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Health and Wellbeing Implications of Urban Green Exposure on Young Adults in a European City

Saumya Rathnayake[1*], and Seth Amofah[2,3]

[1] University of Tartu, Estonia
[2] Heritage Christian College, Accra, Ghana
[3] Dalhousie University, Canada

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ABSTRACT

Urbanization has caused a disconnect between people and nature. There has also been a rise in health and well-being issues in urban dwellers. In recent years, many cities, especially in Europe, have consciously developed urban parks and green spaces to allow the urban population to experience nature without having to travel out of the city. This study explores the health and well-being benefits of exposure to urban green spaces on urban young adults. A sample of young adults living in Tallinn, the capital of Estonia, were studied using Restorative Outcome Scale (ROS) and Subjective Vitality Scale (SVS) to discover psychological benefits. Blood pressure and heart rate monitoring were also employed to examine the physiological benefits of urban green exposure. It was found that there was a direct relationship between urban green exposure and health and well-being. There was a significant increase in restorative benefits and an increase in the overall vitality level.

1. Introduction

This study looks at Tallinn, the capital of Estonia, and the 2023 European Green Capital Award winner (EGCA). According to Pantić and Milijić (2021), the primary purposes of providing green spaces in European cities are to positively impact the environment and human health while providing a quality lifestyle. To encourage greener spaces around European cities, the European Union has introduced the European Green Capital Award (EGCA) (Pantić & Milijić, 2021). To be eligible for this award, the cities must have environmentally friendly infrastructure, including inner city green parks and green spaces. Tallinn was selected for this award because it has met all the 12 environmental indicators, which include air quality, noise, water, sustainable land use, waste and circular economy, green growth and green innovation, nature and biodiversity, climate change mitigation, energy efficiency, adaptation to climate change, sustainable management (City of Tallinn, 2023). In this study, we explore how these urban green infrastructures contribute to the well-being of the young adults living in Tallinn.

Globally, urbanization continues to rise, and as long as the world has an expanding population, urban areas will continue to grow broader. Future urban development presents several difficult

[*]Corresponding author E-mail address: saumya.rathnayake@yahoo.com

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challenges to the world as a result of this continuous growth. 68% of the population on the entire globe will live in urban areas by 2050. (United Nations, 2019). People's lives have been affected by urbanization in both positive and negative ways. On the positive side, it provides urban residents with an array of advantages and has a direct correlation with economic growth and development. In contrast to rural settings, urban settings are generally denser, noisier, dirtier, more complex, and more stressful. (Dye, 2008). In 2019, the World Health Organization highlighted that one of the major health issues of the twenty-first century remains urbanization. Children's and adults' mental and physical health problems are linked to urbanization. (United Nations, 2019). These issues with health and wellbeing may be directly caused with a disconnect from nature (Hartig & Khan, 2016). Many research investigations have shown that spending time in nature can either prevent or mitigate the adverse impacts on one's mental and physical well-being. (Capaldi et al., 2015; Kardan et al., 2015; Shananan., 2016).

Nonetheless, emerging study findings have indicated a need for green spaces in cities (Lehman, 2019). Urban green spaces refer to urban parks, outdoor exercise areas, walking and cycling pathways, community gardens, and street trees and those recreations are essential to addressing the adverse health outcomes associated with the urban population. In order to improve the physical, emotional, and social well-being of their citizens while enhancing the aesthetic value in urbanized settings, urban planning authorities and policy makers are currently focusing on re-greening cities by setting up of green spaces and infrastructure.

The main aim of this study is to explore the health and well-being effects of exposure to urban green spaces. The question below has been designed to help achieve the goal:

1. What are the physiological and psychological health and well-being benefits of exposure to urban green spaces?

Previous studies have looked at the health and well-being benefits of urban green spaces in many cities (Grazuleviciene et al., 2016; Capaldi et al., 2015; Kardan et al., 2015; Shananan 2016; Song et al., 2015). However, Tallinn, one of Europe's greenest cities, still needs to have enough studies conducted to explore the benefits of green spaces for young adults. This study, therefore, fills this research gap.

The paper is organized into different parts. It starts with the literature reviewing on nature therapy, forest bathing, and the health and well-being benefits of exposure to urban green spaces. The paper then outlined the research approach to understanding the relationship between urban green spaces and young adults' health benefits. The paper finally draws conclusions based on the findings.

2. Urban Green Spaces and Wellbeing in Literature

Due to the complexity of human existence, perceptions of health and well-being change over time and differ across cultures and life stages. The concept of health and well-being can be defined either positively or negatively by an individual. To establish a standard definition of health and well-being, the World Health Organization (2020) defines health as "a state of complete physical, mental, and social well-being, marked not only by the absence of disease infirmity".

Since the relationship between humans and nature has existed for centuries, forest bathing (Shinrin-Yoku), a widespread ancient Japanese practice, can be regarded as a form of nature connection activity. Forest bathing is the meaning of the term Shinrin-Yoku, which was translated into English in 1982 by Tomhide Akiyama. It emphasizes the use of the five human senses to absorb the forest atmosphere. (Plevin, 2018). This practice provides substantial health and well-being advantages for human beings (Hansen et al., 2017). According to the Attention

Restoration Theory (ART) of Kaplan and Kaplan (1989), individuals are able to concentrate more effectively after being in nature or simply gazing at natural scenes through a window. Moreover, this theory claims that the natural environment is filled with "soft fascinations" that captivate individuals with comfort, including clouds, the wind, trees, flowers, and water body formations. According to ART, soft fascination facilitates the following benefits: daily stress reduction, relaxed situational perception, conflict-free participation in activities, and critical evaluation of soft fascination stimuli (Kaplan & Kaplan, 1989). Stress Reduction Theory (SRT), developed by Ulrich in 1986, aims to provide an explanation for physiological responses and emotional well-being in the presence of the natural environment. SRT explains that positive psychological responses may result from exposure to a green environment. Complementing these spontaneous, instantaneous, and unconscious emotional reactions are increased positive vibes and decreased arousal. (Ulrich, 1986, Escolà-Gascón & Houran, 2021).

