Exploring Determinants of Healthy Workplace Elements in The Office Building

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Abstract. An ideal environment in the workplace is essential to employees and users because of its excellent and positive effect on their general well-being and health. To maintain the general well-being and health of the employee, the implementation of a healthy working environment is recommended for an office or workplace. A healthy workplace enables employees to benefit from maximum satisfaction as well as the commitment to their work, thus giving a powerful impact on the productivity of the organisation. However, employees and users have no awareness of how to produce healthy environments and practices in the workplace. Therefore, this study aimed to attain determinants of the healthy workplace in an office building through the identification of healthy workplace elements. Ample literature review was conducted to identify healthy workplace elements and criteria and further to explore its determinants. It is found that healthy workplaces comprise two factors; namely healthy environments and healthy practices. Healthy practices are generally advantageous in the short term, whereas a healthy environment gives long-term advantages. This research is expected to supply additional information to employees and employers regarding the significance of healthy workplaces, hence, it will improve the implementation of a healthy workplace in an office building.

1. Introduction

The purpose of a workplace is for employers and employees to undertake their duties. It is important to adopt a healthy lifestyle in the workplace among workers because most of their time is spent at the workplace [1]. The essential factor in determining the quality of life of workers is the comfort and health of working environments. A workplace with an ideal environment has a minimal safety hazard and free from adverse health contaminants. According to the World Health Organization [2], a healthy workplace is where everyone cooperates in order to attain an accepted vision associated with workers’ health and well-being and that of their close community. A healthy workplace includes supportive psychosocial and physical environments, a healthy culture which encourages employee health as well as stressing emotional, physical, spiritual and social components within the workplace [3].

The creation of a healthy working area allows employees and employers to enhance their health and to become more active, productive and positive and also to have a commitment to their work. A healthy workplace affects employee performance which is improved as they become emotionally and physically able to undertake their work. O’Donnell [4], confirms this opinion as he says that a higher employee performance standard results in a greater productivity level and company profit is increased.

Healthy workplaces were implemented in Malaysia in 1994 when the Occupational Safety and Health Act (OSHA) was introduced. This act provides a guideline on how to create a safe working environment which includes comprehensive information concerning guidelines, regulations and codes of practice.
The World Health Organization [5], claims that the objective of a healthy workplace includes creating a healthy, supportive and safe work environment; ensure the health protection and health promotion in management motivate a healthy lifestyle and work style; and also to have a positive effect on the local community and its surrounding areas and also on the environment.

Employers are responsible for achieving a healthy workplace and are required to provide a safe and healthy working environment. Furthermore, employers must supply and maintain a safe working environment for their employees, such environment being risk free [6]. Furthermore, they should guarantee that every supervisor, manager and employee know their occupational health and safety duties. This ought to be undertaken by documentation and consultation in order to guarantee that occupational health and safety are applied. Furthermore, employees are obliged to be responsible for generating a healthy workplace in which they are required to support and cooperate with the employer in order to achieve a healthy workplace environment.

2. Healthy Workplace Element

The Department of Occupational Safety and Health Malaysia [7], stresses the importance of healthy workplaces in generating a comfortable working environment as well as to avert employee stress and depression. Figure 1 below illustrate two elements of healthy workplace identified by World Health Organisation [8], consist of physical environment and healthy practice. It is essential that physical work environments are healthy and safe where the employees are not exposed to many hazards; for example, electrical, chemical and machine hazards which need to be controlled. They should conform to the requirement of occupational health and safety in providing a healthy environment in the workplace. Meanwhile the healthy practice includes the company’s flexibility and resources in order to support healthy lifestyle in workplaces as well as to change employee behaviour and to make employees aware of the significance of health [9]. The organisation ought to motivate employees regarding utilising flexible time for employee exercise, immunisation clinics, smoking cessation programmes, healthy food choice in the cafeteria and vending machines, stress management training, fitness club subsidies and various talks on health or disease.

