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Psychological Effects of Walking and Relaxed Sitting in Urban Greenspaces During Post-pandemic: A Case Study in Bogor City, Indonesia

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ABSTRACT

The COVID-19 pandemic disrupted the world order from the beginning of 2020 to the end of 2022. The COVID-19 pandemic has had a significant impact on changes in healthy living practices, such as decreased physical exercise and increased stress, compromising psychological well-being. The psychological impacts of walking and relaxing in urban green spaces on IPB University students are investigated in this study. Bogor City Alun-Alun, Sempur Park, and Heulang Park were used for the experiment. Participants completed 15 minutes of walking and relaxed sitting before and after the experiment, and the psychological impacts were assessed using Profiles of Mood States (POMS), State-Trait Anxiety Inventory (STAI), and WHO Quality of Life (WHOQOL-BREF) before and after the experiment. The results indicate that physical activity improves psychological wellness. These findings give scientific evidence for the psychologically relaxing effects of walking and relaxed sitting, as well as recommendations to support the development and construction of therapeutic urban green spaces.

Highlights	Contribution to the field statement
- This paper provides evidence for the effect of walking and relaxed sitting on psychological effects. - Improving psychological health is urgently needed for young adult students in the aftermath of the COVID-19 pandemic. - The positive effect of walking and sitting relaxed activities can improve psychological health in park users (IPB University students).	This paper suggests further studies to improve quality of life, stressing that further research could focus more on regular physical activity, walking and sitting. In addition, these findings suggest a series of recommendations that can assist in designing urban greenspaces that can enhance the psychological effects of their users.

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1. Introduction

The COVID-19 pandemic has posed unprecedented challenges for citizens all around the world. The pandemic has a direct impact on economic, social, and other elements of life, such as health (Chaplyuk et al., 2021). The COVID-19 pandemic has had a substantial impact on the psychological health of young adults, such as depression, stress, and anxiety (Taha et al., 2014), as well as post-traumatic stress disorder (Shultz et al., 2015). Adolescent mental health can be impacted by social and physical restrictions, as well as school closures for young adults. According to the godataipb.org data source: 44.5% of students experienced fatigue and 55.2% lost interest in the survey 'Career Awareness and Mental Health of IPB University Students in the Pandemic Period with 299 respondents, active undergraduate and vocational students of IPB University on 24-30 July 2020. A walk, according to 165 people, is an effective way to improve one's mood. Young people can have an impact on the development and promotion of mental health and well-being (MHWB) programs (Raviola et al., 2019). Lower rates of depression are connected with increased access to green open spaces, physical activity, and mental health. Green open spaces improve mental health by increasing physical exercise, providing a social space for residents, fostering social relationships, and relieving stress and mental fatigue (Cohen-Cline et al., 2015). To establish a therapeutic landscape, physical, social, symbolic, and experiential spaces must be developed (Völker & Kistemann, 2015). Previous studies have shown that exposure to natural stimuli in green spaces through physical activity or relaxation may have a psychological impact on daily routines (Li, 2010). Forest bathing is one method of natural therapy that can be used. Forest bathing is a way to enjoy the forest by walking around and enjoying everything it has to offer. This natural and low-cost activity is believed to relieve stress-related disorders by allowing plants to relax physiologically (Tsunetsugu et al., 2009).

Several studies on the physiological and psychological relaxing effects of walking and exploring urban parks and forests on young adults have been conducted. Physiological studies have shown that park and forest environments reduce heart rate and blood pressure while enhancing parasympathetic nervous activity (Park et al., 2009). Furthermore, psychological studies have shown benefits in increasing subjective evaluations of feeling comfortable, natural, relaxed, strong, serene, and rejuvenated (Park et al., 2009), reducing negative moods (e.g., tension, anger, fatigue, depression, confusion), and anxiety states (Tsunetsugu et al., 2013). Yu et al. (2017) reported that a brief two-hour walk in the forest reduced pulse rate, systolic and diastolic blood pressure, and negative emotions (e.g., anger, confusion, depression, tension, fatigue), anxiety, and raised emotion positively.

Therapeutic garden planning and design must focus on meeting the physical, psychological, social, and spiritual needs of human users. In gardening, selection and meticulous arrangement of garden elements are required so that a park can reach functional and aesthetic value. Therapy rooms in open settings in Indonesia typically simply feature a contemplation walk; a therapeutic garden that meets the criteria would be more beneficial. The function of therapeutic parks should be evaluated in city parks that have been established so that parks can become public health therapy areas. Therapeutic gardens have unique aesthetic and functional values that must be considered when designing them. Existing facilities in Indonesian urban parks should be evaluated because planning is still inadequate, such as a lack of aromatic plants that stimulate the sense of smell, a lack of noise-reducing plants to reduce disturbance, and a lack of infrastructure with track widths and lengths that meet the needs of visitors of all ages (Massie et al., 2020). The purpose of this study is to offer such evidence for use in landscape planning guidelines to assist therapeutic urban greenspaces in Indonesia. This study investigates the effects of walking and relaxed sitting on psychological wellness. Our study hypothesizes that walking and relaxed sitting in urban greenspaces can improve psychological impacts.

