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Access to nature and its impact on performance and psychological wellbeing at work

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Abstract
A large part of the day is spent in the workplace. Therefore, the creation of a healthy work environment, impacts the psychological wellbeing and performance of employees at work. In this context, the purpose of the study is to investigate the impact of the natural environment, access and type of access on the performance of employees and their psychological health. The study follows a quantitative methodology. 66 participants in total, belonging to different ages, educational levels, and work experiences were part of the survey. Results showed a significant correlation between the outdoor access and employees' performance at work. Outdoor access was a good predictor of performance in the workplace. In addition, the study found a statistically significant correlation beetween outdoor access and stress levels in the workplace, as well as depression between respondents.

Keywords: nature, performance, psychological health, office, employee, access, environmental incentives

Introduction

The positive health outcomes associated with exposure to green spaces have been the focus of environmental psychology research in the last decades. Exposure to green spaces enhaces reduction of stress and anxiety levels, increases social interaction and improves overall psychological health. Most studies in this field are theoretical rather than empirical. Considering the fact that people spend most of their day in the work environment, the importance of studying environmental psychology, i.e., access to natural environments at work and its impact on human behavior becomes a very important research issue.

In contrast to other important factors that affect job performance and psychological well-being, such as personality, problem-solving ability, or job requirements, improving contact with nature at work is relatively easy, simple, and practical. Even just posting pictures of a natural landscape in a person's office or taking a walk outdoors can be simple ways to increase contact with nature, which is important for reducing stress and increasing performance at work [1].

Creating a healthy work environment, together with opportunities for nature contact, is an important and practical way to reduce employees' stress and promote their physical and psychological health. In this context, the study gives a major contribution as an empirical investigation.

The purpose of this study is to investigate the correlation beetween access to nature and its impact on performance as well as in their psychological health. The objectives of the study are as below:

1. To investigate the basic literature theories related to the topic in question and its use in socio-environmental research;
2. To investigate the theories and variables that link and explain the relationship between the built/natural environment and employees' performance outcomes as well as psychological health;
3. To investigate the correlation beetween access to nature on the performance as well as on the psychological health of the study respondents.

The hypotheses of the study are

- **H1:** There is a statistically significant correlation between access in nature, the amount of this access and performance of employees at the workplace.
- **H2:** There is a statistically significant correlation between access in nature, the amount of this access and the psychological health of employees at the workplace.

Theoretical framework

Environmental Stress Stimulating Load Theory

The basic theories used in this study are Stimulus Load Theory and Environmental Stress Theory. Both theories are presented in the study of Sangar [2], which emphasized the importance of the physical environment as an indicator of the impact on performance at work as well as on the psychological well-being of employees. The environment in this theory was explained as a source of information received by the human senses that, consequently, provides people with psychological stimulation [3]. But what are environmental incentives? Sagar [2]. characterized environmental stimuli in the built environment, as light, noise, ambient temperature, movement of people in the environment, density, materials, natural elements, etc. A study by An, Colarelli, O'Brien and Ooyajian on the other hand, highlighted that natural elements and sunlight are positively related to job satisfaction and organizational commitment, and negatively related to depressed mood and anxiety [4].

The above-mentioned stimuli may be overloaded or weak, depending on the perception of the human senses. In general, people are oriented towards those stimuli which they perceive as more powerful (overloaded) [5]. These stimuli, in turn, can reduce the individuals' performance and well-being below the optimal, consequential, and responsive level. This stimulus overload can also cause cognitive-

behavioral weakness, decrease tolerance, or ignorance of environmental factors [6]. However, if we have weak stimuli, i.e., a monotonous environment, it can also cause changes in behavior and overall performance [5]. So both overloaded and weak stimuli have negative impacts regarding human behavior and performance.