![Figure 1. Element of Healthy Workplace](image)

3. Methodology

An extensive literature review was conducted to explore information related to a healthy workplace. This paper specifically aims to highlight the elements and determinants of healthy workplace to be implemented in the office building. The study begins with a review of the criteria of healthy workplace and benefits towards health and productivity of employee and employer. A list of determinants for healthy workplace in an office building was presented and discussed. The literature review was carried out to identify the element and criteria of healthy workplace and its determinants that can assist stakeholders such as building designers, facilities managers, employer and employee to take necessary action in implementing healthy workplace concept with regards to healthy environment and healthy practice. The information was obtained from various journal which contains the ‘healthy workplace’ and ‘elements’ as keywords. Other related research materials were also referred.
4. Finding and Discussion: Healthy Workplace Determinants

Table 1 below shows a list of thirty-one (31) determinant arising from integrating healthy concept and criteria in the workplace which specific to the office building. Based on the findings, four (4) categories under healthy practice element, and eight (8) categories under healthy environment element were identified. For healthy practice element, it consists of health promotion, physical activities, healthy eating and free smoking, whereas under healthy environment element, it consists of temperature, lighting, air quality, ventilation, colour, noise, cleanliness and space.

Table 1. List of determinants of a healthy workplace

| ELEMENT          | CATEGORIES         | DETERMINANTS                                                                 | AUTHORS |
|------------------|-------------------|------------------------------------------------------------------------------|---------|
| HEALTHY PRACTICE | HEALTH PROMOTION  | Health screening [10],[9]                                                    |         |
|                  |                   | Health information session [11],[12]                                        |         |
|                  |                   | Health risk appraisal [13],[3],[14],[15]                                     |         |
|                  |                   | Poster, message and information on physical activity [3],[9],[15]           |         |
|                  | PHYSICAL ACTIVITIES| Using stair [15],[12],[16]                                                   |         |
|                  |                   | Walking [17],[8],[18],[16]                                                   |         |
|                  |                   | Indoor exercise [17],[19],[16]                                               |         |
|                  |                   | Subsidizing fitness membership [18],[20],[15]                               |         |
|                  |                   | Flexible time for physical activity [21],[6],[22],[15],[12]                 |         |
|                  |                   | Recreational facilities provided [19],[23],[20]                             |         |
|                  | HEALTHY EATING     | Provide healthy food and drinks in cafeteria or vending machine [17],[24],[11],[16] |         |
|                  |                   | Provide drinking water / water filters [5],[17],[15]                        |         |
|                  |                   | Talk/seminar about healthy eating information [12],[25],[23],[20]           |         |
|                  | FREE SMOKING       | No Smoking Policy [7],[15],[16]                                             |         |
|                  |                   | Smoking cessation programs [26],[10],[8]                                    |         |
|                  | TEMPERATURE        | Using air-conditioning system [7],[23]                                     |         |
|                  |                   | Comfortable temperature [7],[19]                                           |         |
|                  | LIGHTING           | Natural lighting [19],[27],[28],[29]                                        |         |
|                  |                   | Artificial lighting [6],[15],[27],[29]                                      |         |
|                  | AIR QUALITY        | Control by air-conditioning system [6],[20]                                |         |
|                  |                   | Indoor Plant [15],[30]                                                     |         |
|                  | VENTILATION        | Natural Ventilation [7],[29]                                               |         |
|                  |                   | Artificial Ventilation [7],[31]                                            |         |
|                  | COLOR              | Bright ceiling colour                                                     |         |
|                  |                   | Light & medium wall colour                                                | [7],[6] |
|                  |                   | Dark floor colour                                                        |         |
|                  | NOISE              | Control excessive and unwanted noise [26],[6],[15],[27]                     |         |
|                  |                   | Install noise barriers [6],[15],[8]                                        |         |
|                  | CLEANLINESS        | Regular cleaning [7],[5],[32],[27],[33]                                    |         |
|                  |                   | Waste material removed daily [32],[31]                                     |         |
|                  | SPACE              | Comfortable and Sufficient                                               | [7],[6],[15],[16] |
|                  |                   | Enough space & easy movement                                               | [6],[29] |

