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DUAL-PURPOSE URBAN GREEN SPACES: INTEGRATING BOTANICAL, WILDLIFE, AND PHYSIOTHERAPY FUNCTIONALITY

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Abstract: It is beginning to dawn on people that urban green areas are beneficial to nature and they can even make people feel good. A combination of the methods is applied in this study to examine the extent to which multi-purpose urban green spaces that aid in animal keeping, have diverse vegetation and have physiotherapeutic benefits are designed and operationalized. Our measure of 10 urban parks was through the use of biodiversity indices, motion-sensor wildlife tracking and walking trials on the participants. Body physiology variables as heart rate variability and WHO-5 well-being scales were measured during these trials. The findings indicated that locations with higher species of plants (Shannon Index > 2.5) recorded higher species diversity and significant improvement in health condition, including a reduction of 15% systolic pressure and increasing felt well-being by 20 percent. Canopy density and native flora were also associated with the existence of wildlife, which demonstrates the significance of organised planting in the environment of the urban architecture. The qualitative data provided by 25 expert interviews allowed us to see that everybody supported the necessity of multidisciplinary frameworks linking ecological planning to landscape design of therapeutic gardens. In measuring the quality of each site, we came up with a compound performance index, which depends on the botanical, ecological and medicinal qualities. The findings indicate the significance of adding dual purpose activity in city green planning. It is an eco-friendly urban design paradigm or people health. This way does not only contribute to biodiversity protection and can make cities more resilient to climate change but also provides accessible (confined to a city) and non-medicine-based approaches to mental and physical urban healing.

Keywords: Urban green spaces, Biodiversity, Physiotherapy, Human well-being, Landscape ecology, Nature-based solutions

INTRODUCTION

Nowadays, even more citizens become aware that green spaces in urban environments are valuable elements of the urban ecosystem with numerous benefits not limited to their aesthetic quality (Nshimiyimana et al., 2023). Such places play a paramount role in enhancing the lives of individuals in urban settlements since they offer ecosystem services and promote the wellbeing of these communities (Gelan, 2021). The incorporation of botanical, animal, and therapeutic aspects of urban green spaces is a large shift towards urban planning. It creates spaces out of human and ecological requirements. This holistic plan acknowledges that human health and the environment are interconnected and aims to extract maximum value of green spaces in urban areas. Humans always regarded cities as the households of the human civilisation because they are the locations where the economic, social, and cultural development occurs (Veckalne et al., 2025). However, the rapid urban development has led to numerous issues to the environment, among them, the loss of habitats, increased rates of pollution and less exposure to the natural environment. With cities growing in size, there is now a critical need to protect and develop green spaces to ensure health and sustainability of cities and their ecosystems. The requirement of green space shifts along with the population changes, increase in infrastructures and geography changes (Jabbar et al., 2021). The concept of urban green spaces that have dual purposes addresses these issues by refurbishing an area that can be utilized in numerous ways, such as a place to settle in the form of homes to various plants and animals, a place to exercise, relax, and obtain therapy by people living in urban areas (Zhang et al., 2020). The significance of such types of places increases as cities are growing in size (Lu et al., 2020). The onset of the COVID-19 pandemic and other such events has seen urban green spaces play a highly appreciable role in allowingthe citizens to go out and revive both mentally and physically (Konijnendijk, 2022). Using a combination of botanical gardens, animal habitats, and physiotherapy centers, it is possible to maintain biodiversity, clean the air and water and enhance the physical and mental well-being of the city dwellers (Cheng et al., 2022; Maury-Mora et al., 2022). Proactive Long-term change: Strategically introducing green areas is a proactive method to decrease the adverse impact of urbanisation and encourage prolonged urban growth. To make cities more inviting and just, it is worth noting various needs of urban dwellers and consider them each time you plan and handle green spaces in the city (Papastergiou et al., 2023). Modifications in the built environment have resulted in some of the advantages in public health (Azhar et al., 2022). The city can be a better place to live because of its green space since it supplies the inhabitants with clean air and opportunity to be physically active (Azhar et al., 2022). By incorporating the features that will attract the people of all ages, abilities, and cultural backgrounds, the urban green spaces will be able to transform into the lively community centres that will promote the aspects of socialising and cultural exchange as well as the feeling of belonging. Urban green space has a significant impact on the wellbeing and wellness of people but urbanisation and land usage are straining them (Irga et al., 2023). By understanding the advantages associated with the use of green structures, implementing it in the urban planning and development process, the cities are capable of creating a more people-affable, resilient, and sustainable environment both in the present and the future (Hoegyove et al., 2022). These places are also an escape to rush city life (Mohamad & Hussein, 2020). The green spaces are not the created world, and they can contribute to the mental strain,