Environmental Stress Theory

The second theory used in this study is that of environmental stress. As mentioned above, incentives can be overloaded or weak. In both cases, there are effects not only on performance but also on individual psychology. There are several types of stressors which affect the relationship of human behavior with the physical environment. Elements such as pollution, extreme temperatures, noise, overcrowding, etc. The theory of environmental stress has been extensively addressed by researchers. Giffort and Bell addressed the human-environment relationship in physiological, emotional, and cognitive terms [3], [5]. Based on the stressors to which man is subject to, there are a number of reactions which are formed due to the stimulation of the senses and exceds the optimal level [6]. In the face of various environmental stimuli, especially when they are overloaded, people show changes in their psychological as well as physiological state, especially when these stimuli are perceived as threats [6]. In these cases, the body creates resistance and makes efforts to minimize its effect through coping strategies [5]. It is important to note that prolonged exposure to environmental stress causes fatigue, as hown in literature, decreases resistance to stress or decreases interaction with others [3], [6]. Cognitive assessment is the degree of severity perceived by different stressors, by different people, which varies based on the psychological and emotional responses people display as a response to environment stimuli. It is a possible explanation of the way different people display different coping strategies regarding stress and well as different stress levels [3], [5]. Tirana, the capital of Albania, where this study was conducted, is a perfect example of overload stimuli. The stimuli overload is present especially in color and pressure caused by the overload of stimuli of the built environment. Lack of greenery is also the lack of an important (positive) stimulus which promotes psychological wellbeing and relaxation. Tirana is also overloaded with incentives regarding air pollution, noise which exceeds European norms and is quite populated and constantly expanding.

Literature Review

Impact of environmental stimuli and its elements

Sangar [2] has stated that in general, the physical-human environment relationship has been examined only in social and physical terms. Recently, the impact on human wellbeing (psychological and physiological health) is also being addressed. In his study, which explored the theoretical basis of the relationship between human behavior and the physical environment, he shows that social sciences, behavior and health, psychology, sociology, geography, anthropology, neuroscience and public health, as well as disciplines of design, architecture, interior design and urban and regional planning are also included in this field of research [2]. Studies on the impact of environmental incentives take into account both the natural and built environment and their impact [7]. Atmospheric environmental elements, such as sound, wind, temperature, and light, are perceived through sensory organs such as the ears, nose, skin, and eyes and have a significant impact on the human condition, behavior, and physical well-being [3], [6]. People relationship with the environment is manifold and is related to sensitivity, cognitive processes and physiological ones. Therefore, natural environments with all their elements constitute the most preferred environment for the optimal human condition [2]. Stimulus theory is important in the relationship between human behavior and the natural/ constructed environment - as it influences thinking, emotional state, social interaction, and overall health. The relationship between human behavior (B) and the environment is a function (f) of personal factors (P) and the environment (E) when these behaviors occur. The formula B = f (P, E) expresses exactly this relationship [2]. Many researchers in environmental psychology have concluded that the natural or built environment influences certain human behaviors by promoting, modifying, or inhibiting them [8]. To understand this relationship, researchers have examined the impact of physical or atmospheric environmental stimuli on the formation of human behavior [9].

The natural environment and its importance in human health

The science of environmental psychology defines the natural environment as an inclusive environment in which humans are an integral and adaptive part, despite the constant changes throughout their existence of about 30,000 years [10]. The natural environment has been assessed as:

- complex that causes sensitivity and emotions in individuals,
- source of inspiration and aesthetic appreciation that fosters creativity [11]
- part of childhood and education memories,
- the basis of our planet and life support systems,
- regenerative and therapeutic factor and barrier from overload and stresses of modern life,
- an important criterion for planning and a set of principles for creating comfortable human structures and environments and opportunities for improving life, and
- A moral compass and the basis of existence and aesthetics [12].

People believe that nature has tremendous power to act as a regenerative agent. This ability is perceived through cognitive processes, connection to ecosystems and improvement of individual characteristics, social interaction as well as psychological and physiological health [3]. Whether just staying in nature or looking at it [10], according to researchers, has immediate regenerative effects [13], despite the fact that the same effects can be achieved in the built environment [14]. In general, exposure to green spaces and nature reduces stress, improves mood, increases life satisfaction, mental stimulation and reduces risks of mental health problems [15], [16]. Nature has regenerative effects both on the concentration level [17] and on the mood of individuals. Specific types of contact with nature are differentially associated with aspects of health and well-being [18]. Integration of the sensory characteristics of nature into the build environment could be a powerful tool for enhancing mental health on a large scale [19]. Despite the