Richardson & Michell (2010) shared knowledge about how the environment can impact cardiovascular and respiratory disease. Males residing in urban greener areas had a marginally lower risk of cardiovascular disease by 5% and a significantly lower risk of respiratory disease by 11%, according to the study. (Richardson & Michell, 2010). Mitchell & Popham (2008) studied income-related health inequalities in populations with a greater natural environment. The study demonstrates that populations located in the most greener regi ons experience a reduced disparity in all-cause and circulatory disease mortality associated with income deprivation compared to those residing in less green regions. Another study (Kardan et al., 2015) carried out in a more urban setting in Toronto, Canada, showed how much a tree in a neighborhood park or street could enhance well-being. In comparison to those who reside in streets with lower tree densities, those who reside in streets with a greater density of trees report better overall health and fewer cardio-metabolic conditions.

Numerous studies investigating the relationship between nature and health are available within the environmental context of Japan. An investigation conducted in Japan involving hypertensive middle-aged individuals revealed a substantial decrease in heart rates when they were led through forested areas as opposed to spending time in an urban setting (Song et al., 2015). Furthermore, Ochiai et al. (2015) observed that middle-aged Japanese women experienced a significant decrease in heart rate subsequent to the forest walk. The decrease in heart rate indicates that the individual is more at ease in the forest setting. Young male students who engage in 20 minutes of walking in a forest environment experienced a reduction in blood pressure, according to another study. (Park et al., 2008).

Another investigation took place in 2009 to analyze the physiological outcomes of forest recreation on male students. Heart rate and diastolic blood pressure measurements of the participants were significantly reduced following time spent in a forest environment (Park et al.). The majority of prior research has reached the conclusion that while reducing heart rate and diastolic blood pressure, participants experience considerably more relaxed and comfortable feelings. Additional advantages of urban nature walks include attention restoration and stress reduction. (Hartig et al., 2003).

According to a controlled field study conducted in Kaunas, Lithuania (Grazuleviciene et al., 2016), stress relief was observed to be enhanced by a mere 30-minute stroll through an urban park, as opposed to the participant who strolled along an urban street. Seven days of walking in an urban street environment resulted in a negative impact on the stress relief of the participants. Another group of scholars (Repke et al., 2018) has been investigating the health benefits of nature exposure. The findings of the research demonstrated that residential location accessibility to and exposure to nature ease stress, anxiety, and depression, and enhance overall

health and well-being. In addition, the Japanese study (Song et al., 2015) describes the stress effects associated with the use of hypertensive middle-aged Japanese individuals. The findings of the research emphasized that participants experienced a notable rise in comfort, peacefulness, and connection to nature while walking the woods as opposed to the urban street.

The majority of urban dwellers lack any physical interaction with nature in the course of their daily activities. As a consequence, municipalities currently provide conveniently located urban parks and green spaces within their city limits (Hartig & Kahan, 2016). Low levels of childhood green space exposure are associated with psychiatric disorders in adulthood, according to Engemann et al. (2019). The effects of exposure to green space on the cognitive development of school-aged children were the subject of another study (Dadvand et al., 2015), which discovered that greater greenness is associated with improved academic performance and working memory. In order to engage in regular physical activity in a natural setting, such as urban parks, nature walking paths, or cycling paths, modern urban societies have embraced the notion of "green exercise" (Mackay & Neill, 2010). According to the same study, engaging in green exercise is beneficial for the mental health of urban dwellers.

3. An Experimental Field Study of Young Adults' Exposure in an Urban Green Space

This study investigated the effect of well-being outcomes on the health of young adults living in urban areas. A mixed methods approach was employed in this study for both data collection and analysis. The decision to use mixed methods was chosen due to the ability to gather useful quantitative data and the provision of comprehensive textual explanations regarding motivations and outcomes (Creswell & Creswell, 2018). Carrying out a field experiment is the most reliable way of measuring the physical and psychological benefits of nature time on one's health and well-being. In order to gain a comprehensive understanding of the subject matter, scholars performed semi-structured interviews (Brich et al., 2020) with the identical cohort of participants who were involved in the experimental investigation. Both data collection methods gathered primary data covering all the relevant aspects to address the research problem and to fulfill the research goal.

The study sample consisted of 15 participants and all of them were voluntarily recruited, based on the selection criteria summarized in Table 1.

Table 1.
Summary of the empirical study process

Title	**Value**	**Remark**
Sample Size	15 People between 18 and 25 years Purposive sampling	Living in the city limit of Tallinn, no known health conditions at the time of the study.
Data collection method	Experimental quantitative data, face to face interviews (mixed method)	ROS and SVS tools Heart rate and Blood pressure readings. Value of nature to participants
Data Analysis	descriptive and inferential statistical methods and thematic analysis	Quantitative data analysis done descriptively. Interview data analyzed based on themes

The data collection exercise was conducted in the summer of 2023, the same year Tallinn hosted the title of "European Green Capital." All the experiments and interviews were conducted in June. The experimental study consisted of physiological and psychological data

measurements in two stages (pre-stage/post-stage). Under the physiological data measurements, heart rate (Song et al., 2015; Park et al., 2009) was measured using "Fitbit versa two activity band" and blood pressure (Lee & Lee, 2014, Ochiai et al., 2015; Park et al., 2009) was measured using "A&D Medical digital blood pressure cuff monitor – Model: UA-651". The participants' psychological measurements were done using valid and reliable scales, The Restorative Outcome Scale (ROS) and Subjective Vitality Scale (SVS). These scales have been used for previous studies (Bielinis et al., 2021; Bielinis et al., 2018; Takayama et al., 2014) to measure the restorative and vitality effects of spending time in nature.

