

Human health oriented design approaches in office buildings: Salutogenic model

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Abstract

Office buildings have frequently changed from the past to the present due to historical factors (the collapse of empires, colonialism and expansionist policies, the industrial revolution, wars, the development of technology, epidemics, etc.) and the transformations these factors have created in user needs. Office designs, based on user health and productivity, have also had to keep pace with the changing needs of the age. Therefore, the design of office spaces is an important criterion that reflects how people feel and how it affects their work performance. Research examining the relationship between health and office environments often focuses on a single variable (noise, lighting, office layout, air quality, etc.) and addresses the pathogenic effects of the physical environment, while largely ignoring salutogenic components. Thus, there is a need for a theoretical framework and a holistic approach that encompasses health-promoting research data by adopting the concept of “salutogenic,” introduced by sociologist Aaron Antonovsky, which aims to address the origins of health and promote well-being in a positive manner. The aim of this article is to explore how the adoption of salutogenic principles in the architectural design of offices can positively affect the physical, mental, and social health of employees and how this process should be managed. The data obtained through a literature review method enable the application of salutogenic models in office buildings. Within the scope of this study, Antonovsky’s concept of the salutogenic model is examined, and the adaptation of design models developed based on this concept is discussed in the context of office buildings.

Keywords: Aaron Antonovsky, human health, office buildings, salutogenic approach, salutogenic design theories

1. Introduction

Office buildings have undergone significant changes from past to present due to historical factors such as the collapse of empires, colonialism and expansionist policies, the industrial revolution, wars, technological developments, and epidemics, as well as the transformations these factors have created in user requirements. Accordingly, office design, shaped by considerations of user well-being and efficiency, has had to adapt to the evolving needs of each era. In this context, the early 20th century marked a critical turning point with the emergence of Taylorism and the increasing emphasis on employee well-being, which brought worker health to the forefront as a key concern. Given that individuals spend a considerable portion of their daily lives indoors, the built environment has both direct and indirect impacts on health. Within this framework, the design of a space establishes the conditions for the activities that take place within it, either facilitating or hindering professional tasks and social interactions. In this way, it influences how individuals perceive, experience, and behave in that environment (Ruohomäki et al., 2015). Therefore, the spatial organization and atmosphere of office environments play a crucial role in shaping individuals’ well-being, productivity, and overall work experience.

This study adopts a salutogenic perspective by integrating sustainability considerations into architectural design and explores how office spaces can be organized and managed to promote and

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Article history: Received 04 July 2025, Revised 22 December 2025, Accepted 21 March 2026, Published 30 April 2026

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enhance human health. The concept of “salutogenesis,” introduced by sociologist Aaron Antonovsky, focuses on promoting health through a positive framework (Antonovsky, 1979). Rather than concentrating on factors that cause illness, the salutogenic approach emphasizes the enhancement of well-being by addressing the fundamental origins of health. In this respect, it highlights the relationship between individuals and the built environment in terms of well-being, vitality, social interaction, and mental health. Furthermore, it supports the development of sustainable and health-oriented ecosystems by emphasizing environmental factors such as air, water, and soil.

The salutogenic approach seeks to understand how individuals manage and adapt to stress. According to Antonovsky, a stronger sense of coherence in response to stress is associated with improved physical and psychological well-being. In this regard, the model explains the dynamic relationship between health, environmental context, stressors, and coping mechanisms. Antonovsky (1979) defined health not merely as the absence of illness, but as an active process in which individuals maintain coherence and functional capacity while navigating internal changes and evolving relationships with their surroundings.

In healthcare research, a paradigm shift has occurred from pathogenic approaches toward health-promoting approaches. In this context, numerous empirical studies have examined the effects of building environments on user well-being and performance. A substantial body of evidence addresses health and comfort issues among office workers (Clements-Croome, 2011; Bluysen, 2013). However, most empirical studies on office environments have adopted a pathogenic perspective, focusing on factors such as indoor environmental quality, thermal comfort, visual comfort, air quality, and acoustics, primarily aiming to prevent illness or discomfort. Research exploring positive spatial qualities that enhance user satisfaction, health, and well-being in workspaces remains limited (Ruohomäki et al., 2015). Within the built environment context, healthcare architecture researchers have explicitly adopted the salutogenic paradigm and examined architectural strategies designed to strengthen patient health (Golembiewski, 2010). Yet, the salutogenic concept has received relatively little attention in workplace-related literature. Existing studies often take a general approach, without specifically addressing how workplace interventions influence individuals’ sense of coherence—comprising meaningfulness, manageability, and comprehensibility (Dilani, 2009; Ruohomäki et al., 2015; Roskams & Haynes, 2020).

Architect Alan Dilani, founder of the International Academy of Design and Health, proposed integrating Antonovsky’s principles into the built environment, particularly in healthcare architecture. Following this approach, many designers have adopted a health-focused philosophy and incorporated it into architectural, interior, and urban design practices within workplace environments (Ziegler, 2014). As salutogenic principles have been applied in healthcare facilities, it has become increasingly important to develop and integrate design strategies that support human health from a psychosocial perspective into contemporary office design practices.

Today, architectural design approaches are shifting from viewing spaces solely through functional and aesthetic criteria toward a more holistic perspective that supports individuals’ social, physical, and psychological health. Within this framework, design approaches such as biophilic, active, neuro-architectural, adaptive, agile, inclusive, and mindfulness-based design offer valuable insights into promoting health across multiple dimensions. However, these approaches often address health through relatively isolated aspects, such as physical activity, cognitive performance, emotional regulation, or accessibility. From a health-oriented perspective, they implicitly support components of Antonovsky’s Sense of Coherence—comprehensibility, manageability, and meaningfulness. Nevertheless, this support often remains fragmented, as design strategies are treated as thematic interventions rather than being explicitly integrated within a holistic theoretical model. In this context:

- Biophilic design supports psychological well-being by reconnecting with nature,
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- Active design encourages physical activity,
- Neuro-architecture focuses on cognitive and emotional processes,
- Adaptive design prioritizes functional flexibility,
- Agile design aims for flexible and productive work environments that save time,
- Inclusive design emphasizes accessibility and equality principles,
- Mindfulness-based design supports calmness and focus.

In contrast, salutogenic architecture offers a more comprehensive and systematic approach by integrating physical, psychological, and social health parameters within the framework of the Sense of Coherence, rather than treating these aspects as independent strategies. This study contributes to the literature by systematically adapting Antonovsky's Sense of Coherence framework to office environments. The three components of the Sense of Coherence—comprehensibility, manageability, and meaningfulness—are examined through spatial, environmental, and organizational design factors specific to office buildings. In this context, comprehensibility is linked to open-plan layouts that enhance spatial readability, as well as color and lighting strategies that support wayfinding. Manageability is promoted through biophilic design elements that strengthen employees' perceived environmental control, adjustable lighting systems, and ergonomic, flexible furniture. Meaningfulness is addressed through design approaches such as shared spaces that encourage social interaction, and by fostering emotional connections between users and their work environments through corporate identity and opportunities for personalization. By translating abstract salutogenic principles into practical design parameters, this approach provides a structured framework for evaluating and improving office environments from a holistic, health-oriented perspective.