4.1. Healthy Promotion
Voluntary participation of both management and employees is required in health promotion in the implementation of coordinated programmes which are utilised within the workplace as a location for promoting a better standard of health [35]. Healthy promotion programmes can be implemented at workplaces in various ways. This can be undertaken by health screening and health information sessions.
Such health screening includes blood pressure, weight, and hearing tests, as well as heart, cholesterol and skin checks, and also flu vaccinations. Moreover, health information sessions include topics such as men’s and women’s health, diabetes education, healthy cooking, quitting smoking programmes as well as relaxation and sleep [16]. Furthermore, Health Risk Appraisal (HRA) may be applied in order to analyse someone’s health and lifestyle for the purpose of assessing that person’s risk of preventable chronic illness or death. According to Public Health Guideline [36], the effective ways for health promotion is by placing health sign through posters or health message and information through email and brochures.

4.2. Physical Activities
Physical activity can be usefully promoted in the workplace. Therefore, employees may be motivated in several ways to participate in physical activities such as encouraging more of them to use stairs instead of lifts, and also to walk to their workplace [12,15,18,37]. Furthermore, physical activities may be undertaken by basic indoor exercises such as ‘Yoga’ and ‘Zumba’ [38]. The employers are also encouraged to help with the financial expenses incurred with physical activities outside of work; for example, sports or leisure centre memberships [15,20], as well as with the provision of recreational facilities such as a gymnasium to allow employees to use it after working hours [15,24]. Furthermore, the employer may support flexible working hours in order to enable employees to take opportunities to undertake physical activities [3].

4.3. Healthy Eating
The organisation should also be responsible for ensuring a healthy option for foods and drinks are provided in the cafeteria or vending machine [11,16-17,24]. According to Melanie et al. [39], the healthy eating concept can be support by providing comfortable and adequate space to motivate employees to eat breakfast and to have a lunch break as well as to give informative talks on the topic of healthy eating [15,24]. In addition, a sufficient supply of good-quality drinking water ought to be supplied at the workplace to encourage workers drink sufficient water for the benefit of their body [5,15,17].

4.4. Free Smoking
The World Health Organization [2], claims that smoking is one of the principle causes of death. Smoking can result in heart disease which is the cause of 30 percent of all cancer cases and 80 percent of all chronic lung diseases. Employers ought to assume responsibility for protecting the working environment by making it smoke free. It can be done through implementation of extensive smoke-free policy which assist form a culture and physical environment that promote non-smoking. By the development of this policy, a company may communicate to all employees and visitors that the workplace is committed to supplying a healthy working environment [7,15-16].

4.5. Temperature
A reasonable temperature needs to be maintained inside the building during working hours because this has an impact on workers comfort. The Department of Occupational Safety and Health Malaysia [7], claims that a comfortable temperature in the offices building in Malaysia is between 20 and 26 ºC and this temperature can be maintained by using the air-conditioning system. The air conditioning system should be placed directly to any desk or workstation situated near to windows where this location will receive more sunlight and considerably warmer than the average office temperature inside the building. Consequently, extra glass partitions, skylights or windows should be designed appropriately to ensure there is no excessive temperature in the building [7].

4.6. Lighting
Lighting is vital in any type of building. The increased amount of natural lighting in the workplace is able to enhance employee physical well-being [28-29]. The workplace or building design ought to be considered; for example, the use of glass and provision of extra windows to allow more natural lighting. Any artificial lighting ought to be enough to prevent visual fatigue and to avoid reflection or glare into workers’ eyes. Good lighting has the capability of reducing visual strain and allowing employees to see
clearly. However, poor lighting can have an impact on worker productivity as well as the health of the workers [6,19,27].