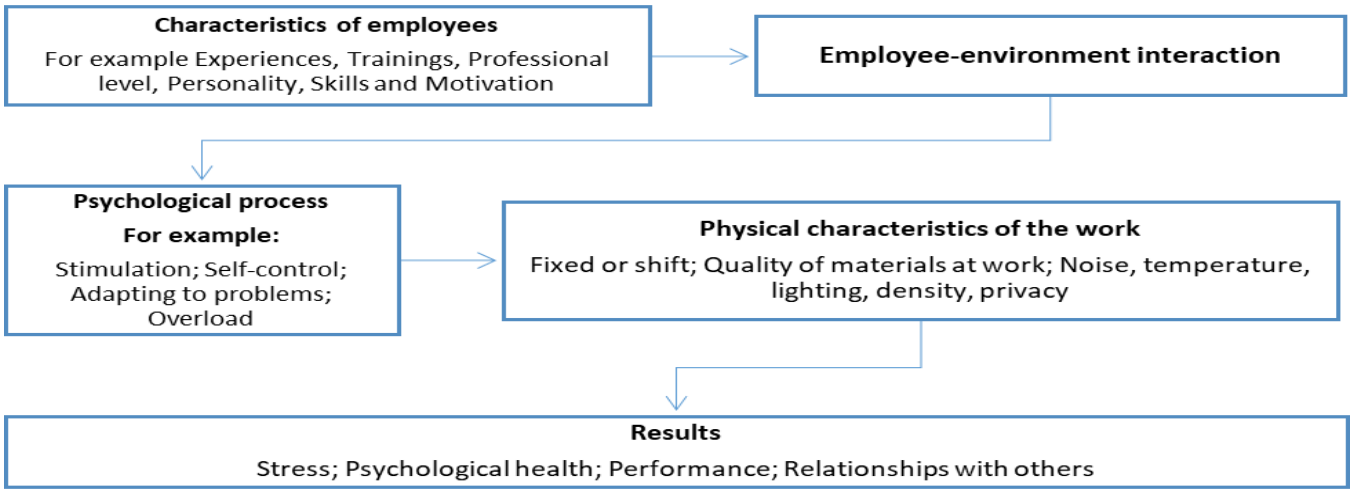
complexity and wide scope of the natural environment, environmental psychology researchers [20] have emphasized the importance of recognizing and considering it in the urban planning and design process due to its impact on human well-being and health [10].

Environmental incentives impact on job performance

People spend about 25% of their time throughout their lives at work, which makes it a very important part. Many authors have investigated the factors that can affect the performance, job satisfaction and psychological well-being of people in the workplace [2]. Environmental psychologists have stated that here is an important correlation between physical environment and engagement, performance, emotional, social and health status and stress at work [10]. Elements of design of the built environment, i.e., work environments, such as noise, light, climate/temperature, introduction of natural elements in the design, etc. are among the most studied elements in this field. Some of the elements that affect perceived environmental stress and consequently, job performance, are listed below.

- Noise, for example, is one of the strongest environmental stressors, especially in industrial work environments, where it can also cause hearing loss. The impact of noise on employee performance at work depends on first on the combination of the individual characteristics of the employee, the type of work and the type of noise to which the individual is exposed, but it is not the same for all cases. Miller [21] has concluded that in certain circumstances noise can boost performance at work. Noise is an element displayed both inside and outside the workplace, which violates privacy, damages interpersonal relationships, causes physiological damage such as hearing loss, and even exacerbates cardiovascular problems [10].
- Another important element in work environments is *climate (temperature)*. An environmental factor that affects the behavior and performance of people in the workplace. The climate in the work environment is measured through effective temperature, which includes humidity and the movement of air masses [3]. Environmental engineers have described comfort zones in an environment, but environmental psychologists have actually discovered that comfort actually depends on perception, effective current temperature, meanwhile the optimal performance can even been achieved outside the comfort zone. Environmental stress, in this case, occurs when temperatures change significantly from the comfort zone, but many people can adapt after long-term exposure to these extreme temperatures. Some air components, including carbon monoxide, air ions, and odors may affect performance at work, but their effects are not very sensitive under normal conditions. On the other hand, the presence of chemical waste or pathogenic organisms and the lack of air pollution control can seriously impair health, work engagement and, in some circumstances, impair social interaction between employees [10].
- The other element is *light*. Light affects work behavior, especially when it is insufficient (causing decreased productivity and accidents at work) or too strong. Adding lighting at a normal interval improves performance at work [22]. Access to abundant lighting and natural landscapes is psychologically important for people.
- On the other hand, a few effects of the way of decorating workplaces on performance at work have been noticed, but it has also been noticed that employees are very sensitive to *overlapping decorations* which occupy spaces in the work environment and cause dissatisfaction in employees. In terms of office design and decoration, one of the reasons why employees are dissatisfied is because companies do not give them the opportunity to reorganize or personalize their offices and do not consult with employees at the design stage. Creating shared offices or workspaces, for example, damages and disrupts employee relationships. A comprehensive design study found that improving work environments would lead to increased productivity by 15% for managers and technical professionals, and 17.5% for office workers. Similar studies report a better design of office premises increases performance at work from 10, up to 50% [10].

