

# Environment Friendly Complementary Therapies that Promote Long-Term Health and Wellness in the Workplace

Kanimozhi Chakrapani<sup>a\*</sup>, Kalpana B<sup>a</sup>

## ABSTRACT

**Background:** The World Federation of Mental Health established workplace mental health as theme for 2024, emphasizing the significance of prioritizing mental health and well-being in the workplace to benefit individuals and communities. Although discussions regarding mental health in the workplace have been increasingly prevalent, numerous individuals continue to encounter stigma associated with severe mental health issues. The study's objective was to investigate whether there is a disparity in employee stress and health based on the type of cabins that offer differing views of greenery.

**Materials and Methods:** The green environment and its influence on stress, physical and mental health status of the office goers were assessed with introduction of green interventions over the workers cabin. The experiment involved questioners regarding the description of the employees cabin initially and based on that through purposive sampling the total sample of 60 is grouped as employees in green cabins, grey cabins and in window cabins.

**Results:** A decrease in the stress level for window cabin with post test value of 21.05 compared to the pre-test value of 27.35 and is statistically significant at 0.05 % with a mean difference of 6.6. Findings indicated that individuals working in window cabins felt better about their environmental preference, cabin appearance, air quality, and greenery satisfaction.

**Conclusion:** The fact that the employees spending majority of the time in the indoor demands a better physical environment blending with nature to make a better cure for the stressed outs.

Received date: 26.12.2025

Accepted date: 02.07.2026

**Keywords:** Complementary therapies, Horticulture interventions, Mental health, Occupational stress, Cabin environment.

<https://doi.org/10.65601/FoMR.2026.1.3.3>

## \*Corresponding Author:

<sup>a</sup>Department of Floriculture and Landscape architecture,  
SRM College of Agricultural Sciences,  
SRM Institute of Science and Technology,  
Baburayanpettai, Chengalpattu District- 603 201,  
Tamil Nadu, India.

Email: [kanimozc@srmist.edu.in](mailto:kanimozc@srmist.edu.in)



All the articles published in FoMR are open-access, providing free access to everyone. FoMR articles are licensed under the Creative Commons Attribution licence (<https://creativecommons.org/share-your-work/cclicenses/>). This license enables reusers to distribute, remix, adapt, and build upon the material in any medium or format, so long as attribution is given to the creator. The license allows for commercial use.

## INTRODUCTION

The company and the workforce benefit by promoting the wellness of the employees. To cultivate a productive workplace that benefits individuals and the business, prioritizing employee well-being is essential. Preserving personal health and welfare significantly influences organizational performance (CIPD, 2024) and to venture this knowledge creation and productivity, the responsibility lies with the architectural discipline to provide a suitable space (Genjo et al., 2019). Approximately 85-90% of individuals spend the majority of their lives indoors, making the indoor environment crucial for public health; (Liquan & Yanqun, 2011). Substandard air quality contributes to an increase in sick building syndrome and diminishes the performance of occupants (Lee et al., 2009) and the indoor environment characterized by deficient ergonomic design which is inversely associated with asthma exacerbation and respiratory allergies while also contributing to psychological issues such as sadness and stress, as noted by Henneberger et al., (2006). The modern workplace induces pressure; for some individuals, this result in heightened alertness, motivation, learning, and productivity, while for others, it becomes overwhelming, leading to stress. Excessive or unreasonable pressure results in stress and can adversely affect employee health and corporate performance (WHO, 2020). The World Federation of Mental Health established workplace mental health as the theme for 2024, emphasizing the significance of prioritizing mental health and well-being in the workplace to benefit individuals, organizations, and communities (Mental Health Foundation, 2024). The components of an office, including personnel, spatial design, equipment, furnishings, and the overall environment, must be cohesively integrated to ensure that employees feel healthy, comfortable, and capable of working efficiently (Vimalanthan et al., 2014).

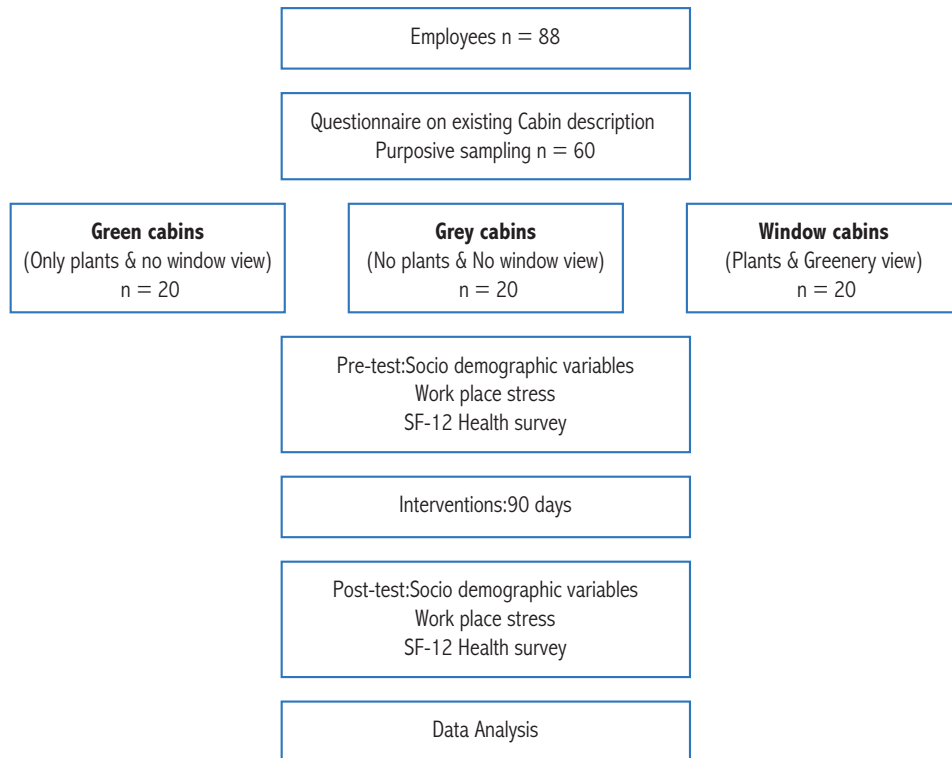
Although discussions regarding mental health in the workplace have been increasingly prevalent, numerous individuals continue to encounter stigma associated with severe mental health issues. This indicates that additional efforts are required to address mental health stigma in the workplace. In a highly pressured world, enhancing the office atmosphere is a crucial issue; thus, using green cabins in an eco-friendly setting can improve interior air quality for occupants by eliminating dangerous