The field field study was conducted in one of the largest urban parks in Tallinn, Estonia, Kadriorg Park. A part of the field study site is finely maintained garden-type, and the other is wilderness area with giant tree canopies, pine trees, and the natural shrub layer. The nature viewing session occurred in the tree canopy area since it had more nature elements to observe. Prior to accessing the field experimental site, participants were requested to complete the ROS and SVS scales in order to obtain psychological attribute measurements. For physiological data, the heart rate and blood pressure of the participants were measured and recorded. The carrying or use of digital devices was not allowed throughout the field experiment. Figure 1 shows the structure of the field study step by step clearly.

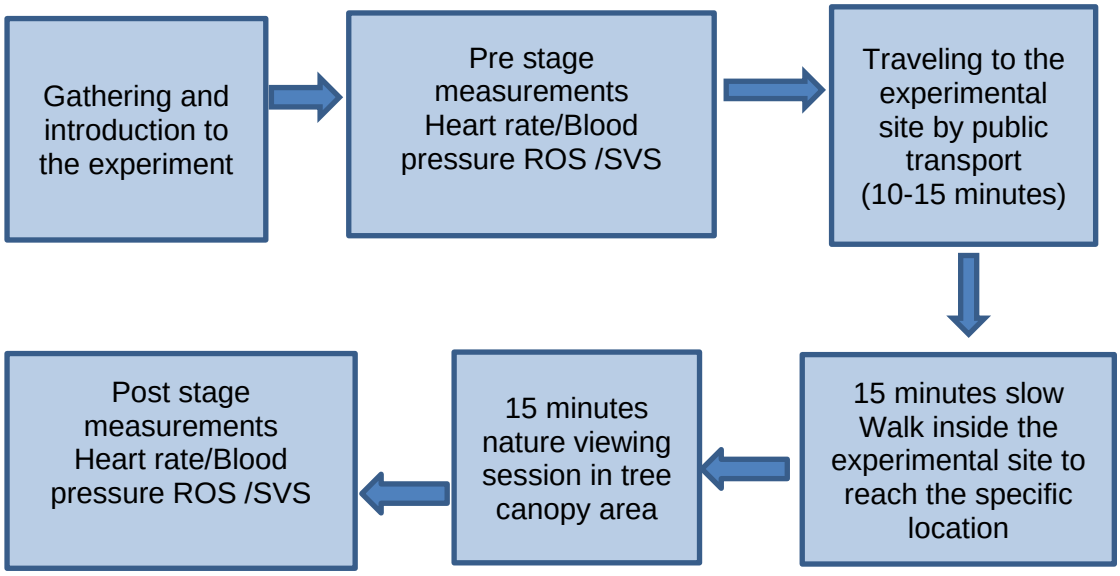

Figure 1. Schedule of the field study

Following these pre stage experimental activities, participants were instructed to take a leisurely stroll towards the tree canopy area at the designated field study site. After arriving at the study site for the nature viewing session after an approximate 15-minute slow walk, the participants spent the next 15 minutes observing nature in the form of trees, breeze, sun, sky, clouds, and birdsong. Using their five senses, participants were guided to establish a connection with nature while seated or standing at their convenience. However, they were instructed to maintain a comfortable distance from other participants and to remain silent. Park et al. (2009) demonstrated that 15 minutes of exposure to nature is sufficient for inducing the therapeutic advantages of the natural environment in human beings. Forest bathing begins with slow walk through woodlands and then observation of the surrounding using human five senses (Park et al., 2007). The researchers gathered post-stage physiological and psychological data by requesting participants to complete ROS and SVS scales and by measuring their heart rate and blood pressure levels following the 15-minute nature viewing session.

Multiple previous research studies have employed ROS as a valid and credible tool to measure restorative benefits (Bielinis et al., 2021; Bielinis et al., 2018; Takayama et al., 2014; Ojala et al., 2019). A total of six items on this scale that refer to cognitive outcomes and restorative emotions in a particular setting. Following each item is a seven-point Likert scale, ranging from 1 (completely not at all) to 7 (completely). The ROS modified by Takayama et al. (2014) was utilized in this study. The following six statements are "1. I feel calm," "2. I feel focused and alert," "3. I have enthusiasm and energy for my everyday routine," "4. I feel restored and relaxed," "5. I can forget everyday worries," and "6. My thoughts are clear" . SVS is a widely used tool in vitality assessments. Overall, two versions of the SVS templates can be found and one version assessing enduring individual characteristics and traits that are positively associated with self-actualization and self-esteem, and negatively associated with anxiety and depression.

The other version, as described by Takayama et al. (2014), assesses subjective vitality effects instead of long-lasting aspects. Each item is rated on a seven-point Likert scale ranging from 1 (exactly not) to 7 (completely). Both versions comprise seven distinct items. Numerous similar studies (Bielinis et al., 2021; Bielinis et al., 2018; Takayama et al., 2014; Ojala et al., 2019) have utilized the SVS to assess vitality level, and several studies (Nix et al., 1999; Ryan & Frederick, 1997) have confirmed the SVS's reliability. For this study, researches decided to use a modified version of SVS by Takayama et al. (2014) which only include four items with a seven-point Likert scale. The four items aref "1. I feel alive and vital," "2. I do not feel very energetic," "3. I have energy and spirit," and "4. I look forward to each new day".

Following the completion of the experimental field study, participants were engaged in semi-structured interviews (Brich et al., 2020), which lasted an average of 15 to 20 minutes. The researchers administered a pre-designed semi-structured questionnaire. On the basis of previous studies (Brich et al., 2020; Simkin et al., 2020; Ojala et al., 2019), the questionnaire was developed. Permission was requested by the researcher to record the interviews.