4.7. Air Quality
In offices, many factors can contaminate air quality; for example, viruses, bacteria, dust, mould spores, solvent vapours, or chemicals which are produced and utilised within the building. According to Neira [15], air conditioning systems control the air quality within an office environment. However, air conditioning also can cause air contamination due to inadequate ventilation, humidity and excessive heat build-up. Therefore, suitable control techniques for reducing air contamination should be done by regular maintenance of air conditioning units [6,15]. Besides, previous studies proved that by placing indoor plants in the building, it could help reduce carbon dioxide and remove volatile organic compounds that directly affect the indoor air quality [30].

4.8. Ventilation
Workplaces should be suitably ventilated with clean and fresh air. The Department of Occupational Safety & Health Malaysia [7], states that ventilation indicates air movement and the rate of fresh air input. Offices ought to be ventilated either by natural or artificial means. Air movement of fewer than 0.1 meters per second may cause stuffy rooms, while a movement of 0.2 metres per second can cause draughts. Although windows or other openings may give adequate ventilation, a mechanical ventilation system ought to be used where necessary. Such system should be monitored regularly as well as being kept clean and properly serviced in order to avoid the growth of bacteria or other organisms [7,29,31].

4.9. Colour
Colour choice can influence the environmental mood within the workplace and the amount of surface reflection. Department of Occupational Safety & Health Malaysia [7] and Work Safe Victoria [6] have an identical recommendation in that white or off-white is suggested for the ceiling because this reflects at least 80 percent of the light. Walls should have a reflectance of between 50 and 70 per cent and a gloss or semi-gloss finish. Walls which are close to windows ought to be a light colour, while those at a greater distance from windows should be of a moderate colour and below eye level. The floor should reflect less than 20 percent of light thus, it should be of a dark colour. In addition, the use of colourful posters and pictures alleviates the boredom of the surroundings and relieves eye strain.

4.10. Noise
Noise can be defined as a sound from internal and external sources. Internal noise includes office equipment (printers, telephones and photocopiers), people in conversation, as well as background noise caused by the building such as air conditioners and lifts. Moreover, external noise includes general industrial noise and road traffic. There are several things to do to control an excessive and unwanted noise in workplace environment such as use sound-absorbent materials in wall panels, ceiling panels, floor covering and dividing screens [6,15]. Photocopiers, printers or other noisy equipment should be placed inside separate rooms [8]. Besides that, lowering the volume setting on telephone is the easiest way to reduce existing noise levels.

4.11. Cleanliness
The cleanliness at the workplace is important things to achieve healthy workplace as it will provide comfort as well as to avoid infection of the users in the workplace. To generate cleanliness within the workplace, certain factors should be considered, such as fittings and furniture; moreover, the surface of the walls, floors and ceiling within the office building ought to be reasonably clean [5,7,27,33]. Furthermore, indoor traffic routes and floors ought to be cleaned at least weekly, and any accumulated waste material should be removed daily [31-32]. Moreover, an adequate refuse bin also should be provided to ensure that waste can be disposed of appropriately [7].
4.12. Space
The Health and Safety Executive [29], states that there are three types of space that need to be considered for comfortable and sufficient workspace comprising; primary space (lift, lobbies, amenities, meeting rooms, and similar areas); secondary space (corridors and storage); and tertiary space (individual workstation). Workstations ought to be comfortable and sufficiently spacious for people to move easily. Desks and chairs should be safe and appropriate. [7]. The volume of the room when empty, divided by the number of people normally working in it, should be at least 11 cubic meters. [6,15,38]. The Department of Occupational Safety & Health Malaysia [7], recommended personal space of at least 6 square metres per person, including fittings and furniture, but excluding passageways and amenities.

