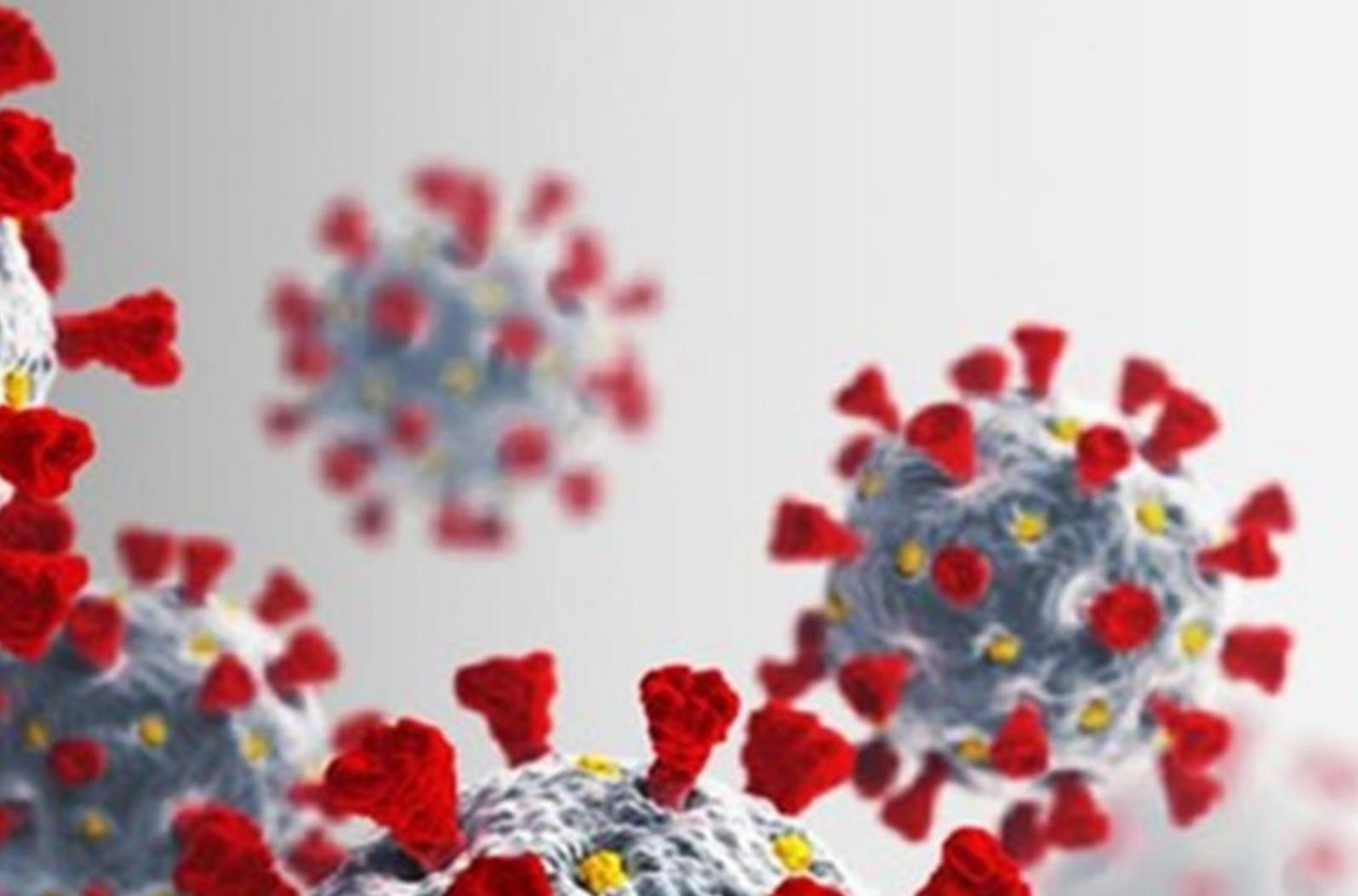


Report

POST-COVID PUBLIC PARK DESIGN CONSIDERATIONS: PUBLIC HEALTH AND SAFETY PERSPECTIVE

ASSOC. PROF. DR. SHUREEN FARIS ABDUL SHUKOR
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Public Health and Safety Perspective