The following figure gives a model of the characteristics and physical elements of the work environment and their impact on the performance and psychological process of employees.



Source: Adapted by Gifford [3].

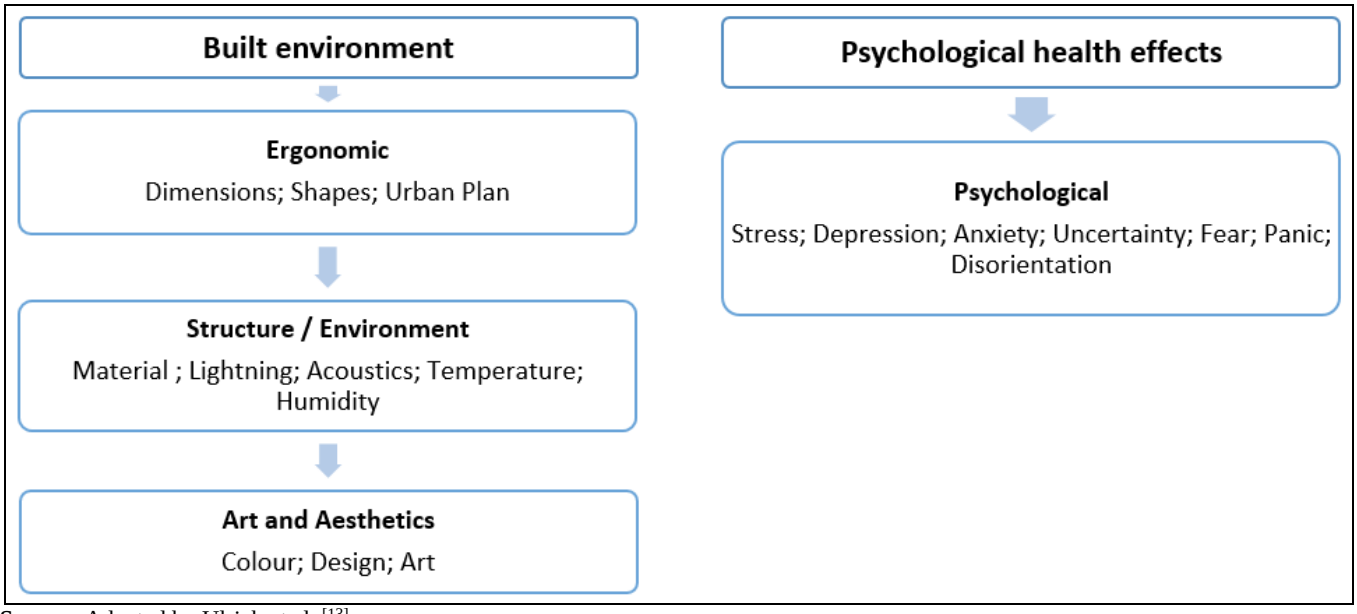
Fig 1: A model of the impacts of physical characteristics of the work environment on employees

Studies examining the impact of the built environment on the health status of employees have continued for years [9]. The Center for Health Design in the USA has been engaged in this issue recently. The study is based on the assumption that the built environment can affect people's behavior, their psychological and health status [23].

Table 1: Cause-effect relationship

Cause (missing, or excessive)	Basic cause	Effect
Noises	From equipment; Noises from outside;	Insomnia; Anxiety; Increased stress;
Light	Artificial lighting; Natural lighting;	Anxiety; Depression;
Engagement / interactivity	Personal space Large environment with many employees	Increased stress; Noise-related problems;
Floor	Floor material (carpet, tile, gloss or linoleum)	Depression; Uncertainty;
Other environmental factors	Window; Music Paintings Landscape view Air quality	Anxiety; Stress.