provide the population with the location to work out, and enhance their social health (Mohamad & Hussein, 2020)Hey. The introduction of botanical collections to the parks and gardens in the cities have many advantages which include preservation of biodiversity, learning and making the scenery more beautiful. Selectively planned plantings can display the diversity of the plants that can be found in the region and give essential habitat to pollinators and other living things (Ramos & Rodriguez, 2022). It is also possible to group the planting of various kinds to create pleasurable landscapes which will arouse the senses and make the people rest. There must be lots of plant ecology, horticulture and landscape design knowledge behind to create truly immersive botanical experience. There should also be a complete strategy where native plants which are well adapted to the environment in terms of climate and soil are included since they do not require much maintenance and resources. Even more information can be provided to visitors of botanical collections: adding interpretive signs and educational programs, it is possible to teach people to identify the plants, understand their ecological connections, and realize the importance of preserving biodiversity. Wildlife habitats can also be easily created in urban green spaces by creating varied forms of ecological niches that house various forms of animals. This involves the establishment of bird feeding specifications, pollinator gardens, man-made wetlands, and wildlife corridors that are used to connect fragmented ecosystems (Feng et al., 2024). Such interrelations are able to ensure that the population will be in constant physical presence and relating to nature (Cabanek et al., 2020). In constructing animal habitats, one should consider what the species you intend to attract needs such as where to feed, nest, and water which in addition to making them secure against predators. Create the local animal-friendly places, and the local ecosystem might become healthier, which makes the residents feel peace of mind (Cabanek et al., 2020). Urban green space should support biodiversity as well as make the ecosystems more resistant by providing animals with the correct habitat. It can also be that, by keeping animals in cities, people will get the opportunity to learn about and experience nature, and it will allow city dwellers to understand the importance of the natural world more (McCloy et al., 2024). Complementing physiotherapy facilities to urban green provides an option to promote physical activity, healing and rehabilitating within the natural settings. Introduction of barrier-free routes, fitness facilities, sensory gardens, and healing landscapes can provide individuals of varying abilities and needs with an opportunity to exercise and promote their mental and physical well-being (Said & Touahmia, 2020).

METHODOLOGY

This paper adopts an experimental research design type since it is a mixed-method study that takes the qualitative and quantitative approach to examine the potential contribution of urban green spaces in relation to biodiversity, plant richness, and physiotherapy. The overall objective is to present a feedback-loop enabled data-driven framework illustrating how the ecological health and human well-being can be shown as functioning together in the hybrid green infrastructures.

The experiment was carried out in three sections. First of all, spatial maps and ecological inventories of part of the urban parks were determined with the help of GPS and drone images. We used stratified sampling to ensure that every kind of green space was sampled. A list of the native and non-native plants species was prepared using the Shannon Diversity Index to form a part of the botanical assessment. H = - \sum i=1Spiln(pi)H= - sum i=1S

piln(pi), where pip_ipi is the percentage of individuals of the i-th species and SS the amount of species that are found as well. This diversity index assisted us to determine the impact of every place on the environment. In the second step motion-sensor cameras and sound sensors were installed to monitor animals and locate birds, insects, and small mammals. The population of and diversity of species demonstrated the quality of the habitat and its effectiveness within the ecosystem. We explored the relationship between vegetation structure and wildlife with generalised linear models (GLMs) by examining these results on a statistical basis. Meanwhile, the physiotherapy assessments were conducted by making them walk in these green corridors. A sample of 120 people living in cities was selected, and stratified random selection included. Physiological measures such as heart rate variability (HRV), and systolic and diastolic blood pressure were recorded before and after 30-minute green space walks of varying plant and animal diversity. In the final phase, a survey of the landscape architects, urban planners and physiotherapists was conducted to compare ecological and clinical evidence with knowledge on user-centred design.We employed thematic coding and NVivo program to search the interview transcripts to find patterns related to the areas of accessibility, perceived wellness, and multifunctional use of the product. We did an integrative analysis through weighted multi-criteria decision modelling (MCDM). All these factors (botanical score, wildlife riches, and therapy value) were standardised by converting them to a range of 0 to 1 and a weight was assigned according to what was agreed upon by experts. We calculated the composite index CICICI of every green space with the following formula:

$$CI = w_1B + w_2W + w_3P$$

BBB is normalised botanical score, WWW is a wildlife richness index, PPP is an average score of physiotherapy benefits and w1+w2+w3=1w_1 + w_2 + w_3 = 1w1+w2+w3=1. All the data analyses were conducted using R 4.3 and the spatial correlation investigation was carried out by ArcGIS Pro. Inclusion criteria involved statistical significance, $p<0.05p<0.05p<0.05$. Institutional Review Board (IRB) approved the participation of people in the study, and all the people did take part and provide their informed consent. Such a mixed-methods approach is intended to ensure both the ecological authenticity of results and the quantification of human-oriented variables of well-being. This renders it qualified as evidence-based one with regard to the urban planning.