2. Materials and Methods

2.1 Experiment Sites

The experiment was conducted from August to September 2022 in Bogor City, Indonesia, at Bogor City Alun-Alun, Sempur Park, and Heulang Park (Figure 1). The three parks were chosen because (1) they are public urban greenspaces that anyone can access without paying an entry fee; (2) they are located in the city centre; (3) there is a walking and relaxation therapy area such as a shady area, and there is a jogging track area; and (4) the tree growth rate is mature enough to provide shade (Pratiwi et al., 2022). This study used Bogor City as a case study since the extent of urban greenspaces in Bogor City already surpasses the standards stated by Law no. 26 of 2007 concerning spatial planning, with the area of green open space in Bogor City exceeding the minimum figure of 30% of the city's area. Despite having enough green open spaces in Bogor City, many Bogor City citizens suffer from psychological health issues. Bogor City Alun-Alun is 1.7 hectares in size, featuring a 500 m jogging track. Sempur Park includes a 973-meter-long running track with an average width of 1.5 meters, whereas Heulang Park has a 2.8-hectare space. Alun-Alun is Indonesia's one-of-a-kind historic open space (Kohori et al., 2019). The following criteria are applied to identify pedestrian paths: (1) a minimum length of 400 m one way; (2) a level slope; and (3) the presence of trees along the path. While the factors for selecting seats include (1) security; (2) a flat slope; and (3) the presence of shade, such as a big tree, which leads to a nice view (Pratiwi et al., 2020).
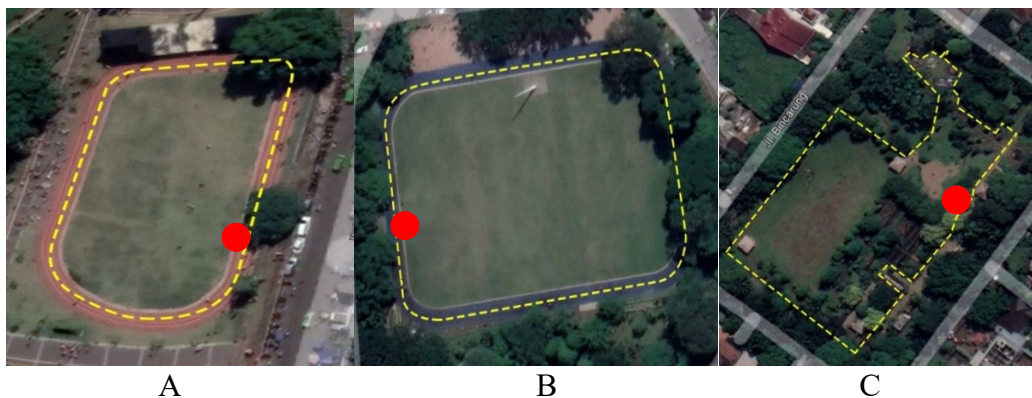
Figure 1. Experiment location. (A) Bogor City Alun-Alun. (B) Sempur Park. (C) Heulang Park
Note: The yellow line is the walking track, and the red circle is the relaxed sitting point.

The three parks have distinct vegetation cover characteristics, such as low vegetation cover in Bogor City Alun-Alun due to its recent revitalization in 2021 and high vegetation cover in Heulang Park and Sempur Park (Figure 2). There are differences in terms of climatic components (Table 1).

A

B

C

Figure 2. Experiment location. (A) Bogor City Alun-Alun. (B) Sempur Park. (C) Heulang Park.

Table 1. Climate Components Average in Bogor City Alun-Alun, Sempur Park, and Heulang Park.

Walking				Relaxed Sitting			
Climate Components	Bogor City Alun-Alun	Sempur Park	Heulang Park	Climate Components	Bogor City Alun-Alun	Sempur Park	Heulang Park
Temperature (°C)	31.4	32.5	31.6	Temperature (°C)	30.8	31.2	30.9
Humidity (%)	52.2	46.2	52.4	Humidity (%)	54.1	51.8	52.6
Wind speed (m/s)	0.2	0.3	0.5	Wind speed (m/s)	0.2	0.4	0.7
Noise (dB)	56.4	54.9	59.2	Noise (dB)	56.7	54.5	61.8
Light intensity (Klux)	22.8	27.3	25.5	Light intensity (Klux)	19.2	14.9	11.6

2.2 Participants

In this study, the snowball sampling method was employed to choose participant (Pratiwi et al., 2020) through 11 key informants spread across nine faculties and two schools at IPB University. Posters and Google forms were used to recruit participants, which were then circulated on social media and WhatsApp. Following that, participants will be given information about the research objectives, trial processes, trial dates, and a comprehensive study protocol. The research protocol was reviewed by the doctor in charge of the study at IPB University Polyclinic. Participants had to meet the following criteria: (1) be IPB students aged 19-26 years old, (2) reside in Bogor or its vicinity, (3) not be presently

being treated for cardiovascular disease or hypertension, and (4) be physically fit enough to run for 20 minutes or longer. This qualifying criterion is based on previous research conducted at IPB University (Pratiwi et al., 2022). The city and regency of Bogor are home to up to 30 student participants. Previous research with sample sizes ranging from 9 to 19 individuals showed significant results (Pratiwi et al., 2019, 2020). Thus, 30 subjects are sufficient to provide statistically significant findings in the experiment. The park therapy experiment included six males and twenty-four females (mean age, 21.1 ± 0.2 years). The experimental procedure adheres to the norms of the IPB University's Research Ethics Commission involving Human Subjects (Number: 735/IT3.KEPSM-IPB/SK/2022).

