



Developing a WELL building model for office environments

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Received: 3 February 2023 / Accepted: 4 January 2024

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Abstract

Many reported cases of occupants in modern office buildings suffer from severe health risks, negative impacts on well-being, and productivity loss. Existing building standards often prioritize energy performance and green environments over human sustainability. Moreover, office buildings have a distinct group of occupants that require extra attention. Hence, the study aims to develop a WELL building model specifically for office buildings to support occupants' well-being, health, and productivity (i.e., WELL). To achieve that objective, this study developed a list of physical indoor building features through a systematic literature review and semi-structured interviews. Then, the features were inserted into a survey and sent to office building occupants and built environment professionals. The collected data was analyzed using the analytic hierarchy process (AHP) and confirmatory factor analysis (CFA). The findings suggest twelve new features applicable for supporting WELL in office buildings: workspace privacy, sufficient space, office layout, cleanliness, efficiency in building services, individual control, building automation system, Information Technology (IT) infrastructure, Wireless Fidelity (WiFi) risk, security system, safety at parking lots, and safe design. Also, three new concepts for supporting WELL in office buildings were established: office space, building services and maintenance, and smart systems. The new concepts and features lay a foundation for designing office buildings that comprehensively target occupants' WELL. Finally, this study is unique as it accentuates the development of a WELL building model specifically for office buildings.

Keywords Office building · WELL building model · WELL features · WELL concepts · Well-being · Health · Productivity

Introduction

Office buildings have a significant influence on occupants' well-being (Altomonte et al. 2020; Mansor and Sheau-Ting 2020), health (Fooraghi et al. 2020; Awada et al. 2021), and productivity (Al Horr et al. 2016; Tekce et al. 2020). However, modern office building designs neglect building occupants. As a result, there is an increase in reported cases of building-related illness, including fatigue, headache, dizziness, skin

itchiness, and eyes, nose, or throat irritation (Gül 2011). Ill-health results in lower productivity levels, higher sick leaves, and escalated medical costs. For example, organizations have lost 73.3 days per employee, or approximately USD 4.8 million annually, due to absenteeism from illness and presenteeism at work in Malaysia (AIA 2019). Toxic building environments, including constrained spaces, barriers to movement and interaction, and lack of personal privacy, can impact building occupants' mental well-being and behavior, lower productivity, and increase organizational loss (Too and Harvey 2012). For example, in the United Kingdom (UK), poor mental health costs UK companies estimated to suffer a production loss of GBP 30 billion annually (ACAS 2014). Furthermore, the World Health Organization (WHO) states that a hostile workplace can lead to physical and mental health problems. Globally, anxiety and depression have led to an estimated 12 billion working days loss, amounting to USD 1 trillion lost in productivity each year (WHO 2022). Hence, positive actions and interventions are necessary to protect building occupants in the long run.

In recent decades, the global built environment industry has focused on green constructions and carbon footprint

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