airborne contaminants, fostering a healthier public environment and increasing overall pleasure. The Heschang-Mahone Group examined productivity at the Sacramento Municipal Utility District Call Center, where staff were either positioned with views of flora through expansive windows or deprived of such opinions. Employees with a vegetative perspective made 6-7% more calls per hour compared to those without such a view. The initial expense for window installation was recouped within four months due to enhanced productivity (Alker et al., 2014).

Workplace spaces featuring green cabins will enhance focus since comfort is crucial to increased happiness and productivity. For this reason the research findings will enable employers, organizations, and institutions, whether private or governmental, to enhance the work environment and emphasize the value of employees' quality of life for the benefit of all stakeholders. Numerous studies on office environment concentrated on the effect of plant growth on the office space; thus, we sought to emphasize the critical importance of mental health and well-being in professional settings where green initiatives emphasize, safeguard, and enhance mental health. The study's objective was to investigate whether there is a disparity in employee stress and health based on the type of cabins that offer differing views of greenery. Research on these environmental factors could benefit millions globally.

## METHODOLOGY

The research is a quasi experimental design where sample included office workers at the institution in Chengalpattu, Tamilnadu; permission was obtained through proper channels from the head of the institution, and ethical approval was obtained to carry out the experimental work. An informed sheet was provided to the participants, and informed consent was obtained from all the participants. The experimental rooms were twelve different office rooms located on the ground, first, second and third floor of the concrete structure built in the year 2020 at Chengalpattu district, Tamilnadu, with a see-through glass view with the front view facing the garden, sides of the building facing the adjacent building. The office rooms were with different volumes and fixed with air conditioners based on the workers' affiliations and the working hours is 08.30 am to 04.30 pm with eight hours work



**Figure 1** Flow chart of the green interventions on the employees cabin environment

schedule irrespective of work nature. The details of the complete study were depicted in the flow chart in Figure 1. The sample was sorted into three groups: employees in the grey cabin with no plants and no window view (Figure 2a) and window cabin with plant and window view (Figure 2b) employees in the green cabin with plants and without window view (Figure 2c), based on the purposive sampling method.

The experimental conditions supported providing plants at a minimum rate of Rs. 10. The interested faculties are asked to buy the one pot - one table program initiated on June 5th, the environmental day. However, many numbers can be purchased as per their requirement. All the experimental conditions had a chair and a desk for work with or without a window. Indoor plants like *Pothos*, *Aglonema* and *Areca palms* was selected as the plants to be placed on the table for the following reasons: it grows well with little sunlight, and it has anti-bacterial and anti-fungal activity, effective in removing indoor pollutants like formaldehyde, benzene and xylene (Mahlawat & Sangwan, 2025). The experiment period was 90 days, from June 5<sup>th</sup> 2025, to August 5<sup>th</sup> 2025.

The temperature and relative humidity for the three months were recorded. The mean temperature at 07.22 hours and at 14.22 hours was measures in Celsius and percentage and the mean maximum temperature is 27.6°C and minimum temperature of 25° C and the maximum relative humidity is 82.6 % and the minimum relative humidity is 45 %.

The assessment tool used in this study comprises questions categorized into several sections, including the socio-demographic variables, SF-12 Health survey, workplace stress scale, and subjective feedback.

### Socio-demographic and work environment

The demographic section included questions regarding age, gender, education, work experience, affiliations, marital status, and income of the participants. The work environment questions were related to the cabin description, which specifically pertained to information about the presence of plants, the absence of plants, and the participants viewing a greener environment. The air movement, participant's perception and attitude towards



**Figure 2** (a) Grey Cabin with no plants and no window view (b) Green Cabin with the introduction of foliage indoor plants with no window view (c) Window cabin with introduction of plants and greenery view

nurturing plants, influence of plants and stress management were evaluated through yes/no/maybe questions.

### Workplace Stress Scale

The scale is a well-established tool for evaluating the stress levels of individuals employed in organizations. It has eight succinct statements that identify prevalent job stressors, enabling the straightforward assessment of an individual's stress level and areas of concern. However, it is not infallible in accuracy, as it relies on the awareness and honesty of the personnel. It is widely utilized by researchers, professionals, and individuals pursuing a better and more balanced work environment. The stress level is categorized into five levels as indicated in table 1.