2.3 Experimental Design
In one day, thirty participants were separated into two groups. Bogor City Alun-Alun, Sempur Park, and Heulang Park are in Group 1; Heulang Park, Bogor City Alun-Alun, and Sempur Park are in Group 2. 09.00 - 12.00 was the experimental period for park therapy with walking and relaxed sitting activities. Each group has two participants. Each participant may only take part in the experiment once. Participants were required to undergo a medical examination by the polyclinic's medical team before the trial. The participants were then required to bring a health certificate on the day of the trial. All participants assembled in the conference room, and then all staff conducted a screening that included 1) measuring body temperature (no fever of $38°C$) and 2) checking general health conditions (no cough, runny nose, or shortness of breath). Following that, participants completed and signed the consent form. Before the experiment, participants were explained to and asked to complete a questionnaire to assess their mood, anxiety, and quality of life (Pratiwi et al., 2020, 2022). For 15 minutes, each participant walks or sits at a predetermined location. The participants then returned to the break room to complete the questionnaire. A minimum washout duration of 30 minutes was considered sufficient in this experiment to eradicate the treatments used in previous studies (Pratiwi et al., 2020; Pratiwi & Furuya, 2019). During the experiment, participants were obliged to 1) wear a mask, 2) keep their distance, 3) not smoke, 4) not eat, and 5) not consume caffeinated drinks, under the health protocol to prevent COVID-19 transmission (walking or relaxing sitting and filling out a questionnaire) (Pratiwi et al., 2022).

2.4 Research and Tools Materials
Before and after the experiment, participants were asked to complete a Profile of Mood States (POMS) and a State-Trait Anxiety Inventory (STAI). POMS was employed to assess mood conditions, which comprised 35 questions covering six subscales: tension, depression, anger, fatigue, confusion, and vigour. The five-point Likert scale spans from 0 (not at all) to 4. (very). They calculated the total score of mood disorders (TMD) using the following formula: [TEN+DEP+ANG+FAT+CON] – [VIG]. The current state of anxiety was assessed using the STAI state's Anxiety scale following exposure to a green area, which consisted of 20 questions. The scales used are four Likert scales with values ranging from 1 (not at all) to 4. (very) (Fernández-Blázquez et al., 2015; Julian, 2011). The WHO Quality of Life (WHOQOL-BREF) questionnaire was then administered before and after the study. The 26-question quality of life questionnaire covers four areas: physical health, psychological health, social interactions, and environmental situations. The ratings used are five Likert scales ranging from 1 (extremely poor) to 5 (excellent) (very good).

2.5 Analysis Methods
The Friedman test for data with an abnormal distribution and the Repeated Measures ANOVA test for data with a normal distribution were used to assess the Profile of Mood States (POMS) and State-Trait Anxiety Inventory (STAI) questionnaires. The Friedman and Repeated Measures ANOVA tests were also employed to analyze the differences in the findings of the POMS and STAI subscales obtained from individuals walking and relaxed sitting in three different locations. Because the data acquired from the WHO Quality of Life questionnaire (WHOQOL-BREF) is normally distributed, the Paired T-test was used to examine it. For data with an abnormal distribution, Spearman's correlation was used,

while for data with a normal distribution, Pearson's correlation was used. Actual data are presented as averages, and statistical differences were considered significant at $p < 0.05$. All statistical analyzes were performed using SPSS-22. The research flow is presented in Figure 3.
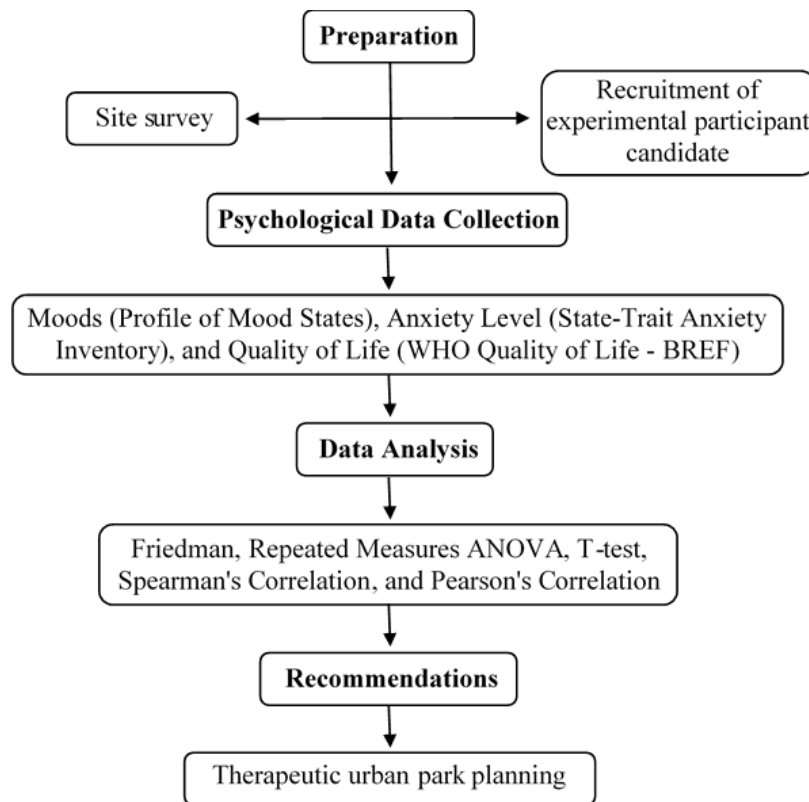

Figure 3. Research flow.

