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Exploring the Spatial Dimensions of Social Sustainability in the Workplace through the Lens of Interior Architects in Jordan

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Abstract: In both industry and academia, sustainability has become a priority in the interior design and architecture industry, having a significant impact on society. However, most recent studies on building sustainability focus mainly on environmental and economic issues, with social sustainability often being complicated and overlooked in relevant research. This paper argues that there is a need for workplace design guidance that prioritizes parameters at the intersection of twenty-first-century workforce–corporate interests, embodying the notion of social sustainability within the built environment. Through this perspective, the physical environment is considered the container of its social content, and its features and characteristics have a direct impact on the quality of life and work for office workers. Although international currents in the age of globalization have stimulated tangible progress in the context of sustainability, the interior design of most design and architecture offices in Jordan suffers from an underrepresentation of the distinctive features of socially sustainable, user-welcoming interior spaces and environments. The current study explores the experiences of interior design professionals in Jordan through four windows of “Physiological Health and Comfort”, “Efficiency and Ergonomics”, “Privacy and Social Interaction”, and “Spatial Organization (Design)” from a quantitative perspective. A survey was developed to investigate these criteria and was administered among 145 full-time design professionals working in offices in Amman, Jordan. The study aimed to investigate the experiences of these practitioners in relation to their office work environment, with a focus on exploring Indoor Environmental Quality (IEQ), Quality of Work Life (QWL), and Quality of Life (QoL) from the perspective of social sustainability. Descriptive statistics, correlations, and regression models were employed to analyze the survey data and evaluate the findings. Overall, the study highlights the need for theoretical and practical incentives to promote the adoption of socially sustainable development in workplace design, particularly in the context of interior design in Jordan. By focusing on the experiences of interior design professionals with their workplace environment, this study provides valuable insights for the development of workplace design guidelines that prioritize social sustainability parameters within the built environment.

Keywords: social sustainability; interior design; office workspaces; indoor environments; design guidelines; spatial organization; ergonomic; physiological health; indoor environmental quality; quality of work life; building-in-use assessment



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1. Introduction

According to classical perspectives, sustainability is an attempt to fulfil our present needs without compromising the ability of future generations to meet their own [1,2]. Among the main pillars of sustainability, social sustainability is the most intangible, broad, and fuzzy dimension of sustainability which requires more research [3]. The literature addressing social sustainability is fragmented and in need of more exploration [4]. Social sustainability requires more attention in academic discourse because it provides a

framework for analyzing and improving the human-centric dimensions of development, which can be overlooked or marginalized in conventional economic and environmental approaches. By emphasizing the human aspects of sustainability, social sustainability highlights the interdependence of society as the medium of interaction between economic and environmental factors [5].

Social sustainability is a broad subject and has been explored through different lenses [6]. The ability of a society to maintain and improve the well-being of its members over time by fostering equitable, inclusive, and participatory systems and practices that respect human rights, cultural diversity, and environmental integrity is referred to as social sustainability. Access to education, health care, housing, food, water, and energy, as well as quality of life, social justice, civic engagement, gender equality, and community resilience, are all examples of social sustainability [6,7]. However, the spatial dimensions—at the micro scale—in relation to social sustainability seems to be a gap in the literature in need of further investigation [8]. Although previous studies have addressed the relationship between society and space in addressing sustainability on a macro scale [9–11], the micro-scale spatial dimensions related to the design of indoor spaces have not been well explored.

Within the framework of this paper, the aforementioned topic has been explored regarding the spatial dimensions of indoor workspaces. Considering the “people first” approach and aiming to improve their life is central to social sustainability discourse [12]. Furthermore, a large portion of the population spends a significant amount of their lives in indoor work environments. Accordingly, the spatial qualities of indoor workspaces can play a crucial role in promoting social sustainability in a number of ways. Encouraging collaboration and socialization, enhancing well-being and inclusion, and the improvement of work performance are a few examples of how the quality of the indoor environment might facilitate moving toward social sustainability. Through this window, and concerning spatial dimensions, the current study undertakes social sustainability through windows such as Environmental Quality (EQ), Indoor Environmental Quality (IEQ), Quality of Life (QoL), and Quality of Work Life (QWL). From this perspective, these concepts are among the factors that influence achieving the end goal of social sustainability.

Accordingly, a comprehensive literature review was first conducted to establish the theoretical framework for this study. A quantitative method was utilized to address the existing variables found in the literature and expand them. In order to collect data for the study, a questionnaire aimed at space users was used. Questions identified from the literature review were classified into four categories: (A) “Physiological Health and Comfort”, (B) “Efficiency and Ergonomics”, (C) “Privacy and Social Interaction”, and (D) “Spatial Organization (Design)”. The target group for the study consisted of designers (predominantly architects, interior designers, and civil engineers) who were actively working in interior design offices in Jordan. The survey aimed to explore the experiences of these practitioners concerning their office work environment. The participants were users of the workplace, but the study aimed to provide more reliable insight by targeting professional designers who are actively engaged in the interior design practice. Descriptive statistics, correlations, and regression analysis were utilized for evaluating and making conclusions from data gathered from the survey.

2. Literature Review

Social sustainability is challenging to describe in a way that is both understandable and meaningful to businesses and the various external stakeholders in the government and the society with whom they engage [13]. Although the review by Voordt and Jensen [14] shows that appropriate building characteristics have been recognized for their positive effects on health, satisfaction, and productivity, the correlations between these impacts remain understudied. Therefore, the way through which the work environment enables productivity is impactful on satisfaction, productivity, and quality of life [15]. The current paper engages the literature under the larger tangible umbrella of Indoor Environmental Quality (IEQ) and, by extension, the Quality of Work Life (QWL) and Quality of Life (QoL)

for office workers. These concepts are, therefore, considered enablers of social sustainability (see Figure 1).

Until recently, workplace environmental quality has been explored under the umbrella of environmental psychology focusing on worker satisfaction (both job and environmental satisfaction). Stimulus–response logic addresses user satisfaction as a behavioral reaction to the physical environment. This approach does not control many of the personal, experiential, and prejudiced factors that impact employees’ workplace quality perceptions [16,17]. Through these perspectives, the workplace environment is not a mere background to the task, but rather an intrinsic part of the user experience with a significant impact on the quality of the job [17]. A summary of the reviewed literature is presented in Appendix A.



Figure 1. Literature model. Adapted from Vischer and Wifi [18] and expanded upon by the corresponding author.

2.1. Workplace Environmental Quality (EQ) or IEQ

Environmental quality (EQ) is an expression used to measure users’ satisfaction with their surroundings [19,20]. It has also been defined as “the combination of environmental elements that interact with users of the environment to enable that environment to be the best possible one for the activities that go on in it” [21]. This term is often used in studies on workplace user needs [22,23]. A worker’s Quality of Life (QoL) and Quality of Work Life (QWL) are strongly dependent on environmental quality (EQ) [18]. Within the scope of the current paper, and under the umbrella of EQ, Indoor Environmental Quality (IEQ) is a significant driver of social sustainability addressing the relationship between the physical characteristics of indoor spaces on user experience [24]. Indoor Environmental Quality (IEQ) refers to the various factors that affect the way people use and interact with space. This often encompasses four categories, which are thermal comfort, air quality, lighting, and acoustics [25–28]. QWL discourse has evolved through its impact on the larger umbrella of QoL [18].