Descriptive and inferential statistical methods were employed to analyze the quantitative data (Takayama et al., 2014). The inferential statistical method was used to generalize the study population from the sample data. The researchers employed graphical illustrations to clarify the presentation of the data in accordance with a descriptive statistical method. Pair t-tests were utilized to compare the data measurements obtained during the pre stage and the post stage of the field experimental study. The data are presented in the form of mean scores and p-values, with statistical significance defined as a p-value of less than 0.05. Statistical analysis was conducted in its entirety utilizing Microsoft Excel. The gathered qualitative data were evaluated by thematic analysis. Thematic analysis was employed due to its appropriateness and practicality in classifying and distinguishing patterns within the dataset. The themes were derived from the transcriptions of the interviews.

4. Ethical Considerations

Knowing that participants' physiological and psychological data have been collected for the study, each of them was made aware of the purpose of the data and how it's going to be stored and treated. Personal identifiers were removed, and codes and pseudonyms were used right from the beginning of the data collection. This helped in protecting the identity of participants. After data were analyzed, they were saved on password protected laptop for future reference. The data will be deleted when publication of the findings is completed.

5. Findings

5.1. Statistical Findings from the Experimental Study

This section of the study analyzes and interpret study results regarding the health and well-being effects of spending time in urban green spaces on urban young adults living in Tallinn, Estonia.

5.2. Physiological Importance of Urban Nature Exposure

In order to determine the physiological significance of nature exposure, the heart rates and blood pressure levels of participants were monitored in two phases (pre-stage and post-stage) throughout the field experimental study conducted in an urban green space. Heart rate values decreased considerably following exposure to nature. The researchers compared the mean score differences between the pre-stage and post-stage heart rate values of the participants using the paired sample t-test. The findings revealed noteworthy statistical distinctions ($p < 0.05$) between the data gathered pre stage and post stage. The mean score value in the post-stage is 6.6% less than the mean score value in the pre-stage. The statistical outcome comparison of pre-stage and post-stage heart rate values are presented in Table 2.

Table 2.
Statistical results of heart rate variables

Variable	P value	Pre stage		Post stage	
		Average (mean)	Standard deviation	Average (mean)	Standard deviation
Heart rate (BPM)	0.00016	78.7	6.9	73.5	5.4

The heart rate distribution of the experimental participants is illustrated in Figure 2. It explains the variations in heart rate among each participant during the pre-stage and post-stage of the experimental study.

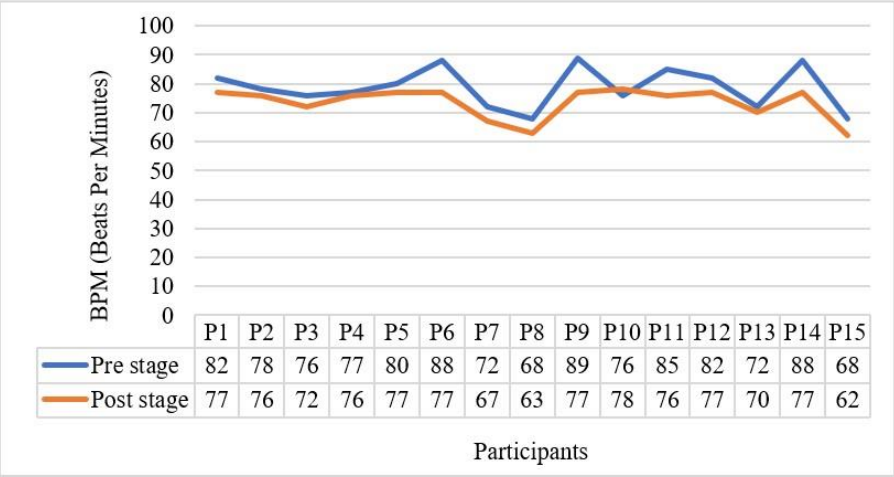

Figure 2. The heart rate distribution among the participants

Post-stage measurements revealed that only one participant (P10) exhibited a marginally increased heart rate throughout the field experiment. Following their exposure to nature, all remaining participants exhibited heart rate measurements that were significantly reduced. A paired sample t-test was employed to compare blood pressure measurements obtained during pre stage and post stage. An individual's systolic and diastolic blood pressure decreased

considerably following time spent in nature. The statistical differences between pre-stage and post-stage systolic and diastolic blood pressure measurements are presented in Table 3.

Table 3.
Statistical results of systolic and diastolic blood pressure measurements

Variables	P values	Pre stage		Post stage	
		Average (mean)	Standard deviation	Average (mean)	Standard deviation
Systolic blood pressure (mmHg)	0.00028	108.7	11.9	107.1	12.4
Diastolic blood pressure (mmHg)	0.018	73.7	9.2	71.5	8.6

The mean score for systolic blood pressure in the post-stage is 1.5% less than that of the pre-stage. The systolic blood pressure measurements revealed a statistically significant p-value ($p<0.05$). Equally, the mean score for diastolic blood pressure measurements decreased by 2.9% between the pre-stage and post-stage assessments. The distribution of systolic and diastolic blood pressure among the participants of the experimental study is depicted in Figure 3 and Figure 4, respectively. The variations in systolic and diastolic blood pressure measurements between the pre-stage and post-stage for each participant clearly illustrated in the figures.

