Public Health England

Protecting and improving the nation's health

The impact of physical environments on employee wellbeing – topic overview

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. It does this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. PHE is an operationally autonomous executive agency of the Department of Health.

Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
Tel: 020 7654 8000
www.gov.uk/phe
Twitter: @PHE_uk
Facebook: www.facebook.com/PublicHealthEngland

Core content provided by Robertson Cooper Ltd – a firm of business psychologists that works across the private, public and government sectors. They specialise in helping organisations to achieve bottom-line improvements by enhancing wellbeing, engagement and resilience across their workforces, established by providing insight into the factors that drive these aspects of working life.

For queries relating to this document, please contact: sam.haskell@phe.gov.uk

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Executive summary

The surroundings in which employees spend their working lives are an important source of job satisfaction and impact on work motivation and patterns of interaction. They can be as much of a source of pressure as a heavy workload, poor work-life balance or significant organisational change.

This report provides an overview of the literature around the impact of particular elements of the physical work environment on employee wellbeing, specifically the office layout, office furniture, workplace lighting and temperature and employee control over their work environment. All of these factors should be considered in order to ensure that the physical characteristics of the work environment do not have a detrimental effect on engagement, productivity and wellbeing.

Summary of methodology

This topic overview is one of four commissioned by Public Health England (PHE) exploring certain priority – but generally under-explored – issues around health, work and unemployment. The target audience is a combination of local government, national organisations interested in health and work, and businesses themselves. The core content of this report was developed by RobertsonCooper Ltd using a search of relevant published and grey literature, and unstructured interviews with key informants.

Office layout

Open plan and 'flexi' office types have the potential to increase collaboration, boost innovation and use space efficiently. However, it is important for organisations to integrate space for quiet, privacy and concentration in their office plans. Higher rates of sickness absence have been associated with a lack of perceived control and privacy at work.

Office furniture

Allowing employees flexibility in office furniture and working stations is associated with reduced sickness absence and greater job satisfaction. The evidence suggests that it is important to consider ergonomics, including adjustable chairs and desks.

Lighting and temperature

Both lighting and temperature have significant impacts on physical and psychological wellbeing in an open plan office, and managers should be proactive in addressing issues highlighted by staff. The quality and comfort levels of lighting can impact wellbeing, for example poor lighting levels can result in discomfort and fatigue. An ideal office temperature was found to be 22-26 degrees Celsius, with those outside this range associated with worse performance and motivation.

Employee control over the work environment

Control at work is a key determinant of health and wellbeing. The extent to which employees perceive that they have control over their physical work environment has been associated with improved performance, job satisfaction and group cohesiveness.

Conclusion

Specific recommendations for action are made for each element of the physical work environment.

Key recommendations

Below are key recommendations for action under each of these elements of the physical work environment:

Office design

- design office environments to accommodate the varying tasks and the specific needs of the workforce
- considering privacy in open plan offices, without compromising collaboration. Private spaces and quiet rooms should be available for those who require confidential conversations and focus. Partitions allow for privacy and will mitigate noise and privacy concerns
- design work environments to foster opportunities for employees to easily connect and communicate. This fosters creativity supports employee innovation
- to facilitate quick and easy interaction and collaboration, relevant work stations should be positioned close to each other
- design work environments that go beyond the basic materials needed to do a job, to promote employee wellbeing and productivity
- provide a variety of work spaces for different types of working

Office furniture

- furniture: promoting greater flexibility – in terms of both the adjustability of equipment as well as different working options – and considering the impact that furniture may have on musculoskeletal disorders, which are a huge contributor to work related absence
- chairs: researchers have identified several key features of an ergonomic chair design. They should be able to rotate and have an adjustable height of 38-54cm. They should allow sufficient leg space and the ability to flex the knees by 90 degrees. They should have a backrest of 50cm to provide appropriate support

Lighting and temperature

- where possible lighting levels should be adjustable, changes in lighting levels should be gradual and employees should have local control of lighting levels