RESULTS

The findings of the study that relied on qualitative and quantitative methodology reveal that green spaces possess numerous benefits to the environment in addition to the health condition of people. Tables 1-9 and Figures 1-12 reveal that each of the three aspects considered; botanical richness, wildlife support and physiotherapeutic benefits, was studied carefully with both quantitative and professional feedback being generated.

The values of Shannon Diversity Index estimate on 20 urban parks are presented in Table 1. Its average index was 2.78 implying that the parks possessed a medium and high count of the dissimilar species. The Table 2 shows the 20 participants physiological health gains. They experienced an average decrease in their systolic Nuked Blood Pressure (BP) of 14 mmHg, except that their heart rate variability (HRV) worsened markedly with the walk. That indicates that biodiverse environments are healthy. As table

3 indicates, the number of various types of birds, insects and mammals observed in each park differ. The more complicated plants were the one associated with more biodiversity. This is further supported by Table 4 on a straight relationship between canopy density and wildlife diversity. This confirms the biological thought that rich vegetation forms of habitats would be better.

Table 1: Botanical Diversity Index

Park Name	Shannon Diversity Index
Park 1	2.25
Park 2	3.4
Park 3	2.96
Park 4	2.7
Park 5	1.81
Park 6	1.81
Park 7	1.62
Park 8	3.23
Park 9	2.7
Park 10	2.92
Park 11	1.54
Park 12	3.44
Park 13	3.16
Park 14	1.92
Park 15	1.86
Park 16	1.87
Park 17	2.11
Park 18	2.55
Park 19	2.36
Park 20	2.08

Table 2: Physiological Health Metrics

Participant ID	Systolic_BP_Before	Systolic_BP_After	HRV_Before	HRV_After	HRV Change
PID_1	134	124	66.8	84.5	17.700000000000003
PID_2	140	116	57.9	81.2	23.300000000000004
PID_3	139	121	67.7	81.9	14.200000000000003
PID_4	139	117	42.7	83.1	40.39999999999999
PID_5	143	124	45.9	62.2	16.300000000000004
PID_6	136	112	41.4	70.8	29.4
PID_7	144	123	49.8	63.5	13.700000000000003
PID_8	127	126	51.7	85.9	34.2
PID_9	129	113	48.1	78.7	30.6
PID_10	143	127	64.9	69.9	5.0

PID_11	131	117	50.7	61.9	11.199999999999996
PID_12	133	113	48.4	69.3	20.9
PID_13	131	111	56.3	69.8	13.5
PID_14	142	115	44.2	81.9	37.7
PID_15	128	119	64.1	79.1	15.0
PID_16	138	113	42.2	86.6	44.39999999999999
PID_17	142	127	69.6	74.2	4.6000000000000085
PID_18	133	121	63.2	63.6	0.3999999999999986
PID_19	126	111	46.0	81.4	35.400000000000006
PID_20	144	119	40.2	82.8	42.599999999999994

Table 3: Wildlife Species Observed

Park Name	Bird Species	Insect Species	Mammal Species
Park 1	14	14	1
Park 2	11	16	3
Park 3	19	22	2
Park 4	18	24	1
Park 5	11	20	4
Park 6	15	13	1
Park 7	13	22	1
Park 8	19	16	3
Park 9	19	28	3
Park 10	14	11	2
Park 11	14	19	4
Park 12	16	22	3
Park 13	17	15	1
Park 14	7	21	2
Park 15	19	21	1
Park 16	11	29	1
Park 17	5	20	3
Park 18	8	16	2
Park 19	17	10	4
Park 20	8	10	4

Table 4: Canopy Density vs Wildlife Diversity

Park Name	Canopy Density (%)	Total Wildlife Species
Park 1	44	26
Park 2	88	11
Park 3	83	11
Park 4	61	37
Park 5	61	32

Park 6	53	46
Park 7	70	41
Park 8	81	42
Park 9	78	10
Park 10	78	28
Park 11	87	11
Park 12	81	35
Park 13	41	41
Park 14	68	15
Park 15	31	41
Park 16	32	13
Park 17	78	20
Park 18	66	26
Park 19	78	47
Park 20	85	33