3. Result

3.1 The Characteristics of Sociodemographic

Park treatment involved 30 persons in all. According to the table, the average age of the experimental subjects was 21.1 ± 0.2 years, with 25% male (n = 6) and 75% female (n = 24). The individuals' average height was 158.7 ± 1.3 cm, and their body weight was 52.6 ± 1.7 kg. Most 90% of the participants were studying at the undergraduate program level (n = 27), and 10% were taking the graduate program level (n = 3). Then, when it came to knowledge about forest bathing, 67% of the individuals (n=20) did not know about it, whereas 33% (n = 10) did. On weekends, 35% (n = 13) of the participants preferred the full-day forest bathing program. 27% (n = 10) of subjects preferred the weekend half-day program; 11% (n = 4) preferred the two days and one-night program using a tent; 5% (n = 2) preferred the two days one-night program using a cottage; and as many as 22% (n = 8) preferred a vacation lasting a few days to a week (for the forest bathing program they were interested in, the subjects could choose more than one option). Walking activity programs were preferred by 21% (n = 10) of participants. Relaxed sitting programs were preferred by 33% (n = 16) of the individuals. 21% (n = 10) of the individuals preferred the activity program in the hammock, whereas 6% (n = 3) preferred the activity program on forest land. 11% (n=5) of the individuals preferred the water immersion program; 6% (n = 3) preferred the sensory experience activity program; and 2% (n = 1) preferred the breathing exercise program (for program activities of interest, subjects may choose more than one option) (Table 2).

Table 2. Characteristics of subjects who took part in the forest bathing program at urban greenspaces in Bogor City.

Parameter	Average (N=30)
Age (years)	21.2 ± 0.2
Height (cm)	158.7 ± 1.3
Body weight (kg)	52.6 ± 1.7
BMI	20.8 ± 0.6
Gender	
Man	6 (80%)
Woman	24 (20%)
Educational stage	
Bachelor	27 (90%)
Master	3 (10%)
Forest bathing knowledge	
Knowing	10 (33%)
Don't know	20 (67%)
Forest bathing programs	
Weekend full-day programs	13 (35%)
Half-day program weekend	10 (27%)
2 days 1 night using tent	4 (11%)
2 days 1 night using cottages	2 (5%)
Holidays for several days to a week	8 (22%)
Activity program	
Walking	10 (21%)
Relaxed-sitting	16 (33%)
Lying on the hammock	10 (21%)
Lying on the ground of the forest	3 (6%)
Soaking in the water	5 (11%)
Sensory experience	3 (6%)
Breathing exercises	1 (2%)

3.2 Questionnaire Results from Profile of Mood States (POMS)

The average POMS subscale scores obtained from 30 subjects before and after walking in three different Bogor urban greenspaces (Bogor City Alun-Alun, Sempur Park, and Heulang Park) revealed significant differences in the subscales of anger ($p = 0.023$), confusion ($p = 0.001$), depression ($p = 0.000$), tension ($p = 0.000$), and vigour ($p = 0.028$) due to a decrease in negative emotions and an increase in positive emotions There was no significant difference in negative emotions, fatigue ($p = 0.228$) since negative emotions rose while the subject was in Bogor City Alun-Alun and Sempur Park (Figure 4).
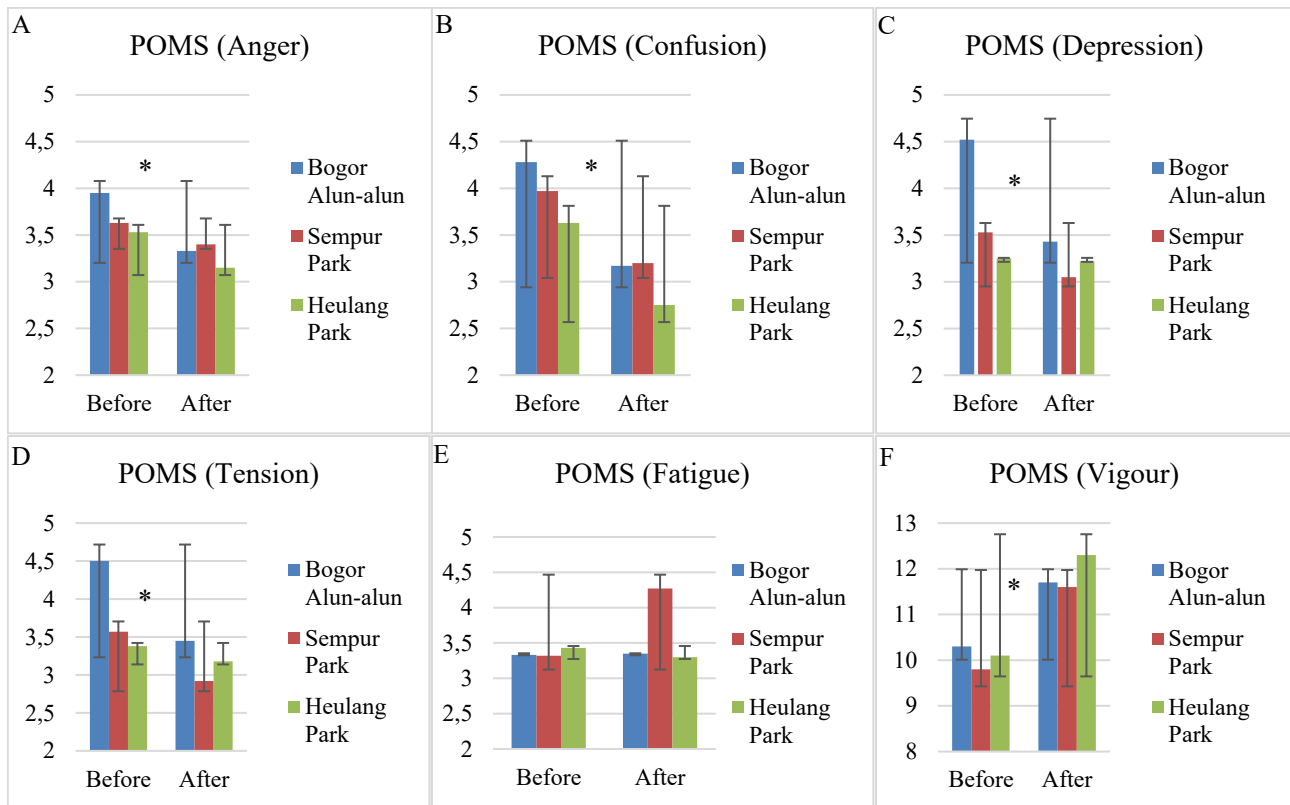
Figure 4. Comparison of the results of the POMS subscale and before and after walking experiment in the three locations. (A) Anger. (B) Confusion. (C) Depression. (D) Tension. (E) Fatigue. (F) Vigour.

