Jun 23rd, 9:00 AM - Jun 28th, 5:00 PM

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Citation

Fayyad, N., Lam, B., Evans, R., and Choi, Y. (2024) Workplace wellbeing and interior design: A systematic literature review, in Gray, C., Ciliotta Chehade, E., Hekkert, P., Forlano, L., Ciuccarelli, P., Lloyd, P. (eds.), *DRS2024: Boston*, 23–28 June, Boston, USA. https://doi.org/10.21606/drs.2024.901

DRS BOSTON 2024 JUNE 24 — 28

Workplace wellbeing and interior design: A systematic literature review

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doi.org/10.21606/drs.2024.901

Abstract: This paper offers a systematic review of the literature on workplace wellbeing and interior design, exploring the creation and evaluation of appealing environments that enhance employee wellbeing. This paper adopts a systematic approach to review using the guidelines of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Multiple databases were searched. The final review included 55 studies out of 472 that examined factors related to workplace wellbeing. The findings of this study suggest that background noise and open-plan workspaces negatively affect workplace wellbeing, while visual connections with plants and natural objects enhance it. This paper extends the current literature in two ways. Firstly, by highlighting key factors that impact workplace wellbeing. Secondly, it divides factors that contribute to workplace wellbeing into three categories: positives, negatives, and moderate impact factors. Design professionals and workplace managers can utilize this information to identify features that contribute most to the overall work environment.

Keywords: workplace wellbeing; interior design, office design; physical environment

1. Introduction

Wellbeing is considered a complex multi-dimensional construct (Dodge et al., 2012) that began to be used more widely to describe a positive condition of a person or a group in relation to social, economic, political, physical, and mental health; however, spiritual aspects are also considered (Sfeatcu et al., 2014). Despite its complexity and varying definitions, similar concepts have emerged. For instance, Satisfaction with Life (Cole et al., 1999; Cummins, 1995, 1998; Diener & Emmons, 1984; Diener & Suh, 1997), Happiness (Costa & Mccrae, 1980; Lyubomirsky & Lepper, 1999; Pollard & Lee, 2003; Waterman, 1993; W. R. Wilson, 1967), Quality of Life (Diener & Ryan, 2009; Felce et al., 1995; Shin & Johnson, 1978; Zikmund, 2003), Positive Functioning (Joseph & Maltby, 2014; Joseph & Wood, 2010; E. Lee & Carey, 2013; Rusk & Waters, 2015), and Balance (Cummins, 2010, 2016; Dodge et al., 2012;

Ryff & Singer, 2008), have all been used to describe wellbeing more broadly and accurately. Workplace wellbeing commonly relates to wellbeing in working environments. The Job Demands–Resources (JD-R) Theory (Bakker & Demerouti, 2017; Demerouti et al., 2001) proposes that the characteristics of interior spaces can act as demands, causing environmental stresses or resources, by facilitating relaxation and social cohesion. However, the International Labor Organization (ILO, 2018), believe that wellbeing involves all aspects of working life, from the constituent elements of the working environment (e.g., working hours) to how workers feel in their workplace (i.e., their perceptions about various aspects of working life).

The office setting is known as a physical representation of organizational culture. It is, therefore, crucial that office settings maintain their employees' needs to keep existing talents and attract new ones (Gallup, 2017; Vischer, 2008). This physical representation should have flexible layouts which can be easily renovated as needed, as well as offering cost savings for organizations (Charles & Veitch, 2002; B. Haynes et al., 2017; Pejtersen et al., 2006). The design of a workplace encompasses the use of spatial components, lighting, surface treatments, furniture, and accessories to achieve appropriate functional and de-sired visual quality (Ching & Binggeli, 2012). For instance, light, heat, sound, and people pass through wall openings; acoustics and lighting are affected by the height of the surface and materials used, while the amount of sunlight that enters a space can be tempered using special window treatment. Technical installations and construction buildings may not be smoothly and effortlessly changed, while interior space elements are easier to handle to redesign the workplace physical environment to keep current and better reflect the wellbeing of its inhabitants (i.e., employees). Studies suggest, however, that the positive potential of workplaces are not fully recognized by current practice and, therefore, designers and building managers must adopt high level measurements to design the next generation of workplaces, taking into consideration the positive potential that the workplace can yield (Clements-Croome et al., 2019).