2.2. Functional Comfort and Indoor Environmental Quality (EQ)

One way to evaluate the quality of an environment is by assessing its functional comfort [16]. Comfort encompasses various interior settings, including homes, offices, hospitals, schools, workshops, and shopping centers. People desire comfort in their daily lives, and they spend around 85–90% of their time indoors. The comfort level of a building plays a crucial role in defining its modern characteristics [29]. Functional comfort refers to how well the environment allows people to carry out their work in a productive and efficient manner while also feeling supported by their surroundings. When people experience functional comfort, they are able to work without feeling stressed, and they feel at ease within the environment. As a result, a high level of functional comfort indicates that the environment is of high quality and comfortable for its inhabitants [18]. The comfort of office workers is influenced by their understanding of the physical environment and their familiarity with job tasks and requirements. Their perception of comfort is determined by cognitive processes, expectations, previous experiences, learned behaviors, feelings, and personality traits [16–18].

Poor physical comfort can jeopardize employees’ health and hinder their job performance, particularly if indoor air quality is compromised. According to Vischer and Wifi [18], workspace physical comfort that establishes the fundamental requirements for habitability is the minimum threshold for IEQ (Figure 2). Generally, modern office spaces meet safety and health standards and pose minimal physical discomfort, except for rare cases of system failure or safety hazards such as fire. While building standards ensure safety, health, and basic comfort, they do not guarantee a workspace that supports the

various job tasks of employees, whether collaborative, computer-based, focused, interactive, or specialized [16,17,30].

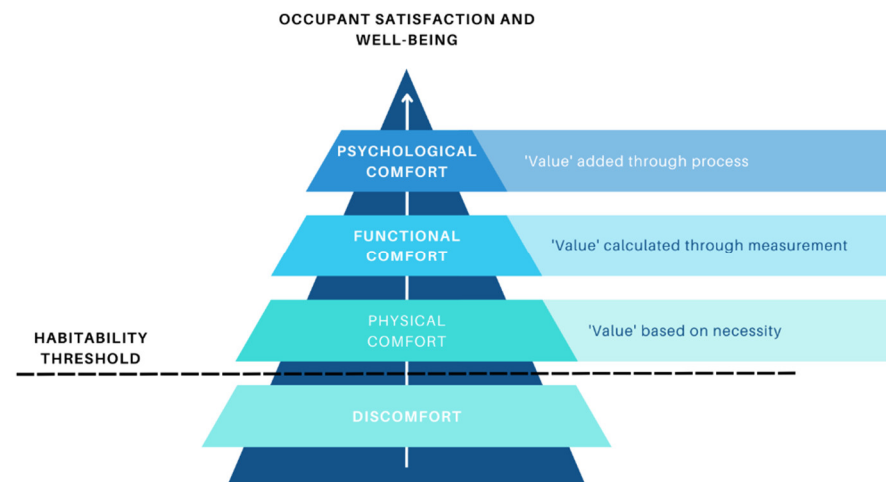


Figure 2. The workspace comfort or workability pyramid. Source: Adapted from Vischer [31] (by the corresponding author).

A functionally comfortable workplace helps workers carry out their tasks, whereas an uncomfortable workplace requires extra effort from workers to overcome environmental obstacles and perform their tasks, leading to stress [32,33]. Workspaces can be classified on a scale of functional comfort, which ranges from supportive and comfortable to work-inhibiting and stressful. Data collected from users of a space can be used to systematically measure how well a workspace supports job performance [18,34]. Research on functional comfort has demonstrated that only a few environmental factors have a direct impact on task performance. These factors, which have become a significant part of the discourse according to Vischer and Wifi [18], include:

- Thermal comfort, ventilation, and indoor air quality [27];
- Lighting and illumination of the environment [35];
- Windows and daylighting [36];
- Acoustic comfort and noise management [37];
- Access to privacy for concentration and confidentiality [38];
- Workstation dimensions, storage, enclosure, and layouts [39];
- Access to collaborative and shared spaces [40];
- Cleaning and maintenance [41];
- Safety and security [42].

Assessment of all these criteria should be sufficient for employees' work tasks as they have shown to have a significant influence on IEQ, and, consequently, on the quality of work life. Psychological comfort is at the top of the comfort pyramid and is affected by factors such as temperature, lighting, noise, and territoriality. Nevertheless, satisfaction and well-being are not limited to psychological comfort; building design, hierarchy of spaces, and layout are influential in functional comfort. Physical and perceived features of the interior space must be distinguished, and user perception data are essential to measuring functional comfort and wider concepts such as Environmental Quality, Quality of Work Life, and Quality of Life. Building support spaces such as cafeterias, elevators, and toilets also impact functional comfort, which varies depending on the company and job type. When these environmental supports are lacking, employees may feel stressed and be unable to communicate effectively, leading to slower work and more mistakes that ultimately lower their Quality of Life.

2.3. Quality of Work Life (QWL)

The concept of Quality of Work Life (QWL) is based on the idea that the satisfaction of different levels of workers' needs (such as survival, social, ego, and self-actualization) is associated with organizational resources and capacities dedicated to meeting those needs [43]. The individual's current state in their quest to achieve their job goals determines the quality of one's work life. These goals are organized in a hierarchy, and the closer employees get to achieving them, the more positive impact this has on their overall quality of life, their workplace performance, and ultimately, society's overall functionality [44,45]. Varghese and Jayan [46] describe Quality of Work Life as "a multidimensional construct, which includes: job security, better reward system, higher pay, opportunity for growth, participative groups and increased organizational productivity". This definition of the Quality of Work Life places the work environment at the forefront by emphasizing how employees assess their present circumstances in relation to their expectations and their perceived ability to achieve their goals [47,48].

According to Nadler and Lawler [49], improvement in QWL is associated with four types of activities: "Participative problem solving, Work restructuring, Innovative rewards systems, Improving the work environment". In this paper, the latter is targeted, although other activities retain spatial dimensions and would consequently be affected by the work environment.

Since the 1970s, scholars have studied QWL as a QoL subcategory [50–54]. The significant impact of QWL on overall QoL is evident in the literature from around the world [55–57]. This is because the satisfaction of job objectives, ambitions, expectations, and needs is an integral part of contemporary everyday life. The concept of QWL was developed to alleviate the detrimental effects of work on employees, enhance their well-being and health, and improve the workplace environment by modifying work conditions and space design.

Quality of Work Life (QWL) is a multi-faceted concept that prioritizes the well-being of employees, addressing their emotional needs for job satisfaction and team efficiency. It is important to note that job satisfaction and QWL are distinct but related concepts [49]. A company's QWL is crucial for the efficient operation and success of its workers. When adopting a work enhancement strategy, QWL is utilized to boost motivation and encompasses aspects such as job security, satisfaction, simplicity, and employee development and dependence [58,59].

The concept of QWL is based on the belief that workers are the company's most valuable resource and should be treated with respect and dignity [55]. Walton [51] developed one of the most notable indexes measuring QWL. Walton explores QWL in eight categories: safety and health, growth and security, self-development, social integration, life space, social relevance, fair compensation, and constitutionalism [51,54]. This model has been instrumental in survey design addressing QWL [60,61].