Accordingly, this study adopts a theory-driven narrative literature review to examine the relationship between office design and physical, psychological, and social health within a salutogenic framework. This study focuses on open-plan offices, encompassing health-oriented environments that integrate flexible work arrangements, such as activity-based design, agile design, and hybrid work, along with design strategies like biophilic and inclusive design. The literature was surveyed using academic databases and platforms, including PubMed, Google Scholar, Elsevier, SpringerLink, Wiley Online Library, Taylor & Francis Online, BMJ, and IJERPH (MDPI). Searches employed combinations of keywords such as Aaron Antonovsky, salutogenic approach, salutogenic design, salutogenic architecture, health-oriented office buildings, Sense of Coherence, psychosocially supportive design, and health and well-being. The review covers studies published from 1979, when Antonovsky introduced the salutogenic model, through 2025, reflecting the development of salutogenic and health-oriented design research up to the present.

2. Human Health Parameters

The Constitution of the World Health Organization, adopted at the International Health Conference held in New York in 1946 and entering into force in 1948, defines health as “a state of complete physical, mental, and social well-being, and not merely the absence of disease or disability” (World Health Organization, 2020). As the concept of health encompasses multiple dimensions, including medical, social, economic, and spiritual factors, ongoing debates regarding its definition have persisted (Larson, 1999). However, this definition has also been criticized for its ambitious use of the term “complete” in describing health (Huber et al., 2011).

In 1986, during the first International Conference on Health Promotion and Development, the World Health Organization introduced a new perspective through the Ottawa Charter, defining health as a process that enables individuals to increase control over and improve their own health. According to this framework, achieving complete physical, mental, and social well-being requires that individuals or groups be capable of identifying and fulfilling their aspirations, addressing their needs, and adapting to or transforming their environment. Health, therefore, is understood not as

the ultimate goal of life, but as a fundamental resource for everyday living. It encompasses both personal and social resources, in addition to physical capacities. Consequently, promoting health is considered a shared responsibility that extends beyond the healthcare system alone (World Health Organization, 1986). A balanced approach that equally values the physical, mental, and social dimensions of health throughout the lifespan is a key determinant in enhancing overall well-being (Azzazi & Nafiz, 2016).

Health is defined in terms of various factors that interact in a complex, comprehensive, integrated, and synergistic manner. Beyond the health sector, which plays a leading role in the process of health development, individuals, groups, organizations, communities, and nations all have significant responsibilities. While each individual is responsible for improving their own lifestyle, organizations are responsible for providing healthy, safe, and supportive environments that promote well-being (Azzazi & Nafiz, 2016).

It is essential to create environments in which individuals can feel healthy, comfortable, and secure; freely express themselves through their ideas and actions; and maintain positive social relationships. In addition to needs that individuals can directly control (such as nutrition, sleep, and stress management), individuals must also maintain good physical, mental, and social health to cope with environmental factors beyond their control (such as the built environment, culture, and economy). The physical, social, and mental dimensions of health integrate the individual with their environment, enabling movement toward higher levels of functioning or optimal well-being. Due to the dynamic interaction among these dimensions, no single dimension can be separated from or function independently of the others (Roscoe, 2009) (Figure 1).

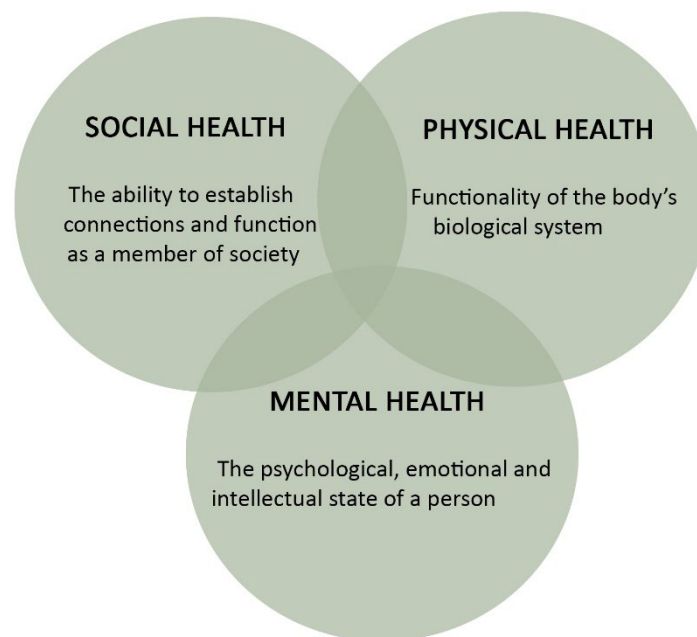


Figure 1 Dimensions of health (Amzat & Razum, 2014)

Understanding the concept of health is essential, as an imbalance in any part of the body can affect the functioning of the entire system. Accordingly, a disruption in one component of health may lead to short-term or long-term effects on other components. Adequate sleep, balanced nutrition, and regular physical activity are key determinants of physical health. For instance, inadequate nutrition and the consumption of carbohydrate-rich snacks may lead to hypoglycemia (a drop in blood sugar below normal levels), resulting in reduced cognitive performance, including slower perception and shorter attention span. Conversely, proper and sufficient nutrition that provides adequate protein, vitamins, and minerals to meet energy requirements has been shown to increase work productivity by approximately 20% and to reduce negative outcomes such as absenteeism, workplace accidents, and stress (Bor, 2020).

Sleep quality and duration play a decisive role in cognitive and psychological functioning. Insufficient or poor-quality sleep is associated with negative outcomes such as reduced perception speed, anxiety, and stress (Litwiller et al., 2017). Sleep is essential for various physiological processes, including brain function and overall systemic regulation. In this context, the short-term consequences of sleep disturbances include increased stress sensitivity, somatic pain, reduced quality of life, emotional distress, and impairments in cognition, memory, and performance (Medic et al., 2017). Conversely, even short daytime naps have been shown to improve cognitive performance, particularly by enhancing alertness. Accordingly, napping is culturally accepted in the business environment in Japan and is supported by some organizations as a productivity-enhancing practice (Dutheil et al., 2021). Similarly, companies such as Googleplex, Zappos, and Uber have incorporated dedicated rest areas into their office environments, allowing employees to sleep and rest during working hours.

Insufficient physical activity negatively affects not only physical health but also personal and behavioral attributes such as self-confidence, leadership, and empathy. It is also associated with social and mental health issues, including depression and anxiety (Park et al., 2022). In response, some organizations have begun to integrate physical activity into daily work routines. For example, Unilever's headquarters in Hamburg promotes cycling to work and organizes in-office sports programs.