Source: Adapted by Ulrich *et al*. [13]



Source: Adapted by Ulrich et al. [13]

Fig 2: Knowledge and results

Reducing the stress level of employees increases their quality and effectiveness at work. Researchers have suggested that proximity between workplaces, where employees engage, enhances effective time management [13]. Also, various studies and theories related to the correlation of environmental elements with physiological and psychological stress, as well as with coping and adaptive behaviors, reduce stress or its impact on work. Moreover, the study of environmental stress has shown that prolonged exposure to stressors is associated with post-traumatic outcomes, including chronic illness and psychological damage. Such results reinforce the need for specific theoretical studies of acute and chronic environmental stress [24].

Research methodology

The current study uses the quantitative method to examine the statistical relationships among variables, such as outdoor access, job performance, and psychological health (stress, somatic symptoms, anxiety, and insomnia, interactivity, and depression) and to generalize findings on the target population as a whole. The quantitative method consists of extracting reliable data. This study used a questionnaire as a tool for data collection, where two main elements were taken into account: the reliability of the result and the validity of the questionnaire.

Instrument

A mention above, questionnaire was the method used to collect quantitative data. Questions in different sections were set up depending on the study variables to provide answers to research questions as well as study hypotheses. The first section includes general demographic information of the respondents, such as: gender, age and education. It contains closed-ended questions with alternatives. The other sections include questions about respondents' access to nature, or even stimulated natural environments, as well as their job performance and psychological health to establish the relationship between these variables and find out if there is a statistically significant correlation between them. The survey questions were mainly in Likert scale, from where respondents had to choose between the alternatives set out in the questionnaire indicating the degree of agreement or disagreement with each of the formulations given.

Sampling (Sample)

The sample was intentional. Respondents chosen were employed in different areas and different types/environments at work, such as offices, universities etc. They had different levels of access to nature or natural elements, variables that were correlated with the performance and psychological health of the respondents. The sample was also intentional, as the researcher picked up some work environments which had benefits for the study. A total of 66 people participated in the study, belonging to

different ages, educational levels, and work experience. All respondents were personally contacted by the researcher. However, in terms of the number of questionnaires collected, this sampling remains below the convenient sampling.

Pilot

Prior to distribution, the designed questionnaire underwent a pilot phase in order for the researcher to confirm the clarity of the questions and whether the message of the questions was fully understood by the respondents so that the answers could be accurate and valid. The pilot phase was conducted with two subjects (peer review). During the pilot phase, some questions in the questionnaire underwent further corrections.

Statistical analysis

The Pearson correlation in the study was used to correlate the variables among them. Variables were defined or calculated on a section-by-section basis for each measured perception. The missing data were marked into the database as "missing" and were treated as such during their analysis and processing. Statistical significance is $p \leq 0.05$. Regression analysis was also used in the study to evaluate the relationships between a dependent variable and one or more independent variables and how their value changed in relation to each other to confirm or not the study in question. Grhaps in the th first sections and tables also, were used to present different information and data, as well as to ensure that the presentation of the values was as accurate and clear as possible.

Reliability of results

In this case, the reliability and internal consistency of the answers or data collected from the questionnaires was assessed through Cronbach's alpha, which resulted in> 0.802, indicating a good and acceptable validity of this instrument.

Table 2: Internal validity of the measuring instrument

Reliability Statistics	
Cronbach's Alpha	N of Items
802	91

Results

Demographic analysis of respondents

Most of the respondents' age ranged between 26-36 years old. The minimum age of respondents was 18-25 years. Due to the location of the researcher, most of them had their residence in urban areas. Only 30% of them lived in rural areas. Respondents had completed most of the studies at the scientific master level, followed by a high percentage that had completed professional master. In addition, 21.2% of respondents had completed general secondary education. Most of the respondents had 5-10 years of work experience. The selection of this sampling was intentional.

In order to measure the performance of employees in the most adequate way, a long work experience is needed for the most accurate results. Most respondents (45.5%) worked in a shared office as a type of work environment. A few of them worked in open spaces or separate rooms. Respondents stated that they had little access to natural environments in the workplace. They referred mostly to green outdoor environments in their first perception regarding the term "natural environment". 31.8% of them stated that they had no access to natural environments at all during working hours. Only 27.3% of them admitted that they had moderate or very access to natural environments during working hours. Respondents who had moderate access or too much access claimed that their access was direct, so they could go out in nature, or get very close to it for a walk or take a lunch break.

