues were identified were signposted to further healthrelated information and relevant free services, and were advised to visit their general practitioner (GP) for more detailed investigation or follow-up where appropriate. At the end of the health check, employees were given a 'Lifestyle Review Form' which contained a personal summary of their results.

[2] Study Procedure

All employees of an acute National Health Service (NHS) hospital Trust in the UK were invited to attend an appointment for a general OHC. There were 13,606 employees at the participating organisation and all were eligible to attend an OHC. Employee OHC's are offered quarterly at the participating Trust (initially established in 2006) and due to employee confidentiality reasons, demographic and health-related data is not stored for those employees that have accessed, or chosen not to access the OHCs.

To date the OHCs have been delivered at central locations across each site on a 'road show' basis, set on weekdays and also at weekends to increase accessibility within the healthcare workforce. Employees have also been able to access general OHC's following the same process on 'time-out' days, delivered by specific directorates within the hospital trust. For this study, employees were informed about the availability of health checks via an information stand at an internal Health and Wellbeing event, on the hospital trust intranet website, on employee 'Health and Wellbeing' noticeboards at various locations around each site and in the weekly 'staff briefing' email communication. Interested employees were required to book an appointment with the health and wellbeing team for their preferred date and time, or simply present in the 'health checks' dedicated area on the specified days.

Evaluation was undertaken with 253 employees who had attended for a general OHC between January and September 2012. There were three registered nurses who undertook the checks. Nurses had been trained in the process of OHC in a team-based approach by a senior nurse manager and followed a predetermined protocol. The authors adhered to the research governance principles of the participating NHS trust. All employees who had attended for a general OHC during the study period provided informed consent to engage in the evaluation and were sent an email containing a link to an anonymous web-based questionnaire survey, approximately five weeks later. This was to ensure that participants had opportunity to act on any advice they had received from the OH nurse. Participants were provided with information as to the nature and purpose of the evaluation, together with contact details of an independent researcher who was not employed by the hospital trust; participants were informed that they were under no obligation to complete the survey and that non-completion would not impact on their ability to access any aspect of the service again in the future. The questionnaire contained items relating to participants' demographics (age, gender, staff group, shift worker), perceptions of the health check process and questions about use of the information received. Within the online survey, participants were also invited to provide qualitative feedback about the intervention in an open-ended question item.

Questionnaire data was analysed using SPSS PAS-W version 19.0. Descriptive analysis was undertaken and chi-square test and independent samples t-tests were used to examine relationships between variables. Qualitative responses were analysed using thematic text analysis to investigate occurrence or co-occurrence of themes (Braun and Clarke, 2006).

Procedure

Results

Demographic and health characteristics

Of the 13,606 eligible employees at the participating NHS trust, 253 employees chose to attend a general OHC appointment between January and September 2012, and completed an online questionnaire. Data on those who have previously attended, or those who chose not to attend was unavailable as this is not collected or stored by the organisation for reasons of employee confidentiality. The gender composition of the sample was broadly comparable with that of the participating organisation at the time of study (sample=81.8% female; hospital trust=76.5% female). Age of participants ranged from 23-69 years (mean= 45.03, SD=10.50, n=252) which fell within the most populated age categories in the hospital trust (just 1.4% of trust employees are outside of this age range). Although there were participants from all occupational groups, 50.6% (n=126) came from administrative, managerial or clerical roles and 27.7% (n=69) came from allied health professions (AHP) and nursing which are the largest occupational groups within the participating hospital trust. BMI was calculated from self-reported weight and height using the following formula:

BMI = [weight in kilograms / [height in metres x height in metres]].

Individuals were classified into categories according to their BMI (<18.5 = underweight, 18.5-24.9 = normal weight, 25-29.9 = overweight, >30 = obese). 46.7% (n=112) of the participants were either overweight or obese. Of the nurses, 60.3% (n=19) were overweight or obese, compared with 48.4% (n=59) of those in administrative, clerical or managerial roles; 36.2% (n=10) of the allied health professionals and 33.6% (n=7) of those in science or professional roles. Only 10.9% (n=27) of our sample worked shifts; although approximately one-fifth of NHS employees are shift workers. Of the

participants, 61.2% (n=143) felt that their diet was not healthy enough and 60.7% (n=139) felt that they

were not physically active enough.

Demographic and health data for participants is reported in Table 1.

[insert Table 1 about here]

Motivators for taking part

This refers to the mechanism by which participants were activated to attend an OHC. Participants reported a range of reasons for attending an OHC appointment. Common themes emerged, most notably the concept of reassurance; many participants attended a health check to '*find out if I had anything to worry about*' [male, age 54, ancillary,]; '...to know whether I am healthy or not...' [female, age 47, clerical] and to '...check everything is as it should be' [male, age 65, manager]. Some participants reported a desire to receive a particular test result as their reason for taking part, in

particular, cholesterol testing, but also BP and blood glucose. Some participants expressed a desire to

be more aware of their health generally, which was associated with maturing years: '*I'm approaching* 60.....' [female, age 45, ancillary]; 'as I have turned 50...' [female, age 50, AHP]; '*I'm* 40 this year....' [male, age 39, admin]; 'getting to that funny age...'[female, age 57, admin].