**Table 1** Work place stress scale

|                            |                                          |
|----------------------------|------------------------------------------|
| Total score of 15 or lower | Chilled out and relatively calm.         |
| Total score of 16-20       | Fairly low                               |
| Total score of 21-25       | Moderate stress                          |
| Total score of 26-30       | Severe.                                  |
| Total score of 31-40       | Stress levels are potentially dangerous. |

### SF-12 Health Survey

A twelve-question questionnaire was designed and administered to evaluate the health-related quality of life (HRQoL). Six components comprise the Physical Component Summary, and six comprise the Mental Component Summary. The cumulative score of both measures can range from 0 to 100, with a more significant number indicating a higher

quality of life. To interpret the PCS and MCS scoring system, a mean of fifty and a standard deviation of ten are utilized for the general population. Scores for health-related quality of life that are higher than 50 indicate that the individual's health is above average, whereas scores that are lower than 50 indicate that the individual's health is below average.

### Subjective feedback

The questions concerned the working conditions and the cabin's atmosphere. On a Likert scale ranging from 1 to 5, the participants were asked to score their level of satisfaction, with 1 indicating complete dissatisfaction, two indicating dissatisfaction, 3 indicating neither dissatisfaction nor satisfaction, 4 indicating the level of satisfaction and five indicating completely satisfied. The questions were asked before and after the intervention to evaluate the employees' preferences about the environment, cabin look, air quality, satisfaction with plants, and overall well-being after the installation of plants.

### Statistical analysis

The statistical analysis for the work stress and health survey was analyzed through a paired t-test to compare pre-test and post-test, and the frequency and percentage calculations were made for subjective feedback and presented in the chart.

## RESULTS AND DISCUSSIONS

### Socio-demographic variables

The frequency and distribution of the demographic variables were collected and presented in percentage and frequency for the three different cabins. The total values are provided in each category, as shown in Table 2.

**Table 2** The frequency and percentage distribution of Socio-demographic variables

| Socio Demographic Variables |                  | Window Cabin |    | Green cabin |    | Grey Cabin |    | Total |      |
|-----------------------------|------------------|--------------|----|-------------|----|------------|----|-------|------|
|                             |                  | F            | %  | F           | %  | F          | %  | F     | %    |
| Place                       | Rural            | 12           | 60 | 13          | 65 | 7          | 35 | 32    | 53.4 |
|                             | Urban            | 6            | 30 | 5           | 25 | 13         | 65 | 24    | 40   |
|                             | Peri urban       | 2            | 10 | 2           | 10 | 0          | 0  | 4     | 6.6  |
| Sex                         | Male             | 17           | 85 | 9           | 45 | 13         | 65 | 39    | 65   |
|                             | Female           | 3            | 15 | 11          | 5  | 7          | 35 | 21    | 35   |
| Age                         | 20-30            | 12           | 60 | 10          | 50 | 10         | 50 | 32    | 53.4 |
|                             | 31-40            | 8            | 40 | 10          | 50 | 6          | 30 | 24    | 40   |
|                             | 41-50            | 0            | 0  | 0           | 0  | 2          | 10 | 2     | 3.3  |
|                             | >50              | 0            | 0  | 0           | 0  | 2          | 10 | 2     | 3.3  |
| Education                   | HSC              | 1            | 5  | 10          | 50 | 4          | 20 | 15    | 25   |
|                             | Degree & above   | 19           | 95 | 10          | 50 | 16         | 80 | 45    | 75   |
| Work Experience             | < 1 year         | 4            | 20 | 3           | 15 | 3          | 15 | 10    | 16.7 |
|                             | 1-10 years       | 14           | 70 | 14          | 70 | 13         | 65 | 41    | 68.3 |
|                             | >10 years        | 2            | 10 | 3           | 15 | 4          | 20 | 9     | 15   |
| Affiliations                | Faculty          | 12           | 60 | 6           | 30 | 4          | 20 | 22    | 36.7 |
|                             | Technician       | 2            | 10 | 0           | 0  | 7          | 35 | 9     | 15   |
|                             | Supporting staff | 6            | 30 | 14          | 70 | 8          | 40 | 28    | 46.7 |
|                             | Administration   | 0            | 0  | 0           | 0  | 1          | 5  | 1     | 1.6  |
| Marital Status              | Married          | 14           | 70 | 16          | 80 | 10         | 50 | 40    | 66.8 |
|                             | Unmarried        | 6            | 30 | 4           | 20 | 8          | 40 | 18    | 30   |
|                             | Divorced         | 0            | 0  | 0           | 0  | 1          | 5  | 1     | 1.6  |
|                             | Widower/widow    | 0            | 0  | 0           | 0  | 1          | 5  | 1     | 1.6  |
| Income                      | < 10000          | 2            | 10 | 0           | 0  | 2          | 10 | 4     | 6.6  |
|                             | Rs. 10000- 50000 | 9            | 45 | 17          | 85 | 18         | 90 | 44    | 73.4 |
|                             | >50000           | 9            | 45 | 3           | 15 | 0          | 0  | 12    | 20   |

*F = Frequency*

The respondents about the location were classified into three categories: rural, urban, and peri urban. The predominant group of employees was from the rural category, at 53.4%, followed by those from metropolitan areas at 40%. The employee demographic comprises 65% male and 35% female participants across several categories. The predominant age group was 20-30, with 53.4% of the population, followed by 40% in the 31-40

categories. Twenty-five percent possessed Higher Secondary Education, whereas seventy-five percent held a degree or higher. The work experience category scores 68.3% for those with 1 to 10 years of experience. Of the affiliations, 46.7% were support workers, 36.7% were faculty members, and 15% were technicians. The marital status data indicates that 66.8% were married, 30% were single, and 1.6% were divorced and widowed. The