Note: (*) *p*-value ≤0.05

Significant differences in fatigue ($p = 0.001$), confusion ($p = 0.000$), depression ($p = 0.004$), tension ($p = 0.000$), and vigour ($p = 0.004$) were observed when subjects performed the relaxed sitting experiment. There was no significant difference in negative anger feelings ($p = 0.103$) because negative emotions increased while the participant was at Heulang Park (Figure 5).
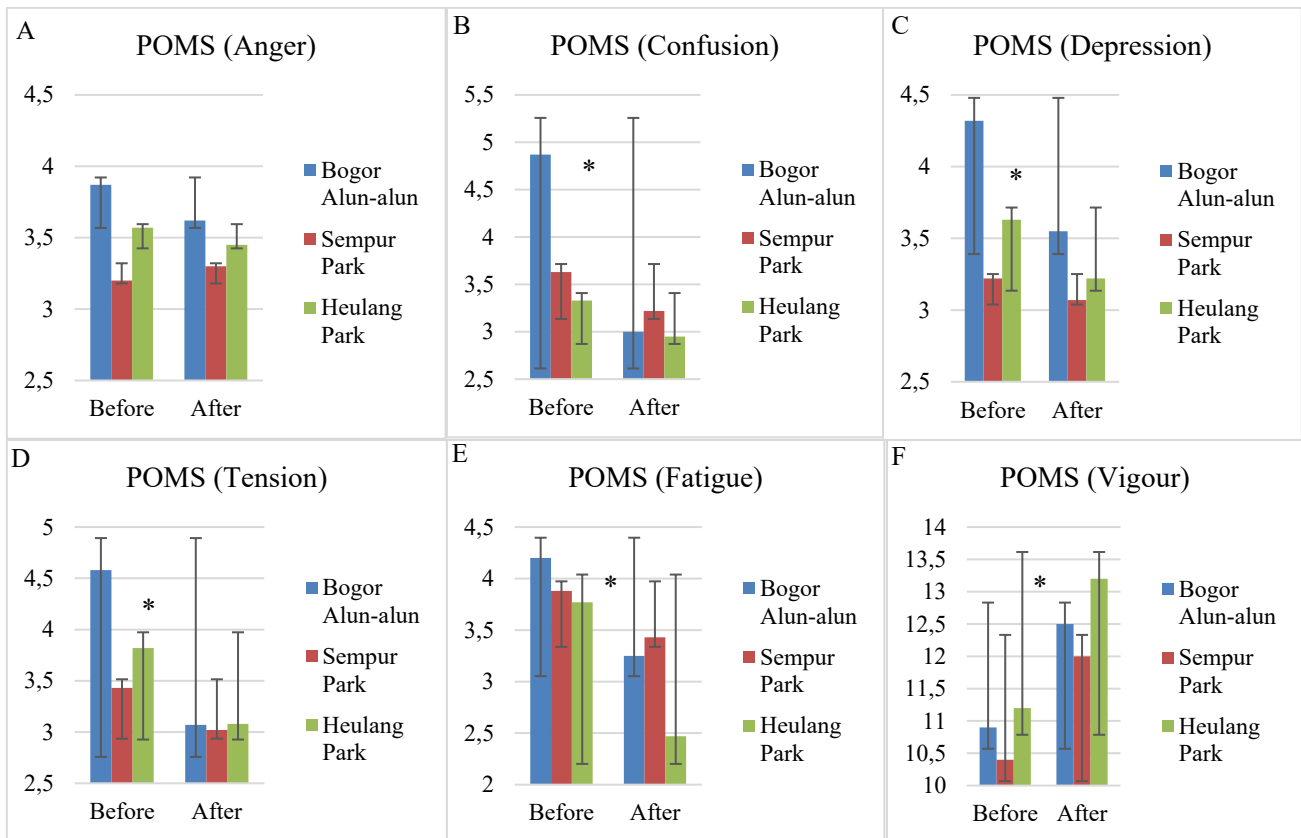
Figure 5. Comparison of the POMS subscale results before and after relaxed sitting experiment in the three locations. (A) Anger. (B) Confusion. (C) Depression. (D) Tension. (E) Fatigue. (F) Vigour.
Note: (*) *p*-value ≤0.05