Workplace needs encompass job requirements, workspace environment, supervisors' behaviors, organizational commitment, and ancillary programs. Staff engagement can help meet workplace requirements through activities, resources, and outcomes [62]. Nevertheless, the concept of Quality of Work Life (QWL) includes physical workspace as a factor that impacts productivity and work satisfaction [18,63].

Vischer's functional comfort pyramid [21,31] and Preiser's habitability framework [64] rate workspace qualities based on space-related needs (see Figure 2). A habitable workspace satisfies safety, functional performance, and psychological comfort needs. Improving employees' QWL by matching them to habitable workspaces is crucial for a company's sustainability [65,66]. The job or task; physical conditions such as space design, materials and technologies; and socioeconomic factors such as administration policy and work–life balance all affect a person's Quality of Work Life (QWL) [67]. Workplace stress leads to negative health and behavioral outcomes, and environmental control can reduce stress levels. Environmental control can be achieved mechanically or instrumentally, and socially or psychologically [16,33,39,68]. Environmental empowerment, or greater environmental

control, positively affects staff members' well-being [49,54,69]. Environmental control can be achieved mechanically and instrumentally, such as with light switches and dimmers, furniture design adjustments, and thermostats, or can be managed socially and psychologically, such as by giving workers access to information related to office environment decisions and engaging them in workspace design and space planning. "Environmental empowerment", which refers to greater environmental control, affects the well-being of staff members [16,70].

Employees' productivity and job satisfaction can be negatively impacted by poorly planned and designed workplaces, resulting in wasted time and effort [17,32]. Unsupportive or uncomfortable work environments can also lead to decreased motivation, high turnover rates, and poor work performance, ultimately affecting firm productivity [17,21,22,71,72]. On the other hand, natural elements such as interior greenery and views of the outdoors can have a positive effect on employees' restorative value and mental fatigue [73,74].

Furniture distribution and space layout also impact the Quality of Work Life (QWL) [75]. The widespread open office plans aiming to enhance collaboration and interactions have faced much criticism [76]. This criticism stems from the various negative characteristics that are the natural side effects of open office plans. For instance, many studies cite noise distractions and lack of privacy as factors that negatively impact task performance [76,77]. Nevertheless, it has also been argued that private workspaces might not be the most productive type and are outdated; contemporary offices require open-plan designs that support collaboration, communication, and worker engagement [78]. However, crowded open-plan layouts and poor acoustic and visual privacy may negatively impact task performance [79–81].

In terms of user satisfaction and work performance, green or sustainable buildings have different quality criteria than conventional buildings, with users in green buildings rating air quality, thermal comfort, and overall satisfaction higher than those in conventional buildings [82–84]. However, users' knowledge and expectations about how green buildings should promote health, comfort, and productivity may impact their quality evaluation.

2.4. Quality of Life (QoL)

Since the term "Quality of Life" is hard to define and somewhat subjective, it may be most useful to focus on the qualitative "human" aspect of social sustainability: improving the quality of people's lives [85]. The World Health Organization (WHO) defines QoL as an individual's perception of their position in life in the context of their culture, values, and concerns [86]. Nevertheless, QoL has been an integral part of discussions related to social sustainability [87]. The significance of QoL issues in enhancing sustainable development has led to an increase in studies contributing to its discourse. Additionally, the topic of QoL is being addressed both as a separate topic and as a key aspect of the subject of sustainable development [88]. QoL can be effectively used as one of the significant measures of social sustainability at the micro level (individual perception of social sustainability) [89,90].

The aforementioned Quality of Work Life (QWL) directly affects QoL, which is defined as the degree to which an individual's experience of life satisfies their wants and needs [18,57,91]. QoL is important ideologically because it supports people in living the best way they can in their environments. Perceptions, needs, personal differences, preferences, culture, and expectations affect how people assess their Quality of Life. However, poor quality may be seen more consistently [92].

The built environment, including both indoor and outdoor spaces, significantly impacts the human life experience. In Western societies, people spend 90% of their time indoors, and the quality of these environments affects their health, comfort, and well-being [93]. Environmental psychology has studied the effects of built and natural environments on human behavior, attitudes, safety, and attachment for decades. Maslow's theory of human needs, proposed in 1962, remains a reliable framework for understanding the quality of life [92,94]. The hierarchy of needs ranges from basic physiological needs to less essential but still crucial needs such as safety, esteem, love, and self-actualization. Meeting these needs leads to a better Quality of Life, both in terms of individual happiness

and the effectiveness of the built environment. Therefore, a successful built environment meets its inhabitants' needs and enhances their well-being. Within the context of this paper, QoL, which has a direct impact on the overall move towards social sustainability, is explored through QWL, which, as the literature suggests, has a direct impact on the overall move toward social sustainability.

3. Materials and Methods

3.1. Research Design

The study aims to investigate the relationship between the physical characteristics of indoor office environments and, consequently, their impact on QWL, QoL, and, by extension, social sustainability in office spaces. The aforementioned review of relevant literature identified four key perspectives to evaluate indoor environmental quality: (A) Physiological Health and Comfort, (B) Efficiency and Ergonomics, (C) Privacy and Social Interaction, and (D) Spatial Organization. To collect data for this study, a survey questionnaire was designed and administered to interior designers in Jordan. The target group was asked to evaluate their office spaces (as a user). The survey questions were structured to explore the four perspectives identified in the literature review. The aim was not to limit the sample to specific age or gender categories but rather to maximize the sample size to gain a comprehensive understanding of interior design and architecture firms in Jordan. Quantitative methods, such as descriptive statistics, correlations, and regression models, were employed to analyze and study the interior spaces of the selected case studies. To ensure the accuracy and relevance of the questionnaire responses, written and visual aids were utilized to support the survey questions. The results of this study will provide insights into how the design of indoor spaces can affect the Quality of Work Life and social sustainability in office work environments in Jordan. By investigating Indoor Environmental Quality (IEQ) from multiple perspectives, this study contributes to the existing body of literature on office work environments in Jordan. The findings of this study can inform design practices and policies aimed at improving the Quality of Work Life and social sustainability in office work environments in Jordan.

3.2. Survey Design: Building-In-Use (BIU) Assessment Tool

The Building-In-Use (BIU) Assessment, created in the 1990s, was one of the first assessment tools that gathers accurate workplace user feedback on their environment [95]. The purpose was to standardize the collected data from space user questionnaire responses to ensure that user feedback can be usefully harnessed to assess building performance [21]. Space users rate building conditions and features using a short-standardized questionnaire. Collected standardized data can be used to create a database of typical patterns, which allows the calculation of space user responses to office workplace environments. Individual building scores are compared to database norms to offer a framework to assess the meaning of user ratings of their workplace environment and to determine whether they are superior or inferior to typical office building workspaces. The introduction and widespread use of this tool to assess workplaces, along with the rich research findings such a tool yields, have led to numerous novel notions and conceptions [95,96].