Interior Designers have studied the relationship between wellbeing and workplace for decades. For example, the definition set by the Council for Interior Design Qualifications (CIDQ) describes Interior designers as overseeing improving the human experience through elevating health, safety, and welfare. The human experience, as defined by CIDQ (2019), is the "influence of the moment-to-moment physical and sensory elements found within the intimate details of interior space that impact on occupants' emotions, health and overall feelings" (Council for Interior Design Qualification (CIDQ), 2019). This is supported by Vischer, (2008) who concludes that occupants need more than just health and safety; they need an environment that supports their psychological, as well as physical wellbeing. Interior design is, therefore, considered how the human experience is created and the product of that experience will either successfully support the user's tasks and wellbeing or fall short of those goals.

Various studies have explored environmental effects on employees in workplaces. This is because physical settings in work environments are considered a tool to achieve higher organizational wellbeing. However, since modern corporate real estate practice started operating

predominantly under a cost reduction paradigm, in which efficiency is generally prioritized over effectiveness, which is evident in the transition from private to open-plan offices to achieve greater space efficiency (Harris, 2019; B. P. Haynes, 2007), making the changes in working life across the world a common perception (Cox & Griffiths, 1995; Schabracq & Cooper, 2000). Such changes have led to new challenges and problems for organizations and employees. Many of these changes mean that workers are under growing pressure to compete, adapt, and learn new skills in order to meet the demands of their work (Cox & Griffiths, 1995), which in turn decreases their wellbeing. Ultimately, the limited theoretical understanding, when translated into practice, did more harm than good (Ashkanasy et al., 2014; Sander et al., 2019) which has made it harder to achieve a positive design in which employees' wellbeing is fulfilled.

This paper aims to examine available and eligible data by approaching the literature systematically to establish how variables of interior spaces affect employees' workplace wellbeing.

2. Methods

"The aim of a literature search is not to retrieve everything, but to retrieve every-thing of relevance while leaving behind the irrelevant" (Petticrew & Roberts, 2008). This paper performs a systematic review of available literature related to workplace wellbeing and interior design. To make the reporting process of the review more transparent, the researcher follows the guidelines established by Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) (Moher et al., 2015).

This paper focuses on interior space variables affecting workplace wellbeing and is based on a total of (55) studies which are included in the final review of (472) studies. The comprehensive search strategy included various test searches. The search terms and strategy used to collect data that linked interior design to the related topic are stated in Figure 1. As a result of their representation in the literature in both modes, the two terms "Wellbeing" and "Well-being" have been used interchangeably. Each title's full text should contain all the keywords that were inserted into the reference journals' databases, not just its title and abstract. To ensure this, keywords were inserted into the reference journals' databases with double quotes. Multiple databases were consulted, namely: Scopus, Web of Science, Google Scholar, etc.

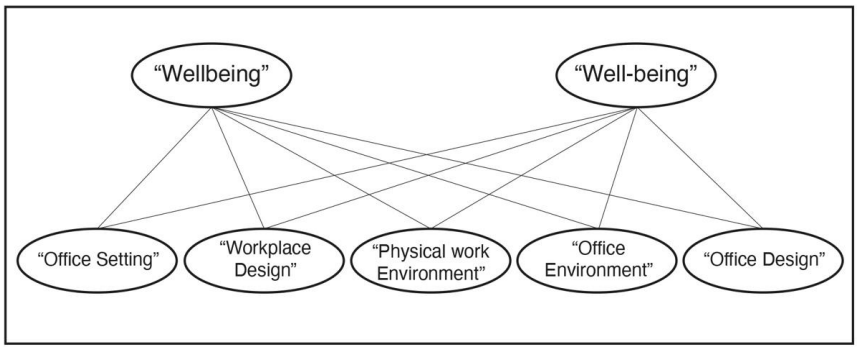

Figure 1 Search terms and strategy

Before screening and reviewing took place, the preliminary database search, as shown in Figure 2, was performed in three phases. First, titles were scanned to exclude all irrelevant papers. Second, abstracts were studied to identify relevant and irrelevant papers. Third, based on the identified features, the papers were classified. Hence, in order to summarize the research results, initial classifications were developed. Table 1 presents the eligibility criteria used in each phase. This integrated selection process resulted in a total of 55 identified studies.