**Table 3** Frequency and distribution of stress among employees

| Stress Level                        | Window Cabin |    |           |    | Green Cabin |    |           |    | Grey Cabin |    |           |    |
|-------------------------------------|--------------|----|-----------|----|-------------|----|-----------|----|------------|----|-----------|----|
|                                     | Pre-test     |    | Post-test |    | Pre-test    |    | Post-test |    | Pre-test   |    | Post-test |    |
|                                     | F            | %  | F         | %  | F           | %  | F         | %  | F          | %  | F         | %  |
| Chilled out & relatively calm (<15) | 2            | 10 | 8         | 40 | 3           | 15 | 8         | 40 | 0          | 0  | 0         | 0  |
| Fairly low (16-20)                  | 2            | 10 | 2         | 10 | 2           | 10 | 2         | 10 | 1          | 5  | 0         | 0  |
| Moderate stress (21-25)             | 5            | 25 | 4         | 20 | 5           | 25 | 4         | 20 | 4          | 20 | 2         | 10 |
| Severe (26-30)                      | 2            | 10 | 1         | 5  | 1           | 5  | 1         | 5  | 0          | 0  | 0         | 0  |
| Potentially dangerous (31-40)       | 9            | 45 | 5         | 25 | 9           | 45 | 5         | 25 | 15         | 75 | 18        | 90 |

employees' salaries ranged from 10000 to above 50000, and 73 % of the employees were earning in between 10000 to 50000 income range and around 20% of the employees earns above 50000.

### Work Stress Scale

The frequency and distribution of stress are evaluated according to the five stress scales and explained in table 3. According to the data, the stress level has decreased progressively in the green and window cabin, with 40 % of the employees in the relatively calm category during the post-test. In the grey cabin, the stress levels were potentially dangerous, with 90% scoring during the end of the intervention.

The effects of green interventions on the work stress scale were evaluated using paired 't' test before and after interventions for the three groups and presented in Table 4. The results reveal a decrease in the stress level for the employees of window cabin with post test value of 21.05

compared to the pre-test with an average value of 27.35 and are statistically significant with a mean difference of 6.6. The green cabin showed a pre-test value of 25.15 with a substantial decrease in the stress level of 20.55 with a mean difference of 4.6. The grey cabin pre-test value for stress is 32.6, and the stress levels have increased to 35.75 with a negative difference of -3.15 at a 5% significant level.

Table 5 explains the association between the level of stress reduction among the employees with their selected socio demographic variables. There were no other significant differences in overall socio demographic variables and the statistical significance was calculated using chi square analysis.

### SF-12 Scoring

Before the green cabin horticulture intervention, the employees had varying SF-12 scores for physical and mental health and the values are compared using Paired t test after intervention and discussed below.

**Table 4** Effect of green interventions on WSS using paired' test with pre and post test values

| Variables    |           | Mean  | SD    | Mean Difference | n  | t    | p      |
|--------------|-----------|-------|-------|-----------------|----|------|--------|
| Window Cabin | Pre-test  | 27.35 | 9.92  | 6.6             | 20 | 1.51 | 0.068* |
|              | Post-test | 21.05 | 10.06 |                 |    |      |        |
| Green Cabin  | Pre-test  | 25.15 | 8.23  | 4.6             | 20 | 1.99 | 0.026* |
|              | Post-test | 20.55 | 6.54  |                 |    |      |        |
| Grey Cabin   | Pre-test  | 32.6  | 7.57  | -3.15           | 20 | 1.95 | 0.002* |
|              | Post-test | 35.75 | 5.49  |                 |    |      |        |

SD: standard deviation, n: sample size, t: paired t test values, p\* value means significant at < 0.05

**Table 5** Results showing difference in stress level after the intervention between the employees placed at different cabin environment with regard to socio demographic variables

| Variables       | Grey Cabin |      |      | Window Cabin |    |      | Green Cabin |    |        |
|-----------------|------------|------|------|--------------|----|------|-------------|----|--------|
|                 | $\chi^2$   | df   | p    | $\chi^2$     | df | p    | $\chi^2$    | df | p      |
| Place           | 1.21       | 8    | 0.10 | 7.41         | 8  | 0.49 | 9.8         | 8  | 0.27** |
| Sex             | 4.5        | 4    | 0.34 | 2.35         | 4  | 0.67 | 1.40        | 4  | 0.99** |
| Age             | 12.15      | 12   | 0.43 | 4.58         | 12 | 0.97 | 5.39        | 12 | 0.94** |
| Education       | 2.22       | 8    | 0.97 | 4.21         | 8  | 0.83 | 5.83        | 8  | 0.66** |
| Work Experience | 1.19       | 10   | 0.99 | 15.26        | 10 | 0.12 | 6.8         | 10 | 0.73** |
| Affiliations    | 5.5        | 16   | 0.99 | 5.04         | 16 | 0.99 | 4.42        | 16 | 0.99** |
| Marital Status  | 1.33       | 15   | 1    | 1.42         | 15 | 1    | 3.03        | 15 | 0.99** |
| Income          | 0.39       | 4.38 | 0.27 | 4.38         | 8  | 0.82 | 0.27        | 8  | 0.99** |

$\chi^2$  = Chi-square value; df = degrees of freedom; p = p\*\* not significant value

