The Effects of Different Natural Environment Influences on Health and Psychological Well-Being of People: A Case Study in Selangor

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Abstract: Background: People benefit from the recreational services provided by an urban corridor, urban park, and urban forest. Due to ongoing land-use interest and urban development, however, these natural environments are coming under increasing pressure. Simultaneously, the world is becoming increasingly urbanised, and living in cities has been linked to mental health issues. On the other hand, different natural environments are known to create healthier environments, and the need for effective restorative environments has never been greater. The purpose of the study was to compare the impacts of walking in different natural environments. Methods: I) Kota Damansara Community Forest Reserve, II) Mutiara Damansara Recreational Park, and III) the Urban Green Corridor along Jalan PJU 7/2 were used as control study sites in this study. Each site was visited only once by the study participants (40 women and 40 men). Walking for 30 min was a part of the experiment. To identify the psychological effects of different natural environments, the Depression, Anxiety, and Stress Scale (DASS21), Profile of Mood States (POMS), Positive and Negative Affect Schedule (PANAS), and Restoration Outcome Scale (ROS) were utilised. Results: In all three natural environments, the restorative effects were found to increase significantly. Conclusion: The overall conclusion of the field experiment is that being in an urban green corridor can also provide a refreshing environment. In terms of stress reduction among working adults, the recreational park is sufficient, while urban-forested areas are more effective in improving mental health by minimising stress, anxiety, and depression.

Keywords: urban natural environment; restoration; stress; depression; anxiety; mental health

1. Introduction

In middle- to high-income countries, stress, depression, and anxiety disorders are now the leading causes of disability, making working adults' mental health and well-being critical modern public health issues [1]. This trend could be linked to increased urbanisation in Asian countries such as Malaysia, where 67 percent of the population lives in cities. By 2050, expanding urban areas will reduce access to natural spaces, which can potentially pose a barrier in managing stress [2]. In this regard, the vast majority of Malaysians live and work in densely populated areas. Working adults are thought to experience more stress, anxiety, and depression as a result of living in these structure-dominated environments [3]. In particular, stress has been linked to cardiovascular-related diseases such as elevated blood pressure [4], in addition to mental health disorders such as anxiety and depression.

Work-related stress is not just the effect of work pressure on workers but on society as a whole, because the growth of society and the actual spending of resources would influence an age prone to stress and physical illnesses [5]. In response to the current situation, some Malaysians believe the pressure is two-sided. First, it is a more localised issue in everyday Asian society, particularly in Malaysia, where superstitious beliefs and cultural sensitivities heavily stigmatise mental health problems. Second, this trend is exacerbated in conservative
countries such as Malaysia, where any psychiatric illnesses, from schizophrenia to mental fatigue, are frequently viewed as god’s punishment, caused by supernatural forces, or self-obsessed behaviour. As a result, most Malaysians frequently conceal any form of mental illness to prevent society from being persecuted arbitrarily [6]. Therefore, Malaysians must find ways to manage their work-related stress per their social characteristics.

Green spaces (e.g., green corridors, street trees, parks, and forests) and blue spaces are examples of urban natural areas (e.g., lakes, rivers, oceans, and ponds). Despite the range of forms that the natural environment may take, most research has focused on aggregated “green space”, with little research investigating possible differences in impact based on the type of natural environment [7,8]. The urban natural area has a different characteristic in terms of features and its benefits; for example, urban forests are also unique from rural forests in terms of ecology (e.g., more fragmentation and non-native species pressure) and environment (e.g., urban heat island and higher pollution levels) and are more dynamic [9,10]. Next, though urban parks are often bigger, they may also have the appearance of tiny ‘pocket parks’. Finally, urban parks provide vital amenity qualities to city inhabitants, aiding in reducing the visual effect of asphalt and concrete-dominated environment [11]. On the other hand, the urban green corridor aims to create green lungs that link to major open spaces or heavily forested regions [12].