Table 1 Criteria used to select paper for inclusion and exclusion.

Categories	**Inclusion**	**Exclusion**
Setting	Administrative office buildings or office floors	Doctor's office or factories
Dependent variables: (measures)	Psychological Well-being/ Well-being or papers with 50% and above measuring wellbeing	Not directly measuring psychological wellbeing, such as engagement being less than 50% concerned with wellbeing
Independent variables: (relating to interior design)	Measures of actual or perceived interior space, comprising spatial characteristics and arrangements, lighting, surfaces.	Relating to building construction, technical installations, facility services, and technologies

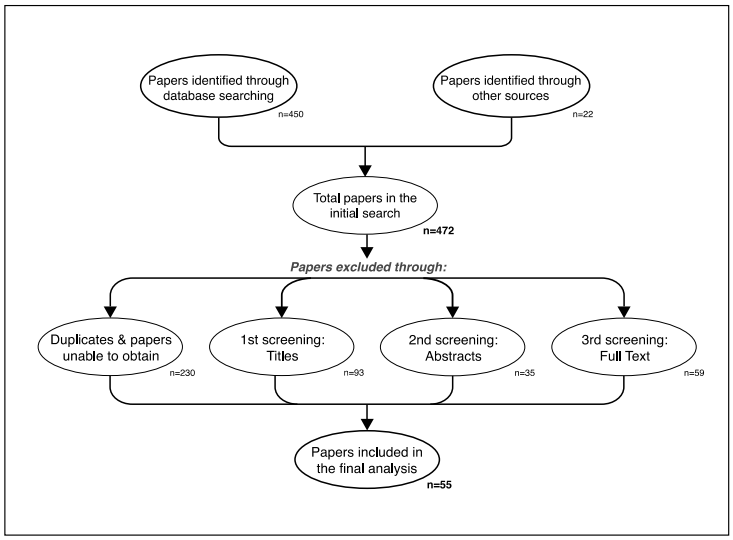

Figure 2 Screening process

Based on the collected papers, a standardized template was developed and tested to extract the data from all papers. Five components were included in the template, as shown in Table 1. While some papers studied other dependent variables; this review only re-ports those related to psychological wellbeing. Lastly, the studied interior workplace variables were gathered organized and categorized using content analysis, following the instructions of (Krippendorff, 2004), and (Miles & Huberman, 1994). The investigated psychological wellbeing aspects underwent the same analysis procedure, as conclusions were drawn based on existing research about workplace design, as well as the evidence it revealed about the effects of design on employee wellbeing.

Although interior space variables may be related, there are indications that the measures identified differ in numerous ways. The systematic approach followed in this study identified several interior space variables which, when rigorously studied, promoted positive physiological attitudes that impacted on the quality of work produced by employees. As shown in Figure 3, the relationship between wellbeing and interior variables in the workplace are divided into three categories in related literature: (1) studies that identify the variables with negative effects (i.e., open office plans and background noise), (2) studies that include variables that have more of a positive effect than a negative one, and (3) studies that demonstrate positive effects on wellbeing which are identified with all variables included in this paper (i.e., daylight, individual control, and natural elements).

Noise was identified as one of the strongest contributors to disturbing employee wellbeing, together with open office spaces, which lack privacy and, in turn, lower the rate of employee wellbeing in the workplace. Conversely, daylight and visual connection with greenery objects were shown to increase employee wellbeing and raise productivity.