Beyond individual health behaviors such as sleep, nutrition, and physical activity, both the built and social environments serve as important contextual determinants of health. Environmental factors—including indoor air quality, access to nature, thermal comfort, acoustics, and lighting conditions—along with social interaction, organizational culture, and social support, have significant effects on individuals' physical and psychological well-being. For example, studies indicate that contact with nature supports mental health (Xiang et al., 2025), enhances attention and cognitive performance (Fukumoto et al., 2024), and fosters creativity (Williams et al., 2018). Furthermore, empirical research demonstrates that visual exposure to natural elements or landscapes in work environments can positively influence employee well-being (Gilchrist et al., 2015; Kaplan, 1993).

3. Salutogenic Approach

3.1. Definition of the Concept of Salutogenic

To fully grasp the salutogenic perspective, it is essential to trace the evolution of how health has been defined globally. According to medical sociologist Antonovsky (1979), people constantly encounter stress, illness, or challenges throughout their lives. Therefore, by criticizing the WHO's conception of health as "not merely the absence of disease or disability, but a state of complete physical, mental, and social well-being," he argues that it is impossible for everyone to be in a state of complete well-being. Furthermore, while the WHO's definition treats illness and health as completely separate concepts, Antonovsky argues that people are never completely healthy or completely ill; instead, they are constantly somewhere between health and illness (Antonovsky, 1979). In his influential work *Health, Stress, and Coping* (1979), Antonovsky introduced the term "salutogenic," which emphasizes the promotion of health and well-being rather than the prevention of disease. The word itself combines the Latin *salus* (health) and the Greek *genesis* (origin), referring to the study of the origins of health (Boscherini, 2017).

Antonovsky (1996) emphasized that salutogenesis should encompass the whole person, rather than concentrating solely on specific diseases, disabilities, or individual traits. He argued against narrowing the focus to isolated aspects, instead advocating for a more comprehensive understanding of human health. The primary goal of the salutogenic model is to enhance individuals' capacity for health and to position well-being as a foundation for leading a fulfilling and productive life (Eriksson & Lindström, 2008). Broadly speaking, the term "salutogenic" describes a scientific orientation centered on identifying the origins of health and the elements that actively support it, as opposed to examining the causes of illness and associated risks (Mittelmark & Bauer,

2017). While the salutogenic approach directs attention toward resources that foster positive health outcomes, the pathogenic model focuses on mitigating risk through prevention, protection, and treatment. Despite these differing approaches, both ultimately aim to support individual health (Figure 2) within the surrounding environment (Mittelmark & Bauer, 2017). This framework aligns with Antonovsky's perspective that people continuously move along a spectrum between health and disease.

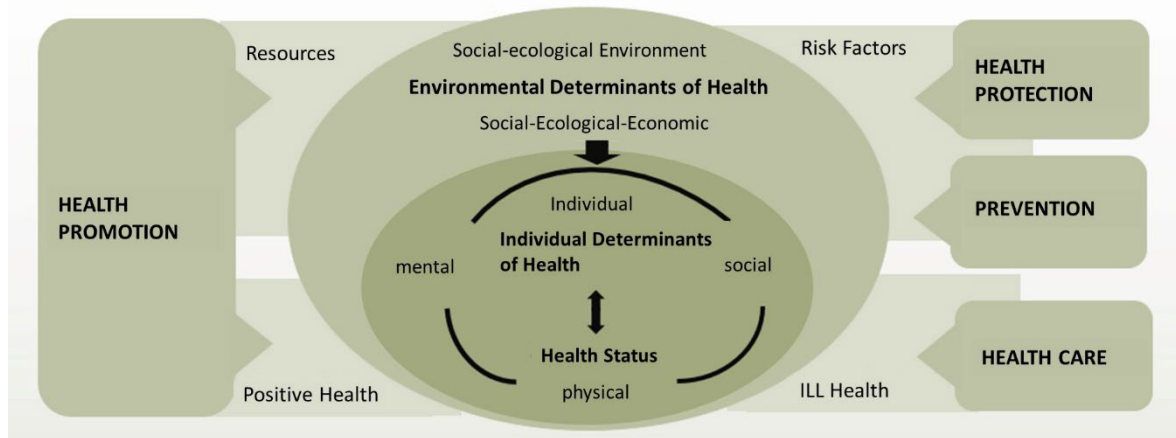


Figure 2 Relationship between salutogenic and pathogenic approach (Mittelmark & Bauer, 2017)

Salutogenic theory is a model that focuses on health rather than disease (Golembiewski, 2022; Mittelmark & Bull, 2013). Traditional medical approaches are usually pathogenic-oriented; that is, they aim to prevent or treat diseases. However, Antonovsky argues that this is not sufficient. The salutogenic approach aims to ensure that people remain healthy by improving their ability to cope with stress and difficulties. Antonovsky explains the difference between salutogenic and pathogenic approaches using the metaphor of “teaching swimming instead of preventing falling into the river.” He emphasizes that individuals cannot completely avoid stress or illness; however, they should be enabled to cope with these challenges by developing resilience (Antonovsky, 1987). The characteristics of Antonovsky's (1987) salutogenic orientation are summarized as follows:

- 1) Instead of a sharp categorisation of sick-healthy, Antonovsky sees health as an ever-changing process in which everyone is at a certain point.
- 2) While conventional medicine focuses on the causes of the disease, Antonovsky emphasises that this is not enough, it is important to consider the individual's whole life history, environment and coping strategies.
- 3) Instead of focussing on the causes of disease, it is necessary to focus on the factors that help people to maintain their health and become healthier.
- 4) Antonovsky states that stress is not a negative thing and in some cases it can strengthen the individual.
- 5) Rather than looking for a single miracle cure, Antonovsky recommends addressing all the factors that support the individual's adaptation to their environment.
- 6) It also emphasises that studying individuals who can stay healthy in the same environment will contribute to health policies as well as disease factors.

3.2. Salutogenic Design Parameters

Salutogenic originated in 1971 when Antonovsky, based on interviews with a group of Israeli women who survived concentration camps during the Holocaust in World War II and entered menopause, introduced the Sense of coherence in stressful situations and serious difficulties, where some remained healthy while others failed to remain healthy (Eriksson & Lindström, 2008). Thus, salutogenic, the source of health, is a stressor-oriented concept that focuses on resources,

sustaining and developing movement towards health. It answers why people stay well despite stressful situations and difficulties (Lindström & Eriksson, 2005).

Antonovsky's salutogenic model includes several core concepts for understanding how health is maintained and improved. One of the main defining features of the model is the sense of coherence. Another key concept is generalized resistance resources, which refer to protective factors that enable individuals to cope with stress. Antonovsky argues that generalized resistance resources—such as cognitive resources (problem solving, critical thinking), social support (family, friends), material resources (economic security), cultural resources (beliefs, values), and psychological resources (self-confidence)—function as protective factors that help individuals manage stress. He also emphasizes that these resources play an important role in the development of the sense of coherence (Antonovsky, 1987). The stronger these resilience resources are, the more effectively individuals can cope with stressful situations.