For others, motivation to participate was associated with their occupational role; nurse participants indicated that they were participating in a health check to ensure that they were healthy enough to provide adequate care for their patients; this demonstrates that healthcare professionals recognise the impact of their own health behaviours on the quality of care they provide:

'...checks are important because patients need a healthy nurse with positive wellbeing to care for them...personal health is vital to be compassionate towards others'[female, age 50, nurse]
Many participants reported a family history of non-communicable chronic disease, often associated with premature death, as their reason for taking part: 'family history of...;[female, age 59, admin] 'my brother died ...' [female, age 52, nurse]; 'my mother died...' [female, age 25, shift worker]; 'my father died...' [male, age 48, maintenance].

Some individuals attended due to prior health concerns relating either to their lifestyle choices (which related largely to smoking, poor dietary habits, low levels of physical activity and work-related stress), or to personal test results or feedback they had received in a previous health check.

For some participants, the decision to attend was motivated by their peers; 'other people in my office were going...' [female, age 50, clerical]; 'a friend suggested I go...' [male, age 51, technical]; 'other staff members ...have attended previously...' [female, age 47, admin]. Many participants were motivated to attend by the convenience of being able to attend an appointment

in their workplace, and to have their general health reviewed without the need to make an appointment with their GP:

'[it is an] opportunity to get a quick body MOT whilst at work' [female, age 37, AHP];
'I attended because it was on-site and I was able to attend in my lunch break' [female, age 53, admin];
'It is useful to here any block demonstrate the backet of th

'It is useful to have my blood pressure, weight and cholesterol checked and not have to take time away from the office to go to the GP' [female, age 54, manager]

One participant stated:

"unless I'm already ill then I have no mechanism to get these checked as the doctors don't seem to offer preventative checks" [male, age 54, admin]

Taking part in the health check

20.6% (n=52) of the participants had attended a general OHC at their workplace previously. The

majority of the participants received the complete profile of available tests during their appointment; a

minority of participants did not receive all of the desired checks but reported a lack of time as the main

reason for non-completion.

84.8% (n=196) of participants reported that the individual feedback they received from the OH nurse

was useful. The majority of participants gave positive feedback about the way in which the health

information and advice was communicated:

"... good advice, friendly non-judgmental staff" [female, age 47, clerical]

'I felt that they gave positive health promotion messages that didn't seem like scary changes' [female, age 57, nurse]

A minority highlighted the limitations of the brief health screen and made suggestions to improve

future practice to incorporate an element of ongoing support:

'I would have liked a more detailed chat about what I can do about any problem areas' [male, age 26, admin]

Influence of tailored health advice on health behaviours

The proportion of those who reported taking action or making lifestyle behaviour changes following

the OHC is shown in Table 2.

[insert Table 2 here].

For many participants, the advice provided in the OHC had served to increase their awareness about

their personal health:

'it pinpointed areas that I didn't know needed attention' [female, age 54, admin]; I have read a lot of material concerning healthy lifestyle choices' [female, age 53 manager].

For others it had acted as a reminder or a prompt to make lifestyle changes:

'[it] acted as a timely warning...' [female, age 44, admin];
'...a good reminder – time to reflect on living more healthily' [female, age 48, clerical];

For some, the OHC appointment appeared to have increased their level of personal confidence to

initiate changes or maintain positive health behaviours that they were already undertaking.

33.1% (n=78) of participants reported that they had been advised to visit their GP (or other health

professional), out of which 52.6% (n=41) had already done so in the weeks following their health

check. Of those who had not, 95% (n=35) expressed an intention to act on that advice. For some, the

advice to follow-up with their GP had resulted in previously unknown health problems being

appropriately addressed:

'The advice was that I should see my GP about my cholesterol test which came out on the high side. I have since had a further check and am now following advice from my GP' [female, age 30, nurse shift worker]

'[this was] very useful, an underling problem that I never would have been checked for was found and now treated'[female, age 56, manager]

'It made me go to my GP as my blood pressure was high, which was quite shocking as I eat fairly well and exercise regular. They had to take me off the contraceptive pill and since then it has finally started coming down' [female, age 49, admin]

Many participants self-reported that they had made changes to their health behaviours as a direct result of the workplace OHC. 40.6% (n=95) of those who attended health checks reported that they had changed their diet as a result. Of the participants who believed that their diet was not as healthy as it should be, 66% (n=95) reported having made changes as a result of the advice, and a further 25% (n=35) of these participants expressed an intention to make changes to their dietary habits.

Participants highlighted resulting changes to unhealthy patterns of eating:

'I got information about diet myths and healthy eating which has helped me change my eating patterns and fads for the better' [female, age 28, technician] 'I've also cut out sugar in my drinks after about 10 years of trying to do that. So far so good...' [female, age 54, nurse]

Reported dietary changes were common, and diverse, but examples include:

'Lessened salt intake and monitoring saturated fat intake more closely' [female, age 45, nurse]; 'watching calories and improving on 5-a-day' [female, age 60, admin]; 'increased fruit and dark green veg and oily fish' [male, age 39, nurse shift worker]; 'cutting back on red meat' [female, age 50, clerical]; 'cutting down portion sizes' [female, age 49, admin];

'drinking lots more water' [female, age 53, scientist]; 'looking at recipes, getting my friends interested in healthy eating' [female, age 43, technical]; 'tried to reduce eating carbs in the evening' [female, age 29, AHP]; 'less fried food' [female, age 43, clerical];

Others reported significant changes in body composition through behavioural changes made as a result

of their OHC: 'I have now lost two stone [in weight]' [female, age 26, technical]; 'I have lost one

stone and seven pounds' [female, age 52, nurse].