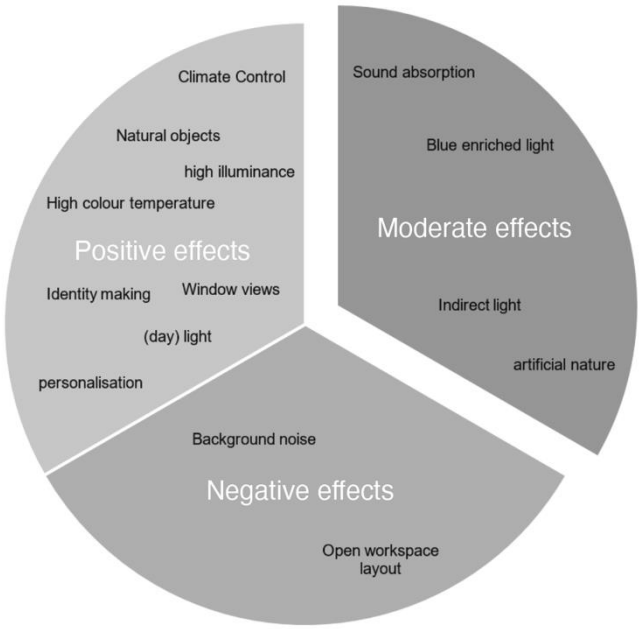

Figure 3 Relationships between identified variables and wellbeing

3. Results

3.1 Characteristics of studies

The literature shows that designing workplace interiors carefully, and considering employee psychological wellbeing, is an upcoming research area with 472 papers published in the past 42 years. Different disciplines are included in the final papers collected. Articles reviewed involve field research, laboratory research, and reviews. Most applied research designs are cross-sectional and use controlled field studies. The remaining studies are divided into prospective reviews (pre-test and post-test), longitudinal (one pre-test and at least two post-test), or systematic reviews of the literature. The methods used vary widely and not all articles report the effect size.

3.2 Features identified

In the papers collected, the commonly studied features of interior space were Layout (15 papers), Biophilia (14 papers) and Light (11 papers), covering most of the included papers. The others concerned noise (8 papers) and individual control inside the workplace (7 papers). Following a detailed description of the interior design variables, a summary analysis is presented.

Light and wellbeing

According to a study by Preto & Gomes (2018) workplaces that use adjustable light levels throughout the day promote happier employees which means better psychological wellbeing levels. This is achieved by creating a sense of space and depth and giving visual comfort (Králiková et al., 2021). For increasing employee wellbeing, potential daytime architectural lighting characteristics were identified by (Sithravel & Ibrahim (2021) and marked for further investigation in windowless workplaces in tropical contexts. These characteristics included five main factors (i.e., intensity, spectrum, timing, duration, and space distribution). The amount and quality of light in individual workspaces is determined in part by the amount and quality of light available from natural and artificial sources through walls, translucent surfaces, and reflections on polished and light-colored materials. Psychologically, high illuminance and a high color temperature affect employees' wellbeing positively, as suggested by De Kort & Smolders (2010). Some studies also indicated that physical and psychological wellbeing can be developed through adequate light levels and the quality of light (Lamb & Kwok, 2016; Thayer et al., 2010; Veitch et al., 2008; Viola et al., 2008), but not alertness (van Duijnhoven et al., 2018); further, more daylight was seen to enhance sleep quality (Bjornstad et al., 2016a; Boubekri et al., 2014; Sithravel & Ibrahim, 2021). In Table 2, a summary of the papers that addressed light, in relation to workplace wellbeing, is presented.

Table 2 Examples of studies investigating light and wellbeing.

Paper	Authors	Interior space variable	Findings
Lighting in the Workplace: Recommended Illuminance (Lux) at Workplace Environs	(Preto and Gomes, 2018)	Light adjustments	Adjustable light levels increase employee wellbeing rates.
A Longitudinal Investigation of Work Environment Stressors on the Performance and Wellbeing of Office Workers.	(Lamb and Kwok, 2016)	Perceived light level (combined with noise and thermal comfort)	Due to headaches, an increased use of pain-killers was directly linked to stressors caused by the environment (light, noise, and temperature). While exposure to comfortable light levels ($p < .05$) had positive effects on employees' mood in the workplace.
Nature Contact and Organizational Support during Office Working Hours: Benefits relating to Stress Reduction, Subjective Health Complaints, and Sick Leave.	(Bjørnstad *et al.*, 2016)	Amount of sunlight	There was a significant association between more indoor nature contact, including sunlight, and better health, better organizational support, and less sick leaves.