Descriptive analysis

Results are presented through descriptive statistical data, through minimum, maximum, averages and standard deviation based on section. The first section of the questionnaire consisted of 24 questions, which measured the access to natural stimuli with a Likert scale from 1-5, ranging between a minimum value of 23 points, which indicates that there is no access to natural stimuli at all, up to 115 points which indicates an absolute approach to nature or incentives of nature among respondents.

The respondents presented values between 43 minimum and 89 maximums, with an average value of 69.2 points and standard deviation Std = 13.14892. The degree of perceived access (through direct contact with nature or natural incentives incorporated in the design of the work environment) of the study respondents was below average. The results showed that the respondents in this study have moderate access or little access to the most natural environments.

The second section of the questionnaire measured the self-perceived degree of performance at work, respectively overall performance, contextual performance as well as counterproductive behavior at work. The rate of self-perceived performance at work, measured through 5 questions, varied in the values "5 minimums", which indicates low performance and 25 as maximum, which indicates a perception of high performance at work. Respondents' values ranged from a minimum of 7 to a maximum of 25, with an average of 20 points and a standard deviation of Std = 4.35382. Respondents generally presented a self-perception above the average of overall performance at work.

The rate of contextual performance among respondents, which consisted of 8 questions, was also measured in this form. Values among respondents ranged from 17 minimum and 40 maximums, with an overall average of 33.9, and standard deviation Std = 5.83209.

Even in terms of the contextual performance scale, respondents showed above average levels. In terms of counterproductive behavior at work, a scale measured through 5 questions on the Likert scale, values among the respondents were between a minimum of 5 points and a maximum of 14 points with an overall average of 7.6 points and a standard deviation of Std = 2.14. Respondents exhibited high levels of counterproductive behavior at work. On the other hand, the fourth section of the questionnaire was designed to conduct an overall assessment of the psychological health of respondents in the workplace, namely, levels of stress, somatic symptoms, anxiety and insomnia, social dysfunction and depression. In terms of the degree of perceived stress, the average among respondents is 31.3, which indicates that respondents experience levels of stress at work above the average. Respondents rated below-average levels for somatic symptoms, as well as below-average levels for anxiety and insomnia. The results

of social dysfunction on the other hand were high, above the average at 24.5, although with a higher standard deviation. Meanwhile, in terms of depression, respondents showed low levels.

Verification of hypotheses

In this section we try to evaluate our study hipothesis. The first hypothesis sought to establish whether access to nature had an impact on employee performance at work

. **Table 3:** Correlation between outdoor access and performance at work

		Access type	Access in nature	Performance at work
Type of access	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	66		
Access in nature	Pearson Correlation	.683**	1	
	Sig. (2-tailed)	.000		
	N	66	66	
Performance at work	Pearson Correlation	-.071	.399**	1
	Sig. (2-tailed)	.571	.001	
	N	66	66	66
**. Correlation is significant at the 0.01 level (2-tailed).				

The correlation analysis in the table above showed that access to the natural environment or stimulated natural environment affects the work performance of respondents. The correlation for this case is statistically significant and is positive at the value r =. 399 **, meaning that the higher the outdoor and nature access, the higher the performance of respondents. The hypothesis that outdoor access affects employee job performance is fully validated.

Furthermore, in the second hypothesis the study tried to explore the relationship between access to nature and psychological health of respondents. Several variables were attributed to psychological health, such as stress, somatic symptoms, anxiety, insomnia, social dysfunction and depression.

Table 4: Correlation between outdoor access and psychological health of employees at work

		Type of access	Access in nature	Stress	Somatic symptoms	Anxiety insomnia	Social dysfunction	Depression
Type of access	Pearson Correlation	1						
	Sig. (2-tailed)							
	N	66						
Access in nature	Pearson Correlation	-.683**	1					
	Sig. (2-tailed)	.000						
	N	66	66					
Stress	Pearson Correlation	.212	-.328**	1				
	Sig. (2-tailed)	.088	.007					
	N	66	66	66				
Somatic symptoms	Pearson Correlation	.010	-.033	-.294*	1			
	Sig. (2-tailed)	.935	.790	.017				
	N	66	66	66	66			
Anxiety insomnia	Pearson Correlation	-.003	.022	-.349**	.723**	1		
	Sig. (2-tailed)	.979	.860	.004	.000			
	N	66	66	66	66	66		
Social dysfunction / interactivity	Pearson Correlation	-.066	.242	-.055	.070	.316**	1	
	Sig. (2-tailed)	.599	.051	.662	.577	.010		
	N	66	66	66	66	66	66	
Depression	Pearson Correlation	-.229	-.392**	.058	.204	.355**	.099	1
	Sig. (2-tailed)	.064	.001	.645	.100	.003	.427	
	N	66	66	66	66	66	66	66
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