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EXECUTIVE SUMMARY

Visiting parks has been proven to support physical and mental health especially among urban residents. However, the restrictions on the use of public space and social distancing order have contributed to many obstacles for people worldwide to enjoy the urban green spaces. Due to this, a survey on the comparison between Malaysians' usage of urban green spaces prior and during the duration of the COVID-19 pandemic was conducted. An online self-administered questionnaire survey was conducted during the Movement Control Order (MCO) period (May-July 2021). Descriptive analysis and content analysis were applied and a total of 415 responses from the whole Malaysia was recorded. Results showed that the frequency of weekly visits to urban green spaces has dropped drastically during the lockdown as compared to before the MCO. There was also a huge increase in the number of respondents who didn't visit the urban green spaces during the MCO. However, there was a positive increment in the usage of residential garden during the MCO as compared to before the MCO. The majority of the respondents involved in the survey mentioned that they diverted their visitation to the nearest urban green spaces available during the MCO. Respondents involved in the survey expressed the need for design improvements in the parks. Four aspects of constraints were identified: 1- the inconsistency and confusion from the imposed SOP enforced by the government and local authorities regarding parks and green space usage, 2- limited access of the facilities provided at the park, 3- concerned of safety, well-being and comfort, 4- location of the green spaces and the quality of the provided facilities. Added facilities which are fitting to the current situation of COVID-19 such as sanitization area, and multipurpose area are among the items mentioned under the section for park improvisation. Facilities for different groups of age were also mentioned in this section as some of the changes that users would like to see in a post- COVID-19 urban green space design. The findings managed to highlight the usage pattern of urban green space among Malaysians prior and during the pandemic. The preferences put forth by park users are crucial in order to inform designers, planners and local councils in preparing future design of parks in a post-COVID-19 environment.



PART I

INTRODUCTION

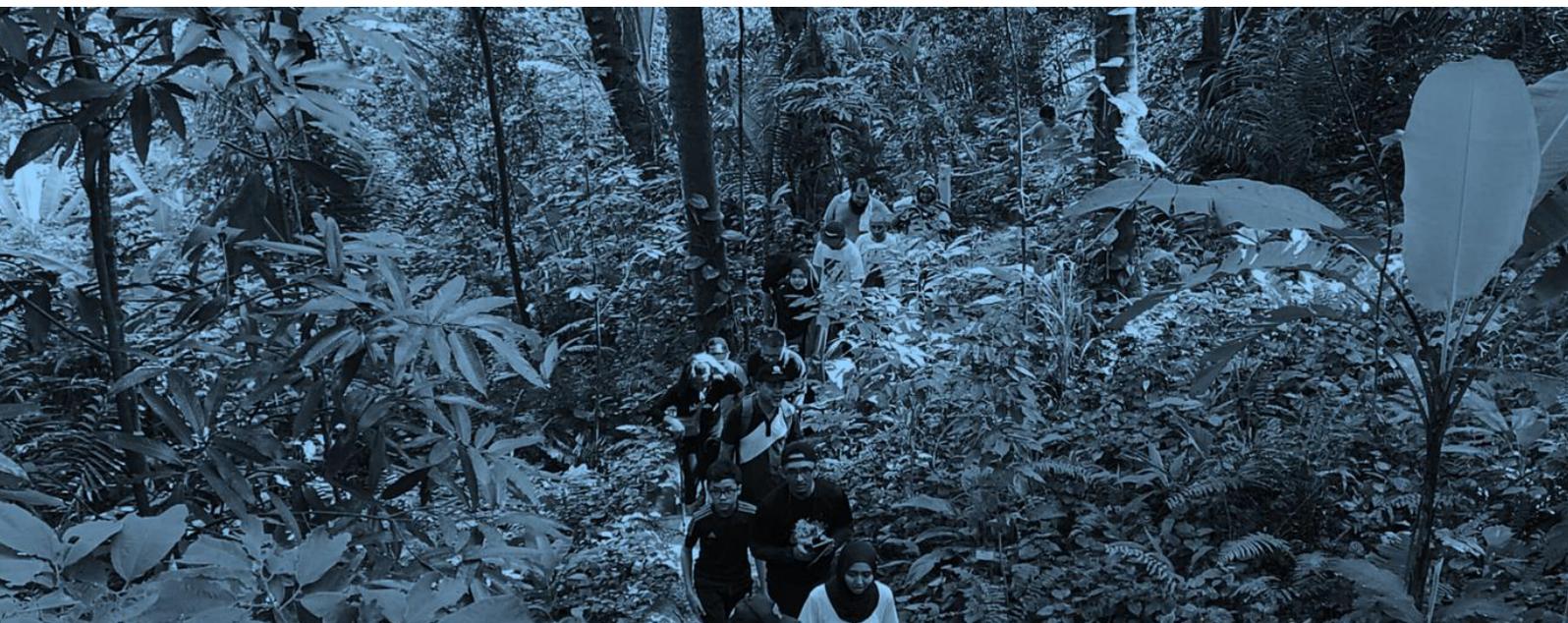




PART I- INTRODUCTION

The society today is faced with increasing occurrences of various forms of poor health-related issues due to modern lifestyles. Contributing factors include an increasingly sedentary population, increasing levels of psychological stress related to urban living and contemporary work practices. Efforts to promote public health and well-being have become an important agenda in Malaysia. Green settings have been identified as places accessible to everyone in the community without any formal, financial or symbolic restrictions. There are numerous studies about green and nature surroundings that can be related to the enhancement of positive effects of green and nature on human emotions. According to Han (2010), nature interactions have positive effects on human emotions. The natural environments provide opportunities to gain distance from routine activities and thoughts.