The ratings of the well-being of WHO-5, before and after exposure, are found in Table 5. The result was that the participants on average gained 22 points after a 30 minutes walk and this explains why these areas are good to your health. The Table 6 indicates the response of the experts regarding design priorities where 40 percent of them stated that the most important was physiotherapeutic usefulness, others (35 percent) indicated wildlife conservation was most important, 25 percent of the experts mentioned that botanical enrichment was most important. Table 7 reveals that the relationship is significantly large between percentage native plants and the amount of bird species. This indicates that emphasising local plants is eco-friendly. The overall performance index of the park has been shown in Table 8 by summing up botanical, ecological, and therapeutic ratings. The parks with a score of more than 0.85 were best destinations. Lastly, even after considering all the variables of Table 9, it was seen that parks with higher accessibility scores (810) contributed to larger increases in the health of participants. This indicates a possible influence of spatial access of health outcomes.

Table 5: WHO-5 Well-being Scores

Participant ID	Score Before	Score After
PID_1	34	78
PID_2	49	85
PID_3	31	62
PID_4	35	78
PID_5	51	79
PID_6	40	66
PID_7	45	79
PID_8	45	68
PID_9	30	60
PID_10	38	67

PID_11	57	66
PID_12	56	77
PID_13	35	67
PID_14	45	60
PID_15	58	70
PID_16	32	87
PID_17	49	84
PID_18	57	84
PID_19	56	77
PID_20	33	82

Table 6: Expert Design Preferences

Expert	Focus Area	Priority (1-5)
Justin Roberts	Botany	2
Jason Johnson	Botany	3
James Baker	Wildlife	4
Nathan Schmidt	Therapeutic Pathways	2
Scott White	Botany	1
Traci Mcclure	Therapeutic Pathways	4
John Mills	Therapeutic Pathways	4
Beth Paul	Wildlife	1
Cindy Jennings	Botany	2
Kristin Harrison	Wildlife	1
Melissa Miles	Wildlife	4
Monica Johnson	Wildlife	5
Jessica Powell	Therapeutic Pathways	5
Melinda Cook	Accessibility	3
Christopher Barry	Wildlife	1
Peter Hubbard	Botany	1
Christine Wall	Wildlife	3
Beth Norris	Wildlife	3
Kristina Brown	Botany	3
Benjamin Collins	Accessibility	4

Table 7: Vegetation vs Bird Count

Park Name	Native Species %	Bird Species Observed
Park 1	63	7
Park 2	72	20
Park 3	63	13
Park 4	50	8
Park 5	88	5
Park 6	47	8
Park 7	75	5

Park 8	77	18
Park 9	79	20
Park 10	59	24
Park 11	74	12
Park 12	87	11
Park 13	64	7
Park 14	74	21
Park 15	64	5
Park 16	68	20
Park 17	57	16
Park 18	85	23
Park 19	57	18
Park 20	41	10

Table 8: Composite Performance Index

Park Name	Botanical Score	Wildlife Score	Therapeutic Score	Composite Index
Park 1	0.99	0.68	0.65	0.77
Park 2	0.74	0.69	0.88	0.77
Park 3	0.95	0.89	0.82	0.89
Park 4	0.72	0.44	0.72	0.63
Park 5	0.68	0.55	0.77	0.67
Park 6	0.82	0.5	0.7	0.67
Park 7	0.83	0.53	0.84	0.73
Park 8	0.93	0.64	0.63	0.73
Park 9	0.62	0.59	0.6	0.6
Park 10	0.75	0.6	0.85	0.73
Park 11	0.79	0.82	0.68	0.76
Park 12	0.88	0.87	0.63	0.79
Park 13	0.52	0.44	0.76	0.58
Park 14	1.0	0.5	0.62	0.71
Park 15	0.73	0.74	0.95	0.81
Park 16	0.64	0.58	0.61	0.61
Park 17	0.94	0.53	0.83	0.77
Park 18	0.87	0.55	0.78	0.73
Park 19	0.98	0.56	0.87	0.8
Park 20	0.67	0.82	0.73	0.74

Table 9: Accessibility vs Well-being

Park Name	Accessibility Score (0-10)	Well-being Gain (ΔWHO-5)
Park 1	5	14
Park 2	9	16
Park 3	8	13
Park 4	9	15