### Physical Component Score

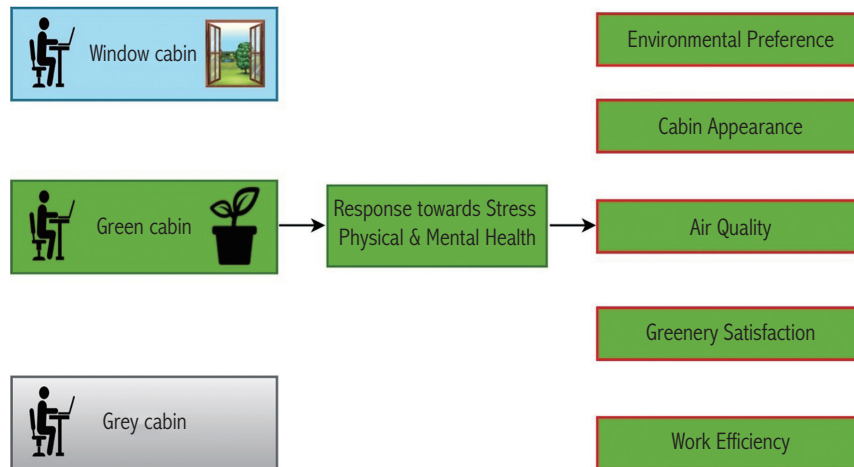
The pre-test scores for the window cabin are 38.79, 42.19 for the green cabin and 29.04 for the grey cabin and after the intervention, the post-test score is likely to be 48.94 for the window cabin with a mean difference of 10.15, which is a positive score and for the green cabin, the post-test value

is 44.63 with a mean difference of 2.44, whereas for the grey cabin, the post-test score is 28.39 with a negative difference of -0.65. Although there are changes in the scoring, the values are not significant for window and grey cabins but significant for green cabins, as shown in Table 6.

**Table 6** Effect of horticulture interventions on Physical and Mental Component Summary

| Physical Component Summary |           | Mean  | SD    | Difference | n  | t    | p       |
|----------------------------|-----------|-------|-------|------------|----|------|---------|
| Window Cabin               | Pre-test  | 38.79 | 7.04  | 10.15      | 20 | 4.68 | 0.26*   |
|                            | Post-test | 48.94 | 6.64  |            |    |      |         |
| Green Cabin                | Pre-test  | 42.19 | 11.80 | 2.44       | 20 | 0.64 | 0.001** |
|                            | Post-test | 44.63 | 12.38 |            |    |      |         |
| Grey Cabin                 | Pre-test  | 29.04 | 7.86  | -0.65      | 20 | 0.27 | 0.39*   |
|                            | Post-test | 28.39 | 7.08  |            |    |      |         |
| Mental Component Summary   |           |       |       |            |    |      |         |
| Window Cabin               | Pre-test  | 40.20 | 9.46  | 11.09      | 20 | 0.66 | 0.25*   |
|                            | Post-test | 51.29 | 8.08  |            |    |      |         |
| Green Cabin                | Pre-test  | 43.26 | 6.04  | 1.86       | 20 | 3.9  | 0.004** |
|                            | Post-test | 45.12 | 8.04  |            |    |      |         |
| Grey Cabin                 | Pre-test  | 32.21 | 10.73 | -1.94      | 20 | 0.82 | 0.206*  |
|                            | Post-test | 30.27 | 7.51  |            |    |      |         |

SD: standard deviation, n: sample size, t: paired t test values, p\* non significant (>0.05) p\*\* value means significant at < 0.05



**Figure 3** Subjective feedbacks of the employees at different cabins for the green interventions

### Mental Component Score

The pre-test score for the MCS shows a low score of 40.20 for the window cabin before the intervention. For the green cabin, it is 43.12, and for the grey cabin, the score is 32.21. After an intervention, with the mean difference of 11.09, 1.86 and -1.94 for the window, green and grey cabin, the post-test values are 51.29, 45.12 and 30.27. The values are significant for the window cabin and non-significant for the green and grey cabin.

### Subjective feedback

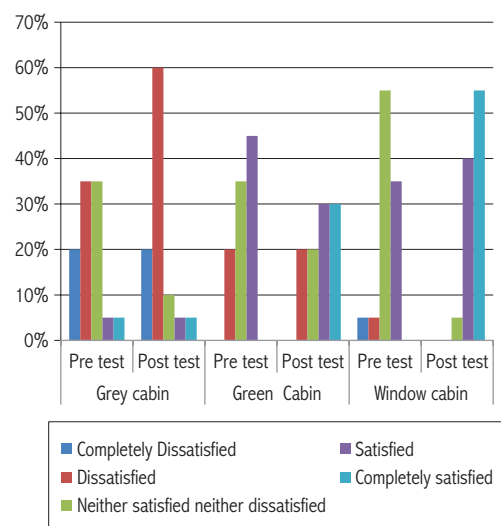
The employees gave feedback through questionnaires before and after the interventions using a five-point Likert scale with the following questions on environmental preference, cabin appearance, air quality, plant satisfaction and well-being as depicted in Figure 3.

### Environmental preference

The cabin environment is a welcoming gesture to the employees, and based on that, the employees were asked to rate their rooms. Hence, the three-cabin employees rated their rooms before and after the interventions provided, as depicted in Figure 4.

Among the three groups, the grey cabins experienced complete dissatisfaction, 60%, after the interventions. The green cabin had a complete satisfaction of 45% compared to the pre-test score values, with 30% being neither satisfied nor dissatisfied. The window cabins had a 55% satisfactory level during the post-test.