5. Conclusion
As the concern relating to health and wellbeing of workers increases, the need for integration of healthy concept in the workplace become more imperative. The healthy workplace has a strong effect on employees’ or organisation’s productivity and gives positive impact on both physical and psychological of employee. This paper describes the result of the literature review in identifying a list of determinants in an office building through the identification of healthy workplace elements. A healthy workplace is split into two (2) factors which comprise twelve (12) main categories and thirty – one (31) determinants. Some of the determinants are well-practised in Malaysia while some of the determinants are not practised due to high-cost commitment. There is also little awareness on the part of workers or users on healthy workplace thus the Government through its related agencies should update a guideline on healthy workplace to be enforced in the building. An organisation itself should develop a guideline on healthy workplaces such as advice on healthy foods provided at the meeting, no-smoking policy and etc. The findings from this paper can serve as a basis to conduct future research on the viewpoint of workers on a healthy workplace within an office building.

6. References

[1] Lowe G S 2003 Healthy Workplaces and Productivity : A Discussion Paper Economic Analysis and Evaluation Division (Canada: Health Canada) pp 4–10
[2] Guberti E and Marzocchi R 2017 The Workplace: A Priority Setting for Health Promotion, Eur. J. Public Health 27 3–5
[3] Makrides L, Heath S, Farquharson J and Veinot P L 2007 Perceptions of Workplace Health: Building Community Partnerships Clin. Gov. 12 178–187
[4] O’Donnell M P 2000 Health and Productivity Management: The Concept, Impact, and Opportunity: Commentary to Goetzel and Ozminkowski Am. J. Heal. Promot. 14 215–217
[5] Omi S 1999 Regional Guidelines for the Development of Healthy Workplaces (Regional Office for The Western Pacific) pp 5–20
[6] Fitzgerald C, Begg F, Pratt L and Kushinsky R 2006 Officewise – A Guide To Health & Safety In The Office (Melbourne: Work Safe Victoria) pp 32–45
[7] Abdullah Z, Musri M, Rahman M A, Rahman M A and Amat H C 1996 Guidelines on Occupational Safety and Health In The Office (Kuala Lumpur: Department of Occupational Safety And Health) pp 1–16
[8] Neira M 2010 Healthy Workplaces : A Model for Action (Switzerland: World Health Organisation) pp 1–15
[9] Zwetsloot G I J M, Van S A R, Dijkman A J, Heinrich J and Den B H 2010 The organizational benefits of investing in workplace health Int. J. Work. Heal. Manag. 3 143–159
[10] Goetzel R Z, Roemer E C, Liss-Levinson R C and Daniel K S 2008 Workplace Health Promotion : Policy Recommendations that Encourage Employers to Support Health Improvement Programs for their Workers Health (Irvine. Calif) 29 3–15
[11] Bennett J B, Weaver J, Senft M and Neep M 2017 Creating Workplace Well-Being (New Jersey: John Wiley & Sons, Ltd.) pp 570–604.
[12] Andersen L L, Proper K I, Punnett L, Wynne R, Persson R and Wiezer N 2015 Workplace Health Promotion and Wellbeing Sci. World J. 2015 1–6
[13] Dishman R K, Oldenburg B, Neal H O and Shephard R J 1998 Worksite Physical Activity Interventions Am. J. Prev. Med. 15 pp 344-359
[14] Aldana S G 2001 Financial impact of health promotion programs: A comprehensive review of the literature Am. J. Heal. Promot. 15 296–320
[15] Neira M 2010 Healthy Workplace Framework and Model: Background and Supporting Literature and Practices (Nottingham: Institute of Work, Health and Organisations) pp 82-98
[16] Jones G 2016 Guide to Promoting Health and Wellbeing in the Workplace (Queensland: ACT Government) pp 23-62