The results of Total Mood Disturbance (TMD) comparing walking and relaxed sitting activities in urban greenspaces revealed the most significant difference when the subject completed the relaxed sitting activity ($p = 0.000$) against the walking activity ($p = 0.083$). Scores were obtained before and after walking in Bogor City Alun-Alun (4.05; 2.90), Sempur Park (3.85; 3.40), and Heulang Park (3.78; 3.02). While the scores obtained before and after the subject sat relaxed in Bogor City Alun-Alun (4.75; 3.12), Sempur Park (3.93; 3.08), and Heulang Park (4.75; 3.12), respectively (3.88; 2.23). The resulting score demonstrates the best emotion decrease while the subject is in Heulang Park. The Japanese POMS questionnaire categorizes POMS scores as "low" (-20 - 19), "moderate" (20 - 59), and "high" (60 - 100). Total Mood Disturbance (TMD) findings show that the subject's negative mood dropped while his positive mood grew; scores before and after walking/relaxed sitting varied from 4.75 to 2.90, which is considered "low" (Figure 6).
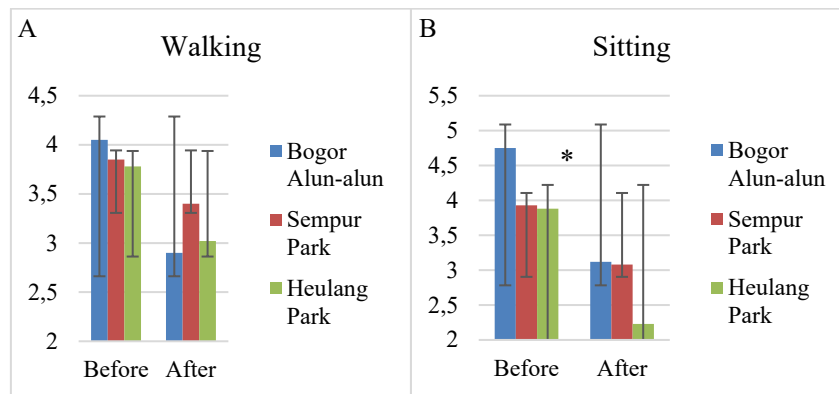
Figure 6. Comparison of the POMS (TMD) results in subscale walking and relaxed sitting before and after an experiment in the three locations. (A) Walking. (B) Relaxed sitting.
Note: (*) *p*-value ≤0.05

3.3 Questionnaire Results from State-Trait Anxiety Inventory (STAI)

The average STAI score indicated significant differences for walking (p = 0.000) and relaxed sitting (p = 0.000) for the three sites. The STAI was measured before and after walking at Bogor City's Alun-Alun (36.2; 32.3), Sempur Park (34.5; 32.1), and Heulang Park (34.5; 32.1). (34.3; 30.1). STAI was also evaluated before and after a relaxed sitting at Bogor City Alun-Alun (37.4; 34.2), Sempur Park (35.1; 32.1), and Heulang Park (35.1; 32.1). (35.2; 28.8). These findings show that anxiety levels in Heulang Park have greatly decreased. The score also demonstrates that relaxed sitting has more substantial effects than walking. STAI scores are often divided into three categories: "absent or low anxiety" (20-37), "moderate anxiety" (38-44), and "high anxiety" (45-80) (Kayikcioglu et al., 2017). These findings suggest that the subject's anxiety level before and after walking/relaxed sitting is 31.5 - 35.9, indicating "none or low anxiety."(Figure 7).
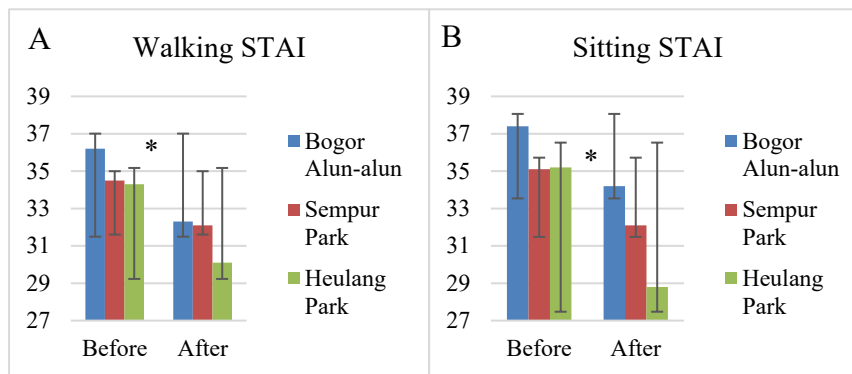

Figure 7. Comparison of the STAI subscale results before and after walking/relaxed sitting at the three locations. (A) Walking. (B) Relaxed sitting.
Note: (*) *p*-value ≤0.05

3.4 Comparison of Walking and Relaxed Sitting Activities

Walking and relaxed sitting exhibited significant outcomes from the Total Mood Disorder (TMD) and Anxiety-State Inventory (STAI), specifically walking (p = 0.000) and relaxed sitting (p = 0.000), with an average score of relaxed sitting (155.4) and walking (p = 0.000). (99.8). The difference in TMD at the Bogor City Alun-Alun site for walking (1.15) and relaxed sitting (1.63); Sempur Park for walking (0.45) and relaxed sitting (0.85); and Heulang Park for walking (0.76) and relaxed sitting (0.85). (1.65). The STAI difference in Bogor Alun-Alun for walking (3.9) and relaxed sitting (3.2); Sempur Park for walking (2.4) and relaxed sitting (3.0); and Heulang Park for walking (4.2) and relaxed sitting (3.0).