Layout and wellbeing

In workplace layout, objects within the environment are arranged and physically defined (Y. S. Lee, 2010). Open-plan workplaces are classified by various employees sharing one room with no separation between individual workstations by fixed structural elements (e.g., walls) or movable partitions. The studies reviewed reveal that open-plan design has a substantial impact mostly on communication and office costs, but also has negative effects on employee attitudes and behavior, both of which influence employees' wellbeing (James et al., 2021), see Table 3. The positive effects include flexible designs that allow for increased communication and efficient workflow (Bernstein & Turban, 2018), which can improve knowledge sharing between workers, and easier supervision; further, open plan designs are often lower in rent charges and offer lower maintenance costs which are beneficial to office managers. The negative effects are apparent in increased stress, illness, higher levels of distraction, reported job dissatisfaction, and decreased work feedback (Shafaghat et al., 2014), due to collaboration not being always serendipitous but rather intentional (Ayoko & Ashkanasy, 2020).

For office work requiring concentration and no distraction, cellular offices provide a means of dividing up open-plan areas, in which walls enclose single or private rooms (Danielsson & Bodin, 2008; Seddigh et al., 2014). A well-known type of cellular office is the cubicle workspace where each cubicle typically holds up to five employees; they offer enclosed desk spaces for each employee with partitions between desks. Roberts et al (2019) found that cellular offices benefit employees by providing a reduction in visual distraction, leading to increased task perseverance. However, such designs may have a negative impact as they may reduce collaboration among employees.

Another type of workspace layout that aims to support both concentration and communication is the combi-office. These are divided into individual rooms or open-plan offices, both of which contain assigned workstations. Additionally, work concentration and communication both formally and informally are improved by providing in a formal or informal basis (Bodin Danielson, 2008; De Been & Beijer, 2014). However, due to high rental rates, such offices are considered expensive for organizations for single office rooms as well as unoccupied group areas (van Meel, 2011). Alternatively, Active-based Flexible Offices (A-FOs) are environments in which the main area is in an open-plan, semi-open or enclosed common-use location for activity-related purposes (Wohlers & Hertel, 2017). As a new way of working, recent years witnessed worldwide corporate relocation boost to Activity-based Flexible Offices (AFOs) (Kim, 2016). Advantages include providing spaces suitable for both concentrated work alongside networking opportunities and communication responding to work needs (Ayoko & Ashkanasy, 2020). On corporate level, benefits of A-FOs are detected through reducing overhead costs, and increasing flexibility, innovation, and productivity (De Been & Beijer, 2014; Hirst, 2011; Kim, 2016; Morrison & Macky, 2017).

Interaction and good idea exchange among colleagues are achieved via openness of the main work environment. However, by choosing from a variety of (enclosed or open) activity-related working locations, employees can reduce the negative impacts of openness of work environments such as noise and interruptions. Doing so increases employees' sense of control over their work environment and thus their sense of wellbeing (Wohlers & Hertel, 2017). In Table 3, a summary of the papers that address office layouts in relation to workplace wellbeing is provided.

Table 3 Examples of studies investigating layout and wellbeing.

Paper	Authors	Interior space variable	Findings
Office Layout Affecting Privacy, Interaction, and Acoustic Quality in LEED-certified Buildings.	(Lee, 2010)	Cubicle workspace, enclosed private and shared offices.	People in high cubicles showed significantly lower satisfaction and job performance in relation to visual privacy and interaction with co-workers than both enclosed private and enclosed shared office types. They also showed significantly lower satisfaction with noise level and sound privacy and lower job performance perceived by acoustic quality than enclosed private, enclosed shared.
A Comparison of Psychological and Work Outcomes in Open-Plan and Cellular Office Designs: A Systematic Review	(James *et al.*, 2021)	Open-Plan vs Cellular Office	Relocation to an open-plan workplace has very few potential benefits.
The Physical Environment of Office Work: Future Open Plan Offices.	(Ayoko and Ashkanasy, 2020)	Open plan office	Open plan office environments of the future might affect possible areas of work; for example, work design, interpersonal processes, noise and distractions, human resource management (HRM) practices and leadership.