A considerable focus has been placed on natural dosage therapy in many developed countries, with a growing interest in the health benefits of spending time in natural environments [13]. Natural environments such as urban parks, green corridors, and forests are frequently considered as essential parts of health promotion since preventive medicine is closely related to human health [14]. Furthermore, exposure to the environment is known to reduce health problems and prevent deaths of senior urban residents. There are theories about how restoration flows into different natural environments. Among other, Ulrich’s Theory of Stress Reduction (SRT) and Kaplan’s Theory of Attention Restoration (ART) have been applied in investigations of landscape designs in urban areas. The view of effective environments is that of stress reduction, which is based on the belief that the natural resilience of ecosystems helps to stimulate these strong emotions and negative emotions instantaneously [15]. According to the Attention Restoration Theory (ART), “rebuilding” refers to the phase that individuals experience while healing from something which is less able to meet their regular daily tasks and demands [16].

The Stress Recovery Theory (SRT) articulates the discovery and reduction of psychological reactions due to mental disorders on the advantages of natural areas [17]. Together with related changes in efficiency and awareness, these issues are made evident by respect and the beneficial effects of describing nature areas with special versatile features. Such small characteristics and their multifaceted life, strategy, strength, and surface characteristics, as mysterious as the inner environment and as peaceful as, for example, the lack of danger and the existence of qualities, should probably be evident. In ancient Rome, the use of nature to promote mental and physical well-being was considered as “nature therapy”, where natural areas were the places for people to regularly take evacuees to the woods to ease urban crowds [18].

Although research on the role and importance of nature in restoration has increased, it is unclear which nature stimulates restoration [19]. Most studies have compared the restoration effects of green areas to constructed areas following exposure to them and have found that a natural environment vitally reduces stress. Similarly, many studies have focused on the health effects of physical exercises in green environments (forest bathing) and shown similar results [20,21]. There is currently plenty of evidence of field experiments that examined how various urban green areas support restoration [22,23], and even fewer field studies have compared the nature dosage of various urban green areas [24,25]. There is a clear gap in knowledge about the various restorative effects of the different urban green areas. For instance, we do not understand how urban green spaces such as the urban green corridor, urban park, and urban forest affect perceived health or mental health.
In many countries, urban green corridors, urban parks, and urban forests are essential leisure services for people [26,27]. In Malaysia, urban parks and urban forests, for example, are the most typical physical activities environments [28]. Although Malaysia has increased understanding of the well-being effects of the recreational use of urban green areas, the availability of forest areas has been decreased by replacing urban green corridors and pocket parks [29]. However, this plan has reduced the adequacy of the green areas for recreation [30]. Therefore, there is a need to study how different urban green areas can benefit and affect the results of restoration.

1.1. Urban Natural Area as Restorative Environments

Results of previous research, concerning how different types of green areas are restored, are fragmented [31]. Experimental studies have shown how the quality of green areas affects the rehabilitation of people is somewhat inconsistent [32].

Moreover, clinical trials have been demonstrated in nature dosage therapy among adults with hypertension and diabetic patients [33,34]. In this context, psychological studies showed that a natural environment is effective for stress reduction, depression and anxiety relief, and psychological restoration. Recent research has shown that forest walks can improve health status and reduce psychological stress in healthy individuals [35]. Furthermore, the most common form of physical activity in preventing cardiovascular diseases is walking, which is increasingly important [36,37]. To date, however, little evidence is available on the direct benefits of walking in different environmental conditions, which actually affect the stress, anxiety, and depression of adults [38,39].

Therefore, the objectives of this study were to assess the short-term impacts of walking on different environmental conditions among working adults, stress, anxiety, and depression, as well as to provide psychological information on the health outcomes of various walking environments.

1.2. Objectives

This study focused on the restoration of visits in three urban contexts: an urban green corridor, an urban park, and an urban forest area. For this purpose, psychological measures were used as the responses to stress, anxiety, and depression due to a complex, temporal chain of psychological and emotional responses. In particular, the researchers are interested in determining how these changes occur during experimental phases, including a walking step. Specifically, the objective was to study the impacts of walking on Dass-21, the scale of the restructuring outcome, and the positive and negative impacts of mood conditions.

1.3. The Hypotheses of the Study

1. We anticipated that urban green corridors would vary in terms of their restorative quality, with urban forested areas being more restorative than urban parks.
2. We hypothesised that after the experiment, all dependent variables (restorative outcome scale, positive affect, and mood states) would demonstrate more significant depression, stress, and anxiety relief in the urban landscape area than in the urban green corridor (control).
3. We foresaw a significant reduction in the negative mood states and effects in urban parks and urban-forested areas.