(6.4). Bogor Alun-Alun ($p = 0.170$), Sempur Park ($p = 0.031$), and Heulang Park ($p = 0.017$) were the analytical results. When compared to walking, relaxed sitting activity is more significant. Based on the sociodemographic characteristics questionnaire, 33% (n = 16) of the individuals prefer seated-viewing programs. These findings also suggest that Heulang Park has the biggest improvement in psychological health, as measured by the difference between TMD and STAI scores (Table 3).

Table 3. The results of the difference between total mood disturbance and state anxiety before-after walking and relaxed sitting at the three locations.

Parks	Activity	Total Mood Disturbance		Difference between before and after	State-Trait Anxiety Inventory		Difference between before and after
		Before	**After**		**Before**	**After**	
Bogor Alun-Alun (N=30)	Walking* (99.8)	4.05	2.90	1.15	36.2	32.3	3.9
	Relaxed Sitting* (155.4)	4.75	3.12	1.63	37.4	34.2	3.2
Sempur Park* (N= 30)	Walking* (99.8)	3.85	3.40	0.45	34.5	32.1	2.4
	Relaxed Sitting* (155.4)	3.93	3.08	0.85	35.1	32.1	3.0
Heulang Park* (N= 30)	Walking* (99.8)	3.78	3.02	0.76	34.3	30.1	4.2
	Relaxed Sitting* (155.4)	3.88	2.23	1.65	35.2	28.8	6.4

Note: (*) *p*-value ≤0.05

3.5 WHO Quality of Life (WHOQOL-BREF)

The WHOQOL-BREF score before and after the experiment did not substantially improve (90.27; 92.13). The results of the subscale scores before and after the experiment show that domain 1 "physical health" (23.9; 25), domain 2 "mental health" (20.5; 20.9), domain 4 "environment" (27.8; 28), and domain 3 "social relations" (10.5; 10.4) increased, while domain 3 "social relations" (10.5; 10.4) decreased. As a result, walking and relaxed sitting in urban greenspaces do not affect the subject's quality of life ($p = 0.156$) (Figure 8).

Figure 8. Comparison of the results of the WHOQO-BREF subscale before the experiment and one month after the experiment.

4. Discussion

4.1 The Benefits of Physical Activity to Psychological Health

Based on the results of the POMS and STAI questionnaires, therapy in parks, such as walking and resting, can enhance psychological health. According to Sakip et al. (2015), A park is a place that encourages and facilitates physical activity and plays an important role in the connection between humans and the environment. Parks may serve as a gathering area for individuals of various backgrounds and personalities. Physical health has an impact on psychological well-being. Individuals have psychological health when they are free of all symptoms of psychological disorders and can go about their daily lives (Adisty et al., 2015). These findings are consistent with previous research, which found that physical activity in natural settings is related to better psychological health than physical activity in other settings. Previous research has found that physical activity and interaction with nature in parks are strongly linked to various psychological health benefits (Li et al., 2016). According to Frances (2006), one of the biopsychosocial advantages of outdoor recreation include improved mood, a distraction from mental health illnesses, improved coping mechanisms, increased capacity to cope with challenges, increased emotional maturity, and increased self-acceptance. Relaxed sitting activities considerably enhance psychological health over walking activities, and Heulang Park greatly improves psychological health compared to Sempur Park and Bogor City Alun-Alun. It is also stated in this situation that the physiological impacts of the environment have a substantial impact on the results of psychological stress alleviation. Greenery can alleviate stress, physical discomfort, anxiety, and depression symptoms while also improving attention, mood, and cognitive performance (Dijkstra 2009).

4.2 The Benefits of Physical Activity with Quality of Life

The activities of walking and relaxed sitting in the urban green space in Bogor City did not affect the subject's quality of life; this may be attributed to the fact that the experiment, particularly the walking and relaxed sitting experiment, was only performed twice a month. Experiments should be carried out at least once a week to increase the subject's quality of life. Based on studies conducted by Lok et al. (2017) for ten weeks, regular physical exercise has a significant impact on depression and quality of life. The subject's highest subscale result is domain 4 (environment), indicating that the environment in Bogor City greenspaces has a significant impact on the subject's quality of life. Physical aspects of the environment are prominent features of urban parks. Bogor City Green Space contains trees and a variety of plants, creating the impression of natural nuances. Shady trees provide shade and support for leisure activities by providing clean air. A pleasant park with an enhanced environmental function is an ideal park for supporting recreational activities.

4.3 The effects of Park Characteristics on Psychological Health

Each of the three parks chosen has distinct characteristics. Bogor City Alun-Alun is adjacent to the highway, thus the park conditions are rather loud, and the vegetation around the jogging track is limited. Because Bogor City Alun-Alun was only revitalized in 2021, the mood is less relaxed. Sempur Park is located beneath the highway, thus the park is noisy, and the vegetation is plentiful and shady, but only around the running track. Meanwhile, because Heulang Park is located in a housing complex, the park is serene. Furthermore, the state of the vegetation, which has been numerous and shady, makes the park feel pleasant and relaxed. The variances in these three parks' qualities can have an impact on the psychological health outcomes of the subjects.