Noise and wellbeing

Speech clarity and increased background noise are identified as negative features affecting physical and psychological wellbeing in the workplace. Noise is influenced by many characteristics in the interior workplace, and the ability to absorb or reflect sound waves is only affected in part by the materials used and room dimensions (Seddigh et al., 2015).

A study indicated that greater sensitivity to noise increases the response to auditory stimuli at a physiological level, which is characterized by a stronger response to stimuli during the recovery phase and a slower recovery to baseline (Park et al., 2018). Disturbance and annoyance (Schlittmeier & Liebl, 2015), along with self-rated fatigue (Jahncke et al., 2011) are negative effects caused by higher sound levels. According to data collected from employees in a survey, more than half of the respondents considered office noises and sounds to negatively affected their wellbeing (Borsos et al., 2021; Fayyad et al., 2022). Moreover, physiological stress increases when affected by higher sound levels (Shafiee Motlagh et al., 2018) but using other indicators has not had any effects on physiological stress as emphasized by Jahncke et al (2011). At the cognitive level, this is demonstrated as increased involuntary attention to auditory stimuli, more difficulty refocusing after the interruption, resulting in increased noise interference, and time wasted due to noise in the office space (Kaarlela-Tuomaala et al., 2009). Table 4 provides findings of the papers that address noise and workplace wellbeing.

Table 4 Examples of studies investigating noise and wellbeing.

Paper	**Authors**	**Interior space variable**	**Findings**
Effects of Noise Sensitivity on Psychophysiological Responses to Building Noise.	(Park *et al.*, 2018)	Noise sensitivity	Noise sensitivity was found to affect physiological responses, whereas noise levels showed no significant influence.
The Comfort Map – A Possible Tool for Increasing Personal Comfort in Office Workplaces	(Borsos *et al.*, 2021)	Indoor environmental quality	Combining the negatively and strongly negatively perceived IEQ parameters, more than half of the respondents (53.7%) considered office noises and sounds as the IEQ parameter that negatively affected their wellbeing.
Effects of Acoustic Environment on Work in Private Office Rooms and Open-plan Offices – Longitudinal Study During Relocation	(Kaarlela-Tuomaala *et al.*, 2009)	Acoustic environment	Those working in the private offices found the variability of noise to be higher. The radius of distraction (rD) was under 3 m in the private offices, but over 9 m in the open-plan offices.

Biophilia and wellbeing

As a result of mankind's innate desire to associate with the natural world, "Biophilia", the urge to be one with the environment, has been described by E. O. Wilson, (1984) in his book "Biophilia". After observing frequent migration to urban areas and the accelerating rate of urbanization and the disconnection from nature that has followed, he felt a need to promote this world.

Establishing workspaces with natural elements is thought to be essential to creating environments that are more beneficial for human wellbeing (Ryan et al., 2014), in which employees report up to 15% more perceived wellbeing levels than employees in workspaces with no natural elements (Cooper & Browning, 2015). Several methods exist for including nature in the design of a building, but the simplest and most widely adopted one is using natural materials (Burnard & Kutnar, 2015; Kellert, 2013). It has been suggested that building materials such as wood are perceived by users as being more natural than many other building materials, resulting in a more sustainable and cost-effective connection to the natural environment (Burnard et al., 2015; Burnard & Kutnar, 2015). A study by (Shen et al (2020) concluded that occupants of wooden rooms had better cognition than occupants of concrete rooms, which suggests interior building materials affect cognition.