2. Methods

2.1. Study Sites

During separate days, the participants were exposed to one of the three different environments located in Selangor, Malaysia. There are three environments: Kota Damansara Community Forest Reserve represented the forested region; Mutiara Damansara Recreation Park represented the built urban park; and the urban green corridor along Jalan PJU 7/2 in Mutiara Damansara represented the urban natural green infrastructure.
Approximately, 3°10’ N and 101°35’ E (Figure 1) is the location of Kota Damansara Community Forest Reserve, covering a total of 321.7 acres. The forested area has a high temperature climatic environment (average annual temperature of 23 °C) and high rainfalls (yearly average at 2370 mm). Kota Damansara Community Forest Reserve is a remnant logged in the once extensive Sungai Buloh Forest Reserve on the secondary lowland mixed dipterocarp. Most of the forestry reserve Sungai Buloh has been degassed and developed in recent decades for highways, housing, shopping centres, and other land uses. During the experiment, the participants walked first along the Scouts’ Trail in the approximately 2 km Kota Damansara Community Forest Reserve.

The Recreational Park Mutiara Damansara, located at 3°16’ N and 101°61’ E, covered an area of 13 km. It has an air-temperature climate (average annually at 27 °C) which is similar to Kota Damansara Community Forestry Reserve annual temperature. It is a public park in the Persiaran Surian, which is also known as Kota Damansara’s heart. The park was designed to accommodate gardens, flower beds, and ancient park trees that include benches and a hut. The participants were guided on the paths in the recreational park.

The control site in the urban centre, an urban green corridor along Jalan PJU 7/2 that is located at 3°16’ N and 101°61’ E, Mutiara Damansara, is a linear natural infrastructure with trees and shrubs that provides urban ecological services to green areas active transport routing commercial land utilisation.

2.2. Sample

All 80 working adults were men and women working in Damansara-based service industries. They were working in customer service, advice, staff, and retails. Moreover, they
were also working within five kilometres of the study sites. The participants were between 25 and 60 years old (M = 33.68, SD = 12.06); 24 are men, and the remaining are women.

2.3. Experimental Design

2.3.1. Timing of the Experiment

The experiment was carried out from 0800 to 0930 h on weekdays and weekends, from early December 2019 to early February 2020, depending on the available dates of the participants. The weather during the experiment was mostly humid and hot. It is crucial to note that the experiment was not performed during rainy or monsoon seasons. During the field visits, the average temperature was 30.0 °C, with 75% humidity and 15 km/h wind speed.

2.3.2. Recruitment

The participants were recruited through email invitation letters which were sent to many corporate human resources managers, and the invitation was circulated through various social media platforms. The invitation, which included a link to a Google Form Survey that offered a field experiment, was emailed to the potential participants with the phone number and email address given. Those involved in the study responded via email and telephone. This also involved a voluntary involvement. Additionally, the participants had their first close interaction with the researchers, and their suitability to participate in this experiment was confirmed (e.g., medical issues). The guidelines were also communicated to the participants through social media platforms such as WhatsApp. These guidelines include the best way to prepare for each visit (e.g., no alcohol or tobacco consumption before the experimental day, avoidance of physical fitness training, and some guidance on attire), and how to find the gathering spot as well as the specific date and time of each of the two visits for each experimental site. The participants were asked to work as usual to ensure the work-related stress level. As a result, most of the participants attended the experiments after their working hours.

2.3.3. Materials of This Study

Psychological Measures

The participants’ self-reported restorative effects, psychological distress, and attitude were measured using four separate psychological scales: DASS-21, Profile of Mood States (POMS), Positive Affect and Negative Affect Schedule (PANAS), and Restoration Outcome Scale (PANAS).

In nature and well-being research, the Positive Affect and Negative Affect Schedule (PANAS) is often used [40]. It is used to assess positive and negative effects, with each category consisting of 10 items (POSITIVE: alert, involved, alert, excited, enthusiastic, determined, motivated, proud, interested, and healthy) and (NEGATIVE: aggressive, irritable, embarrassed, guilty, distressed, angry, frightened, afraid, jittery, and nervous). In this work, the PANAS POS from positive affect items and PANAS NEG from negative affect items were compared before and after each of the three study sites.