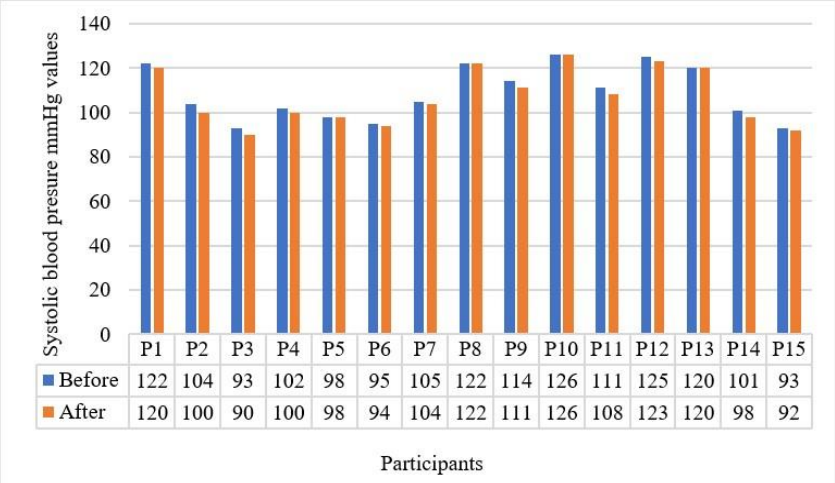

Figure 3. The distribution of systolic blood pressure values among the participants

As illustrated in the figure above, during the post-stage of the field experiment, the systolic blood pressure of 12 participants was considerably lower than during the pre-stage. The remaining three participants (P5, P8, and P13) provided exact measurements of their systolic blood pressure both pre stage and post stage change.

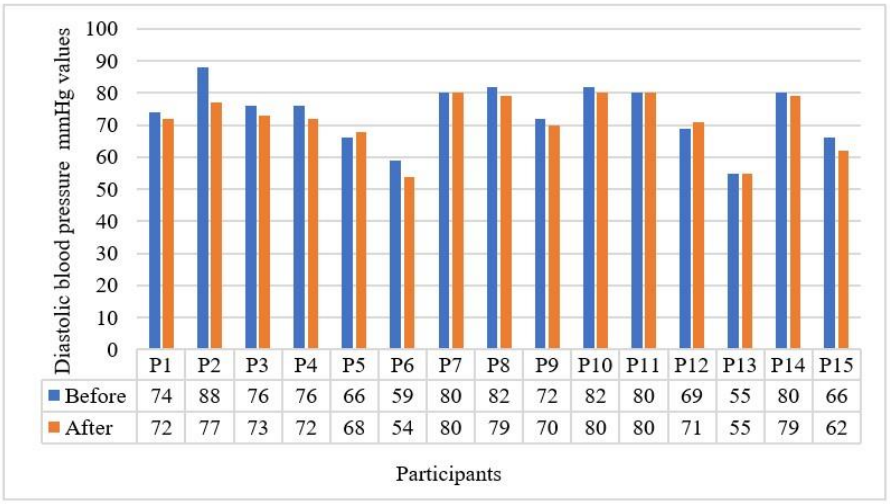

Figure 4. The distribution of diastolic blood pressure values in the pre-stage and post-stage among the participants

Twelve participants had lower diastolic blood pressure readings in the post-stage measurements compared to the pre-stage measurements in the experimental study, as shown in Figure 4. The remaining three participants (P7, P11, P13) reported no changes of pre-and post experiment diastolic blood pressure values. Throughout the field experiment, only one participant (P13) demonstrated that systolic and diastolic blood pressure levels remained unchanged from pre-stage to post-stage. The findings corroborate that the majority of participants experienced a reduction in blood pressure subsequent to their exposure to nature.

5.3. Psychological Significance of Urban Nature Exposure

The comparison of ROS statement results from the pre-stage to the post-stage of the experimental study is presented in Table 4. An evaluation of each of the six statements in ROS was conducted using a paired sample t-test. Each statement of the ROS was found to be statistically significant ($p < 0.05$), according to the results.

Table 4.
Statistical results of ROS

Statements	Mean response (Pre-stage)	Mean response (Post-stage)	P values
I feel calm	2.8	4.8	8.E-06
I am focused and alert	3.1	4.5	0.0058
I have enthusiasm and energy for my everyday routines	3.3	4.7	0.0139
I feel relaxed and restored	2.6	5.2	1.0E-05
I can forget everyday worries	2.6	4.7	0.0006
My thoughts are clear at the moment	2.5	5	6.E-07

The statistical findings presented above suggest that participants in the field experimental study experienced considerably greater restorative effects subsequent to their exposure to nature. Based on the highest mean score difference between the pre-stage and post-stage and the most significant p-value, "I feel relaxed and restored" was determined to be the most powerful statement of the ROS. The response patterns of the participants to the statement are illustrated in Figure 5.

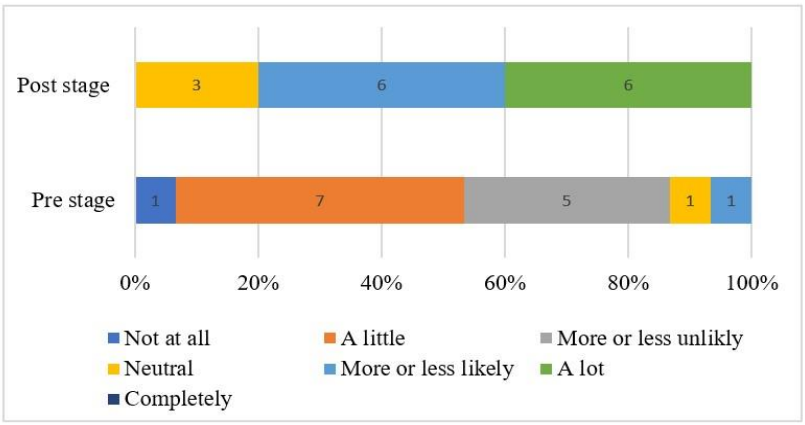

Figure 5. Participants' respond pattern to the "I feel relaxed and restored"

The figure presented above illustrates that the post-stage response to the assertion "I feel relaxed and restored" was extremely positive. During the post phase of the field experimental investigation, every participant reported feeling neutral, more or less likely, or a lot of relaxed and restored feelings. Moreover, the "My thoughts are clear at the moment" statement was identified as the second strongest statement in the ROS. "I can forget everyday worries," "I feel calm," "I am focused and alert," and "I have enthusiasm and energy for my everyday routines" statements respectively showed the positive effects on participants in the post-stage response for the ROS. The overall results from ROS confirmed that the response to exposure to urban nature was positive, and the participants observed significantly greater restorative benefits from it.