The sense of coherence refers to the ability to perceive life as meaningful, manageable, and understandable. According to Antonovsky, the stronger this sense is (Figure 3), the more resilient individuals are to stress. For the sense of coherence to be high, individuals must possess sufficient generalized resistance resources. Accordingly, individuals with strong social support, education, and economic security are expected to be more resilient to stress. For generalized resistance resources to function effectively, it is therefore essential that individuals have developed a strong sense of coherence.

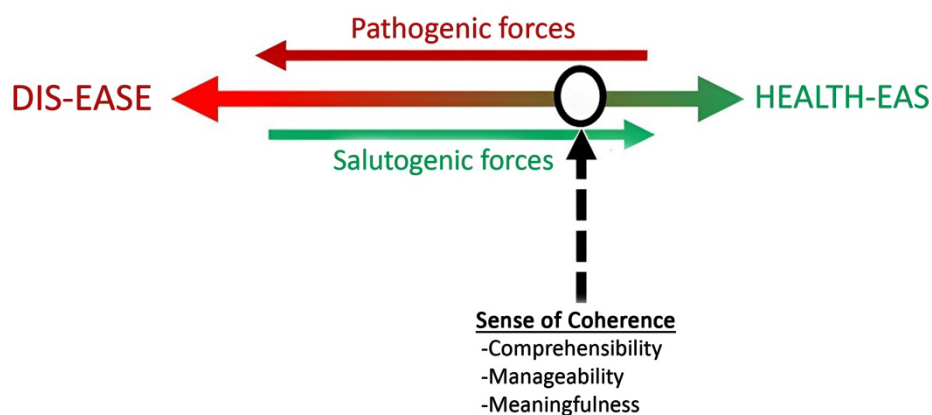


Figure 3 A sense of coherence on the health – illness continuum (Roskams & Haynes, 2020)

The concept of sense of coherence represents an individual's perception of life and their ability to handle stressful experiences. It reflects a mindset and behavioral orientation shaped by internal assurance, enabling individuals to recognize, access, and effectively apply the resources available to them (Lindström & Eriksson, 2005). According to Antonovsky (1987), this sense is composed of three core dimensions: comprehensibility, manageability, and meaningfulness.

Manageability: Manageability refers to an individual's belief that they have the resources required to cope with the difficulties in their life. In other words, individuals should perceive that they are not alone in facing sources of stress and that they can overcome these difficulties through internal and external resources, such as social support, skills, and economic opportunities (Antonovsky, 1987). Manageability also refers to having the physical resources and actions necessary to sustain life. In architectural terms, it encompasses environments designed in a way that allows individuals to meet their physical needs. In this context, accessibility and inclusive design are considered important elements of manageability (Golembiewski, 2022).

Comprehensibility: Comprehensibility refers to an individual's perception of the events they encounter as logical, structured, and predictable. In other words, individuals should feel that the events in their lives are not random or chaotic, but occur within a certain order (Antonovsky, 1987). Comprehensibility relates to an individual's ability to make sense of both their internal and external

environment. In an architectural context, it is associated with the ability to easily read one's surroundings, orient oneself, and understand the functioning of space (Golembiewski, 2022).

Meaningfulness: Meaningfulness refers to an individual's perception of life events as meaningful and worth overcoming. It reflects the belief that life's challenges are not merely burdens, but also opportunities for development and personal growth (Antonovsky, 1987). Meaningfulness is considered the strongest motivational resource enabling individuals to continue their lives. While manageability and comprehensibility may facilitate survival, they are not sufficient on their own; meaningfulness is the most critical component. Meaningfulness is an abstract concept, whereas architecture deals primarily with concrete and physical realities. Since individuals' search for meaning is abstract and personal, this may pose challenges for architects attempting to design spaces that respond to diverse user needs (Golembiewski, 2022).

According to Lindström and Eriksson (2005), comprehensibility corresponds to the cognitive dimension, manageability reflects behavioral responses, and meaningfulness represents the motivational component. In the model proposed by Rakhshani and Khakzand (2025), comprehensibility is associated with mental health, manageability with physical health, and meaningfulness with social well-being. When these three components function together, individuals are better able to cope with stress and maintain a healthier life (Antonovsky, 1996). Empirical studies examining the relationship between sense of coherence, mental health, and psychosocial behaviors indicate that individuals with a strong sense of coherence experience fewer mental health problems, such as depression and anxiety, and show lower susceptibility to heart disease. Additionally, positive physical health indicators—such as lower diastolic blood pressure, lower resting heart rate, and higher oxygen uptake capacity—have been identified among these individuals (Eriksson & Lindström, 2006).

Burton and The World Health Organization (2010) defines a healthy workplace as an environment in which everyone works together toward a common vision that supports the health and well-being of employees and the surrounding community. Such workplaces include elements that protect and promote health and safety in terms of physical, psychological, social, and organizational conditions (Burton & World Health Organization, 2010). Although the salutogenic model and the concept of sense of coherence have increasingly gained attention in various fields, including architecture and the built environment, comprehensive research identifying specific physical elements that support health remains limited. The majority of existing studies focus on the salutogenic approach primarily within treatment and rehabilitation settings (Rakhshani & Khakzand, 2025; Dietscher et al., 2017; Pelikan, 2022). The concept of a salutogenic work environment has not been extensively explored in the academic literature, even though several positive architectural elements have been implemented not only in healthcare facilities but also in conventional workplace settings (Dilani, 2005).

Office designs that support the Sense of Coherence contribute to reduced stress levels, increased productivity, and greater employee well-being. Comprehensibility is supported by factors such as spatial order, clarity, and functional organization, while manageability can be enhanced through ergonomic solutions and technological support. Meaningfulness can be fostered through motivating design elements that help employees perceive value and purpose in their work. Numerous design strategies related to these components can be further developed and integrated into office environments. This approach, which aligns closely with salutogenic design principles, contributes to transforming offices into environments that actively support employee health and well-being rather than serving solely as places of work. Roskams and Haynes (2020) examine the non-exhaustive list that is open to developing the office design approach regarding the sense of coherence as follows:

Comprehensibility in Offices:

- Establishing clear and regular rules regarding the use of different functional work areas.
 - Ensuring active participation of employees in change processes.
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Manageability in Offices:

- Supporting employees' perception of environmental control through the use of biophilic design elements.
- Making arrangements that encourage social harmony in shared areas.
- Increasing physical activity through adjustable furniture.

Meaningfulness in Offices:

- Designing personal desks to allow for individual identity expression.
- Clearly communicating the organizational purpose to employees through the corporate brand.