DASS-21 was selected for its ability to assess psychological distress in general and its widespread use in clinical and nonclinical settings. Meanwhile, the symptoms of depression, anxiety, and stress were measured using the translated and validated English language and Bahasa Malaysia editions. DASS-21 was broken down into three negative emotional states: depression (7 items), anxiety (7 items), and stress (7 items). Devaluation of life, hopelessness, loss of interest, self-deprecation, anhedonia, dysphoria, and inertia are some of the psychological symptoms used on the depression scale. On the other hand, the anxiety scale assessed skeletal muscle effects, autonomic arousal, subjective perception of anxious impact, and situational anxiety. Stress scales assessed psychological symptoms such as being easily agitated, irritable or over-reactive, finding it difficult to relax, and nervous arousal.
Another reliable measurement for measuring people’s psychological reactions (beneficial outcomes) to nature is the Restoration Outcome Scale (ROS) [41,42]. It is based on the scales introduced by [43] and completed by [44]. This psychological test consists of six statements that participants must rate on a seven-point Likert scale (i.e., from one to seven, with one equalling “not at all” and seven equalling “completely”).

The Profile of Mood States (POMS) is a well-known, factor-based, and validated measure of psychological distress [45] that uses 50 statements to assess short-term mood changes across six mood domains including tension-anxiety, depression, anger-hostility, exhaustion, confusion, and vigour [46,47]. On a scale of 0 (not at all) to 5 (significantly), the participants were asked to rate their current mood states (entirely). The POMS data are then used to measure the Total Mood Disturbance (TMD) score, which is a factorsynthesised indicator used to quantify the effects of natural environments on mood states [42]. The higher the TMD score, the more mood disturbance there is.

Experimental Procedure

The participants were invited to visit every experimental site (Kota Damansara Community Forest Reserve, Mutia Damansara Recreational Park and Jalan PJU 7/2 urban green corridor, and Mutia Damansara). The participants visited each experimental site twice, and the experiment lasted for two hours in total. There was a minimum of one week between the visits to various experimental sites, and the sequence in which each site was visited was randomised. The participants were put into groups of not more than six persons, resulting in fewer than 20 participants every week. The size of the group was decided based on the amount of comfortable seating spaces available in the van. The dates were selected by the participants themselves so that the experimental days would match their schedules, and there would be no restriction on the fact that the participants could not be known of each other. On each visit, there were different participants in the group, since some of them had changed the dates of their visits.

A day prior to each experimental day, the participants were notified through social networks. They were picked up from their location before 7:30 a.m. on the experimental day, and the journey to the experimental site took around 10–20 min. The participants were briefed about the experiment upon their arrival to the site. Prior to their first visit, the participants must sign a voluntary consent form and return it to the researchers. The first questionnaire (DASS-21, POMS, and PANAS) must be completed while the participants were travelling to the site in the van. Before the walking phase began, the participants were reminded to not communicate with each other or other visitors throughout the phase. Next, the participants walked at a regulated pace for 30 min in each of the three experimental sites with one meter distance gap between each participant under the researcher’s guidance. Each route was roughly 2 km long. Following their walk, the participants returned to the van and completed the second round of questionnaires (DASS-21, POMS, PANAS, and ROS). The participants were given a light refreshment after the experiment (Figure 2).

2.3.4. Data Analysis

Data were analysed using a repeated one-way analysis of variance (ANOVA) and a descriptive statistical analysis. A paired t-test was used in this analysis to compare the three sites and analyse the psychological impacts of the pre and post. Meanwhile, the Positive and Negative Affect Schedule (PANAS) and Depression, Anxiety Stress Scale (DASS-21), Restoration Outcome Scale (ROS) were applied to analyse the psychological and physiological effects of three conditions before and after the walking activity. In order to illustrate or summarise the characteristics of the Profile (POMS), the Positive and Negative Affect Schedule (PANAS), the Depression Anxiety Stress Scale (DASS-21), restoration outcome scale (ROS) in this study, the mean, standard difference and frequency of the variable were used. A $p < 0.05$ was considered as statistically significant for all comparisons, while a $p < 0.001$ was considered highly significant.
Figure 2. Study design.

3. Results
3.1. Psychological Results

As previously stated, the participants were given two sets of questionnaires (one before beginning the walking phase and the other after the walking phase) to assess the psychological effects of visits to three different locations. Using the Likert scale, the participants assessed their psychological distress, mood, and beneficial impacts. The participants agreed that after visiting the three locations, they attained mental well-being improvement.