The table above showed two statistically very significant correlations. The first is related to the level of stress of the respondents, which represents the value er = -. 328 **, the correlation is presented in a negative value, which means that the variables also have a negative correlation between them. The higher the access of respondents to nature is, the lower the level of stress among them and vice versa, the lower the access to nature was, the higher the level of stress among respondents. The same result is presented regarding the depression variable. In this case, the correlation value is higher, r = -. 392 **, and also in negative value. The less access to natural or stimulated environments, the higher the depression levels among respondents. The second hypothesis of the study is only partially confirmed, as outdoor access affected and had a statistically significant correlation with stress and depression, but there was no significant correlationfound between the variables of somatic symptoms, anxiety and insomnia or social dysfunction.

Regression analysis

After the correlation analysis, the regression model is used to predict the variables in the study. The first model is attributed to performance regression analysis at work, with

predictors of nature access. The following table is a summary of the regression model used. This table gives R values (Variance squared) and R2 values for the model obtained. For these data, R has a value of .399, which is high considering the existence of a single predictor. In addition, the table shows the value of F-ratio, which is calculated using the equation F = MSM / MSR, and the corresponding significance value of this F-ratio. For these data, F is 12.098, which is significant with p <.001 (value in the column labeled Sig. less than 0.001). In this regard, there is less than 0.1% chance that such a large F-ratio would occur. Therefore, we can conclude that our regression model results in a good prediction.

Table 5: Regression

Model summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.399[a]	.159	.146	7.45016
a. Predictors: (Constant), Aksesi_ne_natyre_total				

Anova[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	671.510	1	671.510	12.098	.001[b]
	Residual	3552.308	64	55.505		
	Total	4223.818	65			
a. Dependent Variable: Performanca_ne_pune_total						
b. Predictors: (Constant), Aksesi_ne_natyre_total						

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	45.256	4.952		9.139	.000
	Aksesi_ne_natyre_total	.244	.070	.399	3.478	.001
a. Dependent Variable: Performanca_ne_pune_total						

When checked, the contribution of the variable was estimated using the standardized Beta for the coefficient in question. The regression results confirms that nature access is a variable and a defining criterion for performance at work (Beta = 0.399, p <.001).

The predictability model for the stress variable was also applied, but the regression could not be verified, nature access was not a good predictor for stress levels among participants.

Furthermore, regression for depression variable was tested. The second model, therefore, is attributed to the depression level regression analysis, with nature access as predictor. The following table is a summary of the regression model used for this study. For these variables, R has a value of .392, which is high to some extent considering the existence of a single predictor.

In addition, the table shows the value of F-ratio, which is calculated using the equation F = MSM / MSR, and the corresponding significance value of this F-ratio. For these data, F is 11.601, which is significant with p <.001 (value in the column labeled Sig. less than 0.001). It is less than 0.1% chance that such a large F-ratio would occur.

Therefore, the regression model results in a good prediction; access to nature was a good predictor of depression levels among respondets.

Table 6: Regression

Model summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.392[a]	.153	.140	2.60965
a. Predictors: (Constant), Aksesi_ne_natyre_total				

Anova[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	79.006	1	79.006	11.601	.001[b]
	Residual	435.858	64	6.810		
	Total	514.864	65			
a. Dependent Variable: Depresioni_total						
b. Predictors: (Constant), Aksesi_ne_natyre_total						

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2.240	1.735		1.291	.201
	Access_in_nature_total	.084	.025	.392	3.406	.001
a. Dependent Variable: Depresioni_total						

The contribution of the variable, when checked, was estimated using the standardized Beta for the coefficient in question. Nature access is a variable and a determining criterion for the level of depression among respondents at work (Beta = 0. 392, p <.001).