3.3. Salutogenic Design Theories

3.3.1. Alan Dilani – Psychosocial Supportive Design

In the 1990s, architect Alan Dilani, founder and general manager of the International Academy of Design and Health (IADH), built upon Antonovsky's health-supporting model and proposed its application to architecture. Dilani addressed architectural design approaches that support health rather than disease by associating design qualities and building materials with the characteristics of the physical environment (Ziegler, 2014). He introduced the Psychosocially Supportive Design paradigm in the architectural design of healthcare facilities by applying Antonovsky's salutogenic principles. Dilani argued that interdisciplinary approaches are necessary to explore the applicability of positive architectural features that reduce stress not only in healthcare facilities but also in existing workplaces and the broader built environment (Dilani, 2005). Following this, Dilani—together with numerous architects, designers, and theorists—has explored Antonovsky's theory more comprehensively and has begun to reinterpret architecture, interior environments, and urban planning through a salutogenic lens (Ziegler, 2014). The aim of Psychosocially Supportive Design is to stimulate mental processes that attract human attention—such as creativity, satisfaction, pleasure, and fulfillment—by positively supporting health both psychologically and socially, and to provide a practical guide for designers and planners seeking to enhance health through physical design (Dilani, 2001, 2004).

As emphasized by Dilani, the Psychosocially Supportive Design approach serves as an effective framework for helping designers and planners understand how the built environment can positively influence human health. It highlights that the implementation of salutogenic design strategies is essential for creating environments that support human well-being and encourages collaboration across multiple professional disciplines to establish optimal living and working conditions. These principles primarily aim to initiate cognitive engagement by capturing human attention, thereby helping to reduce anxiety levels and stimulate positive emotional states (Yeang & Dilani, 2022). According to Dilani, the essential elements of these principles can be outlined as follows (Dilani, 2009; Yeang & Dilani, 2022):

- 1) **Comprehensibility:** It includes order, such as eliminating visual chaos that requires predictability and readability. For example, Wayfinding / Colors / Nature / Perception / Landmarks / Novelty / Interesting Elements (such as making interior stairways interesting)
- 2) **Manageability:** It includes access to resources that can be managed, familiarity with the environment, social support, etc. For example, Natural Light / Aesthetic Elements / Ergonomic Design // Green Environments / Interior Design / Restoration / Stimuli
- 3) **Meaningfulness:** It includes interest in positive stimuli, providing visual and aesthetic meaning. For example, Comfort / Music / Art / Social support / Culture / Sports / Positive Distractions / Pets

The senses—such as sight, taste, hearing, smell, and touch—are fundamental elements that shape the aesthetic experience. Surfaces that provide a pleasant tactile sensation, evocative scents, or expressive colors strengthen this sensory interaction. As a result, individuals' interaction with the environment is enhanced, and the value of a well-designed place is perceived more clearly

(Dilani, 2005). Consequently, psychosocial design supports individuals' sense of coherence by stimulating them both mentally and socially.

3.3.2. Rachel and Stephen Kaplan – Restorative Theory of Attention

Attention Restoration Theory, developed by Rachel Kaplan and Stephen Kaplan (1989), was introduced in their book *The Experience of Nature: A Psychological Perspective*, in which they outlined how exposure to natural environments can support and improve mental well-being (Kaplan & Kaplan, 1989). Interaction with nature reduces cognitive fatigue by helping to replenish depleted attentional resources. According to this theory, the attentional resources of the human mind are limited and become depleted through excessive use. The theory also distinguishes between two types of attention—directed and involuntary—and examines the interaction between them. Involuntary attention refers to a form of focus that arises naturally without conscious effort, whereas directed attention requires individuals to concentrate through deliberate effort (Kaplan & Kaplan, 1989; Kaplan, 1995; Yeang & Dilani, 2022).

Within the restorative approach, it is stated that natural environments should possess four basic characteristics in order to meet individuals' needs for renewal and mental restoration (Kaplan & Kaplan, 1989; Kaplan, 1995):

Being Away: This characteristic provides a break from the pressures of daily life and from elements that cause mental fatigue. Nature offers individuals a setting that enables relief from stress and pressure. However, the sense of separation does not necessarily require physical distance from the environment. Mental disengagement from stressful thoughts within the same physical setting can also generate a feeling of being away (Kaplan & Kaplan, 1989; Kaplan, 1995; Herzog et al., 2003).

Extent: This characteristic suggests that the environment should be explorable and sufficiently inclusive. In this sense, the environment should draw individuals in, create a sense of continuity, and offer a meaningful sense of wholeness (Kaplan & Kaplan, 1989; Kaplan, 1995). Such environments do not need to be large in scale; even compact spaces can evoke a sense of completeness, provided that they offer adequate cognitive stimulation through their content and organization (Herzog et al., 2003).

Fascination: Fascination is one of the most important qualities offered by nature in the process of attentional restoration. It includes elements that capture an individual's attention effortlessly, without causing mental fatigue. Natural features such as flowing water, leaves moving in the wind, or birdsong support mental renewal by directing attention in a gentle and non-demanding way (Kaplan & Kaplan, 1989; Kaplan, 1995).

Compatibility: Compatibility describes the degree of alignment between an individual's needs and the environmental conditions or resources available to meet those needs. An environment functions as a more effective restorative setting when it supports the expectations, intentions, and goals of the individual (Kaplan & Kaplan, 1989; Kaplan, 1995).

Prolonged use of directed attention increases the likelihood of errors by leading to impatience, irritability, and mental exhaustion. Consequently, negative outcomes such as loss of concentration, inattention, reduced willingness to cooperate, and decreased performance may occur (Yeang & Dilani, 2022). Attention Restoration Theory suggests that employees' exposure to nature in workplace settings depends both on the frequency of outdoor green breaks and on the extent to which work environments possess restorative qualities. The presence of indoor plants, water features, windows with views of nature, nature-themed visual elements (such as photographs, images, or videos), and the use of natural sounds enhance the restorative capacity of workspaces, thereby supporting employees' cognitive renewal. As a result, attention can be directed more efficiently and levels of mental fatigue are reduced (Gonçalves et al., 2023).

3.3.3. Heerwagen – Salutogenic Design Theory

Heerwagen, Heubach, Montgomery, and Weimer (1995) investigated the impact of the work environment on employees' health and examined how environmental changes can be used to manage occupational stress in the workplace. In their studies, they emphasized the positive effects of designing office buildings in accordance with salutogenic principles on employee health and work efficiency (Heerwagen et al., 1995). For example, factors such as daylight, natural landscapes, visually engaging wall surfaces, biophilic elements such as plants, and opportunities for social interaction influence individuals' psychological (mood) and cognitive responses (productivity, motivation), thereby playing an important role in stress reduction and overall health (Heerwagen et al., 1995; Bergefurt et al., 2023).

Heerwagen et al. (1995) examined the physical environment from the perspective of person–environment fit by developing a design framework grounded in environmental psychology. They emphasized that, within the context of person–environment fit, individual characteristics such as age and personal preferences, as well as users' physical needs, should be taken into consideration (Heerwagen et al., 1995). This conceptual framework supports Antonovsky's concept of sense of coherence by providing a general evaluative tool for understanding the relationship between the work environment and user well-being (Heerwagen et al., 1995; Ziegler, 2014).