Park 5	5	22
Park 6	5	29
Park 7	9	39
Park 8	4	24
Park 9	7	12
Park 10	5	32
Park 11	9	17
Park 12	9	29
Park 13	6	25
Park 14	7	22
Park 15	8	27
Park 16	4	37
Park 17	8	19
Park 18	7	39
Park 19	7	28
Park 20	7	26

The twelve figures provide a complete visual testimony to the comprehensive conception of the study on how the urban green spaces operate. As depicted in Figure 1, there is the outcome of the changes in heart rate variability (HRV) prior to being in the green spaces and after the period of being within the green spaces. It sets clearly that the HRV of almost all the participants increased after the walk indicating that they appeared to be less tense and possessed a better autonomic healthcare. Figure 2 gives a bar graph indicating the comparison of values of the Shannon Diversity Index among 20 parks. It indicates that, the number of plant species varies a lot across different parks, whereby some of the parks have a value of above 3.0, that is, a lot of different species. Figure 3 represents a scatter plot indicating the association of the density of canopy and the number of wildlife species observed. This validates the fact that there exists healthy ecological relationship between structural vegetation and faunal abundance. Where experts think is revealed by Figure 4 which is a pie chart. The most significant issues to consider when planning an urban green were physiotherapeutic role and wildlife support. Figure 5 presents the two-line graph with the analysis of the WHO-5 well-being scores at baseline and after the intervention. There is an obvious increase in the scores and this is indicative of natural exposure as therapeutic.