- maintain an office temperature of between 22-26 degrees Celsius

Control over the work environment

- engage employees early in the process as it increases the likelihood they will buy into the process and provides an opportunity to gather their ideas. Methods should be wider than just 'another' staff survey – use focus groups, short opinion polls and innovative ways of gathering staff perspectives
- control at work is a key determinant of health and wellbeing and perceived control over work environment is also important. This should be provided where possible

General

- recognise the potential impact of the physical office environment beyond the legal requirements of the Health and Safety Executive (HSE)
- engage staff in workplace design and where possible allow greater flexibility
- integrate evidence into practice, drawing on best and promising practice

1   Introduction

The surroundings in which employees spend their working lives are an important source of job satisfaction. They can be as much of a source of pressure as a heavy workload, poor work-life balance or organisational change.

Recent figures on the economic case for wellbeing at work show the high rates of sickness absence due to stress, anxiety and depression.[1] The latest figures from the Labour Force Survey for 2011-12 show that 27 million working days were lost to sickness absence in total due to work related factors, 10.4 million of which were the result of workplace stress, anxiety and depression, with a further 7.5 million attributed to musculoskeletal disorders. While statistics vary depending upon their source and method of categorisation, a coherent picture of work-related stress is emerging and showing a trend that is on the rise. Although work-related stress is not recognised as an illness in itself, it is a state that may result in ill-health.

The physical environment that organisations provide for employees to carry out their work activities, most commonly in some form of office space, has been shown to have a powerful role in shaping a range of psychological and behavioural outcomes for employees.[2] Research by Robertson Cooper in 2010-13 found that 30% of employees were troubled by their physical working environment.[3] Further, employees who were troubled in this way were more likely to have a negative perception of their own levels of positive psychological wellbeing, physical and psychological health, and engagement, compared to those who were not.[3]

Considering the number of working days lost due to work-related ill-health, it is important for organisations to adopt a more holistic approach to supporting the health and wellbeing of their workforce, moving towards supporting employees to perform to the best of their ability. This includes a need for organisations to take into account the impact of the office environment on health and wellbeing at work, as part of the wider work climate. As well as being a legal requirement under current health and safety law, provision of a suitable work environment for employees is a proactive step organisations can take to enhance the productivity of their workforce, as research estimates that the impact of offices on the personal productivity of occupants to be around 20%.[4]

In addition to the economic case, as with all health and wellbeing management policies, there exists an ethical argument for employees to have a work environment that is fit for purpose, enables performance and is not a source of unnecessary pressure.

This report describes the impact of office layout, office furniture, workplace lighting and temperature and employee control over their work environment on employee wellbeing, and makes recommendations for policy-makers and businesses for action. Case studies

are used to provide specific examples of improvements that can be made and they highlight principles and practices that offer scope for wider applicability across organisations.[5]

2 Methodology

This topic overview is one of four commissioned by Public Health England (PHE) exploring certain priority – but generally under-explored – issues around health, work and unemployment. The target audience is a combination of local government, national organisations interested in health and work, and businesses themselves.

The core content of this report was developed by RobertsonCooper Ltd – a firm of business psychologists that works across the private, public and government sectors.

The content was prepared by conducting a search of peer-reviewed published literature on workplace physical environment and wellbeing. The search terms "office design wellbeing", "office layout wellbeing", "workplace design wellbeing" were used in these databases PsychINFO, Embase, Medline, PubMed, SpringerLink, Science Direct, Wiley Online Library and Google Scholar. A systematic approach was not used due to time constraints.

Beyond the search terms, reference lists were searched to capture further evidence on physical environment and wellbeing. A grey literature search was done, to include reports from key organizations working in the field. Strict inclusion and exclusion criteria and a quality assessment tool were not used, but meta-analyses were prioritised for inclusion.

Unstructured key informant interviews were conducted in order to capture current practice, case studies and recommendations for further action. Key informants included Human Resource Directors and Occupational Health leads and practitioners with a range of organisations. Key informants were selected using a pragmatic approach, based on their availability and willingness to discuss the topic.