- 1) Defining the fundamental human needs associated with workplace environments.
- 2) Determining the environmental attributes and conditions that influence the satisfaction of these needs.
- 3) Recognizing indicators that signify alignment or misalignment within the work setting, particularly in relation to stress levels and overall well-being (Heerwagen et al., 1995).

These indicators are closely associated with the core components of manageability, meaningfulness, and comprehensibility. Research has highlighted several critical environmental factors—such as acoustic regulation, control over social interactions, and opportunities for personalizing space—as essential elements in shaping these experiences (Ziegler, 2014). The elements that support employee health in effective office design, addressed within the framework of person–environment fit, are articulated in Heerwagen's (1998) article "Design, Productivity and Healthy Living: What Are the Links?" as follows:

- Environmental sustainability includes environmentally sensitive designs with the use of energy efficient systems and materials. Solutions that encourage natural light and ventilation both save energy and increase employee comfort. In addition, the integration of green spaces and biophilic design elements provides a healthier working environment by reducing employee stress levels.
- Organisational effectiveness is directly related to open office spaces and flexible space arrangements that encourage collaboration. Modular designs allow workspaces to be reshaped according to need, while noise control and acoustic comfort increase employee focus and productivity.
- Human well-being (employee health and well-being) is supported by meeting employees' needs for privacy and personal space. The ability to control temperature, light and air quality in the workspace improves individual comfort and increases overall job satisfaction. In addition, common areas and recreation zones that support social interaction positively affect employee motivation and psychological well-being.

Design elements under these three headings contribute to the creation of healthy and sustainable working environments by increasing productivity at both individual and organisational levels (Heerwagen, 1998).

3.3.4. Daniel Stokols – Socioecological Theory

The socioecological approach developed by Stokols (1992) offers a holistic model that evaluates human health within the framework of multi-layered relationships between personal attributes and

both physical and social environmental factors. In this approach, first, health is shaped not only by biological or behavioral factors but also through the dynamic interplay between the individual and both the physical environment (architecture, geography, technology) and the social environment (culture, economy, politics) in which they live (Stokols, 1992; Stokols et al., 2013). Second, environments are evaluated not only in terms of their physical or social characteristics but also through multidimensional perspectives, such as objective (actual) and subjective (perceived by the individual) effects, proximity to individuals and groups, independent environmental characteristics (e.g., noise, temperature, lighting, spatial arrangement, and group size), and broader structural patterns (Stokols, 1987, 1992; Schneider & Stokols, 2009).

Third, the socioecological approach advocates the combined use of multiple methods and analyses at different scales by examining participants across multiple levels, including individuals, small groups, organizations, and societies, suggesting that multi-actor health interventions are likely to be more effective. Fourth, while individuals are influenced by their environments, they also actively shape those environments through their own behaviors, and this reciprocal relationship plays a significant role in the formation of health conditions (Stokols, 1992; Schneider & Stokols, 2009).

Stokols (1992) explains the socioecological approach within the framework of environmental design principles based on physical health, emotional well-being and social harmony (Table 1) (Stokols, 1992; Yeang & Dilani, 2022). These design principles guide what features health-supporting spaces should have.

Table 1 Dimensions of Health-Promoting Environments from an Ecological Perspective (Stokols, 1992)

Facets of healthfulness	Environmental resources	Behavioral, psychological, and physiological outcomes
Physical health	Injury-resistant design; ergonomically sound design; nontoxic and nonpathogenic environment, physical comfort	Physiologic health; perceived comfort, absence of illness symptoms and injury; genetic and reproductive health
Mental and emotional well-being	Environmental controllability and predictability; environmental novelty and challenge; symbolic and spiritual elements; low distraction; aesthetic qualities	Sense of personal competence, challenge and fulfilment; developmental growth; strong sense of personal identity and creativity; feelings of attachment to one’s physical and social milieu; minimal experience of emotional distress
Social cohesion at organizational and management community levels	Availability of social support networks; participatory design and processes; organizational flexibility and responsiveness: economic stability; health-promotive media and programming; low potential for intergroup conflict	High levels of social contact and cooperation; productivity and innovation at organizational and community levels; commitment to and satisfaction with organization and community; high levels of perceived quality of life; prevalence of health-promotive, injury- preventive and environmentally protective behavior

This socioecological approach was developed to understand the effects of environmental factors on individual health and to support the creation of health-promoting environments, and it provides a comprehensive foundation for health policies and environmental design approaches (Stokols, 1992). In addition, by examining health–environment interactions across multiple levels, it encourages the involvement of actors operating at different scales—such as individuals, families, groups, organizations, and societies—within the process (Stokols, 1992; Stokols et al., 2013).

3.3.5. Roger Ulrich – Supportive Design Theory

Supportive Design Theory, developed by Roger S. Ulrich in 1991 in response to the increasing effects of environmental factors on human psychology, offers an important perspective, especially

in the fields of health and architectural design, by emphasizing the stress-reducing role of the physical environment. According to Ulrich's research, especially in healthcare structures, he argues that, in addition to the physical needs of different types of users (patients, staff, visitors), stimuli such as social support and positive distractions are also important for health (Ulrich, 1991, 1992). Supportive Design Theory, which focuses on the concept of stress, includes three components that will positively promote health:

Ulrich (1991) emphasizes that an individual's perceived ability to influence their surroundings significantly contributes to stress reduction. When users are able to modify environmental factors such as lighting, sound levels, thermal conditions, privacy, and spatial layout based on their personal needs and preferences, this fosters a sense of psychological well-being and autonomy (Ulrich, 1991). Similarly, Steptoe and Appels (1989) state that individuals with a sense of control cope with stress more effectively and that this has positive consequences for health (Steptoe & Appels, 1989).

Access to social support: Ulrich argues that supportive design should be organized in a way that strengthens individuals' social networks. In this context, shared spaces, comfortable seating arrangements, furniture arrangements, and spatial organizations that encourage interaction support psychological well-being by increasing social ties between individuals (Ulrich, 1991).

Positive distractions in physical environments: Ulrich's research shows that elements of nature and aesthetically pleasing spatial elements serve as positive distractions. According to experimental studies, elements such as plants, water features, works of art, natural light, and outdoor views have been shown to reduce individuals' stress levels, relieve cognitive load, lower blood pressure, reduce anxiety, and support general well-being. These stimuli have increased the importance of biophilic design principles by affecting emotional, cognitive, and behavioral perception (Wohlwill, 1968; Ulrich, 1991). Ulrich's (1991) studies show that the restorative effect of nature creates positive results both psychologically and physiologically. Studies show that patients who stay in rooms with a view of trees after surgery recover faster than those who stay in rooms with a view of brick walls (Ulrich, 1991, 1992).

Ulrich's Supportive Design Theory aims to reduce individuals' stress levels and promote a healthy life through the conscious organisation of the physical environment. The combination of social support, a sense of control, and positive distractions creates healing environments at both individual and societal levels. Although this theory has been used especially in healthcare buildings, it also provides an important framework to guide design decisions in spaces with high stress levels, such as offices and educational buildings.