3.1.1. Participants’ Self-Reported on Depression, Anxiety, and Stress Scale (DASS-21)

Table 1 shows results of the DASS-21 questionnaire. Before the walking phase, the participants had significantly similar stress scores at all the three study locations \((p < 0.001)\). There is a significant reduction in stress after walking for 30 min in the Kota Damansara Community Forest Reserve and Mutia Damansara Recreation Park. However, after the walk in the Mutia Damansara Urban Corridor, the participants showed only a slight reduction in the three types of psychological distress. Compared to the two other study sites, the participants showed a substantial decrease in the anxiety and depression scales after the walking period in the forested area.

Table 1. Comparison of depression, anxiety, and stress scale scores between three sites.

| Place                          | Stress Mean (SD) | Anxiety Mean (SD) | Depression Mean (SD) |
|-------------------------------|------------------|-------------------|----------------------|
|                               | Before           | After             | \(p\)-Value          | Before           | After             | \(p\)-Value          | Before           | After             | \(p\)-Value          |
| Mutia Damansara Urban Corridor | 22.95 *** (8.28)  | 20.58 *** (9.75)  | <0.001               | 18.4 **** (10.65) | 16.38 **** (10.63) | <0.001               | 22.83 **** (8.04) | 20.28 **** (8.62) | <0.001               |
| Mutia Damansara Recreation Park | 22.48 *** (8.37)  | 17.6 ** (10.20)  | <0.001               | 19.2 **** (10.15) | 15.4 **** (10.76) | <0.001               | 17.85 *** (10.40) | 14.38 *** (10.75) | <0.001               |
| Kota Damansara Community Forest Reserve | 22.38 *** (8.36)  | 10.38 ** (7.71)  | <0.001               | 17.98 **** (10.00) | 8.08 ** (7.34)    | <0.001               | 16.93 *** (10.96) | 7.55 * (8.06)    | <0.001               |

* Normal, ** Mild, *** Moderate, **** Severe.
3.1.2. Participants’ Self-Reported on Profile of Mood States (POMS)

A comparison of the POMS scores is presented in Figure 3 (before vs. after; Mutiara Damansara Urban Corridor vs. Mutiara Damansara Recreational Park vs. Kota Damansara Community Forestry Reserve). The “tension” subscales of the POMS indicate no significant improvement after a 30 min walk in an urban corridor. However, after the walk in the Mutiara Damansara Urban Corridor, a slight decrease was observed in the other two negative feelings of “depression” and “anger”. On the contrary, the participants reported significant mood changes after taking a walk through the Mutiara Damansara Recreational Park and Kota Damansara Community Forest Reserve. All the negative emotions were significantly reduced, especially as the participants walked through the Kota Damansara Community Forestry Reserve. Although the participants strengthened the positive subscale “Vigour” following their walks through all the three locations, the strongest was seen in the urban parks and forested areas. In other words, the urban and forested walking process reduced all forms of negative feeling and increased positive feeling.

Figure 3. A comparison between POMS means values in three experimental sites. TMD: Total Mood Disturbance; ** p < 0.05 and * p < 0.1; significant differences via paired t-test.

3.1.3. Participants’ Self-Reported on Positive Affect and Negative Affect Schedule (PANAS)

Figure 4 indicates that the participants’ walk in Mutiara Damansara Recreational Park and Kota Damansara Community Forest Reserve showed a highly significant increase in five positive subscales: interested (MDRP, Before: 2.35 ± 0.09; After: 3.43 ± 0.10; p < 0.01; KDCFR, Before: 3.43 ± 0.14; After: 4.73 ± 0.05; p < 0.01), excited (MDRP, Before: 2.26 ± 0.10; After: 3.61 ± 0.10; p < 0.01; KDCFR, Before: 3.25 ± 0.14; After: 4.76 ± 0.05; p < 0.01), inspired (MDRP, Before: 2.29 ± 0.10; After: 3.33 ± 0.15; p < 0.01; KDCFR, Before: 2.81 ± 0.15; After: 4.65 ± 0.07; p < 0.01), determined (MDRP, Before: 2.53 ± 0.11; After: 3.10 ± 0.11; p < 0.01; KDCFR, Before: 3.41 ± 0.14; After: 4.48 ± 0.09; p < 0.01) and attentive (MDRP, Before: 2.51 ± 0.10; After: 3.20 ± 0.13; p < 0.01; KDCFR, Before: 3.36 ± 0.14; After: 4.41 ± 0.11; p < 0.01). Moreover, the comparison made with the walk in the Mutiara Urban Corridor also showed a significant increase in four positive subscales: strong (Before: 2.59 ± 0.11; After: 2.89 ± 0.12; p < 0.05).
Figure 4. A mean value comparison of the positive effects at two measurement periods at three experimental sites. The value is mean ± standard error, n = 80; *** p < 0.01; ** p < 0.05 and * p < 0.1; significant differences via paired t-test.