Office workspaces have become more diverse, with modern workspaces containing personal and shared spaces, common areas, and modern technological tools [97]. Office planning used to divide the workspace into big rooms with rows of desks and a few private offices for managers, but companies are now investing more in workspaces that actively support employee work duties by observing quality requirements within cost constraints in the design process [31,98]. Research has shown that workplace management and design affect worker job satisfaction, work performance, loyalty, engagement, and the company's human capital value [17]. The BIU Assessment scheme assumes a dynamic and interactive relationship between space users and space, which means that user experience within the workspace environment is continuously redefined by user actions and activities.

The Building-In-Use (BIU) Assessment Tool proposes a tripartite model of workspace comfort [95] including physical comfort, functional comfort, and psychological comfort. Nevertheless, in addressing the topic concerning social sustainability, the model seems to have shortcomings in terms of the spatial organization and hierarchy of spaces. The current study tries to build upon and extend the model from the perspective of interior architecture. Accordingly, in addressing the literature, and within the scope of the paper, the survey was designed to address the four categories described in the following sections. Each category includes several questions that are considered independent variables (IVs) and one question as the categorical dependent variable (A_DV, B-DV, C_DV, and D_DV). Furthermore, the study uses two questions as the main dependent variables (M_DV) aiming to measure overall user satisfaction with the work environment (M_DV_1) and their perceived productivity as the result of indoor qualities (M_DV_2) (Table 1). These two DVs are designed to address QoL and QWL in relation to the physical characteristics of office space, respectively.

3.2.1. Physiological Health and Comfort

This aspect is concerned with the ambient features of the physical environment and how they affect occupant comfort, health, and work performance. This includes the perceived level of air quality, the perceived adequate suitability of natural and artificial lighting, the perceived level of acoustic distractions or noise in the office, and the perceived comfort with temperature and humidity conditions. The functional comfort of workers in offices is directly influenced by all of those space attributes, which has an impact on their quality of life as well as their ability to perform their work tasks effectively [17]. From this perspective, a socially sustainable workplace is one where users see these qualities positively in terms of their comfort and the kind of jobs workers perform. While actual measurements of these values using physical investigation tools can be helpful to characterize any gaps between user perception and typically acceptable ambient conditions, it is arguable that the user perception data gathered through surveys and interviews are equally or even more important to their quality of life and should be carefully studied.

3.2.2. Efficiency and Ergonomics

This aspect is focused on the effects of local workplace design decisions made for the size, arrangement, dimensions, orientation, furniture, and capacity for storage of the workspaces given to users. In addition to considering the level of modularity and flexibility provided to users, this element also considers the general standards of cleanliness and use of the amenities offered in the workplace. There is a good amount of variation within this set of design decisions. Different combinations of these features are better suited to various tasks and responsibilities. Therefore, data gathered from surveys or interviews with employees represent the best source to describe the impact of these space features on the degree of employee functional comfort. To ensure alignment between user and organizational priorities, this should ideally be combined with input from organizational management [99]. In this regard, a socially sustainable workspace is one where such design decisions have been carefully selected to enhance user functional comfort without compromising the priorities of the organization.

3.2.3. Privacy and Social Interaction

This aspect is concerned with achieving a balance between the capability of space users to socialize and work collaboratively together and still be able to establish the required space for working individually and maintaining an adequate level of privacy. The users' general perception of safety and security in the workplace, as well as their ability to carry out activities both individually and collaboratively, are implied under this aspect. The availability of common areas and the proximity and distance between individual desks affect how much social interaction occurs in a given workspace [100,101]. Socially sustainable spaces are those that provide enough subspaces to support social interaction

amongst users while maintaining individual comfort and the ability of inhabitants to carry out their intended duties and functions.

Table 1. Items addressed in the survey.

Category	Scale (Independent Variables)	The Dependent Variable for Each Category	Main Dependent Variables
A: Physiological Health and Comfort	A_Q1_ General cleanliness and hygiene	A_DV_ I feel that deliberate consideration of physiological health and comfort during the interior design process of workspaces will yield a space in which I feel more comfortable and able to better perform my duties.	
	A_Q2_ Thermal comfort		
	A_Q3_ Unpleasant odors		
	A_Q4_ Air humidity		
	A_Q5_ Air circulation		
	A_Q6_ Natural lighting		
	A_Q7_ Artificial lighting		
	A_Q8_ View to the outside		
	A_Q9_ Acoustically comfortable		
B: Efficiency and Ergonomics	B_Q1_ Size of office/workstation	B_DV_ I feel that deliberate consideration of individual workspace efficiency and ergonomics during the interior design process of workspaces will yield a space in which I feel more comfortable and able to better perform my duties.	M_DV_1_ I am satisfied with my workplace environment (satisfaction) M_DV_2_ My current workplace design helps me conduct my duties effectively, efficiently, and with a low level of stress (productivity)
	B_Q2_ Furniture ergonomics		
	B_Q3_ Flexibility and personalization		
	B_Q4_ Work surfaces area		
	B_Q5_ Storage spaces		
	B_Q6_ Computer configuration		
C: Privacy and Social Interaction	C_Q1_ Safety and building security	C_DV_ I feel that deliberate consideration of creating a balance between social interaction and personal privacy within the workspace during the interior design process of workspaces will yield a space in which I feel more comfortable and able to better perform my duties.	
	C_Q2_ Density and over-crowdedness		
	C_Q3_ Availability of common rooms and shared spaces for social interaction		
	C_Q4_ Team proximity		
	C_Q5_ Visual and acoustic privacy		
D: Spatial Organization (Design)	D_Q1_ Fair distribution of spaces with respect to the functional space needs pertaining to their job duties	D_DV_ I feel that deliberate consideration of spatial distribution and hierarchy during the interior design process of workspaces will yield a space in which I feel more comfortable and able to better perform my duties.	
	D_Q2_ Availability of meeting/focus rooms		
	D_Q3_ Access to management		
	D_Q4_ Access to information and archives		
	D_Q5_ Access to service and amenities		
	D_Q6_ Access to common areas		

3.2.4. Spatial Organization (Design)

The spatial aspect examines the level of efficiency with which space is distributed inside the workspace according to the intended function. This aspect also explores whether an appropriate hierarchy of space exists. The spatial organization of interior spaces and the quality of their connection (e.g., level of openness, space arrangement, variety of work areas, and accessibility) are significant factors in employee satisfaction with their workspace [102]. In both interior design and architecture, hierarchy is typically utilized to focus on a particular element or space by emphasizing its size, form, or location relative to other elements or spaces in the building. The transition from public to private areas is characterized by a gradation known as spatial hierarchy. Interior spaces within a building are often intentionally designed to have particular relationships with one another. Spatial relationships may be used to define how spaces interact [15,103]. Common spatial relationships in interior design include the following examples [104]:

1. Space within a space;
2. Interlocking spaces;
3. Adjacent spaces;
4. Spaces linked by common space.

In this context, socially sustainable spaces are those that distribute their common and private subspaces, as well as the transitions between them, in a way that emphasizes the space's main purpose and encourages users to contribute to fulfilling it. Additionally, those environments distribute their space in a way that maintains a sense of justice and equality among users. This aspect further deals with the level of mobility that workers with various degrees of ability experience in the workplace, including the ease of access to common areas, amenities, and the surrounding exterior [105]. In this sense, socially sustainable spaces are those that facilitate the ability of space users of a variety of abilities to move around comfortably and with ease.