The results obtained by Heulang Park are the best among all parks. It might be due to the park's state, which contains a lot of vegetation, making it comfortable and relaxed, producing the most important value among the other two parks. Temperature fluctuations in urban greenspace can have an impact on human comfort. Tree shade may reduce solar radiation and obstruct sunlight dispersion from the sky and the surrounding surface, altering the heat exchange between the structure and the surrounding environment (Shahidan et al., 2010). Forest bathing requires several conditions, including ecosystem space that gives body comfort, attractiveness, and coolness, vegetation density, air temperature and

humidity, forest surface shape, and many more. Heulang Park provides adequate amenities, shade, comfortable living circumstances, and water element visualization. Heulang Park is located in a residential area rather than near a highway. According to research, public open areas with a lot of shade, decent pedestrians, seating, children's playgrounds, food sales locations, and well-maintained park conditions bring comfort to users. The socioeconomic profiles of users are also impacted by the placement of public space. Users will visit park locations in residential areas with adequate park support facilities 2-3 times per week. Unlike the park's commercial position and surrounding tourist attractions, the average visitor comes 1-2 times per month (Amalia et al., 2021)

According to one viewpoint, older trees can influence comfort and health. Heulang Park gives the most comfort since its vegetation has a longer lifespan. Because there are more annual plants in Bogor City Alun-Alun and Sempur Park than vegetation, Heulang Park can have a greater health benefit than other parks.

The more plants there are in the park, the more biodiversity there is, which contributes to a sense of connectedness with the rest of nature (White et al., 2019). Furthermore, the more plants in the park, the more oxygen is available, which relaxes a person's psychology. Then there are water elements like fountains at Heulang Park, albeit the conditions need to improve. In terms of the existence of water features, previous studies have shown that the presence of water bodies (particularly those that are incredibly natural) has a positive impact on psychological problems such as mental health. It happens even when socioeconomic factors are taken into account. Furthermore, listening to the sound of water (along with visuals) considerably reduces tension and improves psychological conditions (Dwiputra & Ardiani, 2017).

4.4 Recommendation

Walking and relaxed sitting in urban greenspaces can improve subjects' psychological well-being after being evaluated. Some recommendations for urban green areas in Bogor City include highlighting the element of water since it may help relax the body and mind (Pouso et al., 2021; White et al., 2019; Zhang et al., 2021); dividing the zone into public and private spaces since zones can provide varied healing qualities depending on the activities they allow (Grahn & Stigsdotter, 2010); can include decorative plants or aromatherapy plants with a variety of colours and soothing fragrances so that visitors can relax while walking around the park (Fujita et al., 2010; Zhang et al., 2021); City parks can be made accessible so that persons with disabilities can access and enjoy the park with less assistance; and benches can be added since they can be utilized to sit and rest, improving psychological health (de Bell et al., 2017).

The design principles are as follows: 1) provide spatial variation; 2) supply an even green material; and 3) facilitate the user's motor activities (walking, reflection, and relaxation). 4) Include positive diversions such as plants and water elements. 5) Reduce distractions by adjusting the level of light and noise in the surrounding space. 6) Consider minimizing uncertainty in healing garden planning and design. Individual physiological and psychological responses might change depending on leaf colour (Marcus & Barnes, 1999).

Moreover, plant colours can assist people in releasing stress and improving their state of mind (Todorova et al., 2004). Green and purple plants are more effective than red, yellow, and white plants for relaxing the body, reducing anxiety, and improving mood. As a result, the plant's colour can aid people in relieving stress and enhancing their emotional condition (Jang et al., 2014). In line with these findings, Xie et al. (2021) also proposed that seeing flowers bloom can have physiological and psychological advantages such as reduced stress and increased well-being. The colour of the flower also has a favourable influence on the individual's physiology and psychology. Jo et al. (2013) stated that aromatic plants have psychological and physiological advantages. Plant aromas may lift one's spirits, alleviate depression, and create a positive and stimulating image. Aromatic plants have been shown to improve the mood and emotions of persons who inhale them. Then, for the design of park benches to encourage relaxed sitting activities, a book called Anatomy of a Park suggests that a suitable park bench design is multi-jogs (Molnar & Rutledge, 1992). The design of multi jogs park seats can

accommodate a wide range of visitors to city parks, including individuals, couples, and groups. This park's bench shape will be even better if built with seating arrangements, particularly clusters. Hinoki cypress wood (uncoated wood, oil-finished wood, vitreous-finished wood) was used in the park bench design to improve psychological wellness because hinoki fir wood has a psychologically relaxing impact (Ikei et al., 2017, 2018). Based on the recommendations and design plans presented, this research provides a new perspective for urban studies, particularly developing cities and their greenspaces by offering therapeutic urban parks to improve people's psychological health.

5. Conclusions

The COVID-19 pandemic has raised the prevalence of psychological health issues among young adults. Many studies have shown that green open spaces can have an impact on both physiological and psychological wellness. However, studies on the advantages of physical exercise such as walking and relaxed sitting in improving psychological health and quality of life are still lacking, particularly in Indonesia. Physical activity in urban greenspaces increased mood and relieved anxiety. Urban greenspaces with proper planning and design can help people overcome psychological disorders. As a consequence, presenting a suitable park design and relaxation amenities is required to achieve maximum psychological relaxation effects and promote park therapy activities (walking and relaxed sitting). Because the young adult participants in this study fall into the low-stress category, future research must explore subject criteria based on all stress levels to supplement existing design plans. Physical activity should then be repeated regularly to assess its impact on quality of life. that it can help users of urban greenspaces restore their overall health.

Conflicts of Interest
The Author(s) declares(s) that there is no conflict of interest.

Data availability statement
The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author/s.

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