Figure 5 illustrates the negative subscales. Four negative subscales demonstrated a significant reduction in the scores when the participants walked along the Mutiara Damansara Urban Corridor, distressed (Before: 2.69 ± 0.12; After: 2.24 ± 0.13; p < 0.1), upset (Before: 2.64 ± 0.12; After: 2.31 ± 0.16; p < 0.1), guilty (Before: 2.20 ± 0.12; After: 1.84 ± 0.14; p < 0.1) and hostile (Before: 1.78 ± 0.13; After: 1.39 ± 0.12; p < 0.1). Next, only the subscale “scared” showed insignificant decrease after the participants had walked in the Mutiara Damansara Urban Corridor. Meanwhile, the other subscales showed significant differences (before and after) between the three experimental sites.

Figure 5. The mean value comparison of negative effects at two measurement periods in three experimental sites. The value is mean ± standard error, n = 80; *** p < 0.01; ** and p < 0.05; significant differences via paired t-test.

A significant difference is seen when the scores on the positive and negative subscales are compared across the three experimental sites. As shown in Figure 3, the positive affect increased more in Kota Damansara Community Forest Reserve (Before: 33.69 ± 0.65; After:
46.49 ± 0.35; p < 0.05) and Mutiara Damansara Recreational Park (Before: 23.93 ± 0.71; After: 33.80 ± 0.75; p < 0.05) compared to Mutiara Damansara Urban Corridor (Before: 24.36 ± 0.94; After: 28.64 ± 0.89; p < 0.05). Meanwhile, the negative affect rapidly decreased in Kota Damansara Community Forest Reserve (Before: 17.75 ± 0.65; After: 5.59 ± 0.33; p < 0.05) compared to the two other experimental settings (Figure 6).

Figure 6. A comparison of means values between the positive and negative affect scores at two measurement periods at the three experimental sites. The value is mean ± standard error, n = 80; *** p < 0.01 significant differences via paired t-test.

3.1.4. Participants’ self-reported on Restorative Outcome Scale (ROS)

Table 2 summarises the average ROS scores. The participants reported significantly higher scores for all the six statements of the beneficial outcomes when comparing their walking activity at the three experimental locations. In particular, the ROS scores for the Mutiara Damansara Recreational Park and the Kota Damansara Recreational Park are higher than 5, indicating that the participants earned restorative benefits for both the natural environment of the parks and the forested region. On the other hand, the participants reported that despite the presence of trees, shrubs and plants, walking along the Mutiara Damansara Urban Corridor did not provide any restorative benefits compared to the two other locations. As a result, the participants’ scores are lower than 4, indicating a neutral influence of the restorative effects from the natural environment.

Table 2. Comparison of Restorative Outcome Scale (ROS) scores between the three experimental sites.

| Statements                                      | Mutiara Damansara Urban Corridor | Mutiara Damansara Recreational Park | Kota Damansara Community Forest Reserve |
|------------------------------------------------|----------------------------------|-------------------------------------|----------------------------------------|
| I feel calmer after being here.                 | M ± SD                            | M ± SD                              | M ± SD                                 |
| After visiting this place, I always feel restored and relaxed. | 3.39 ± 1.55                      | 4.88 ± 1.69                         | 5.70 ± 0.86                           |
| I get new enthusiasm and energy for my everyday routines from here. | 3.46 ± 1.48                      | 5.08 ± 1.64                         | 5.43 ± 0.79                           |
| My concentration and alertness increase here.  | 3.23 ± 1.33                      | 5.00 ± 1.67                         | 5.33 ± 0.85                           |
| I can forget everyday worries here.             | 3.28 ± 1.53                      | 5.20 ± 1.62                         | 5.28 ± 1.09                           |
| Visiting here is a way of clearing and clarifying my thoughts. | 3.06 ± 1.50                      | 5.11 ± 1.66                         | 5.20 ± 1.04                           |
| **p-value**                                     | **<0.001**                        | **<0.001**                          | **<0.001**                            |
4. Discussion