3.3. Data Collection

This study's sample contained interior design and architecture office workers in the region of Amman, Jordan. The researcher distributed an internet-based questionnaire to the staff members of 35 interior design and architecture firms in the study area in order to gain a comprehensive understanding of the office workplaces of such a large population. There were 145 responses received from full-time office workers in total. After filtering and reviewing the returned questionnaires, a final sample size of 143 workers was obtained. Two responses were excluded due to the presence of contradictions and insufficient responses, such as repetitive answers in one case and a lack of response to the majority of questions in another. The final sample consists of 88 females (61.5%) and 55 males (38.5%). The age range of the respondents is as follows: 50.3% below 30 years, 36.4% between 30 and 40 years, 9.8% between 40 and 50 years, and 3.5% above 50 years. The participants' job descriptions included architects, interior designers, and civil engineers, encompassing junior, senior, and project roles in all three fields.

4. Analysis and Results

The internal consistency of the scale was tested using Cronbach's alpha (α) [106]. The test was selected as the relevant statistical literature recommends utilizing Cronbach's alpha (α) for a research problem measuring attitude connected to a scale [107]. The test has been employed in exploring user assessments of the work environment [108,109]. Accordingly, the test was conducted for each group of independent variables, and the results show very strong internal consistency among scaled variables (see Figure 3) [107].

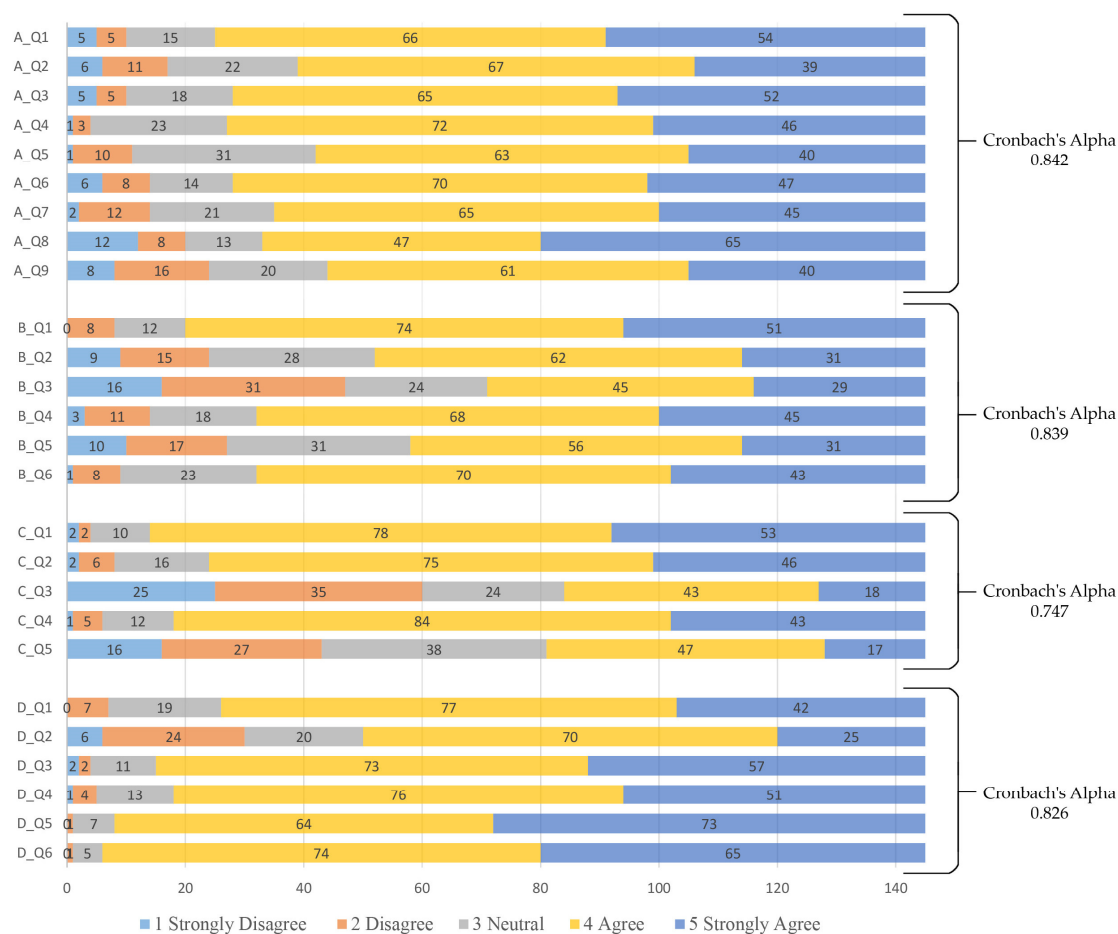


Figure 3. Descriptive statistics of the independent variables and associated Cronbach's alpha for each group.

An overall analysis of the results presented in Figure 1 suggests that most respondents have positive feedback regarding their office workspace. However, some responses do not conform to this pattern (e.g., B_Q3, C_Q3, and C_Q5), and closer scrutiny is necessary to understand these deviations. Further, A_Q8 features a visibly higher number of “Strongly Disagree” responses relative to the rest of Category A items. The following paragraphs explore these items.

A closer inspection of Category A (Physiological Health and Comfort) suggests that, relative to other items, more employees do not prefer outside views (question A_Q8). Upon visiting the office spaces and observing the natural lighting, it was noticed that most office users tend to close their window blinds to avoid sun reflections on their computer screens, which can be uncomfortable and distracting.

Similarly, Category B (Efficiency and Ergonomics) revealed several negative responses related to the flexibility and customization of the workspace (question B_Q3). The main reason for these responses is the limited usable area of the workspace, which restricts user ability to move their desks around or use office furniture in a more flexible manner.

Category C (Privacy and Social Interaction) highlights a greater number of negative responses compared to the other parts. Participants expressed dissatisfaction with the presence of rooms and common spaces (question C_Q3), which is related to the overall workspace area. Additionally, they were dissatisfied with the visual and acoustic privacy (question C_Q5), as most workspaces had an open area workstation with less privacy.

Lastly, Category D (Spatial Organization) had a majority of positive responses to its questions, indicating that respondents were satisfied with the spatial organization of their work area.

To investigate the relationship between the non-parametric ordinal variables collected, a series of Spearman rank correlations were performed [110]. It is important to note that a significance threshold of 0.05 was established for this study. The first section of statistics focuses on the effect of items in each category with the corresponding DV of that category (see Table 1).

In the first category, “Physiological Health and Comfort”, the majority of the items show statistical significance. However, it seems that the lack of unpleasant odors, general hygiene, and artificial lighting has a stronger impact on A_DV. In contrast, air circulation appears to be the least significant factor among all (Table 2).

Table 2. Spearman’s correlations between the general evaluation of “Physiological Health and Comfort” (categorical dependent variable: A_DV) and individual corresponding items.