Since the COVID-19 pandemic outbreak in December 2019, there has been more than 4.69 million deaths of COVID-19 worldwide. In total, about 228 million infected cases were reported with 197 million patients recovered (WHO, 2021). As of September 19th 2021, Malaysia has reported a total of 2 million total confirmed cases of Covid-19 and 23,000 deaths (Ministry of Health, Malaysia, 2021). Research on how a global event of great magnitude may be perceived differently in different geographical contexts is not frequent. Given the worldwide health emergency caused by the COVID-19 pandemic, it is of great interest to explore whether citizens' behavior and perceptions of green spaces in Malaysia may have changed and how.





I.1 Background of Study

Exposure to outdoor green spaces has been lauded as one of the approaches to improve the mental and physical health of the public. Visiting parks has been proven to support physical and mental health especially among urban residents. The usage of parks and recreational green spaces is expected to increase with the relaxation of the Social Operating Procedure (SOP) in the coming months. However, rules on the use of public space and social distancing restrictions have provided obstacles for people to enjoy the urban green spaces.

The purpose of this study was to explore, from a Malaysian perspective, the ways in which the use of parks may have changed due to the restrictions imposed by the containment of the COVID-19 outbreak in Malaysia, in comparison to the period prior to the restrictions. In addition, the study aimed to identify park users' constraints in the use of green spaces during the MCO and gauged their recommendations on how to improve park design while also accommodating the situations triggered by the pandemic.

On March 16th. 2020, the then Prime Minister of Malaysia, Tan Sri Muhyiddin Yassin announced the first nationwide movement control order (MCO) where a nationwide lockdown was imposed from March 18th until March 31st, 2020 (Adam, 2021). Since then, few phases of MCO categories were implemented by the Government- Conditional Movement Control Order (CMCO) from 1st May 2020 until 9th June 2020 and Recovery Movement Control Order (RMCO) from 10th June 2020 to 31st December 2020. Due to the third wave of infection, the Conditional Movement Control Order (CMCO) was re-imposed on certain parts of the country starting from 14th. October 2020.



I.2 The Issues

The COVID-19 pandemic has stemmed a number of impacts on Malaysia, both negatively and positively. Malaysia's economy, inflation as well as unemployment rate are amongst the negative impacts of the pandemic. Whereas air pollution, level of water pollution and noise pollution are amongst the positive impacts of the pandemic towards Malaysia. Additionally, other positive impacts include the decrease of crime index rate, a 70 percent reduction in road accident case rates as well as the implementation of a more effective measures on the influx of illegal immigrants (Mohamad Saleh, 2020).

Furthermore, the negative impacts also created stress amongst Malaysian. A study on Snapchat Generation by Snap Inc. found that 66 percent Malaysian citizens are stressed due to the pandemic. In addition, 44 percent of Malaysian citizens suffers from stress weekly and 70 percent monthly (Eliani, 2021).

Psychological stress during pandemic outbreak of COVID-19 happened severely:

- Anyone can be affected emotionally during an outbreak like COVID-19.
- Everyone reacts differently to critical scenarios.
- Fear, worry, and anxiety regarding COVID-19 can cause strong emotions such as stress and depression in a person.

The Ministry of Health, Malaysia has published well-described guidelines on "Mental Health and Psychosocial Support in COVID-19". The guidelines included the mental health and psychosocial support services for individuals under COVID-19 investigation and those health care workers response workers involved.

Based on evidences, visiting green spaces give many benefits to users in terms of physical, social and mental health. Therefore, this research aims to identify the usage pattern, perception and preferences of urban green space use among Malaysians prior and during the COVID-19 pandemic. Hence, the intention of this report is to assist in the recommendations to improve parks designs and in the long run, support public health and increase the safety aspects.