3 Office layout

Office design

Research has found that both design and empowerment to design work environments have an important role to play in determining employee wellbeing and productivity.[6] Traditional approaches to office space management include the removal of materials other than those required to perform the job and standardisation of workplace design. These have been influential in promoting lean office spaces to harvest an efficient and productive workforce.

However, the results from a 2010 study suggested the opposite effect and highlighted the importance of both a better designed environment, and one which provides individuals with a perception that they have some control over the characteristics of the layout and the opportunity to contribute.[7]

Open plan and 'flexi' offices

The desire to increase collaboration and a drive to use space efficiently has led to an increase in the use of open plan offices. This office structure was believed to foster opportunities to generate new ideas for product or process innovation. Research indicates that the design of work environments can foster the creativity of employees, taking a bottom-up approach to innovation.[8]

Case study: Department of Trade and Industry

Reasons for change

Due to substantial rent increases and a lack of funding, the department reduced the number of buildings they accommodated from eight to three. The department took this opportunity to make changes that would benefit both the employees and the organisation as a whole.

Changes implemented

The changes included breaking away from the 'me and my desk' culture and focusing more on 'me and my team' and 'me and my outcomes'. The majority of staff share open plan spaces in their teams and managers decide where employees sit. This avoids disagreement over who takes which desk and it enables a manager to position employees working on similar tasks or projects together to improve productivity and communication. The flexibility of work spaces also means that when a particular task or project is finished, people can relocate for the next task. Further, low height screens were introduced enabling better communication between employees, but maintaining a sense of boundary.

Outcomes

Overall, the change has greatly increased the flexibility of the work environment and staff reported a greater work-life balance following the changes. The most significant outcome of the relocation was improved communication in the new office spaces. According to staff surveys, employees reported that the previous barriers that existed between colleagues had been reduced.

Research into the influence of office type on health and satisfaction at work found that 'flexi' offices promoted the most positive levels of health and job satisfaction. [7] These are typically open plan office spaces with no assigned seating, which allow for around 70% of the workforce to be present at one time. The desks are divided into a number of work stations to allow private phone calls, meetings and concentrated work. By incorporating a hot desking policy, 'flexi' offices allow flexibility and a high level of interaction among employees. Research has found that having the flexibility to hot desk was associated with stronger organisational identification. [9]

Case study: BT Workabout programme

Reasons for change

Following privatisation, BT had the opportunity to reposition itself within an increasingly competitive global market. They felt that this required an increase in mobile working and working from home. Overall, they wanted to create a more flexible work environment. These changes were implemented through the 'Workabout' programme.

Changes implemented

The BT centre was refurbished with the latest information and communications technology. The refurbishments made better use of the work space and enabled flexible working. The new IT and communication systems enabled people to work in any location in the building.

BT also recognised that these change would impact employees, particularly with regard to using new equipment. They set up a help desk to support staff and a concierge service to supervise printing and photocopying.

Outcomes

The Workabout programme reduced the number of buildings from 76 to eight over ten years. The changes made during this time have produced many benefits for the organisation. A staff survey carried out following the changes found:
- 65% reported good work-life balance
- 65% reported reduced work stress
- 69% reported higher perceived productivity

Overall, BT reported that they made better use of the work space which reduced costs and generally raised the brand image.

Providing opportunity for concentration and privacy

An important objective for most organisations is to maintain employee motivation in order to enhance work effectiveness. Collaborations are an important component of work effectiveness and empirical evidence strongly suggests that the office layout can facilitate this type of interaction. At the same time there is a demand for privacy for confidential conversations and concentrated work and it is therefore important for organisations to design a workplace that integrates both of these needs.

Evidence suggests that partitions are positively related to perceived sense of control and privacy.[7] Larger open-plan work stations without doors require organisations to consider the spatial arrangements of partitions as these can encourage employees to have a sense of reduced distractions and better privacy.