### Environmental Preference

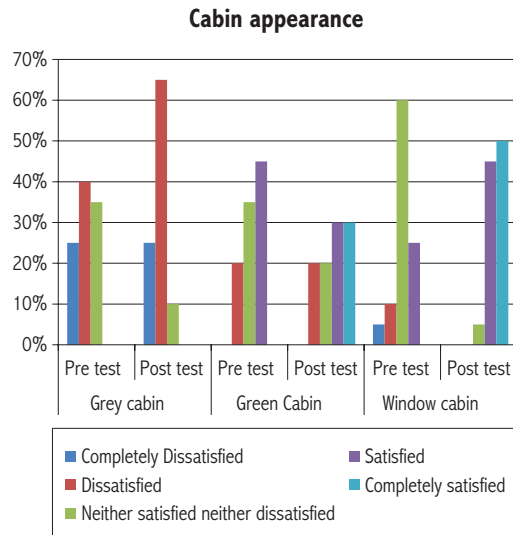


**Figure 4** Cabin environmental preferences by the employees before and after intervention

### Cabin appearance

The cabin makes the room more attractive, welcoming, and energetic. Based on this, the employees rated the room as per Figure 5.

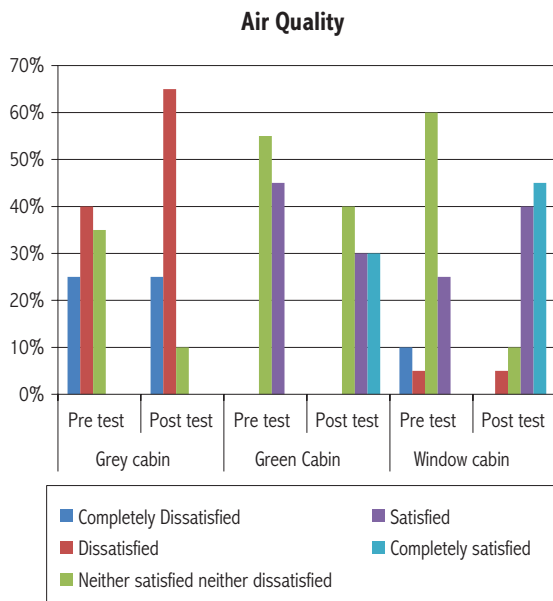
The post-test results show that 65% of grey cabins were dissatisfied with the cabin appearance, whereas 45% of employees were satisfied with the green cabin 50% were completely satisfied and 45% were satisfied with the window cabins.



**Figure 5** Cabin appearance of the three cabins before and after intervention

### Air Quality

The indoor plants mainly were air purifier and the quality of *Pothos* plants and other plants like *Aglonema* reflects the same. The following are the results of the air quality in the three different cabins before and after interventions as felt by the employees (Figure 6)

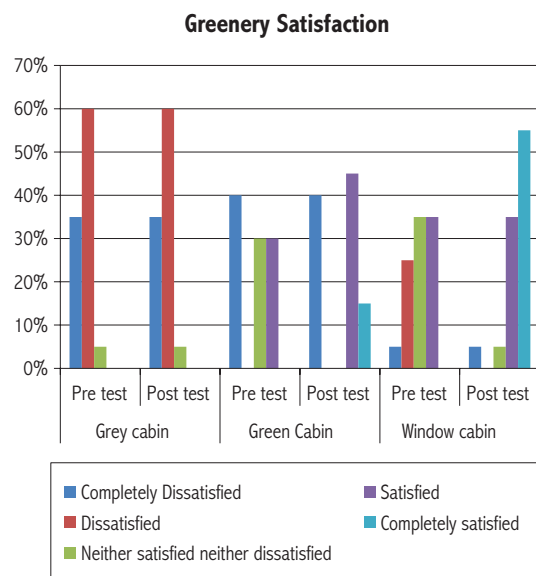


**Figure 6** Air quality feedback by the employees before and after intervention

The results scored through Likert scale by the employees after and before the interventions are provided in the chart. The air quality is poor in the grey cabin to a level of 65%, 40 % satisfied in the green cabin and the 45 % completely satisfied in the window cabin.

### Greenery Satisfaction

The amount of greenery in the surrounding environment provides a positive energy and the quantity of having less are more influences the employees hence the employees were asked to score before the intervention for the level of greenery around the cabin and after the intervention (Figure 7).

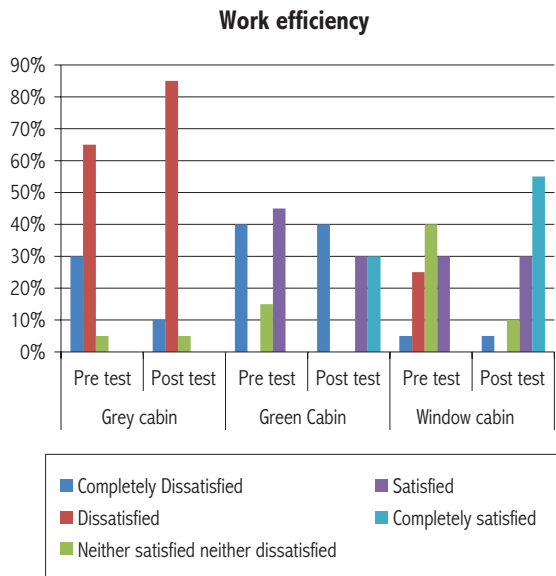


**Figure 7** Greenery satisfactions rating by employees before and after intervention

The greenery satisfaction was nearly poorer in the grey cabin, with a value of 60% of dissatisfaction level during pre and post-test. 40 % of the employees were satisfactory during the green cabin's pre and posttest period. The greenery satisfaction level is completely satisfactory for 55 % of the employees in the window cabin.