[17] Griffiths R and Snashall D 2006 Creating a healthy workplace: A guide for occupational safety and health professionals and employers (London: Faculty of Public Health) pp 8–35
[18] Canadian Centre for Occupational Health and Safety 2012 Physical activity and healthy habits in the workplace benefit workers, employers Retrieved on July 20, 2019 from https://www.ccohs.ca/newsroom/news_releases/20121003-11/
[19] Brown Z, Cole R J, Robinson J and Dowlatabadi H 2010 Evaluating user experience in green buildings in relation to workplace culture and context Facilities 28 225–238
[20] Burton J 2006 Creating Healthy Workplaces (Ontario: Industrial Accident Prevention Association) pp 1–24
[21] Shain M and Kramer D M 2004 Health Promotion in the workplace: Framing the concept; reviewing the evidence Occup Environ Med 61 643–648
[22] British Columbia Ministry of Health 2006 Creating a Healthy Workplace Environment Workbook & Toolkit (Karlsruhe: British Columbia Act Now) pp 1-18
[23] Edward 2016 7 Tips for Creating a Healthy and Positive Work Environment Retrieved on August 10, 2019 from https://globalhealing.com/natural-health/creating-a-healthy-and-positive-work-environment/
[24] Health & Safety Ontario 2011 Healthy Workplaces Journey to Excellence : The Complete Guide (Ontario: Workplace Safety & Prevention Services) pp 1-12
[25] Ontario Society of Nutrition Professionals in Public Health 2013 The Nine Essential Elements of a Healthy Workplace Nutrition Environment Retrieved on 20 August 2019 from https://www.osnpph.on.ca
[26] Chu C, Breucker G, Harris N, Stitzel A, Gan X, Gu X and Dwyer S 2000 Health-promoting workplaces - international settings development Health Promot. Int. 15 155–166
[27] Leblebici D 2012 Impact of Workplace Quality on Employee’s Productivity:Case Study of a Bank in Turkey J. Bus. Econ. Financ. 1 38–49
[28] Maynard G 2013 More daytime exposure to natural light is the answer to sleepless nights Express Retrieved on June 15, 2019 from https://www.express.co.uk/lifestyle/health/405022/More-daytime-exposure-to-natural-light-is-the-answer-to-sleepless-nights
[29] Health and Safety Executive 2013 Workplace (Health, Safety and Welfare) Regulations 1992 1992 No. 3004 (London: UK Statutory Instruments) pp 17-37
[30] Gou Z and Siu-Yu L S 2012 Sick building syndrome in open-plan offices: Workplace design elements and perceived indoor environmental quality J. Facil. Manag. 10 256–265
[31] Zak J, Meysenburg C, Baré U and Reich H 2011 Manual Sustainable Operation of Shopping Centers ECE manual (Karlsruhe: ECE Manual) pp 30–48
[32] Abbasazadeh S, Zagreus L, Lehrer D and Huizenga C 2006 Occupant Satisfaction with Indoor Environmental Quality in Green Buildings Proc. Heal. Build. 3 365–370
[33] Hui E C M, Zhang P and Zheng X 2013 Facilities management service and customer satisfaction in shopping mall sector Facilities 31 194–207
[34] Nutbeam D and Harris E 1995 Creating supportive environments for health: A case study from Australia in developing national goals and targets for healthy environments Health Promot. Int. 10 51–59
[35] McMurray A 2008 Community health and wellness: A socio-ecological approach J. Ageing 27 52-53
[36] Public Health Guideline 2008 *Physical activity in the workplace* NICE guideline (U.K.: National Institute for Health and Care Excellence) pp 6-12

[37] Tucker M and Smith A 2008 User perceptions in workplace productivity and strategic FM delivery *Facilities* **26** 196–212

[38] Kraybill K 2003 *Creating and Maintaining A Healthy Work Environment: A Resource Guide for Staff Retreat* Health Resources and Services Administration (U.S.: U.S. Department of Health and Human Services) pp 10-17

[39] Pescud M, Teal R, Shilton T, Slevin T, Ledger M, Waterworth P and Rosenberg M 2015 Employers’ views on the promotion of workplace health and wellbeing: A qualitative study *BMC Public Health* **15** 1–10