Studies also show that visual connection with greenery in the built environment is often associated with the perception of wellbeing. 'Greenery objects help to improve the acoustic soundscape as they absorb, diffract, and reflect sound noise, depending on the room's physical properties, as well as to improve indoor air quality (depending on plant type), which impact our chemoreceptors and interceptors and therefore our bodily function (Cooper & Browning, 2015). For example, seeing nature, experiencing natural light (Fayyad et al., 2022), and hearing the sound of water help increase the perception of calm and wellbeing among employees. Moreover, interactions between greenery and humans can be active, in the case of usable spaces, or passive, for example, if it is created by the view of indoor plants, the view of the green from a window (Ulrich, 1984), or even only the view of some green element representations. In previous studies, it has been suggested that taking a break outside, having plants inside, and letting the view of greenery in the office elevates psychological wellbeing (Korpela et al., 2015). This was evident in a series of studies of office employees in the US (Largo-Wight et al., 2011), Norway (Bjornstad et al., 2016b), and the UK (Hähn et al., 2021). Therefore, designing a green workplace (e.g., green walls, fresh air, green items, green rest areas, natural scents) is essential. An effort like this can help to reduce employee psychological stress (Hähn et al., 2021). Table 5 provides findings of the papers which address biophilia and workplace psychological wellbeing.

The awareness of environmental and wellbeing benefits, combined with the effect of aesthetic awareness and attractiveness of the green in the design, has led to the construction of buildings in which natural elements play a fundamental role (Oberti & Plantamura, 2017). Moreover, studies indicate that window views influence and contribute significantly to well-

being. Exposure to natural views in the workplace is considered to be a key element in promoting wellbeing, therefore organizations are now interested in redesigning their workplace to achieve such element, which in turn improves wellbeing (van Esch et al., 2019).

Table 5 Examples of studies investigating biophilia and wellbeing.

Paper	Authors	Interior space variable	Findings
Biophilic design patterns: emerging nature-based parameters for health and well-being in the built environment	(Ryan et al., 2014)	Visual connection to nature	Nature views appear to reduce stress, improve emotional functioning, and speed recovery. Additionally, it can assist in the adaptation to windowless spaces, showing that people intuitively add nature content and respond positively to simulated nature.
View through a Window may Influence Recovery from Surgery.	(Ulrich, 1984)	Window views	Surgical patient assigned to rooms with window overlooking a natural scene has shorter postoperative hospital stays. They received fewer negative evaluations in nurses' notes, compared to those with windows facing a brick building wall.
Biophilic design and office planting: a case study of effects on perceived health, well-being, and performance metrics in the workplace.	(Hähn et al., 2021)	Indoor plants	Interaction between humans and nature can lead to increased attention, creativity, productivity, efficiency, health, wellbeing, and motivation, as well as a reduction in stress and fatigue.

Individual control and wellbeing

According to a survey distributed to employees, having control of the environment resulted in negative outcomes (Fayyad et al., 2022). However, the majority of the literature suggests

that personalization and control enhances a person's attachment to their environment, expressing their identity and individual control (Wells, 2000). The likelihood to adjust conditions of the workspace (Bluyssen et al., 2011; Boerstra et al., 2015; Joines et al., 2015; Knight & Haslam, 2010; Toftum, 2010), and workstation personalization (Wells, 2000), are two types of control addressed in the literature that have positive links to psychological wellbeing as well as, to a lesser extent, physical. It is worth mentioning that controlling a single aspect in the workplace will lead to controlling other aspects (Boerstra et al., 2015; Toftum, 2010). Negative effects related results on employees' wellbeing inside work environments especially open-plan ones, is linked to having little, to no control over some elements of the environment (e.g., desk personalization, light and sound control, and ventilation) (Kwon et al., 2019). Table 6 provides a summary of the papers that address individual control and workplace wellbeing.

Table 6 Examples of studies investigating individual control and wellbeing.