Differences identified in the ROS paralleled those identified in the SVS. The results indicated that the post-stage response of the participants to the SVS was significantly more vital. Each statement of the SVS was found to be statistically significant ($p < 0.05$), as confirmed by the results. The statistical distinctions between pre-stage and post-stage ROS statements are presented in Table 5.

Table 5.
Statistical results of SVS

Statements	**Mean response (pre stage)**	**Mean response (post stage)**	**P value**
I feel alive and vital	2.8	4.9	7.E-05
I do not feel very energetic	5.13	3	0.00052
I have energy and spirit	3.53	5.13	0.00079
I look forward to each new day	3.4	5.2	0.00017

The mean score differences between the pre-stage and post-stage of the first, third, and fourth questions in SVS, as well as the p values, indicated that after spending time in nature, participants reported increased vitality. The score for the negative second statement was inverse. The mean score differences and p-values indicated that the negative statement had a positive impact on the participants and was statistically significant.

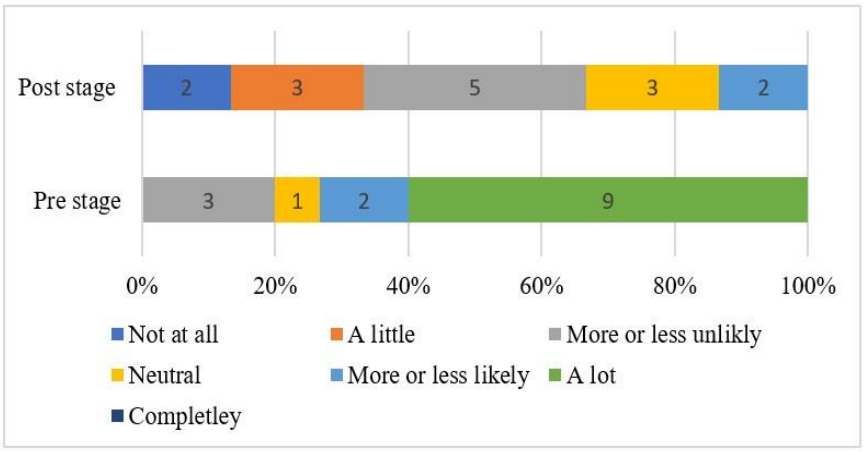

Figure 6. Participants' respond pattern to the negative statement "I don't feel very energetic" on SVS (Pre and post stage)

The figure above illustrates that the pre-stage response of the participants to the statement "I do not feel very energetic" was negative. Nine respondents indicated a lot , two provided more or less likely, one reported neutral, and three reported more or less unlikely. The positive response to this statement was reflected in post-stage responses, as the statement itself is negatively inversed. This result indicated that participants experienced greater energy levels after spending time in nature compared to their pre-nature visit.

Based on the statistical differences, the following four statements received the lowest to highest receptive scores on the SVS scale: "I feel alive and vital," "I do not feel very energetic," "I have energy and spirit," and "I look forward to each new day." The response patterns of participants to the most powerful statement in SVS, "I feel alive and vital," are depicted in Figure 7.

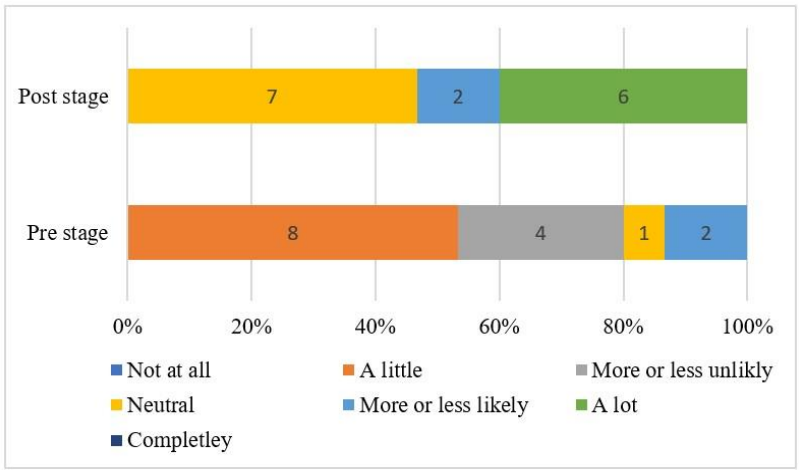

Figure 7. Participants' response pattern to the statement "I feel alive and vital" in SVS

Regarding the most powerful statement of the SVS, "I feel alive and vital," the responses of every participant were neutral, somewhat probable, or substantial. As evidenced by these responses, all participants reported increased vitality and an increased feeling of aliveness following time spent in nature.

In summary, the statistical findings of the field study revealed statistical significance in the physiological measurements comparing the pre-stage and post-stage. Responses to the psychological scales, ROS, and SVS all exhibited statistical significance. The findings of this study suggest that human exposure to urban green spaces has a beneficial impact on the

reduction of pulse rate and blood pressure, as well as the enhancement of restoration effects and vitality.

5.4. Textual Meaning of Urban Green Exposures

The semi-structured interviews were focused on the psychological benefits of exposure to urban nature. It is explained under four sub-themes: stress, attention, mood, and positive emotions.