Several studies have found that partitions compensate for the noise that is often associated with open plan offices. In addition to the spatial arrangements, partition height is also believed to be of great importance. The spatial arrangements and height of partitions have been positively linked to perceived sense of privacy and job satisfaction. A study found that employees who worked near windows and partitions of 1.4m height reported higher levels of satisfaction with their space compared to those in a more traditional open plan environment as it allowed them visual and auditory privacy.[10]

We also know that greater employee control – or, even perceived control – can help reduce the negative impact of distractions associated with open plan offices.[11] For example, a large-scale study with 2,400 Danish employees highlighted higher levels of sickness absence in open plan offices relative to other office types.[12] A further study suggested that these higher rates of absence were likely due to a perceived lack of control and privacy. [13]

Case study: Microsystems Flexible Working Programme

Reasons for change

Sun Microsystems was motivated to invest in new work spaces in order to promote the satisfaction and productivity of its staff. Ultimately, it was felt that implementing such changes would help to attract and retain high quality staff and ensure that they achieve their maximum productivity through flexible working practices.

Changes implemented

Through the Flexible Working Programme, Sun offers three flexible working choices to staff:

- assigned: dedicated office desk with telephone and computer, suiting those who have a regular work pattern
- flexible: hot desking in any office across the UK, combined with working at home one or two days per week
- home-based: working at home between three and five days per week

In addition, Sun introduced bookable meeting rooms and booths for quiet working and confidential calls.

Outcomes of changes

Sun reported real estate savings of over $300m in annual savings and cost avoidance.

Working space

Employees need adequate working space to carry out their work, to move about the work area, to access their work stations and to store work equipment including files and documents. Work spaces that are perceived by employees to be cramped have a negative effect on job satisfaction and efficiency, and increase the risk of long-term sickness absence.[7]

Recommendations for policy makers and businesses

- design office environments to accommodate the varying tasks and the specific needs of the workforce
- considering privacy in open plan offices, without compromising collaboration. Private spaces and quiet rooms should be available for those who require confidential conversations and focus. Partitions allow for privacy and will mitigate noise and privacy concerns
- design work environments to foster opportunities for employees to easily connect and communicate. This fosters creativity supports employee innovation
- to facilitate quick and easy interaction and collaboration, relevant work stations should be positioned close to each other
- design work environments that go beyond the basic materials needed to do a job, to promote employee wellbeing and productivity
- provide a variety of work spaces for different types of working

4 Office furniture

Research suggests that allowing employees flexibility in office furniture and work stations – in terms of both the adjustability of equipment as well as different working options – benefits organisations. It can improve attendance, job satisfaction and thus work performance.[14] Poorly fitting office furniture has been linked to an increase in the likelihood of workers developing musculoskeletal disorders.[15] Current research underlines the benefits of providing models of office furniture and equipment that can be adjusted to meet individual requirements.

In recent years studies of sedentary behaviour have assessed the impact of adjustable chairs and desks that allow flexibility in work positions.[16] 'Hot chairs' provide an opportunity for employees to stand or sit while working, which it was hoped would reduce sedentary work in offices, yet only a small proportion of the participants used these features and the intervention was not effective in reducing sitting time. Another study found that adopting a multi-component approach that comprised installing adjustable work chairs while providing support, coaching and e-mail encouragement from management reduced sedentary behaviour.[17] The findings suggest that it is important to adopt an organisational culture that supports positive ergonomics. If this is addressed by management then employees are more likely to utilise the furniture with ergonomic features intended to enhance their wellbeing.

Four different desk types

Allowing employees flexibility and adjustability in office and furniture layout can help promote better job satisfaction, wellbeing and productivity at work. Below are four illustrative examples of different desk types that could be used depending on the job demands. Desk type has been found to influence work productivity.