Paper	**Authors**	**Interior space variable**	**Findings**
Comfort and Performance Impact of Personal Control over Thermal Environment in Summer: Results from a Laboratory Study.	(Boerstra et al., 2015)	Control of personal desk fan by desk or others	Temperature, air movement, ventilation, light, and noise were judged as being more controlled in the self-control condition, which was preferred. thermal comfort scored no differences.
Adjustable Task Lighting: Field Study assesses the Benefits in an Office Environment.	(Joines et al., 2015)	Adjusting task lighting	Adjusting the task lights, increased levels of both visual comfort and musculoskeletal comfort were reported.
Personal Control and Environmental User Satisfaction in Office Buildings: Results of Case Studies in the Netherlands.	(Kwon et al., 2019)	Personal control over environmental control system	Higher controllability leads to more satisfaction in terms of thermal and visual comfort. psychological impact of personal control on user satisfaction and wellbeing was revealed showing differences in perceived satisfaction according to “no control” and “do not have” be-

	tween thermal and visual comfort. Personal control of ventilation was the most significant factor influencing the satisfaction with thermal comfort.

4. Discussion

Space variables are interrelated, and there is a strong connection between them. Interactions between those variables may occur within the physical work environment, for instance, the layout openness extends idea exchange between employees, but can cause high exposure to noise and a lack of individual control and privacy. However, employees can still get exposed to noise from other elements of the surrounding environment such as ventilation system units even when in a closed or semi-closed office setting (Fayyad et al., 2022).

Upon reviewing the literature, to positively influence employee psychological wellbeing in their workplaces, workspaces should be designed to relieve the effects of workplace psychological stressors (e.g., noise). The built environment can facilitate this by connecting people with nature and potentially improving stress responses, including recovery, by transforming interior environments to appear natural to people. Lighting plays an important role in improving psychological wellbeing and performance for those working in natural light environments, it also has an objective impact on the reduction in drowsiness. Thus, the perception of more attractive spaces is increased with better lighting.

It was also evident that higher sound levels increase physiological stress (Shafiee Motlagh et al., 2018). Increasing involuntary attention to auditory stimuli, difficulty refocusing after interruptions resulting in increased noise interference, and lost work time due to the noise in the office workspace are examples of this phenomenon (Kaarlela-Tuomaala et al., 2009). Open-plan office environments promote the exchange of ideas and better communication (Bernstein & Turban, 2018). Alternatively, it promotes higher levels of distraction, dissatisfaction, and thereby lower levels of wellbeing (James et al., 2021; Shafaghat et al., 2014). Additionally, in open-plan office environments, poor outcomes have been linked to a lack of control over specific elements for instance desk personalization (Kwon et al., 2019) and light adjustability (Preto & Gomes, 2018).

5. Conclusion

This systematic review highlights the paucity of research on the relationship between workplace design and employee wellbeing. The features studied include light, layout, noise, biophilia and individual control. It provides directions for designing wellbeing-friendly workspaces by focusing on improving the variables that score higher rates of wellbeing. The study also highlights that addressing certain factors at work is important, but that doesn't mean

it's the way to achieve wellbeing. To achieve maximum benefits from integrating specific interior design variables, office users should be included in the design process. Getting them involved has multiple rewards, including increased profitability and employee retention by designing productive working environments. This study could be expanded by validating the findings with designers, managers, and policymakers. Furthermore, by investigating the interrelationships between interior design variables we will gain a deeper understanding of workplace wellbeing and how it impacts employees. It is also important that future research incorporates more multidisciplinary perspectives that take social dimensions into account. It is imperative that industry and academia collaborate more if we are to achieve more rigor in our results. Both design and policy research perspectives may enrich the debate. Research in the anthropology of interior architecture and psychology may also assist in developing and implementing new approaches to creating a healthy working environment, while also contributing to the growth of workplace research. However, this review has several limitations. For example, only three databases were consulted alongside other sources which restricts the types of peer-reviewed articles collected. Other types of publications can be considered in future research, such as trade magazines, doctoral dissertations, and other scientific reports.

This study is one step towards establishing a roadmap for developing a comprehensive evaluation of each variable. By utilizing variables identified in this literature as key themes in ethnographic research, the researcher intends to create an evidence-based intervention that meets the specific needs of office users. The results of this review will also be used to understand the interrelationships between different variables when coexisting in the same environment.

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