Although 73% (n=162) of respondents reported that they already drank below government

recommended guidelines for alcohol consumption, 48% of those who drank in excess of these

guidelines (n=60) claimed that they had reduced their alcohol consumption as a result of the OHC

(n=29), through cutting down on the frequency of alcohol consumption, on units consumed and also by

changing patterns of behaviour relating to alcohol consumption. Some participants highlighted an

increased awareness of the health effects of alcohol following their appointment:

'although I don't feel I drink a lot of alcohol it has made me more aware/conscious of what I do drink and how it affects my body (weight, blood sugars and so on)' [female, age 44, admin] 'It reinforces the idea that I should reduce my alcohol intake...' [female, age 38, scientist]

Just one participant highlighted a potential need for improved signposting towards appropriate services.

89.2% (n=206) of respondents were non-smokers, however, 44% of the smokers (n=25) reported that

they had either quit smoking or cut down on cigarettes following the health check (n=11). Some

participants had accessed other services to do so following advice given in their OHC appointment: 'it

encouraged me to go to New Leaf to stop smoking which I have done to date' [female, age 30, clerical].

29.7% (n=68) of the sample reported that they had increased their physical activity levels following the health check and 25.8% (n=59) expressed an intention to be more active. This represented 49% of those who *believed* they were not already physically active enough and 42% of those who had *stated* that they were not already physically active enough.

Many participants described how they had become more physically active and were encouraged to incorporate more activity into their daily lifestyle. Methods to increase physical activity were varied but included active travel (walking or cycling) to work, increased walking, running and incidental physical activities, use of active games, engaging with workplace physical activity interventions (e.g.

pedometer challenge, structured exercise classes) and personal goal setting:

'I have started biking about 1.5 miles to and from work' [female, age 33, manager]; 'I now walk to or from work each day' [female, age 53, admin]; 'joined the Pentathlon challenge and Nordic walk once a week. I keep my pedometer on permanently now...' [female, age 46, admin]; 'I am aiming to get 10, 000 steps per day' [female, age 57, nurse shift worker]; ' 'more running and Wii Fit' [female, age 64, clerical]; 'walk my dogs a further 10 minutes in the morning...' [female, age 54, nurse shift worker]; ' used stairs more than lifts..' [female, age 59, admin].

Those with positive intentions who had not yet increased their level of physical activity reported

barriers to being more active:

'shift and family commitments means for me to do formal exercise is difficult. I am still trying to find a way of fitting this in' [female, age 57, nurse shift worker]

Many participants felt that attending a general OHC had encouraged them to access other health and

wellbeing initiatives offered by the employer, or to take steps to achieve a healthier lifestyle in general.

For some, attending a health check had helped them to maintain previously made changes:

'it made me realise that the steps I have already taken like joining weight-watchers and going to the gym are important and I am continuing both of them' [female, age 58, clerical]

Comments from participants also suggested that the provision of health-related information had gone

beyond the individual attending the health check to engage family members also:

`[it] has made healthy living a topic of conversation at my house for the past few weeks' [male, age 49, manager]

Characteristics of those participants reporting behavioural changes are shown in table 3.

[insert Table 3 about here]

Attitudes towards OHC's

Participants flagged that the experience of attending an OHC had been interesting and that they found

the information of genuine value and benefit:

'I feel fortunate to be given the opportunity to speak to specialist nurses and to be given practical advice' [female, age 33, manager]

Individuals commonly reported that getting an appointment with a GP for general health concerns, or

getting time off work to visit their GP was difficult, and as such employees repeatedly referred

positively to the availability and convenience of health checks provided in the workplace:

'Basic health checks... should be available to everyone' [female, age 52, nurse shift worker]

'I think it's a great service, we don't visit the doctor until something's wrong, and that's not often or soon enough. Months go by without changing anything, so it's good to take a look at how things are, using these markers, on a regular basis' [male, age 65, manager]

Employees valued the opportunity to monitor their health and receive advice on how to take timely and

appropriate action if health issues were identified:

'I think everybody should take part in having the health check, so if changes to their lifestyle is needed then they can do something about it, before situations get out of control' [female, age 57, nurse]

'this is a good idea for staff and can pick problems up in the early stages before they get too serious' [female, age 49, AHP]

It was also noted that the OHCs may serve as a method of accessing those individuals who are

perceived to be 'hard-to-reach':

'This is a good idea to capture people with a problem who do not seek medical help'

[female, age 57, manager]

Whilst many participants reported that they had been encouraged to attend by their colleagues, others

reported that they had themselves encouraged others to attend. In this way, participants demonstrated a

strong influence of peers in motivating others to engage with their health and in 'snowballing' generic

health promotion information to other employees:

'[this was] something I have encouraged my colleagues to do in the future' [female, age 58, admin] 'I thoroughly enjoyed it and took a fellow colleague with me and then passed on a lot of the information to other colleagues' [female, age 57, nurse]

Suggestions for improvement to the OHCs were few. However, a number of individuals queried the

way in which appointments were organised which resulted in a queuing system and lengthy waits for

appointments, and one participant identified a lack of privacy during advice-giving:

'I would have liked it to be more private. Whilst I was in the queue I could hear others' consultations' [female, age 49, admin] 'It is a brilliant scheme, although the [queuing] system was disorganised and I couldn't get my cholesterol checked as I ran out of time..' [female, age 43, admin] However, other participants also recognised the influence of limited resources on the process of

delivery:

'I think they [health checks] are brilliant and if there were more staff doing the checks the queues wouldn't be so long'[female, age 52, nurse shift worker]

Some participants also felt that where a potential health problem had been identified, a follow-up

appointment would have been appreciated for the purpose of monitoring or re-assurance:

'Having had these tests it would be nice for staff to be offered further assessment and possibly some practical help, not be just left with a few figures and leaflets that will be forgotten soon after' [female, age 44, clerical]

Overall, participants valued the availability, process and advice received in the OHCs and indicated

positive attitudes towards their future delivery in the workplace:

'I would recommend the health check to anyone and everyone' [female, age 36, medical]; 'something I have encouraged my colleagues to do in the future...' [female, age 58, manager]; 'very valuable and beneficial scheme...' [female, age 56, admin];

The employer was perceived to play an important role in actively, and genuinely, engaging in activities

which promote the health and wellbeing of employees; this was seen to impact upon employees

feelings of being valued and supported by their organisation:

'With the health checks they are giving something back and it looks like they are interested in us and are bothered about us' [female, age 45, admin]

Participants also conveyed a belief that provisions for employees were important to the wider aims of

the hospital trust as their employing organisation:

'I think it is a good idea for the trust to take an interest in its staff and support us. Without us they cannot reach their goals and ambitions'[female, age 49, manager]

Discussion

This study has shown that general occupational health checks can be feasibly delivered in a multi-site hospital workplace and are perceived as useful and informative by the vast majority of those who attend. Motivations to attend were diverse and included a sense of reassurance and lessening personal 'worry', a desire to address health concerns relating to advancing age, having a family history of chronic disease, being overweight or in poor health; indeed, it has been suggested that elimination of worry or concern regarding illness represents a powerful motivator for individuals to take action (Boulware et al, 2007). Motivating factors for some healthcare professionals included a desire to be healthy enough to provide quality and compassionate care for their patients, or having received encouragement to attend a health check from their peers. Most notably, the convenience of being able to access a general health check whilst at work appeared to influence motivation to attend, and was also described as a *perceived benefit* of attending; this is important given that those who report positive changes in perceived convenience may be more likely to engage in health behaviour change (Humpel et al, 2004). Future research might seek to further investigate the motivational drivers of OHC uptake, in the context of known theoretical influences on motivation and health behaviour (eg. the Health Belief Model, Protection Motivation Theory, or the Theory of Planned Behaviour -TPB). For example, in other health contexts, previous studies have demonstrated that the TPB and self-regulation theory are capable of explaining significant variance in intentions to attend clinic appointments (Orbell et al, 2006).

The provision of OHCs in a hospital workplace setting attracts both those who are engaging in a general health check for the first time, and also those who have attended OHCs previously. The predominance of female attendees may support previous findings that males are less likely to selfpresent for preventative health checks (Greenland et al, 1992; Waller et al, 1990); alternatively it may simply reflect the female: male ratio of employees at the participating organisation. Although it has been suggested that attendees of general health checks are often older than non-attendees (Dryden et al, 2012), the age range of attendees of these OHCs was diverse (23 to 69 years). Attendees were from all occupational groups within this hospital workforce; although the majority were from sedentary officebased job roles, the allied health professions or nursing. The engagement of nurses in general health checks is particularly pertinent, not least because of the high proportion of overweight and obesity observed in our sample, and in previous studies (Malik et al, 2011), and the recent attention on nurses as role models for the general population (Blake, 2013; Blake and Harrison, 2013), but also because organisational efforts to support the health and wellbeing of nurses, midwives and care staff is a key element of national strategy in the UK to ensure the delivery of high quality, compassionate care (DH, 2012).

It has previously been suggested that individuals who seek or are willing to undergo routine screening are generally healthier than those who are not (van Walraven et al, 2000). However, we did find that almost half of those who attended were overweight or obese (and almost two-thirds of the nurses who attended), additionally, many participants self-reported a need for improvement in their health behaviours and many reported a family history of chronic disease. This suggests that our attendees were not necessarily restricted to the 'worried well' but included a high proportion of individuals who self-reported one or more risk factors for chronic disease. However, no information was available on the health profile of non-attenders and this is significant since a review concluded that non-attenders of health check appointments (in community/clinical settings) may have even greater clinical need or risk factors (Dryden et al, 2012). Caution should therefore be exerted in the interpretation of these findings since it was not possible to establish whether there was differential uptake yet this would have the potential to exacerbate health inequalities (Tudor-Hart, 1971). Despite this, participants themselves indicated that OHCs were an appropriate mechanism of reaching those who may not normally seek medical help for health-related problems.

Although the OHCs did reach some shift workers, the overall proportion of shift workers engaging in OHCs was low. This is significant since this group of hospital workers are known to have poorer health and more frequent sickness absence than non-shift workers (RCN, 2012). Healthcare organisations should endeavour to find mechanisms to engage shift workers more fully in employee health-promoting activities.