		A_Q1_ General Cleanliness and Hygiene	A_Q2_ Thermal Comfort	A_Q3_ Unpleasant Odors	A_Q4_ Air Humidity	A_Q5_ Air Circulation	A_Q6_ Natural Lighting	A_Q7_ Artificial Lighting	A_Q8_ View to the Outside	A_Q9_ Acoustically Comfortable	
Spearman's rho	A_DV: Physiological Health and Comfort	Correlation Coefficient	0.330 **	0.320 **	0.345 **	0.233 **	0.086	0.195 *	0.326 **	0.255 **	0.221 **
		Sig. (2-tailed)	0.000	0.000	0.000	0.005	0.302	0.019	0.000	0.002	0.008
		N	145	145	145	145	145	145	145	145	145

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Regarding artificial lighting, it was observed that most office users tend to close window blinds to create a relatively dark atmosphere. This is because they prefer more precise control over the lighting to work on computers and programs related to architecture and design without causing eye strain or fatigue.

Moreover, the presence of unpleasant odors and poor general hygiene in the workspace can negatively affect users’ comfort levels and physiological health. Hence, these factors have a significant impact on A_DV. Proper sanitation and maintenance practices, including regular cleaning of surfaces, floors, and furnishings, can enhance overall hygiene and improve the users’ health and well-being.

Table 3 shows that the correlations within the “Efficiency and Ergonomics” category are noticeably higher. Furniture ergonomics is the strongest factor and the most crucial variable in this category, as it is essential for users to feel comfortable during their long working hours. Ensuring comfort in the workspace strongly impacts user satisfaction and productivity. Additionally, the size of the workspace unit has a significant correlation with B_DV. Personalization and flexibility of the work environment are also strongly associated with the overall evaluation of Efficiency and Ergonomics (B_DV). Providing a personalized and flexible workspace that meets the individual needs of workers can increase their satisfaction and productivity. Overall, these findings highlight the importance of considering ergonomic factors in designing workspaces to enhance productivity and user satisfaction.

Table 4 shows that close proximity between team members is the most crucial factor in the “Privacy and Social Interaction” category. This finding is consistent with contemporary office design trends that prioritize open workstations and spaces to facilitate collaboration. Surprisingly, the availability of common rooms and shared spaces did not show a significant correlation with the overall evaluation, while proximity to team members was

the highest-valued item. This result could suggest that the study participants prioritized personal space and privacy over shared spaces. Alternatively, it could reflect a concern that too many shared spaces might compromise privacy or personal space. These findings underscore the importance of balancing teamwork with individual needs for privacy and personal space. While promoting teamwork is valuable, it should not come at the cost of individual work style or comfort. Therefore, designing a workspace that offers both collaboration opportunities and personal space is crucial for maintaining a balance that satisfies individual and team needs.

Table 3. Spearman’s correlations between the general evaluation of “Efficiency and Ergonomics” (categorical dependent variable: B_DV) and individual corresponding items.

			B_Q1_ Size of Office/Workstation	B_Q2_ Furniture Ergonomics	B_Q3_ Flexibility and Personalization	B_Q4_ Work Surfaces Area	B_Q5_ Storage Spaces	B_Q6_ Computer Configuration
Spearman's rho	B_DV: Efficiency and Ergonomics	Correlation Coefficient	0.414 **	0.536 **	0.409 **	0.372 **	0.287 **	0.298 **
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000
		N	145	145	145	145	145	145

** Correlation is significant at the 0.01 level (2-tailed).

Table 4. Spearman’s correlations between the general evaluation of “Privacy and Social Interaction” (categorical dependent variable: C_DV) and individual corresponding items.

		C_Q1_ Safety and Building Security	C_Q2_ Density and Over Crowdedness	C_Q3_ Availability of Common Rooms and Shared Spaces for Social Interaction	C_Q4_ Team Proximity	C_Q5_ Visual and Acoustic Privacy	
Spearman’s rho	C_DV: Privacy and Social Interaction	Correlation Coefficient	0.298 **	0.288 **	0.121	0.438 **	0.202 *
		Sig. (2-tailed)	0.000	0.000	0.148	0.000	0.015
		N	145	145	145	145	145

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 5 shows that the most crucial factor in the “Spatial Organization (Design)” category is access to services and amenities. This finding is followed by access to common areas and ease of physical access to management staff, with the availability of meeting/focus rooms being the least important factor. These findings are consistent with those presented under “Privacy and Social Interaction”. Providing equal access to amenities and services for all employees is crucial, and this quality is highly valued in the hierarchy of spaces. When questions related to common or shared areas were asked, the answers were mostly negative when the term “room” was used. Conversely, access to common areas is a strong predictor of D_DV. Common areas provide opportunities for casual rest, interaction with colleagues, and downtime. In contrast, meeting rooms are often associated with long and tedious meetings. Therefore, these findings suggest that designing workspaces that prioritize access to common areas over meeting/focus rooms could enhance employee satisfaction and productivity. Providing comfortable and accessible common areas can offer opportunities for social interaction, casual rest, and relaxation, all of which can improve overall well-being and productivity in the workplace.

Table 5. Spearman’s correlations between the general evaluation of “Spatial Organization (Design)” (categorical dependent variable: D_DV) and individual corresponding items.

			D_Q1_ Fair Distribution of Spaces among with Respect to the Functional Space Needs Pertaining to Their Job Duties	D_Q2_ Availability of Meeting/Focus Rooms	D_Q3_ Access to Management	D_Q4_ Access to Information and Archives	D_Q5_ Access to Services and Amenities	D_Q6_ Access to Common Areas
Spearman’s rho	D_DV: Spatial Organization (Design)	Correlation Coefficient	0.399 **	0.127	0.449 **	0.429 **	0.545 **	0.527 **
		Sig. (2-tailed)	0.000	0.128	0.000	0.000	0.000	0.000
		N	145	145	145	145	145	145

** Correlation is significant at the 0.01 level (2-tailed).

The main dependent variables (M_DV_1 and M_DV_2) are derived from the two main questions of satisfaction and productivity of the workers (space users). To address these items, first, a composite variable was created for each category: (A) Physiological Health and Comfort, (B) Efficiency and Ergonomics, (C) Privacy and Social Interaction, and (D) Spatial Organization (Design). Spearman’s correlation was performed between Main IVs and the four categorical composite variables. The first question, M_DV_1, has a very strong correlation with all categories; the strongest is with Category C, “Privacy and Social Interaction”, which is also the category that has the strongest correlation with the second question, M_DV_2 (Table 6). For both items, the model was tested for multicollinearity [111].

For M_DV_1, which measures overall satisfaction with the workplace environment, there is a significant correlation with all four independent categories. The correlations are 0.597 ** for Category A, 0.629 ** for B, 0.665 ** for C, and 0.515 ** for D. The *p*-values for all

of these correlations are less than 0.01, indicating a highly significant relationship between overall satisfaction and the dependent categories.

Table 6. Spearman’s correlations between the two main dependent variables (M_DV_1 and M_DV_2) and composite variables addressing the four independent categories.