Findings revealed that none of the study participants has psychological medication history. Although, all the study participants mentioned that they are dealing with daily stress in different situations. Mainly mentioned stressful situations among the participants were working overtime hours, heavy academic workload, family and relationship problems, and financial problems.

Twelve participants (P1, P2, P3, P4, P7, P8, P9, P10, P11, P12, P13, P15) reported that nature helps them cope with the above-mentioned stressful situations. Across the experience of a busy urban lifestyle, participants were given words and ideas such as calm, refreshed, peaceful, and relief to describe how nature helps to cope with daily stress. To give more evidence, P4 stated:

> *"I easily get stressed and nervous over situations that I cannot control. However, I noticed one thing, while I am in nature, I feel much calmer, and I can forget all my worries and be free from stressful situations. Nature is like a therapist for me."*

Furthermore, the majority of respondents indicated that city life increases the level of stress experienced on a daily basis, and that access to urban nature areas within the city limits serves as a more effective means of relieving stress. P1 stated:

> *"Ever since I spent my childhood mostly in nature, I still adore tall trees, bird songs, and cool breezes, which give me peace of mind. After I moved to the city, my living tempo has changed, and I often experienced stress. Anyway, I make sure to expose myself to nature daily. Near my working place, there is a park where I usually go there and enjoy my lunch while watching nature. These kinds of nature places are helpful for people like us to regain energy due to the busy city environment."*

A mere three respondents (P5, P6, P14) indicated that nature did not offer any solace during times of tension. The participants revealed several additional essential techniques for managing tension. Additionally, some claimed that walking into nature could place them in an extra stressful circumstance.

Despite the fact that the responses of the participants demonstrated that nature does not assist them in coping with tension, they ultimately receive pleasure from it. Those who contributed that point to the conversation were residents of more populous areas. P14 articulated:

> *"I usually listen to music or try to have a nap when I get stressed. Going to nature is not my cup of tea. But that does not mean I don't like to go to nature; I go to the park whenever I have free time and a free mindset. Then I can enjoy nature very much."*

It is found that none of the participants have problems with anxiety or depression via a follow-up inquiry. Analysis of the responses of all participants to queries regarding stress and nature confirms that urban young adults find relief in nature as a means of managing the daily stress they experience.

A significant proportion of the respondents indicated that being in the presence of nature enhances their capacity for attentiveness. As nature's most effective attention-restoring elements, areas with water streams, water reactions in urban parks, urban parks with tree

canopies, blue sky, forest, or flower aromas were cited. It is evident from the responses of the participants that urban living causes the mind and body to be exhausted, whereas nature viewing provides the mind with new challenges to engage in. P3 declared:

> *''While I am walking through the city area, I always make a stop near to cannel area. This place makes me so soothing and regain my attention. I get refresh while looking at the water, and then I can focus more on my studies easily.''*

Additionally, responses indicated that being in nature can elevate one's mood and positive emotions. Ten respondents indicated that they are able to observe positive mood shifts when in nature. The hectic lifestyle results in a constantly changing mood. Participants discuss observing nature through an office window, growing indoor plants, and passing a natural area while traveling to work as nature-related practices that enhance their mood. P9 declared:

> *''To keep a good mood throughout the day, I try my best to go for a walk early in the morning. I feel that it helps me a lot to keep positivity throughout the day. Nature helps a lot. Exposure to a cool breeze or warmth of the sunlight, hearing the morning bird songs make me feel refreshed, and those things can reverse my cranky mood into a cheerful direction.''*

The majority of respondents indicated that time spent in nature increases their overall life satisfaction. They emphasized that by leaving daily worries behind and time in nature, one can experience the present moment with positivity, creativity, and gratitude for life. Additionally, P12 asserts that spending time in nature helps to improve life by fostering the generation of creative and novel ideas, which in turn increase overall life satisfaction.

> *''Whenever I go to nature I forget my worries and I try to reflect on the ways I can improve my life. It is amazing that I get more ideas to improve things in my life, especially my business. And I feel that I am fulfilled with this life when I stay longer in the woods.''*

In summary, the interview findings indicated that exposure to nature has numerous psychological benefits. Nature can support stress relief, attention, and focus improvement, positive mood changes, creativity enhancement, and improve overall life satisfaction (Rathnayake, 2021).

6. Discussion and Recommendations

The outcomes of the present study support the idea that urban young adults experience enhanced health and wellbeing as a result of their exposure to green spaces. Since the urban environment provides many stressors, easily accessible urban green spaces are a great asset for urban dwellers.

This study examined the physiological indicators before and after exposure to nature, and the findings were consistent with earlier research. The heart rate assessments showed statistically significant results following a 15-minute walk, followed by a 15-minute of observing nature. The findings of previous studies conducted by Song et al. (2015) and Ochiai et al. (2015) have demonstrated consistent outcomes following the act of walking within an urban park or urban forest environment. According to the findings of Park et al. (2007), the act of observing a natural scene has been shown to elicit a decrease in heart rate and contribute to the reduction of stress levels.

Moreover, the findings of the current investigation indicate that being in contact with natural environments leads to a decrease in both systolic and diastolic blood pressure levels. This finding corresponds with the findings of an earlier investigation conducted by Lee and Lee

(2014), which demonstrated a drop in both systolic and diastolic blood pressure following a forest walk. According to the findings of Shannan et al. (2016), regular trips to outdoor green spaces have been shown to have a positive impact on blood pressure levels, hence offering potential benefits for individuals residing in urban areas who may be dealing with hypertension-related health concerns. In the same vein, Mao et al. (2012) validated the idea that a brief session of forest bathing has the capacity to reduce blood pressure and exert a beneficial impact on hypertension in older individuals. The study findings and existing literature provide empirical evidence supporting the positive impact of nature on physical health, including reductions in heart rate and blood pressure. These physiological changes have direct implications for overall physiological well-being.