We conducted field studies at three separate urban green zones to assess participants after a walk at three experimental sites with a feeling of regeneration, mood, tension, anxiety, and depression. The data showed that the walking stage has a positive impact on stress, anxiety, and depression. In the Depression Anxiety Stress Scale (DASS21) study, the participants found that their stress, anxiety, and depressions were significantly reduced after their walk through the urban forested regions, compared to the participants during the urban green corridor process. However, there was a slight decrease in the participants' psychological distress after walking in the urban green corridor. This finding is consistent with the study of [48], which found that group walks in green corridors were significantly correlated with less stress. In terms of fear and depression, after the walking process in the forest, the participants registered a substantial decrease in scale compared with the other two studies. In addition, this finding of anxiety reduction is consistent with the results of previous tests [49,50].

Furthermore, studies have revealed how urban green corridors can benefit urban residents by enabling them to participate in more outdoor activities such as physical exercise, recreation, and taking in the scenery, as well as by improving their physical and mental health [51]. This study has indicated that the profile of mood-states scales is significantly changed after the participants walked for 30 min along the urban green corridor. It shows that depression and rage are reduced. This finding indicates that urban green corridors play similar roles in mood restoration as recreational parks and urban woodlands. In addition, research has revealed that maintaining trees with shrubs had the closest impact in a forest in terms of mood restoration [52]. Moreover, various kinds of plants in urban green corridor function differently to provide shade and advantages of health [53].

The urban forest area showed a substantial decrease compared with the recreational park to reduce overall mood disruption. Although the participants strengthened the positive subscale of “Vigour” following their walks through all the three locations, the strongest was in the urban parks and forested areas. The vigour results are further improved by forest walking by previous studies [54]. The walking stage in the urban park and forested area effectively decreases negative feelings and increases positive feelings. The outcome of this study is consistent with [55], which supports the assumption that optimistic moods in green environments increase and vice versa in urban areas.

Furthermore, forested and recreational park can effectively foster restorative advantages and reduce negative feelings. There are fewer negative effects such as anxiety, anger, guilt, fear, aggression, irritability, shame, nervousness, depression, and more relaxation after a walk. Moreover, after walking along the urban green corridor, the participants felt refreshed. In terms of fulfilling the restoration standard, the forest area is more restorative than the recreational park. This finding shows that a large urban forest area has more beneficial effects on stress, anxiety, and depression, which is also confirmed in other studies [48,55]. The number of negative feelings in the forested area was lower than in the other two area. The total restoration in the forested area was more significant after the walking process than the two other green areas. Therefore, forest areas used in the current experiment may be more likely to help treat stress, anxiety, and depression than the park or urban green corridor.

5. Conclusions

The prevalence of mental health problems has been reported to increase alarmingly among working adults in Malaysia. A related research conducted in Selangor shows that working adults in the state are experiencing high stress, anxiety, and depression. The research has shown the importance of urban natural environment for working adult population and others. Even if not all the results are pertinent, there may be significant impacts on people’s psychological and self-detailed well-being in different urban environments. Hence, the ultimate conclusion of the field experiment is that being in an
urban corridor can bring a coherent environment. In other words, we may assume that it can improve restorative, critical, and optimistic mood since it works efficiently with walking activities.

Moreover, the recreational park is satisfactory in terms of reducing stress among working adults. Nonetheless, the urban forest area is found to be more efficient in improving mental health by reducing stress, anxiety, and depression. The results of the experiment indicate that three urban green areas positively affect well-being, particularly for working adults. The findings indicate that the time spent in urban green areas over the weekend has led to stress reduction. Future research should investigate the relationships between psychological and physiological measures, as well as their links to other ecological and biological characteristics of green areas such as sound and air quality, and the impacts of nature exposure on different groups of people (e.g., young people, senior citizens, and those suffering from sleep deprivation), other than the long-term effects of nature. Moreover, the use of biomarkers such as hair, blood and saliva cortisol, and electroencephalograms (EEGs) and blood pressure may provide more definitive cognitive control.

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