### Work efficiency

The environment plays an important role in boosting the workers productivity and hence the employees were asked to rate their work performance before and after the interventions as illustrated in Figure 8.



**Figure 8** Work efficiency rating by the employees before and after green interventions

The satisfaction for work output seems to be dissatisfied for the employees at the grey cabin both at the pre and posttest. For the green cabin at both periods, they were completely satisfied with 40% greenery around them. In the window cabin during the posttest 55 % of the employees were completely satisfied with their work efficiency and 30 % were in satisfied rating.

## DISCUSSION

The study aimed to ascertain the impact of greenery on cabin environments that facilitate recuperation for stressed personnel and to evaluate its effects on their well-being. The current research findings demonstrate that an increase in greenery correlates with a reduction in stress levels. The study demonstrated a positive influence of window cabins with indoor plants on employees' physical and emotional well-being. Significant results were observed for the window cabins containing indoor plants in comparison to the other two cabin interventions.

The health status of the employees in the window and green cabins also showed a positive improvement than the grey environment. Though we expect hypothetically the green cabin to excel than the window cabin for stress management and health, the results of the greenery satisfaction

doesn't contribute to satisfy the employees. This may be attributed to the fact that not all green spaces enhance health (Akpınar et al., 2021), and researchers contend that individuals experience green spaces through specific characteristics, including serenity, spatiality, natural elements, biodiversity, refuge, cultural significance, prospect, and social interaction (Lottrup et al., 2013). Consequently, certain dimensions may be more appealing, motivating, or significant than others regarding individuals' perceived restoration and mental well-being.

The environment significantly influences the workplace; for example, employees seated in a sociopetal arrangement, facing greenery, experience a more relaxing atmosphere conducive to meetings and discussions, particularly for those under stress, compared to a sociofugal arrangement, as noted by Sommer (1967) and hence the employees seated facing windows showed positivity.

The surrounding environment, characterized by ecological choices, will enhance the office space, serving as a crucial factor in meeting the company's productivity targets and promoting the well-being and pleasure of employees (BUTA et al., 2013). The enhancement in performance may appear as a mere slogan; nonetheless, the Harvard research has demonstrated that green workplace environments yield a 61% improvement in cognitive function assessments compared to traditional office settings (Harvard T.H. Chan School of Public Health, 2024). The physical environment influences the psychological treatment of individuals with depression (Nagib and Williams, 2018). In recent years, heightened societal pressure has led to a rise in psychological issues among individuals. Consequently, resistance to stress can be enhanced when individuals are connected to their environment (Faulkner et al., 2018) and can be fostered through human-nature partnerships (Kellert et al., 2008). Both direct and indirect interactions with nature in campus environments enhance vitality, self-assurance, and sensations of wonder, resulting in improved quality of life, elevated mood, and reduced perceived stress (Holt et al., 2019). This has garnered the interest of pertinent scholars and managers regarding the necessity of efficiently allocating resources and formulating effective strategies to enhance urban green spaces and physical surroundings. Based on the findings of

this study the policy makers should consider every inch of office space as a beneficial access towards the mental and physical wellbeing of occupiers regardless of space limitations. The green space could be a mere window view of greenery, potted indoor plants, green walls, or green roofs whatever form it is it shouldn't be underestimated for its contribution towards its restorative benefits and its positive impact on well-being because sometimes, sitting in green space is enough to improve one's mood (Ibes and Forestell, 2020). The findings could be helpful for the architects, landscapist and city planners to consider green environments in the cabins while designing the future workplace environment. The green space in the cabins will bring positive benefits to the employees and encourage them to work efficiently, as evident with the report provided by nature-based solutions, the Ignition project report (Robert et al., 2020) which states that 15 % increase in work productivity when the office spaces are provided with plants. The Statista Research Department (2013) asserts that workplace stress is the next emerging epidemic. If ignored, the Indian economy will be at risk and will experience severe repercussions. Consequently, interventions related to stress management should be customized to the Indian context to be effective in the workplace. In sum, designing campus spaces that connect people to each other is helpful for achieving sustainability goals. The greenery satisfaction rating of the employees proves that mere number of plants in the cabins will not produce profound effects and it can be justified from the that more the numbers (Jumeno and Matsumoto, 2016) more the air quality and subsequently healthier employees. This could be attributed to the facts that the cabin appearance while having more plants boosts the environment and motivates the employees (Mariana et al., 2015). The employee viewing greenery through windows had more work efficiency and satisfaction (Lottrup et al., 2015). Thus in sum the work place should be healthier as they are significantly potential environment where so much of life is spent and solution for mental health and well being should be prioritized (Gritzka et al., 2020) by the authorities.

## CONCLUSIONS

The workspace with up-gradation from sterile and dull environment to fertile and brisk space will stimulate the senses, keeping them energetic and

engageable. The natural elements create a calming sense which reduce stress and promote well-being and the result will be improved emotional stability, fewer sick days, and higher job satisfaction. Collaborative spaces with green features neglecting the monotonous cubicles can encourage interaction and bridge the gap between the employees and their work environment. It is an investment in the employees' productivity and happiness. The future is graced with invigorating greenery in the working space, which will be a boon for the well-being of the workers as the work ethics are upscaled.

## Author Contributions

**Kanimozhi Chakrapani:** Study conception and design, Writing original draft,

**Kalpana B:** Research support in data collection and draft correction.

**Financial support and sponsorship:** No funding

**Data Availability:** Data available on request due to privacy/ethical restrictions. The data that support the findings of this study are available on request from the corresponding author.