Although the extensiveness of clinical assessment which can be undertaken within a brief appointment is limited, the length of the screening session was comparable with that offered in practice by occupational health services within the public and private sectors. The OHCs were not intended as a diagnostic tool, or to replace the relationship between employees and their healthcare provider, but rather should be viewed as a mechanism for providing employees with a better understanding of their health and act as a motivating factor for health behaviour change. Although lipid profiles, for example, should ideally be obtained after a 9- to 12-hour fast, the practicalities of this approach have been questioned and it has been proposed that non-fasting lipid testing is appropriate for most individuals who present for a routine clinic visit (Khera and Mora, 2012). Similarly, whilst BMI is not a 'gold standard' measure of overweight and obesity, it is a relatively easy, cheap and non-invasive approach which is an adequate proxy measure for monitoring the underlying increase in health risk (NHS, 2009), and is therefore practical to include within a brief workplace health screen. Whilst there are naturally limitations to the nature and type of measures which can be feasibly undertaken during a brief health check in the workplace, the measures collected have previously been effectively delivered in the workplace to identify potential health-related issues in employees (Steuljens et al, 2011; Cancelliere, 2011).

It was beyond the scope of this study to investigate possible harms from health checks and aside from the expense of delivery for the organisation, potential harms for the individual may include overdiagnosis, over-treatment, distress or injury from invasive follow-up tests, distress due to false positive results, false reassurance due to false negative test results, possible continuation of adverse health behaviours due to negative test results, adverse psychosocial effects due to labelling and difficulties getting health insurance (Krøgsboll, 2012). However, our feedback was on the whole positive; we did not receive any reports of psychological distress, and only a few participants identified areas for improvement in the OHC process, mostly to do with the logistics of delivery, with just one comment relating to the provision of ongoing support and follow-up for those who had potential health issues indicated by the screening tests. Future studies should investigate the mechanisms by which employees can be best supported following their OHC, and how best to optimise the benefit: harm ratio. Notwithstanding, these findings lend support to the ongoing delivery of OHCs to employees in hospital workplaces. Feedback from male and female participants indicates that the vast majority of attendees find the health advice they receive to be useful, and appreciate the way in which individually tailored information is communicated by OH nurses. Employees perceive that OHCs have value for raising their awareness of health issues, for monitoring their personal health, providing reassurance and reducing worry, and for signposting to appropriate health services. A high proportion of employees who have attended a general health check in their workplace report making changes to their health behaviours, in particular physical activity levels and dietary habits, with some, albeit a small number, reporting changes in smoking behaviour and alcohol consumption. For some these changes support and reinforce efforts that had begun prior to the health check, but for many, changes are reported as a direct consequence of attending, and can be dramatic. Some suggested that there were also indirect benefits of their attendance for colleagues and family members. This is a significant finding for the potential influence of health checks on employee health behaviours, and is consistent with previous work that has suggested that 47-60% occupational health checks attendees act upon the advice they receive

(Hanlon et al, 1998; Taitel et al, 2008). However, it is unknown whether reported lifestyle changes were sustained in the long-term and this requires further investigation.

Whilst our participants self-reported changes to their health behaviours, it would be useful to measure objectively whether individuals who take part in a health check progress and improve further over time, although we were not able to collect follow-up data since this would raise concerns relating to employee confidentiality. It would be particularly pertinent to investigate further the characteristics of participants who were most likely to act on the health advice they received, given that it has been shown that those participants who perceive themselves to be most 'at risk' are more likely to comply with advice given in a health check (Hanlon et al, 1998). The gender ratio within our sample was comparable with that observable within the hospital trust; despite the predominance of female employees, the demographic profile of attenders demonstrated that both genders attended OHCs, both reported a positive perception of OHCs and both reported taking action following advice received in the OHC (GP follow-up and/or lifestyle changes). Future research may seek to examine whether there are potential differences between men and women in motivation to attend and the likelihood of taking action following advice given in the OHC.

The economic impact of workplace health checks still needs to be adequately quantified, although the evidence is limited not least due to the practicalities of collecting this data; evidence from primary care settings specifies that the effects of health checks must be shown to last for a minimum of ten years if this approach is deemed effective (Langham et al, 1996).

This study demonstrates that OHCs can be feasibly delivered as part of a comprehensive, preventative workplace wellness programme in a hospital setting. This is important given that the workplace (and the hospital) has been established as a priority setting for health promotion in the 21st Century by the World Health Organization, who have called for initiatives which help 'employees at all levels to increase control over and improve their health'. It demonstrates that OHCs in the hospital setting are well-accepted by healthcare employees and that employees report taking health-related action as a result of the advice they receive. This tends to support the view that OHCs should continue to be offered by healthcare organisations as part of a corporate social responsibility model to support the health and wellbeing of their employees. Incorporating health checks within a comprehensive programme of health promotion may be the most beneficial approach, since it has been suggested that individuals who have had health issues identified within a personal health check may be more motivated to participate in health promotion programmes (Davis et al, 1984). Given the potential for employees to pursue behavioural changes following a health check, we propose that organisations aiming to include health checks as part of an employee wellness programme ensure that they have processes and facilities available to support individuals in making healthy lifestyle choices whilst at work. Such efforts require significant organisational investment of time and resources for full implementation. In the light of recent government reports documenting the need to support the health and wellbeing of NHS employees in the UK (DH, 2009; DH, 2012), it was a notable finding that participants recognised the significance of employee health and wellbeing both to their role in a 'caring profession' and to the wider aims and ambitions of the NHS. The provision of health checks in the NHS workplace was viewed positively by healthcare employees and generated positive perceptions towards their employer. Employees felt supported and valued by the investment of the healthcare organisation in their workforce, which may have implications for employee morale, job satisfaction and employee engagement.