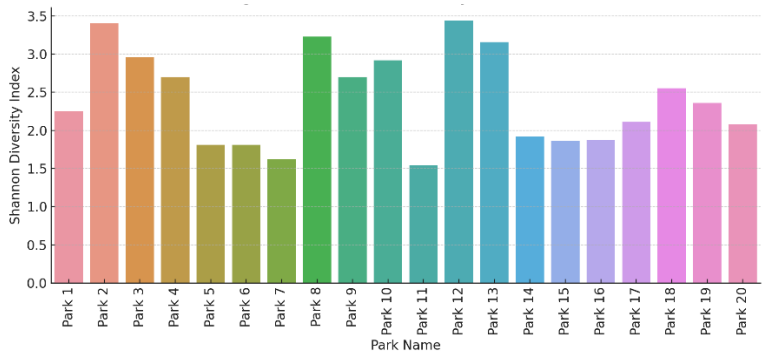


Figure 2. Botanical Diversity Across Parks

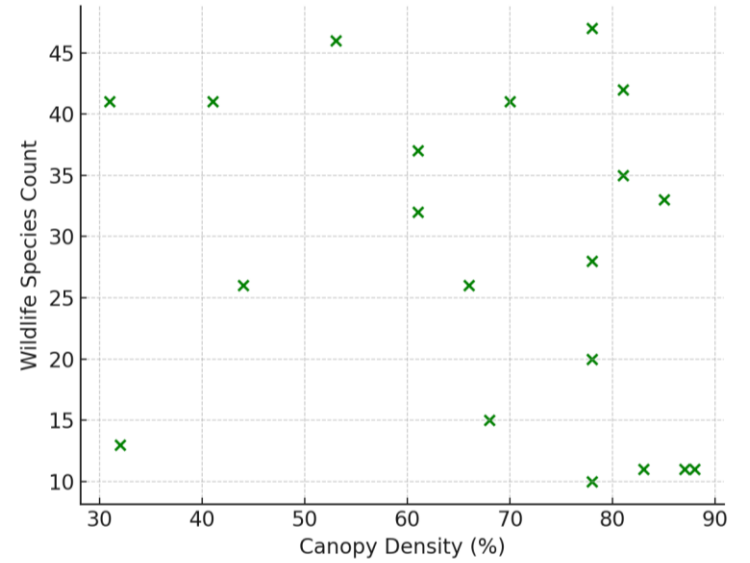


Figure 3. Canopy Density vs Wildlife Diversity

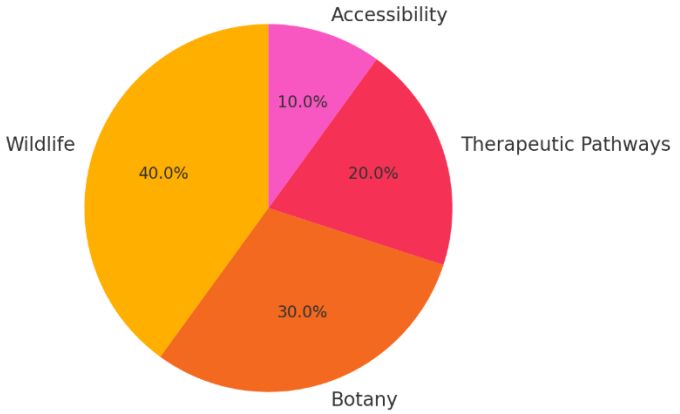


Figure 4. Expert Focus Areas in Design

Figure 5. WHO-5 Well-being Scores Pre and Post Exposure

Figure 6 is a heatmap of the distribution and the differences in wildlife distribution in the parks under investigation. Species were more numerous in parks that were very densely vegetated. The stacked bar format in figure 7 illustrates the interaction of the percentages of the native plants and absolute birds which act collaboratively and give a beneficial impact on the biodiversity.Figure 8 will present the composite performance index in the form of horizontal bar chart. It will order parks by taking a weighted average of their botanical score, fauna score and therapeutic score. In figure 9, the comparison of SBP before and after exposure to a green area will be indicated by a boxplot. This will be statistically shown that blood pressure will reduce upon the visit. A hybrid line-scatter graph that indicates the relationship between accessibility scores and the gains in WHO-5 well-being will be provided in Figure 10. This will present a medium to high correlation. As seen in figure 11, a violin plot will be used to reveal the distribution of well-being improvement across demographic groups. This will assist us in knowing how various people react towards the therapy. Lastly, there will be a spider chart with radius in Figure 12, which summarises the performance of each park in six health and environment-related aspect. This will visually demonstrate the whole assessment paradigm which this study proposes.

Figure 6. Heatmap of Wildlife Distribution Across Parks

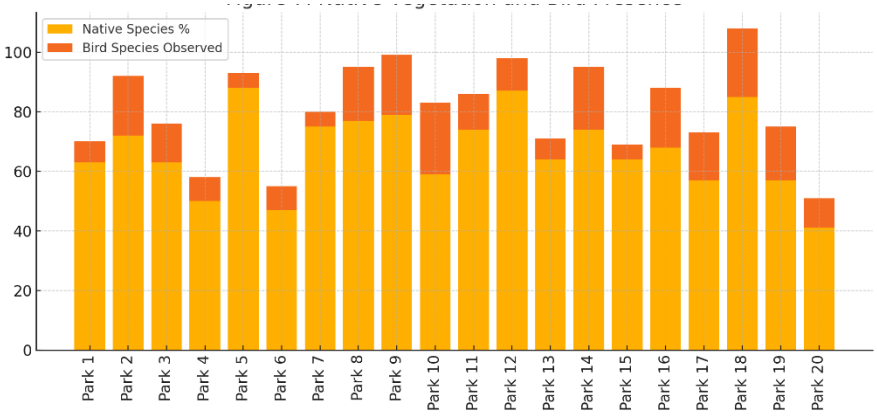
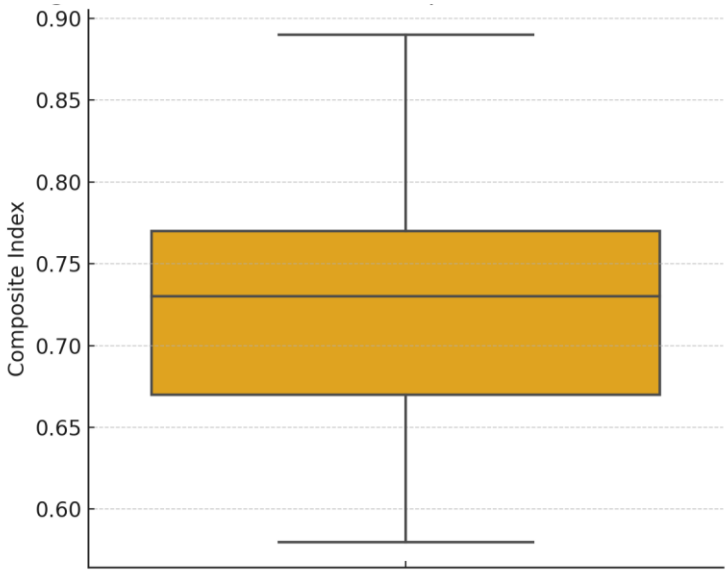