4. Findings and Discussion

According to the findings obtained as a result of the literature review, health in office design should be addressed not only with a pathogenic approach aimed at preventing diseases, but also with a salutogenic perspective that focuses on mental, physical, and social well-being. The sense of coherence (comprehensibility, manageability, meaningfulness), which is the basis of the salutogenic model, improves employees' health in a positive way by increasing their ability to cope with stress. According to the salutogenic approach, open plans, orientation systems, and spatial order in office structures are compatible with the principle of comprehensibility; ergonomic furniture, biophilic design elements, and environmental control opportunities are compatible with the principle of manageability; and personalization opportunities, art, culture, and social interaction areas are compatible with the principle of meaningfulness, affecting employees' motivation and general well-being. A conceptual framework that aims to develop employees' sense of coherence, and that reveals how office spaces can be best designed and managed to mitigate workplace stress (Figure 4), offers important implications for office practices (Roskams & Haynes, 2020). This figure presents the study's original contribution by operationalizing the Sense of Coherence framework within office environments and translating its components into actionable design strategies.

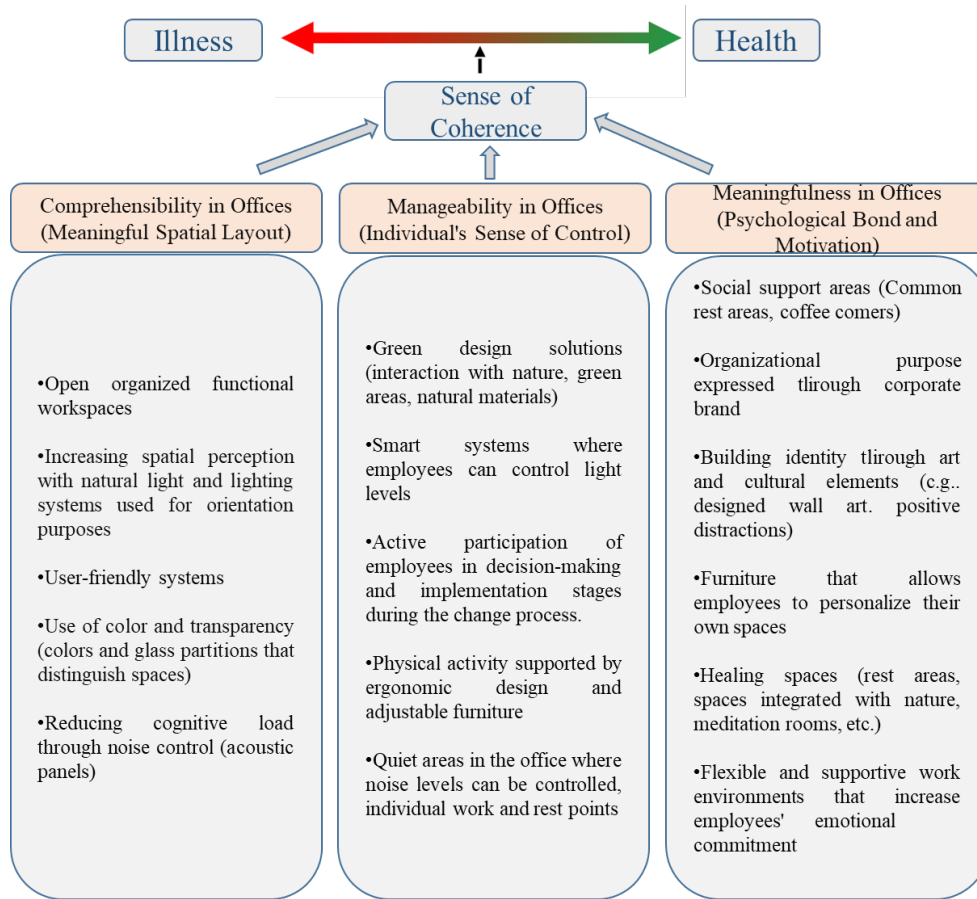


Figure 4 Suggested design factors associated with a sense of coherence (It was developed based on the work done by Roskams and Haynes (2020), Dilani (2009))

Although reducing pathogenic elements in the office environment is an important step, it is not enough to fully optimize workplace health and productivity. Environmental resources defined as salutogenic elements increase motivation by supporting the psychological well-being of employees and contribute positively to work performance. Therefore, both reducing pathogenic risks and strengthening salutogenic elements in office design offers a holistic approach to design.

Within the scope of design theories, Alan Dilani's Psychosocial Supportive Design Theory, Rachel and Stephen Kaplan's Attention Renewal Theory, Heerwagen's Salutogenic Design Theory, Stokols' Socioecological Approach, and Ulrich's Supportive Design Theory offer a guiding framework for integrating the salutogenic approach into architectural design (Table 2). These approaches address human health through different dimensions of environmental impact and explain these relationships from various methodological perspectives, evaluating health not only as a biological phenomenon but also as a holistic structure encompassing psychological, environmental, and social dimensions (Table 3).

Table 2 Classification of Theoretical Frameworks Based on Salutogenic Design Principles

Theorist, Theory	Comprehensibility	Manageability	Meaningfulness
Alan Dilani - Psychosocial Supportive Design	Wayfinding, Colors, Natural light, Perception, Landmarks, Landmarks, Innovation, Interesting Elements	Aesthetic Elements, Lighting, Green Environments, Stimuli, Interior Design, Restoration, Ergonomic Design	Social support, Music, Art, Culture, Sports, Pets, Comfort, Positive Distractions
Judith Heerwagen - Salutogenic Design Theory	Organizational efficiency (open office spaces and flexible space)	Environmental sustainability (Natural light, ventilation, green areas etc.), Organizational efficiency (Modular designs), Comfort systems	Need for privacy and personal space, common areas and rest areas that support social interaction

Roger Ulrich - Supportive Design Theory	Spatial arrangement. Natural light	Biophilic design, Sense of environmental control (lighting, noise, temperature)	Privacy, Social areas, artwork, water features, Positive distractions
Daniel Stokols - Socioecological Theory	Factors that reduce distraction	Ergonomic Design, Non-toxic and pathogen-free environment, Environmental controllability and predictability. Environmental innovation and challenge, Economic stability, Participatory design and management processes	Aesthetic values. Symbolic and spiritual elements, Existence of social support networks, Organizational flexibility and sensitivity
Rachel ve Stephen Kaplan - Restorative Theory of Attention	Extent (environment is explorable and space is inclusive), Fascination (attention-grabbing)	Compatibility (Restorative space appropriate to the individual's needs)	Fascination (Elements that do not cause mental fatigue). Being Away (Mental renewal with nature)

Table 3 The Relationship Between Theoretical Frameworks and the Sense of Consistency