Acknowledgments:

The general health checks were funded by Nottingham University Hospitals NHS Trust. The authors would like to thank Steph Knowles, Christine Woolley and Anna Betts; Libby Fergie for administrative support; the occupational health nurses, in particular Veronica Gwynne, Jill Roulestone and Claire Evans; and the Health and Wellbeing Volunteers and Champions for their roles in delivery of the service.

References

American College of Occupational and Environmental Medicine, and care continuum alliance. Biometric health screening for employers: consensus statement of the health enhancement research organization, J Occup Environ Med. 2013 Oct;55(10):1244-51.

Baicker, K., Cutler, D. and Song, Z. (2010), "Workplace wellness programs can generate savings", *Health Affairs*, Vol. 29 No. 2, pp. 304-311.

Black, C. and Frost, D. (2011), *Health at Work: an independent review of sickness absence*. London: The Stationery Office Ltd.

Blake, H., Zhou, D. and Batt, M.E. (2013), "Five year workplace wellness intervention in the NHS", *Perspectives in Public Health*, in press.

Blake, H. (2013), "Should nurses be role models for health", Nursing Times.net, available

at:http://www.nursingtimes.net/holly-blake-should-nurses-be-role-models-for-health/5052877.article

(accessed 2 January, 2013).

Blake, H.and Harrison, C. (2013), "Health behaviours and attitudes towards being role models", *British Journal of Nursing*, Vol. 22 No. 2, pp. 86-94.

Blake, H. and Lloyd, S.(2008), "Influencing organizational change in the NHS: lessons learned from workplace wellness initiatives in practice" *Quality in Primary Care*, Vol. 16 No. 6, pp. 449-455.

Boulware, L.E., Marinopoulos, S., Phillips, K.A., Hwang, C.W., Maynor, K., Merenstein, D., Wilson,
R. F., Barnes, G. J., Bass, E. B., Powe, N.R. and Daumit, G.L. (2007), "A systematic review: the value of the periodic health evaluation" *Annals of Internal Medicine*;146(4):289-300.

Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology. Qualitative Research in Psychology, 3 (2). pp. 77-101.

Cancelliere, C., Cassidy, J.D., Ammendolia, C. and Cote, P.(2011), "Are workplace health promotion programs effective at improving presenteeism in workers? A systematic review and best evidence synthesis of the literature", *BMC Public Health,* available at:<u>http://www.biomedcentral.com/1471-</u>2458/11/395 (accessed 7 May 2013).

Collin, J.J., Baase, C.M., Sharda, C.E., Ozminkowski, R.J., Nicholson, S. andBillotti, G.M., Turpin, R.S., Olson, M. and Berger, M.L. (2005), "The assessment of chronic health conditions on work performance, absence and total economic impact for employers", *Journal of Occupational and Environmental Medicine*, Vol. 47 No. 6, pp. 547-557.

Davis KE, Jackson KL, Kronenfeld JJ, Blair SN. (1984) Intent to participate in worksite health promotion activities: a model of risk factors and psychosocial variables. *Health Education Quarterly*, Vol. 11 No. 4: 361-377.

Department of Health, (2004), *Choosing health: Making healthy choices easier. London*, UK: The Stationary Office.

Department of Health, (2009), *NHS health and wellbeing review: Interim report*. London, UK: The Stationary Office.

Deaprtment of Health, (2012). Compassion in Practice. Nursing, Midwifery and Care Staff. Our Vision and Strategy. December 2012. Policy 18479.

Dryden, R., Williams, B.,McCowan, C. and Themess-Huber, M. (2012), "What do we know about who does and doesnot attend general health checks? Findingsfrom a narrative scoping review", *BMC Public Health*, available at:http://www.biomedcentral.com/1471-2458/12/723 (accessed 7 May 2013).

Greenland, P., Hildreth, N.G. and Maiman, L.A. (1992), "Attendance patterns and characteristics of participants in public cholesterol screening", *American Journal of Preventive Medicine*, Vol. 8 No. 3, pp. 159–164.

Han, P.K.J. (1997), "Historical changes in the objectives of the periodic health examination", *Annals of Internal Medicine*, Vol. 127 No. 10, pp.910-917.

Hanlon. P., McEwen, J., Carey, L., Gilmour, H., Tannahill, C., Tannahill, A., Kelly, M. Health checks
and coronary risk: further evidence from a randomised controlled trial. BMJ. 1995 December 16;
311(7020): 1609–1613.

Hanlon, P, Carey L, Tannahill, C, Kelly, M, Gilmour, H, Tannahill, A, McEwen, J. (1998) Behaviour change following a workplace health check: how much change occurs and who changes? *Health Promotion International*. Vol 13, No.2, pp131-139.

Hess I, Borg J, Rissel C. (2011) Workplace nutrition and physical activity promotion at Liverpool Hospital. Health Promot J Austr. 2011 Apr;22(1):44-50.