Fig 1 –

Based on Duffy research on modern offices (1997)

(Benching, Steelcase Research)

Administrative positions

Independent operators

Project Teams

Specialist teams

14
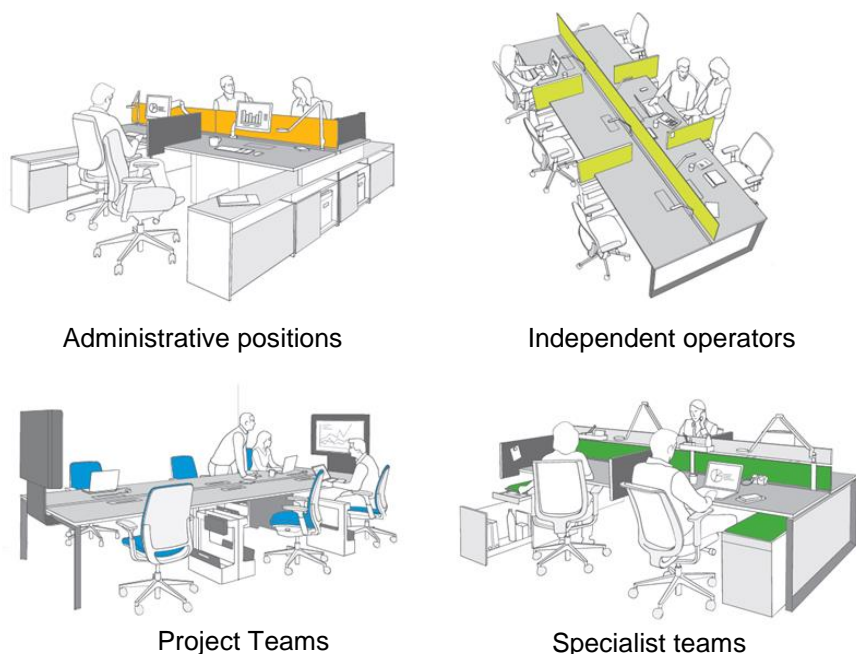
Recommendations

- furniture: allow flexibility and consider the impact that furniture may have on musculoskeletal disorders, which are a huge contributor to work related absence
- chairs: researchers have identified several key features of an ergonomic chair design.[15] They should be able to rotate and have an adjustable height of 38-54cm. They should allow sufficient leg space and the ability to flex the knees by 90°. They should have a backrest of 50cm to provide appropriate support.

5 Lighting and temperature

Particular elements of the physical environment can create distraction and dissatisfaction among staff. Both lighting and temperature have been shown to be important considerations in an open plan office as they have significant impacts on physical and psychological wellbeing.[18]

Typically these elements can be influenced but are often overlooked and are not controlled by staff at a local level. However, they can more easily be managed and influenced if managers are mindful of, and proactive in, addressing any issues highlighted by staff.

There are Health and Safety Executive (HSE) guidelines available on both lighting and temperature, which cover legal requirements, advice for conducting a risk assessment, good practice examples. See:
www.hse.gov.uk/humanfactors/topics/lighting.htm#lighting

Lighting

The quality and perceived comfort of lighting can have a considerable impact on staff. If lighting conditions are poor it can result in discomfort and fatigue as the body attempts to adapt to the ambient level. Factors such as brightness, direction, colour and contrast from one area to another should be considered in the context of the work requirements as well as how they interact with other elements of the physical environment (such as causing glare on monitors).[19]

Research has shown that people who perceive their office lighting as being of a higher quality, compared to those who perceived it as lower quality, rated the space as more attractive, had a more positive mood and reported higher levels of wellbeing at the end of a working day.[20]

Evidence shows that sitting next to a window is perceived as more appealing, stimulating and reduces any discomfort caused by inappropriate lighting. Further, the ability to adjust lighting locally by employees in order to meet the differing demands of tasks is likely to have a positive impact on physical and psychological health.[21]

Temperature

In controlled studies on the impact of office temperature on thermal comfort, work motivation and job performance, it was established that the ideal office temperature should be 22-26 degrees Celsius. The studies indicated that office temperatures outside of this range were associated with a negative impact on work performance and motivation.[22]

Recommendations

- where possible lighting levels should be adjustable, changes in lighting levels should be gradual and employees should have local control of lighting levels
- to maintain an office temperature of 22-26 degrees Celsius.