The study's findings revealed a number of positive psychological enhancements. The study validated the idea that spending time in green spaces contributes to enhanced restorative outcomes among young adults residing in urban areas. The results indicate a statistically significant increase in scores on the Restorative Outcome Scale (ROS) following a 15-minute walking and 15-minute watching session in a natural environment. After being exposed to urban green areas, the mean scores for all the statements on the Restorative Outcome Scale (ROS) shown an increase. The present study's findings regarding ROS indicators align with prior research that employed a comparable methodology to examine the restorative effects of urban parks and forest environments on participants (Bielinis et al., 2021; Ojala et al., 2019; Bielinis et al., 2018; Takyama et al., 2014).

Furthermore, the research conducted by Bielinis et al. (2021) and Bielinis et al. (2018) provided additional evidence to support the idea that short visits to forested areas have a positive impact on human well-being, even during the winter season. A brief duration of contact with natural surroundings demonstrated a noteworthy increase in the subjective vitality. All four statements in the SVS demonstrated statistical significance, indicating a significant increase in vitality levels following exposure to nature. The SVS results also aligned with the previous studies to synthesize ROS results.

The findings of the current study indicate that urban green areas have a positive impact on stress reduction among young adults, hence facilitating their ability to cope with daily stressors. Moreover, the results indicated that the study participants experienced emotions characterized by calm, comfort, relax, and peacefulness. These good emotional states played a role in reducing the daily stress experienced by young adults living in urban areas. These results align with the concepts outlined in Stress Reduction Theory (SRT), which was originally proposed by Ulrich in 1986. According to SRT, the act of observing or being exposed to a natural environment elicits favorable reactions that facilitate the reduction of stress. The gaining of positive responses cannot be obtained via exposure to an artificial environment. Numerous research in the literature supports the notion that engaging with urban parks, green spaces, forests, or residential green areas is associated with a decrease in stress levels (Repke et al., 2018, p. 13; Grazuleviciene et al., 2016; Song et al., 2015; Ochiai et al., 2015; Hartig et al., 2003).

According to the Attention Restoration Theory (ART) proposed by Kaplan and Kaplan, the act of being in the natural environment or even observing nature through a window at one's residence has been found to enhance attention and focus abilities. According to Kaplan and Kaplan (1989), the natural environment possesses soft fascinations that elicit effortless attention. The findings from the present study indicate that the participation of young adults in nature has a positive impact on their focus and attention, as supported by the evidence provided.

Urban young adults have emphasized the need of maintaining a positive mood in order to enhance productivity and provide a sense of peace throughout the day. Based on the replies

given by the study participants, it has been established that there is a significant association between spending time in natural environments and experiencing improvements in mood. A number of previous studies (Simkin et al., 2020; Bielinis et al., 2018; Takayama et al., 2014) have provided further evidence supporting the notion that brief visits into nature can have a substantial positive impact on individuals' moods.

The energy levels of individuals residing in urban areas may be diminished as a result of their exposure to various stressors specific to urban living. Hence, there exists a disparity in life satisfaction levels between those residing in urban and rural environments. Previous research has underscored the positive impact of engaging with nature on individuals' happiness levels, their sense of purpose and fulfillment in life, and their overall satisfaction with life. The current study also demonstrated that the natural environment plays a role in enhancing life satisfaction and feelings of fulfillment among young adults residing in urban areas. Moreover, the research unveiled a novel discovery indicating that being exposed to natural environments enhances one's creative abilities.

7. Conclusion

The objective of this study was to examine the impacts on the health and wellbeing of young people resulting from their exposure to urban green spaces. The empirical investigation was conducted in Tallinn, Estonia, involving a sample of 15 people. The primary outcome of the study demonstrated that urban young adults experience a variety of wellbeing advantages as a result of being exposed to nature. In terms of physiological advantages, the exposure to green spaces in urban environments has been found to have a positive impact on heart rate and blood pressure, leading to their decrease. The physiological indicators mentioned are closely associated with the psychological advantages of being exposed to urban green spaces. The psychological health advantages that have been observed include the restoration effects and increase in vitality levels, stress reduction, enhanced attention and focus, mood enhancement, general life satisfaction, and enhancement of creativity.

Upon conducting a synthesis of the study data and literature, the researchers has substantiated that a majority of the study findings align with past research, while also discovering novel insights. The findings of this study confirmed the positive impact of urban green spaces on individuals' health and well-being. Consequently, the following implications distinctly offer suggestions for young adults residing in urban areas.

1. To examine the potential benefits of urban nature exposure on individuals' physical and psychological health and overall well-being.
2. A recommendation for urban policymakers and authorities is to prioritize the establishment of accessible green spaces within cities as a means to improve the overall quality of life for urban dwellers.

In conclusion, the present study's theoretical and empirical investigation offer valuable insights for urban young adults seeking to enhance their health and wellbeing through the reestablishment of connections with urban green spaces. Moreover, the research provides evidence in favor of mitigating the consequences of the increasing detachment from the natural environment experienced by young adults residing in urban areas. This can be achieved by educational initiatives aimed at raising awareness about the various health and well-being benefits associated with nature, as well as by establishing urban greenspaces as a means to fulfill their innate connection to the nature.

In this investigation, the investigators exclusively collected health-related data from the people involved in the experimental group. Nevertheless, the environmental parameters at the study

site, including temperature, humidity, air quality, and sound level, were not subjected to measurement. This study may benefit from further investigation into several undiscovered areas, including the potential seasonal impacts on health and well-being, the impact of extended periods spent in nature, and the subsequent repercussions on individuals. These aspects need attention and should be considered in future research endeavors.

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