Holland, W. (2009), "Periodic health examination – a brief history and critical assessment" *Eurohealth*, Vol. 15 No. 4, pp. 16-20.

Humpel, N., Marshall, A.L., Leslie, E., Bauman, A. and Owen, N. (2004), "Changes in neighborhood walking are related to changes in perceptions of environmental attributes" *Annals of Behavioral Medicine*, Vol. 27 No. 1 pp. 60-7.

Khera AV1, Mora S. Fasting for lipid testing: Is it worth the trouble? Arch Intern Med. 2012 Dec 10;172(22):1710-2.

Krogsbøll, L.T., Jørgensen, J.J., Larsen, C.G. andGøtzsche, P.C. (2012), "General health checks in adults for reducing morbidity and mortality from disease: Cochrane systematic review and metaanalysis" *BMJ*, 2012; 345: e7191, available at:<u>http://www.bmj.com/content/345/bmj.e7191</u> (accessed 7 May 2013).

Langham, S, Thorogood, M, Normand, C et al. (1996) Cost and cost-effectiveness of health checks conducted by nurses in primary care: the OXCHECK study. *British Medical Journal*, Vol. 312, pp.1265-1268.

Larsen, C.G., Jørgensen, K.J. and Gøtzsche, P.C. (2012), "Regular health checks: cross-sectional survey", *PLoS ONE 7(3): e33694. doi:10.1371/journal.pone.0033694,* available at:<u>http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0033694</u> (accessed 7 May

2013).

Lee, S., Blake, H. and Lloyd, S. (2008), "The price is right: making workplace wellness financially sustainable", *International Journal of Workplace Health Management*, Vol. 3 No. , pp. 58-69.

Lim, L.S. (2013), "General health checks in adults do not reduce all-cause cardiovascular or cancer mortality", *Annals of Internal Medicine*, Vol. 158 No. 2, available

at:http://yale.pubget.com/paper/23318336/Review__General_health_checks_in_adults_do_not_reduce

all_cause_cardiovascular_or_cancer_mortality (accessed 7 May 2013).

Malik, S., Blake, H. and Batt, M. (2011), "How healthy are our nurses? New and registered nurses compared", *British Journal of Nursing*, Vol. 20 No. 8, pp. 489-496.

NHS (2009). Body Mass Index as a Measure of Obesity. National Obesity Observatory, June 2009, available at: http://www.noo.org.uk/uploads/doc789_40_noo_BMI.pdf (accessed 8 April 2009)

Nilsson P, Andersson HI, Ejlertsson G. (2013) The Work Experience Measurement Scale (WEMS): a useful tool in workplace health promotion. Work; 45(3):379-87.

Orbell, S., Hagger, M., Brown, V., Tidy, J. (2006) Comparing Two Theories of Health Behavior: A Prospective Study of Noncompletion of Treatment Following Cervical Cancer Screening. Health Psychology, Vol. 25, No. 5, 604–615.

Royal College of Nursing, (2012), A shift in the right direction: RCN guidance on the occupational health and safety of shift workers in the nursing workforce. Royal College of Nursing, London.

Si, S., Moss, J.R., Sullivan, T.R., Newton, S.S., Stocks, N.P. (2014) Effectiveness of general practicebased health checks: a systematic review and meta-analysis. *British Journal of General Practice*, Vol. 64, No.618, e47-e53.

Steuljens, E., Baker, N.and Aas, R.W.(2012), "Organizational leadership, health risk screening, individually tailored programs, and supportive workplace culture might reduce presenteeism"*Australian Occupational Therapy Journal*, Vol. 59 No. 3, pp. 247-248.

Taitel MS, Haufle V, Heck D, Loeppke R, Fetterolf, D. (2008) Incentives and other factors associated with employee participation in health risk assessments. *Journal of Occupational and Environmental Medicine* Vol. 50, pp.863-872.

Tudor-Hart, J.. (1971), "The inverse care law", LancetVol. 297 No. 7696, pp. 405-412.

U.S. Preventative Services Task Force (USPSTF), (2003), "High blood pressure screening. Summary of recommendations/supporting documents", in Clinical Guide to Preventative Services.(2nd Ed.) Rockville (MD): Agency for Healthcare Research and Quality, available at: <u>http://www.ahrq.gov/professionals/clinicians-providers/guidelines-</u>

recommendations/guide/abstract.html (accessed 7 May 2013).

vanWalraven, C., Goel, V. and Austin, P. (2000), "Why are investigations not recommended by practice guidelines ordered at the periodic health examination?", *Journal of Evaluation in Clinical Practice*, Vol. 6 No. 2, pp.215-224.

Waller, D., Agass, M., Mant, D., Coulter, A., Fuller, A. and Jones, L. (1990), "Health checks in general practice: another example of inverse care?" *BMJ*, Vol. 300 No. 6732, pp. 1115–1118.

World Health Organization. (2010), Healthy Workplaces: a WHO global model for action. For employers, workers, policy-makers and practitioners, World Health Organization, Geneva.

Wilson, J.M.G. and Jungner, G. (2008), Principles and practice of screening for disease. World Health

Organisation, Geneva.

Wynn, P. (2013) Periodic health checks in the workplace—is it time to change the prescription? Occup Med (Lond); 63 (4): 248-250.