6 Employee control over the work environment

Research on employee control over their day-to-day work is well documented within the broader literature as a key influence on stress and wellbeing. The extent to which employees perceive that they have control over their physical work environment (such as changing lighting and ventilation) has been shown to influence performance. Research showed a link between workplace distractions such as noise and performance, whereby employees with more distractions rated their performance to be lower than those with fewer distractions.[11] A sense of personal control relieved some of the negative effects of distractions on performance, showing that design and management of office workspaces should incorporate personal control.

Research has also investigated the role of personal control in shaping employee satisfaction and group cohesiveness, suggesting that the more personal control individuals had over their personal workspace, along with easy access to meeting places, the more satisfied they were with their job and the higher their perception of group cohesiveness.[23]

Further examples of the benefits of employee control over the physical office environment are highlighted in chapters 2, 3 and 4.

Case study: British Astronomical Association (BAA)

Reasons for change

Within BAA, a wide business change programme focused on reducing costs required a reduction in accommodation overheads. The office relocation and redesign aimed to reduce office costs and improve flexibility in working practices among employees.

Changes implemented

To move away from the 'me and my desk' culture, team areas were converted into open plan office spaces and employees could work from any desk in their area. A key aspect of BAA's change management process was the involvement of employees. They provided their own suggestions which included: (i) café-style break out areas, and (ii) training and support during the transition period. This included 'floorwalkers' who monitored and assisted employees.

Outcomes

BAA reported property cost savings of £1.3m per annum. Staff reported increased satisfaction and higher levels of productivity in the new work environments.

Recommendations

- engage employees early in the process as it increases the likelihood they will buy into the process and provides an opportunity to gather their ideas. Methods should be wider than just 'another' staff survey – use focus groups, short opinion polls and innovative ways of gathering staff perspectives
- control at work is a key determinant of health and wellbeing and perceived control over work environment is also important. This should be provided where possible

7 Conclusion

The literature offers a vast amount of information about the links between features of the office environment and employee wellbeing. These features include office layout, office furniture, workplace lighting and temperature and employee control over their work environment. All of these factors should be considered in order to ensure that the physical characteristics of the work environment do not have a detrimental effect on engagement, productivity and wellbeing.

General recommendations

The following recommendations are overarching areas for consideration in designing, redesigning or assessing the work environment:

- recognise the potential impact of the physical office environment beyond the legal requirements of the Health and Safety Executive (HSE)
- engage staff in workplace design and where possible allow greater flexibility
- integrate evidence into practice, drawing on best and promising practice

Topic specific recommendations

Below are key recommendations for action under each of these elements of the physical work environment.

Office design

- design office environments to accommodate the varying tasks and the specific needs of the workforce
- considering privacy in open plan offices, without compromising collaboration. Private spaces and quiet rooms should be available for those who require confidential conversations and focus. Partitions allow for privacy and will mitigate noise and privacy concerns
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- furniture: promoting greater flexibility – in terms of both the adjustability of equipment as well as different working options – and considering the impact that furniture may

have on musculoskeletal disorders, which are a huge contributor to work related absence

- chairs: researchers have identified several key features of an ergonomic chair design. They should be able to rotate and have an adjustable height of 38-54cm. They should allow sufficient leg space and the ability to flex the knees by 90 degrees. They should have a backrest of 50cm to provide appropriate support

Lighting and temperature

- where possible lighting levels should be adjustable, changes in lighting levels should be gradual and employees should have local control of lighting levels
- maintain an office temperature of 22-26 degrees Celsius

Control over the work environment

- engage employees early in the process as it increases the likelihood they will buy into the process and provides an opportunity to gather their ideas. Methods should be wider than just 'another' staff survey – use focus groups, short opinion polls and innovative ways of gathering staff perspectives
- control at work is a key determinant of health and wellbeing and perceived control over work environment is also important. This should be provided where possible

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