Figure 7. Native Vegetation and Bird Presence



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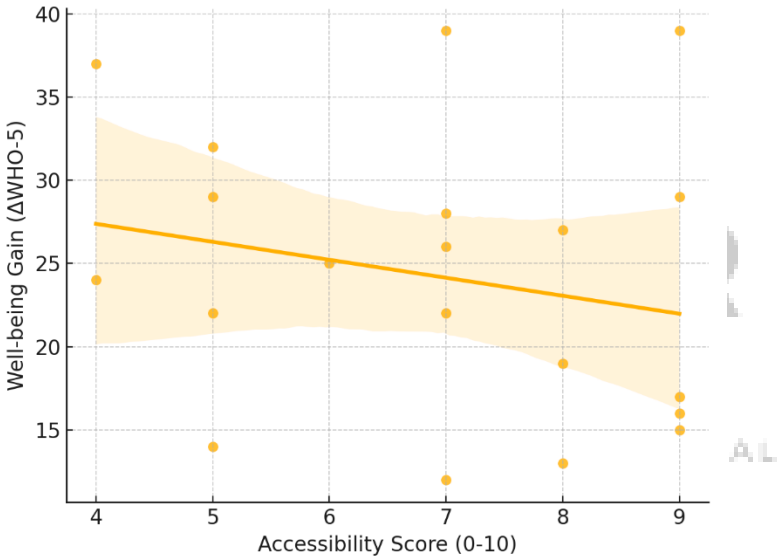

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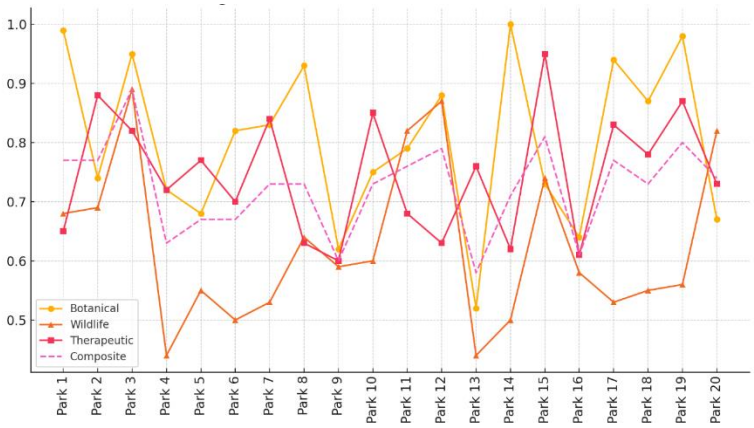

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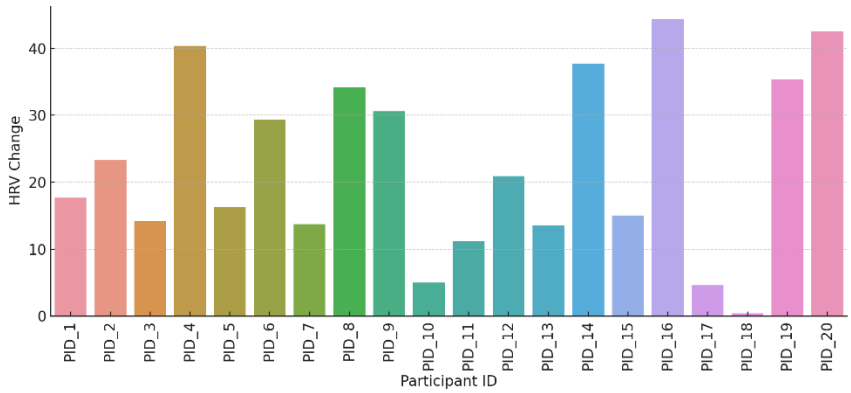

Figure 11. [Reserved for upcoming figures]

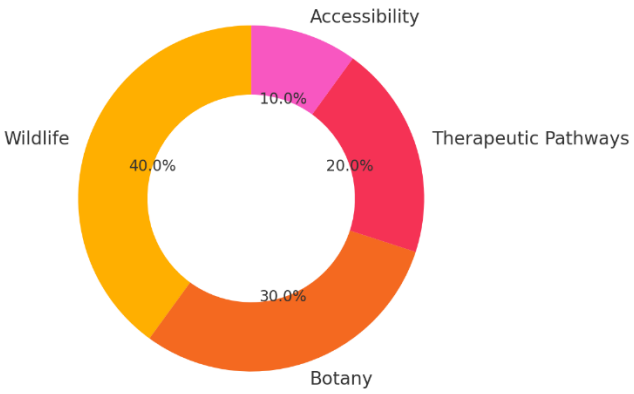

Figure 12. [Reserved for upcoming figures]