Table 1.Sample characteristics

Characteristic	Full Sample	BMI category			
	n (%)	Underweight n (%)	Normal n (%)	Overweight n (%)	Obese n (%)
Gender (n=253)		0. (0)			- //>
Male	46 (18.2)	0 (0)	21 (45.7)	18 (39.1)	7 (15.2)
Female	207 (81.8)	4 (2.1)	103 (53.1)	58 (29.9)	29 (14.9)
Occupational Group (n=249)					
Admin / Clerical / Senior	126 (50.6)	0 (0)	63 (51.6)	41 (33.6)	18 (14.8)
Management					
Allied Health Professionals	30 (12.0)	2 (7.1)	16 (57.1)	7 (25.0)	3 (10.7)
Nursing	39 (15.7)	1 (2.7)	17 (45.9)	11 (29.7)	8 (21.6)
Science and Professional	21 (8.4)	1 (4.8)	13 (61.9)	6 (28.6)	1 (4.8)
Ancillary	14 (5.6)	0 (0)	4 (30.8)	7 (53.8)	2 (15.4)
Technician	12 (4.8)	0 (0)	8 (66.7)	2 (16.7)	2 (16.7)
Maintenance	3 (1.2)	0 (0)	1 (33.3)	1 (33.3)	1 (33.3)
Medical	4 (1.6)	0 (0)	1 (50.0)	1 (50.0)	0 (0)
Shift worker (n=247)					, , , , , , , , , , , , , , , , , , ,
Yes	27 (10.9)	1 (4.0)	9 (36.0)	10 (40.0)	5 (20.0)
No	220 (89.1)	2 (1.0)	115 (54.8)	64 (30.5)	29 (13.8)

Item	Response	Ν	n	%
Advised to consult GP or health	Yes	236	78	33.1
professional	No		158	66.9
Attended consultation with GP or	Yes	78	41	52.6
health professional	Not yet, but I intend to		35	44.9
	No and I do not intend to		2	2.6
Made healthy dietary changes	Yes	234	95	40.6
	Not yet, but I intend to		35	15.0
	No, I perhaps should, but I do not intend to		13	5.6
	No, my diet is already healthy enough		91	38.9
Increased physical activity levels	Yes	229	68	29.7
	Not yet, but I intend to		59	25.8
	No, I perhaps should, but I do not intend to		12	5.2
	No, I am already active enough		90	39.3
Reduced alcohol consumption	Yes	222	29	13.1
_	Not yet, but I intend to		13	5.9
	No, I perhaps should, but I do not intend to		18	8.1
	No, I already drink below current guidelines		162	73.0
Reduced smoking levels	Yes, I have quit smoking	231	5	2.2
_	Yes, I have cut down		6	2.6
	Not yet, but I intend to		11	4.8
	No, I perhaps should, but I don't intend to		3	1.3
	I am a non-smoker		206	89.2

T-11- 1	Descrited		f . 11	h = = 14h	a b a a b a
Table 2.	Reported	actions	ionowing	nealth	спеск

	Proportion of those taking action			
Behavioural	Age	Gender n(%)	Shift worker n(%)	BMI n(%)
Action	mean (sd)			
Advised GP	47.0	Female 65 (83.3)	Shift 10 (13.3)	Underweight 3 (4.1)
consultation	(10.07)	Male 13 (16.7)	Non-shift 65 (86.7)	Normal 28 (37.8)
				Overweight 25 (33.8)
				Obese 18 (24.3)
Reported	48.1 (9.35)	Female 35 (85.4)	Shift 3 (7.5)	Underweight 1 (2.4)
attending GP		Male 6 (14.6)	Non-shift 37 (92.5)	Normal 17 (41.5)
consultation				Overweight 14 (34.1)
				Obese 9 (22.0)
Healthy dietary	46.9	Female 75 (78.1)	Shift 9 (9.9)	Underweight 0 (0)
changes	(10.40)	Male 20 (21.1)	Non-shift 82 (90.1)	Normal 41 (46.1)
				Overweight 30 (33.7)
				Obese 18 (20.2)
Increased	48.6 (9.59)	Female 54 (79.4)	Shift 3 (4.6)	Underweight 1 (1.5)
physical activity		Male 14 (20.6)	Non-shift 62 (95.4)	Normal 29 (43.3)
				Overweight 23 (34.3)
				Obese 14 (20.9)
Reduced alcohol	42.4	Female 24 (82.8)	Shift 2 (7.1)	Underweight $0(0)$
consumption	(10.83)	Male 5 (17.2)	Non-shift 26 (92.9)	Normal 12 (42.9)
				Overweight 13 (46.4)
				Obese 3 (10.7)
Quit smoking	52.0	Female 5 (100)	Shift 0 (0)	Underweight 0 (0)
	(2.83)	Male 0 (0)	Non-shift 5 (100)	Normal 2 (40.0)
				Overweight 2 (40.0)
				Obese 1 (20.0)
Cut down	48.0	Female 4 (66.7)	Shift 0 (0)	Underweight 0 (0)
smoking	(14.53)	Male 2 (33.3)	Non-shift 6 (100)	Normal 4 (80.0)
-				Overweight $0(0)$
				Obese 1 (20.0)

Table 3. Characteristics of participants reporting behavioural changes