			Composite Variables			
			A: Physiological Health and Comfort	B: Efficiency and Ergonomics	C: Privacy and Social Interaction	D: Spatial Organization (Design)
Spearman’s rho	M_DV_1: I am satisfied with my workplace environment (satisfaction)	Correlation Coefficient	0.597 **	0.629 **	0.665 **	0.515 **
		Sig. (2-tailed)	0.000	0.000	0.000	0.000
		N	145	145	145	145
	M_DV_2: My current workplace design helps me conduct my duties effectively, efficiently, and with a low level of stress (productivity)	Correlation Coefficient	0.466 **	0.515 **	0.612**	0.430 **
		Sig. (2-tailed)	0.000	0.000	0.000	0.000
		N	145	145	145	145

** Correlation is significant at the 0.01 level (2-tailed).

For M_DV_2, which measures productivity, there is also a significant correlation with all four independent categories. The correlations are 0.466 ** for Category A, 0.515 ** for B, 0.612 ** for C, and 0.430 ** for D. All of these correlations are significant at the 0.01 level, indicating a highly significant relationship between productivity and the independent categories.

In the end, a simple multiple linear regression model was created to explore the predictability of the two main DVs (environment-oriented satisfaction and productivity: M_DV_1 and M_DV_2) via the composite variables addressing the four independent categories (predictors/constant): (A) Physiological Health and Comfort, (B) Efficiency and Ergonomics, (C) Privacy and Social Interaction, and (D) Spatial Organization (Design) (Table 7). All instances have been thoroughly inspected for multicollinearity, and the resulting outcome is reported to be within the threshold recommended by the relevant statistical literature [111].

Table 7. Multiple regression model for the main two DVs.

Model Summary					
M_DV_1: I am satisfied with my workplace environment (satisfaction)	Predictors: (Constant), A: Physiological Health and Comfort B: Efficiency and Ergonomics C: Privacy and Social Interaction D: Spatial Organization (Design)	R	R Square	Adjusted R Square	Std. Error of the Estimate
		0.708	0.501	0.486	0.6317
Model Summary					
M_DV_2: My current workplace design helps me conduct my duties effectively, efficiently, and with a low level of stress (productivity)	Predictors: (Constant), A: Physiological Health and Comfort B: Efficiency and Ergonomics C: Privacy and Social Interaction D: Spatial Organization (Design)	R	R Square	Adjusted R Square	Std. Error of the Estimate
		0.616	0.379	0.362	0.7428

The multiple linear regression analysis shows that the four categories combined (Physiological Health and Comfort, Efficiency and Ergonomics, Privacy and Social Interaction, and Spatial Organization (Design)) significantly predict user satisfaction (M_DV_1). The R square value of 0.501 indicates that more than 50% of user satisfaction can be predicted by the four categories combined. However, the four categories are not as significant in predicting productivity (M_DV_2) as they are in predicting user satisfaction. The R square value of 0.379 suggests that less than 40% of productivity can be predicted by the four categories combined.

5. Discussion and Conclusions

By designing workspaces that encourage collaboration and communication, employees are more likely to work together and share ideas. This can lead to more creative solutions and can help to break down barriers between different teams or departments within a company. When people feel connected to one another, they are more likely to be engaged and committed to their work. Creating indoor workspaces that are well-lit, comfortable, and conducive to good health can improve the well-being of employees [14]. This can include factors such as air quality, natural light, access to outdoor spaces, and ergonomic furniture. When employees feel healthy and comfortable at work, they are more likely to be productive and engaged [14]. Furthermore, indoor workspaces that are designed with diversity and inclusion in mind can help to create a sense of belonging for all employees. The present study explored these variables in their relation to the Quality of Work Life and Quality of Life, arguing that these qualities are essential components of social sustainability in office spaces.

The study built upon the arguments presented by Vischer and colleagues [16–18,21,31,32,95,96,98], aiming to address them in reference to office spaces and social sustainability. The survey was designed as a contribution to the Building-In-Use (BIU) assessment [95,96] by adding a category dedicated to spatial organization and design. In this argument, the physical characteristics of spaces are considered influential in facilitating or prohibiting their related social content. When indoor workspaces are designed to foster a sense of community while providing individual privacy and personal space, employees are more likely to feel connected to their colleagues and to the organization as a whole. This can include things such as communal areas for eating and socializing, shared spaces for collaboration, and opportunities for team-building activities. Office layout and spatial organization have been shown to be influential on the performance and satisfaction related to the office environment [15,102]. Table 8 presents a summary of the four aforementioned categories and their associated items, arranged in order of statistical significance.

Table 8. Categories in order of observed statistical significance (left-to-right) and most significant items in each category (top–down) as reported via survey.

Categories in Order of Significance	#1: (Highest) C_DV: Privacy and Social Interaction	#2: B_DV: Efficiency and Ergonomics	#3: A_DV: Physiological Health and Comfort	#4: D_DV: Spatial Organization (Design)
#1 (Highest ranked item in the category)	C_Q4_ Team proximity	B_Q2_ Furniture ergonomics	A_Q3_ Unpleasant odors	D_Q5_ Access to services and amenities
#2	C_Q1_ Safety and building security	B_Q1_ Size of office/workstation	A_Q1_ General cleanliness and hygiene	D_Q6_ Access to common areas
#3	C_Q2_ Density and over-crowdedness	B_Q3_ Flexibility and personalization	A_Q7_ Artificial lighting	D_Q3_ Access to management
#4	C_Q5_ Visual and acoustic privacy	B_Q4_ Work surfaces area	A_Q2_ Thermal comfort	D_Q4_ Access to information and archives

Furthermore, providing privacy and individual spaces was observed to be significant in the workplace experience. The most significant correlation in the study was observed between “privacy and social interaction” and satisfaction with the work environment. This can be observed in detail via responses to acoustic privacy [76,77] and the possibility of personalization, which fosters satisfaction and productivity [112]. Accordingly, the findings suggest that the flexibility of the work environment can have a positive influence on the quality of work life [56]. The findings suggest that while most participants are satisfied with their office workspaces, there are still areas that require improvement. Addressing the issues of outside views, flexibility, and privacy may lead to better user satisfaction and productivity in the workplace. Furthermore, the results suggest that factors such as artificial lighting, hygiene, and unpleasant odors have a significant impact on user physiological health and comfort in the workspace; these findings are in line with the existing literature [25–28,36]. Accordingly, proper attention and measures must be taken to

ensure that these factors are adequately addressed in the office environment to promote a healthy and productive workplace.

Social sustainability has gained research interest, but it is still largely ignored in comparison to environmental and economic sustainability. This study aimed to identify workplace design guidance that efficiently maximizes functional comfort and social sustainability to promote the integration of social sustainability principles in the interior design process. In this regard, although all categories and most items in the current study have shown correlations with satisfaction and productivity, the order of significance presented in Table 8 can offer valuable insights for improving the office environment in Jordan. It is evident that “Privacy and Social Interaction”, followed by “Efficiency and Ergonomics”, have a significant influence on moving toward social sustainability. The individual items within each category can be utilized as detailed design guidelines. For example, team proximity emerges as the most influential item within the “Privacy and Social Interaction” category. Additionally, safety and privacy exhibit high levels of significance. This highlights the importance of striking a balance between fostering a sense of community and teamwork while also respecting individuality and personal space.

The results indicate that user satisfaction with the office space and productivity are both influenced by the four categories addressed in this paper (Physiological Health and Comfort, Efficiency and Ergonomics, Privacy and Social Interaction, and Spatial Organization). Nevertheless, privacy and social interaction seem to be the most influential predictor. This is followed by efficiency and ergonomics, which seems to play a significant role in office worker quality of work life.