Theorist, Theory	Content / Methodological Approach	Design Implication	SOC Component
Alan Dilani - Psychosocial Supportive Design (2001;2008)	Conceptual frameworks linking psychosocial well-being and sense of coherence with supportive environmental design, based on interdisciplinary theoretical synthesis.	Environmental legibility, perceived environmental control, and social support → reduced anxiety levels and enhanced positive emotional states through increased cognitive engagement.	Comprehensibility /Manageability/ Meaningfulness
Judith Heerwagen - Salutogenic Design Theory (1986; 1995; 1998; 2010)	Within the context of office environments, environmental comfort, spatial flexibility, and perceived control have been examined in relation to employees' well-being and performance through literature-based research and field studies.	Environmental comfort, opportunities for personalization, acoustic regulation, perceived control over workspace conditions, and integration of biophilic design elements → increased individual comfort, higher job satisfaction, and improved focus and productivity in office environments.	Manageability
Roger Ulrich - Supportive Design Theory (1984; 1991; 2008)	Empirical studies, primarily conducted in healthcare settings, show that exposure to natural landscapes, sunlight, and supportive environmental features is associated with reduced stress levels.	Access to nature, environmental control, and social support → reduced perceived stress and improved well-being.	Manageability/ Meaningfulness
Daniel Stokols - Socioecological Theory (1992; 2013)	The theory presents a conceptual perspective that addresses the interactions between health-promoting behavior change, environmental remediation, and socioecological models.	Design strategies that strengthen social interaction and collective participation → enhanced meaningfulness and reduced stress within a socioecological framework.	Manageability/ Meaningfulness
Rachel ve Stephen Kaplan - Restorative Theory of Attention (1989; 1995)	A theoretical model explaining the restorative effects of natural environments on the human mind through attention restoration.	Natural elements and restorative environments → reduced mental fatigue, restoration of directed attention, and improved cognitive performance and well-being.	Comprehensibility /Meaningfulness

Beyond the theoretical framework discussed in the literature, empirical studies consistently demonstrate that spatial readability, wayfinding systems, and well-organized spatial structures reduce cognitive load, support spatial orientation and task performance, and thereby enhance comprehensibility in office environments. Environmental control features such as adjustable lighting, acoustic regulation, ergonomic design, and biophilic elements are associated with increased perceived environmental control, reduced stress levels, and strengthened coping capacity, directly supporting the principle of manageability. Opportunities for personalization, social interaction spaces, and restorative (healing) environments are associated with employees' emotional attachment to the workplace, intrinsic motivation, and psychological engagement with

their work, indicating a stronger sense of meaningfulness (Colenberg et al., 2020; Haapakangas et al., 2017; Lamb & Kwok, 2016; Bjørnstad et al., 2016; Forooraghi et al., 2021; Colenberg et al., 2023).

It should be emphasized that office spaces are not merely workspaces but built environments that affect an individual's quality of life. Based on the studies examined above, Table 4 summarizes the proposed design criteria based on the theoretical results of the salutogenic framework, to provide a reference for future research.

Table 4 Holistic Salutogenic Design Decisions for Office Environments

SOC Component	Design Lever	Proposition	Expected Outcome	Suggested Method
Comprehensibility	Spatial readability	Clear spatial hierarchy, visual corridors	Reduced cognitive load, improved orientation	Wayfinding performance tasks, spatial cognition tests, post-occupancy evaluation (POE), perceived comprehensibility scales
Comprehensibility	Orientation and wayfinding	User-friendly guidance systems and technological interfaces, directional lighting	Reduced mental mapping time and cognitive load	POE, navigation tasks, self-reported orientation and cognitive load measures
Manageability	Individual environmental control	Adjustable lighting, acoustic control, ergonomic furniture, green design practices	Increased perceived control, reduced stress	Pre–post intervention surveys, perceived environmental control scales, stress-related self-report measures (optionally supported by physiological indicators)
Manageability	Flexibility	Spatial and temporal flexibility (Movable partitions, hybrid working, relaxation corners)	The freedom to choose one's work style and hours strengthens an individual's sense of managing work-life balance and reduces burnout.	Comparative user surveys, observational studies, focus group interviews
Manageability	Participation and autonomy	Employee involvement in decisions, choice of work settings	Enhanced coping capacity	Questionnaires on autonomy and participation, qualitative interviews, focus group discussions
Meaningfulness	Personalization and identity	Customizable workstations, symbolic elements, cultural artifacts	Emotional attachment, motivation	Surveys measuring place attachment and work-related meaning; comparison of personalized vs. standardized workstations
Meaningfulness	Social and restorative support	Social spaces, quiet rooms, biophilic features	Psychological engagement, well-being	Mixed-method POE, qualitative interviews, well-being and engagement scales

5. Conclusion

Although health is today often approached as a service-based commodity, it fundamentally remains a human right and represents a dynamic and positive concept. While individual lifestyle choices play a significant role in shaping well-being and quality of life, the influence of environmental determinants on health outcomes has become increasingly evident. This situation necessitates that the concept of health be addressed not solely within the domain of healthcare, but rather through interdisciplinary approaches encompassing multiple sectors and disciplines.

This study examines salutogenic design approaches focused on human health in office buildings and highlights the importance of spatial arrangements that support physical, mental, and social well-being. In contrast to pathogenic approaches that primarily emphasize disease prevention, the salutogenic approach focuses on the origins of health and aims to enhance user well-being. In this context, office environments should be considered not only in relation to productivity goals, but also in terms of their contribution to individuals' quality of life and psychosocial well-being.

The research findings indicate that the components of comprehensibility, manageability, and meaningfulness, as defined within Aaron Antonovsky's salutogenic model, provide a holistic conceptual framework for strengthening user experience and psychosocial well-being in office design. In addition, the works of theorists such as Alan Dilani, Rachel and Stephen Kaplan, Heerwagen, Stokols, and Ulrich demonstrate the adaptability of the salutogenic approach to architectural design and offer important conceptual insights for health-oriented design models. In this respect, the study serves as a theoretical reference point for future research.

In the future, prioritizing health-oriented design criteria as a fundamental design input in office buildings will be of critical importance. However, for this approach to be effective, it should not be limited solely to the arrangement of the physical environment; rather, it should be integrated with employer policies, organizational culture, organizational structures, and employee support programs.

The proposed design opportunities are based on findings from the literature and on designers' theoretical assumptions. Although designers may aim to support certain behaviors, users may choose to engage with spaces in different ways, or design decisions may not perform as anticipated. Therefore, to better understand the gap between design intentions and user experiences, future studies are encouraged to place greater emphasis on qualitative methods, multi-researcher evaluations, and user-centered empirical research.

Note

This article is derived from the author's ongoing master's thesis study.

CRediT Authorship Contribution Statement

Eda Nur Aydemir Kutluer: Writing – review & editing, Writing – original draft, Methodology, Investigation, Analysis, Data curation, Conceptualization, Data visualization. Betül Bakır: Writing – review & editing, Writing – original draft, Methodology, Investigation, Analysis, Data curation, Conceptualization, Data visualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

All data are available within the paper.

Ethics Committee Approval

Ethics committee permission is not required.

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Resume

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