## Declarations

**Competing interests:** The authors have no relevant financial or non-financial interests to disclose.

**Conflict of interest:** The authors declare no conflict of interest

**Ethical Approval:** The study was approved by the institutional ethics committee (IEC), School of Public Health, SRM Medical College Hospital and Research Institute, Kattankulathur, Chengalpattu district, with a reference number of 0043/IEC/2023, dates 11.12.2023.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent.

## Use of artificial intelligence (AI)-assisted technology for manuscript preparation:

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

## REFERENCES

- Akpinar, A. (2021). How perceived sensory dimensions of urban green spaces are associated with teenagers' perceived restoration, stress, and mental health? *Landscape and urban planning*, 214, 104185.
- Alker, J., Malanca, M., Pottage, C., & O'Brien, R. (2014). Health, wellbeing & productivity in offices: The next chapter for green building. World Green Building Council.
- BUTA, E., CANTOR, M., SINGUREANU, V., HUSTI, A., HORŢ, D., & BUTA, M. (2013). Ornamental Plants Used for Improvement of Living, Working and Studying Spaces Microclimate. *ProEnvironmentPromediu*, 6(16).
- CIPD. (2024). Wellbeing at work. <https://www.cipd.org/en/knowledge/factsheets/well-being-factsheet/>
- Faulkner, L., Brown, K., & Quinn, T. (2018). Analyzing community resilience as an emergent property of dynamic social-ecological systems. *Ecology and Society*, 23(1).
- Genjo, K., Matsumoto, H., Ogata, N., & Nakano, T. (2019). Feasibility study on mental health-care effects of plant installations in office spaces. *Japan Architectural Review*, 2(3), 376-388.
- Gritzka, S., MacIntyre, T. E., Dörfel, D., Baker-Blanc, J. L., & Calogiuri, G. (2020). The effects of workplace nature-based interventions on the mental health and well-being of employees: a systematic review. *Frontiers in psychiatry*, 11, 498503.
- Harvard T.H. Chan School of Public Health. (2024). Green office environments linked with higher cognitive function scores [Press release]. <https://www.hsph.harvard.edu/news/press-releases/green-office-environments-linked-with-higher-cognitive-function-scores/>
- Henneberger, P. K., Derk, S. J., & Sama, S. R. et al., (2006). The frequency of workplace exacerbation among health maintenance organisation members with asthma. *Occupational Environment Medicine*, 63(8), 551-7
- Holt, E. W., Lombard, Q. K., Best, N., Smiley-Smith, S., & Quinn, J. E. (2019). Active and passive use of green space, health, and well-being amongst university students. *International journal of environmental research and public health*, 16(3), 424.
- Ibes, D. C., & Forestell, C. A. (2020). The role of campus green space and meditation on college students' mood disturbance. *J. Am. Coll. Health*, 1-8.
- Jumeno, D., & Matsumoto, H. (2016). The effects of indoor foliage plants on perceived air quality, mood, attention, and productivity. *J. Civil Eng. Arch. Res.*, 3(4), 1359-1370.
- Kellert, S. R., Heerwagen, J., & Mador, M. L. (Eds.). (2008). *Biophilic Design: The Theory, Science, and Practice of Bringing Buildings to Life*. Wiley.
- Lee, Y. S., & Guerin, D. A. (2009). Indoor environmental quality related occupant satisfaction and performance in LEED-certified buildings. *Indoor Built Environ.*, 18(4), 293-300.
- Liqun, G., & Yanqun, G. (2011). Study on building materials and indoor pollution. *Procedia Engineering*, 21, 789-794.
- Lottrup, L., Grahm, P., & Stigsdotter, U. K. (2013). Workplace greenery and perceived level of stress: Benefits of access to a green outdoor environment at the workplace. *Landscape and urban planning*, 110, 5-11.
- Lottrup, L., Stigsdotter, U. K., Meilby, H., & Claudi, A. G. (2015). The workplace window view: a determinant of office workers' work ability and job satisfaction. *Landscape research*, 40(1), 57-75.
- Mariana, H. A., Ciobanu, I., Cicevan, R., Neascu, I., & Cantor, M. (2015). Image of ornamental plants in work environments and their effect on employees. *Agricultura*, 95(4), 204-211.
- Mahlawat, S., & Sangwan, S. (2025). Indoor plants: A solution for indoor air pollution. *International Journal of Agriculture and Food Science*, 7(12), 317-319.

- Mental Health Foundation. (2024). World Mental Health Day. <https://www.mentalhealth.org.uk/our-work/public-engagement/world-mental-health-day>
- Nagib, W., & Williams, A. (2018). Creating “therapeutic landscapes” at home: The experiences of families of children with autism. *Health & place*, 52, 46-54.
- Robert, W., Sam, H., & Jennifer, L. (2020). Nature-based Solutions to the climate emergency. *IGNITION*. 21-22.
- Sommer, R. (1967). Sociofugal space. *American Journal of Sociology*, 72(6), 654-660.
- Statista. (2013). Stress in India - statistics & facts. <https://www.statista.com/topics/10075/stress-in-india/#topicOverview>
- Vimalanathan, K., & Ramesh Babu, T. (2014). The effect of indoor office environment on the work performance, health and well-being of office workers. *Journal of environmental health science and engineering*, 12(1), 113.
- World Health Organization. (2020). Stress [Questions and answers]. <https://www.who.int/news-room/questions-and-answers/item/stress>