The results of this study provide a valuable starting point for further research and can be generalized and applied in various built environment contexts. The study offers valuable reference material for industry practitioners and academics in the interior design and architecture sector, enabling them to develop socially sustainable solutions and achieve sustainability goals more efficiently.

By paying attention to the spatial qualities of indoor workspaces, organizations can create environments that promote social sustainability and support the well-being of their employees. However, it is important to note that the results presented in this study are specific to Jordanian office spaces, and caution must be taken when generalizing them to other contexts. Further studies are needed to investigate the individual parameters of each item and their relationship to the quality of the indoor environment, and how they can contribute to moving towards social sustainability in different parts of the world.

In summary, the findings of this study highlight the importance of creating indoor workspaces that are not only functional but also promote the health, well-being, and satisfaction of employees. By doing so, organizations can achieve social sustainability and contribute to the development of a more sustainable and equitable society.

It is important to acknowledge the limitations of the current study. Firstly, the study did not explore the emergence of remote work in the post-pandemic world, as its focus was primarily on the quality of traditional office workspaces. Future research could delve into the discussion of home office workspaces and their relationship with social sustainability. Secondly, the study’s scope was limited to professional interior design and architecture practitioners, and it may be valuable for future studies to compare these findings with those of office workers without a background in design. Thirdly, the study specifically examined interior spaces of design offices in Jordan, highlighting the need for more international research to consider the contextual and cultural dimensions that could influence the relationship between work environment characteristics and social sustainability. Consequently, the generalizability of the results may be limited, as they can vary depending on distinct environmental, social, cultural, job type, and psychological requirements associated with specific types of work.

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Appendix A

Table A1. The summary of the literature review, definition, significance, and influential factors.

Main Subject	Aspect	Literature	Scholar(s)
Environmental Quality (EQ)	Definitions	An expression used to measure users' satisfaction.	[19,20]
		The combination of environmental elements that interact with users.	[21]
		The term is often used in studies on workplace user needs.	[22,23]
	Significance	Workers' Quality of Life (QoL) and Quality of Work Life (QWL) are strongly dependent on environmental quality (EQ).	[18]
		It is a significant driver of social sustainability addressing the relationship between the physical characteristics of indoor spaces on user experience.	[24]
	Influential factors	Thermal comfort, air quality, lighting, and acoustics.	[25–28]
	Definition	A way to evaluate the quality of an environment.	[16]
Functional Comfort	Significance	The comfort level of a building plays a crucial role in defining its modern characteristics.	[29]
		A high level of functional comfort indicates that the environment is of high quality and comfortable for its inhabitants.	[18]
		Workers' perception of comfort is determined by cognitive processes, expectations, previous experiences, learned behaviors, feelings, and personality traits.	[16–18]
		Data collected from users of a space can be used to systematically measure how well a workspace supports job performance.	[18,34]
	Influential factors	Thermal comfort, ventilation, and indoor air quality.	[27]
		Lighting and illumination of the environment.	[35]
		Windows and daylighting.	[36]
		Acoustic comfort and noise management.	[37]
		Access to privacy for concentration and confidentiality.	[38]
		Workstation dimensions, storage, enclosure, and layouts.	[39]
		Access to collaborative and shared spaces.	[40]
		Cleaning and maintenance.	[41]
		Safety and security.	[42]

Table A1. Cont.

Main Subject	Aspect	Literature	Scholar(s)
Quality of Work Life (QWL)	Definitions	Satisfaction of different levels of workers' needs is associated with organizational resources and capacities.	[43]
		Individuals' current state in their quest to achieve their job goals.	[44,45]
		"a multidimensional construct, which includes: job security, better reward system, higher pay, opportunity for growth, participative groups and increased organizational productivity".	[46]
		Employees' work environment assessment concerning their expectations and their ability to achieve their goals.	[47,48]
		QWL is associated with four types of activities: "Participative problem solving, Work restructuring, Innovative rewards systems, Improving the work environment".	[49]
		QWL can be considered a QoL subcategory.	[50–54]
		QWL is a multi-faceted concept that prioritizes the well-being of employees, addressing their emotional needs for job satisfaction and team efficiency.	[49]
		QWL is utilized to boost motivation and encompasses aspects such as job security, satisfaction, simplicity, employee development, and dependence.	[58,59]
		QWL is based on the belief that workers are the company's most valuable resource and should be treated with respect and dignity.	[55]
		Safety and health, growth and security, self-development, social integration, life space, social relevance, fair compensation, and constitutionalism.	[51,54]
		The concept of Quality of Work Life (QWL) includes physical workspace as a factor that impacts productivity and work satisfaction.	[18,63] [21,31,64]
		Improving employees' QWL by matching them to habitable workspaces is crucial for a company's sustainability.	[65,66]
	Significance		
	Influential factors	The job or task; physical conditions such as space design, materials and technologies; and socioeconomic factors such as administration policy and work–life balance all affect a person's Quality of Work Life (QWL).	[67]
		Workplace stress leads to negative health and behavioral outcomes; environmental control can reduce stress levels. Environmental control can be achieved mechanically or instrumentally, and socially or psychologically.	[16,33,39,68]
		Environmental empowerment, or greater environmental control, positively affects staff members' well-being.	[16,49,54,69,70]
		Employees' productivity and job satisfaction can be negatively impacted by poorly planned and designed workplaces.	[17,32]

Table A1. Cont.

Main Subject	Aspect	Literature	Scholar(s)
		Unsupportive or uncomfortable work environments can also lead to decreased motivation, high turnover rates, and poor work performance, ultimately affecting firm productivity.	[17,21,22,71,72]
		Natural elements such as interior greenery and views of the outdoors can have a positive effect on employees' restorative value and mental fatigue.	[73,74]
		Furniture distribution and space layout also impact the Quality of Work Life (QWL).	[75]
		In terms of user satisfaction and work performance, green or sustainable buildings have different quality criteria than conventional buildings, with users in green buildings rating air quality, thermal comfort, and overall satisfaction higher than those in conventional buildings.	[82–84]
		The term “Quality of Life” is hard to define and subjective, it might be more useful to focus on the qualitative “human” aspect of social sustainability, mainly improving the quality of people's lives.	[85]
	Definitions	The World Health Organization (WHO) defines QoL as an individual's perception of their position in life in the context of their culture, values, and concerns.	[86]
Quality of Life (QoL)	Significance	Maslow's theory of human needs, proposed in 1962, remains a reliable framework for understanding the quality of life.	[92,94]
		The significance of QoL issues in enhancing sustainable development has led to an increase in studies contributing to its discourse.	[88]
		QoL can be effectively used as one of the significant measures of social sustainability at the micro level (individual perception of social sustainability).	[89,90]
		(QWL) directly affects QoL, which is defined as the degree to which an individual's experience of life satisfies their wants and needs.	[18,57,91]
	Influential factors	QoL is important ideologically because it supports people in living the best way they can in their environments.	[92]
		The built environment, including both indoor and outdoor spaces, significantly impacts the human life experience (health, comfort, and well-being).	[93]

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