Discussion

The study result shows that the natural environment affects performance at work. A similar conclusion was reached by Berleant and Carlson [12] who described the natural environment as a factor that stimulates emotions, sensitivity, as a source of inspiration and creativity, as the basis of life development and regeneration, as an opportunity for moral orientation and individual improvement. All of these factors identified by Berleant and Carlson [12] have a significant impact on the degree of employee engagement at work, and consequently on their performance. Moreover, the correlation of these two variables in the current study was positive, which means that performance at work increases when the access to the natural environment or stimulated natural environment increases too. Similarly, Gifford [12] in a study on the impact of the natural environment on human behavior highlighted its regenerative and relaxing abilities, which promote cognitive abilities and improve individual characteristics and improve social interaction, indicating employee effectiveness in work environments. Moreover, Kaplan [17] has highlighted the ability of the natural environment to improve employees' concentration and emotional state, which promote employees' effectiveness in performing their tasks.

Regarding the relationship of nature access with stress, depression and somatic symptoms, anxiety, insomnia and social dysfunction, a statistically significant relationship was found with stress and depression. The empirical results of the current study produced a statistically significant correlation between nature access with stress and depression. In addition, these results coincide with what the stimulus overload theory predicts, weak stimuli are more harmful than overloaded stimuli for psychological well-being of employees. If we were to examine our results referring to the theory of environmental stressors such as pollution, extreme temperatures, noise, overcrowding, they are valid and stable, as this theory states that the presence of these factors at high levels, and for a long time, encourages people to perceive them as threatening and impairs their ability to cope with stress by causing exhaustion, mental disorders and reduced social interaction, as confirmed in their previous studies by researchers Gifford [3], Veitch and Arkkelin [6].

An example of a nature based workspace desig is used below to get a clearer picture of the importance of the results achieved. It is in the same line with the conclusions that the built environment, which incorporates nature in its design, increases the performance of employees at work, as well as their psychological well-being. The case taken as an example, called "*Second Home Hollywood*", was built and conceived as a co-working space, located in the city of Los Angeles, United States of America. The project was designed by a Spanish architecture studio called SelgasCano. In this project, a former Hollywood parking lot was completely transformed into a large office and work complex, which houses about 250 different businesses. In this project, the architects filled the site with sixty oval-shaped office miniatures of various sizes, with yellow roofs at the top. The latter resemble a bunch of flowers (lilies) when viewed from above. The first floor of the building features a range of spaces that are open to the public, including a branch of the Second House library called the Library, a restaurant, outdoor terraces and meeting rooms, which local charities and nearby residents can access for free.

Source: Lindsay [25]

Fig 3: Example of a design which incorporates nature into its design

The space around and between the offices, is populated with more than 6,500 plants and trees, and with more than 112 *native* species in Los Angeles, to create a calm and relaxing work environment. The plant cover also serves as a very good acoustic insulator as well as with thermal properties. This design is the perfect example on how we can manage to increase both performance and the psychological well-being of employees at work increasing direct nature access.

Conclusions

The purpose of the study was to investigate the relationship between access to nature or stimulated nature, and employee performance and wellbeing (mainly psychological) at work. The study managed to confirm his hypothesis that nature access has a statistically significant correlation with employees' performance at work. The results also showed significant correlations between access to nature and psychologicalvariables linkage such as the level of stress of respondents at work, as well as with the level of depression between them. In addition, the regression analysis showed that as far as stress level is concerned, although there was a statistically significant correlation, nature access was not a good predictor of stress level among respondents. Access to nature, on the other hand, was a good predictor of depression between respondents.

The study presented major contributions as an empirical investigation. Although it is clear, in principle, that contact with nature is an important aspect of a healthy work environment, there is a need for more in-depth studies and empirical assessments that confirm both factors and more detailed consequences on the impact of nature on human behavior, specifically in this case at work. Future research

can also develop and test measuring instruments to enable research comparisons such as forms of contact with nature and their impact on human behavior (perhaps in different settings beside work), psychological and physical health. These findings are important both in the context of workspace design (for architects, interior designers etc), but also for the managers themselves, human resources departments, and as a company level, to have the highest possible results from their employees, but also for the employees themselves to be looking for work environments in which they can give the maximum of their performance and wellbeing.

Study limits

The study certainly faced some limitations. First, the time span was too short to conduct a wider sample. The study managed to gather only 66 respondents. Therefore, it is suggested that the study contains a broader sample in the future. Also, regarding instruments, there were significant limitations regarding measuring instruments, standardized nature access instruments specifically. The instrument used for this case was an experimental instrument. It is recommended for further research and reserchers to derive a unified and standardized instrument to be used by all filds and sciences covered by the topic.

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