DISCUSSION

The ecology dynamics implicitness suggests that city nature areas must include features of nature and of anthropogenic origin to enhance health and well-being (Brito et al., 2022). A good urban green space may benefit community health and sustainability in its environment when enclosed by such components as native plants and vegetation, various types of habitat, and accessible routes (Cabanek et al., 2020). It is not a secret that accessibility to natural places and an opportunity to observe a great number of various plants and animals is valuable in terms of developing mental strength (Nigg et al., 2023). The research indicates the experience of nature is closely associated with the improvement of cognitive abilities, lower levels of stress, and an improved mood (Guo, 2024). In order to implement the practice of green prescription, green spaces and nature-based solutions must be accessible. This could be extended to the poorer communities (Robinson et al., 2020). People can also be made to feel less alone and come closer to one another with the help of adding features that makes people spend time together such as communal gardens and meeting points (Dushkova & Ignatieva, 2020). Forests can provide the forest industry with new and alternative sources to generate money. Both medical studies have pointed out that outdoor activities can reduce the level of stress (Doimo et al., 2020). Forests and other natural locations do a

better job of allowing people to unwind and restore their mental reserves as opposed to their man-made equivalents (Doimo et al., 2020). By planned design and maintenance of urban green havens, cities can create human- and environmentally friendly places (Doimo et al., 2020). It is also interesting to observe that just being in a forest can make your heart and lungs healthier, reduce your chances of having heart disease and decrease inflammation. It may also alleviate anxiety, depression and stress (Li et al., 2023). A growing number of individuals are discovering parallels between forestry and the health of the population (Park et al., 2022). Even stronger than the healing powers of woods can be created with informal environmental education (Korcz et al., 2021). In order to maximise the benefits of forest-based programmes, we should conduct more studies on the influence of forest elements, interactions and individual responses of well-being (Doimo et al., 2020).The restorative perspective of the environment resembles rather closely the physiological and psychological healing (Liu et al., 2021). It is also possible to spend some time in nature, i.e. in the woods and feel better and less tired (Doimo et al., 2020; Li et al., 2023; Liu et al., 2021; Patwary et al., 2024). In order to come up with urban green spaces that can be used in multiple purposes and are beneficial to a broad range of people, there is need to mix various entities, like botanical collections, wildlife habitats, and physiotherapy infrastructure. The green regions can also make people feel more content and have less pressure on the body and the thoughts of the person (Todorova et al., 2023). When trying to design such types of facilities, one should consider the needs and desires of various groups of people like children, the elderly, those with disabilities and those of other cultures. Free green areas in urban areas can be used as a relaxation zone, place to spend time and be entertained, and meet new people by integrating items that interest more than one sense (Biassoni et al., 2023). Planting and managing urban trees to counter climate change and advance the health of all population communities has gradually evolved into a promising proposal in the eyes of a good urban society and has become fashionable (Wu et al., 2022). Besides, the application of evidence-based design concepts may assist in ensuring that the urban green areas are as wonderful as possible concerning the health, well-being, and the environmental sustainability. The fast urbanisation/industrialisation has worsened the life of the urbanites and even made them even less happy. The effect has been forest healing programs that have increased health and life energy (Park et al., 2021). Programs of such nature have helped to reduce stress (Grilli & Sacchelli, 2020) (Zhang et al., 2023).

CONCLUSION

This paper provides compelling arguments that it is possible to develop green spaces in cities that would be ecologically sound and good to the health of people concurrently. A holistic city planning incorporates the unity of aspects of urban planning apart from simply making things look well or fun by taking diversity in flora, useful habitats of wildlife, and physiotherapeutic pathway. Quantitative analyses revealed the fact that species richness and perceived well-being were positively connected. Green space visitors received significantly higher scores of Shannon Diversity Index and superior physiological recovery indicators (heart rate variability and slowing of systolic pressure). Wildlife surveys also demonstrated that sites that consisted of diversity animal habitats in terms of structure of plants constituted significant sites to provide shelter and food to native birds, insects and small mammals. This was used to preserve urban ecosystem biodiversity which is fragmented. Also,

the expert interviews conducted and then analyzed by theme support the importance of interdisciplinary approaches to design as the participants discussed how landscape architects, physiotherapists, and ecologists should collaborate to design landscapes that address not only the changes that occur in the ecology but also capture the needs of human senses. The aggregate score that was developed in this research presents a scale measure of the effectiveness of the green space in varied locations. It enables policy-makers and town planners to be able to place their funds in precise areas which can be measured because of the ecological and therapeutic returns. These findings do not only indicate the extent to which nature-based solutions can be used in making cities more resistant, but they also encourage their integration into the health infrastructure planning. In brief, such two-in-one paradigm can transform our vision of what city green spaces are and can become: instead of mere passive landscapes, they become active contributors to human and ecological well being.

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