PART 2

THE BENEFITS OF PARK AND GREEN SPACES





2.1 Human Preferences Towards Nature

The state of knowledge of nature and human health relation has grown rapidly in recent years. The sufficient evidences indicate natural environment play an important role in supporting people's health and well-being. A person's environmental preferences are influenced by the human variety of human needs (Matsuoka and Kaplan, 2008). There are two categorized as human needs as such; nature needs that include; aesthetic preference ranged from scenic beauty, cleanliness, pleasant sound and smells; contact with nature (Kellert, 2005) such as viewing nature, directly engage and experience nature; and recreation and play (Castonguay and Jutras, 2010). While, human-interaction needs which observed as less immediate towards the role of the environment such as opportunity to meet (Veitch, et al., 2006) and socialize with peers (Simmons, 1994).

An experience can be interpreted as a "memorable personal sensation" and/or a "state in the mind/body" (Lindström & Jönsson, 2009, p. 8). The experience of one's surroundings, e.g. an urban green space, is largely individual and shaped in the interaction between the physical attributes of the landscape on the one hand, and human sensing, feelings, moods, thoughts, attitudes, preferences, interpretations, past experiences and reflections on the other (Cresswell, 2009; Kaplan & Kaplan, 1989). Therefore, a given setting is likely to be experienced differently by different people (Randrup, Schipperijn, Hansen, Jensen, & Stigsdotter, 2008) and it is through these manifold experiences that urban green spaces gain their nuanced meaning and the multiple values that transform them from space to "place" (Cresswell, 2009).

Environmental psychology studies have demonstrated that experienced qualities in green spaces can be subdivided into different "perceived sensory dimensions" (Grahn & Stigsdotter, 2010). People seeking different types of experiences may require different environmental attributes for satisfaction (Schreyer & Lime, 1984). Simultaneously, different environmental attributes can be characterized according to how people perceive and experience them. Knowledge about lay people's perception therefore becomes indispensable (Grahn, 1991), not least because green space is regarded as an important quality of urban life, but is variable in terms of opportunities, physical settings, sociability and cultural diversity (Malek, Mariapan, Mohd Shariff, & Aziz, 2011; Ward Thompson, Roe, Aspinall, & Zuin, 2010).



2.2 Benefits of Parks and Green Spaces on the Mental and Physical Health

Parks are emerging as important public health solutions in urban communities. Nearly 40 years of research evidence confirms that nearby nature, including parks, gardens, the urban forest and green spaces, support human health and wellness. An emerging opportunity for parks and recreation is the integration of green infrastructure and parks goals. Infrastructure systems are planned to systematically source and deliver crucial services or products, such as transportation or water systems. The term “infrastructure” usually brings to mind roads, pipes and power lines. Green infrastructure systems, however, are practical integrations of built and ecological systems that incorporate natural and constructed green spaces to replace or augment traditional grey infrastructure.

Parks and green infrastructure can be co-designed for co-benefits. Parks can serve their primary goals to offer recreation and aesthetic amenities, while also containing spaces that mitigate stormwater or improve air quality. Green infrastructure can achieve essential utility functions in the community, but may also be designed to create the environments that provide nearby nature experiences and support health. A study that compared meditative and athletic walking in forest and indoor settings showed that in both environments meditative walking generated more positive psychological effects than athletic walking. Other investigators have found evidence of lower frustration and increased brain activity, resembled meditation, when moving in green space versus being in retail and commercial areas that have no trees.

Stress is a major contributor to ill health. Left unresolved, long-term stress can lead to immune system issues and illness. The experience of nature is one antidote to stress, and the body’s positive response is remarkably fast, occurring within minutes. Studies by environmental psychologists show that visual exposure to nature, in the form of trees, grass and flowers, can effectively reduce stress, particularly if initial stress levels are high.



Experiences of nearby nature contribute to better mental health and improve one's capacity to be productive according to Attention Restoration Theory. Modern life often demands sustained focus on projects, and this effort can lead to cognitive overload, bringing on irritability and an inability to function effectively, often with physical symptoms. Views or brief experiences of nearby nature help to restore the mind from mental fatigue, as natural settings provide respite from the highly focused attention needed for most tasks in school or at work. This may contribute to higher productivity in the workplace, as research shows that office workers with a view of nature are better able to attend to tasks, report fewer illnesses and have higher job satisfaction. Increased time of nature experience (up to 1.5 hours) increases the restorative effect.

Nature settings offer sensory inputs that are mentally restorative and can foster ideation. In a study of creative professionals, nature experiences enhanced creativity by evoking new ways of thinking, promoting curiosity and encouraging more flexible thinking. A nature recharge may support creativity, as the restored mind is better at analysing and developing ideas.

Views of green space from homes are linked to greater perceptions of well-being and neighbourhood satisfaction. Public housing residents reported feeling safer if their development had well-maintained landscaping, including trees and grass. Greener public housing neighbourhoods tend to be safer, with fewer incivilities and less reported crimes. Active involvement in community greening and nature restoration projects also produces social benefits, including strengthening of intergenerational ties and organizational empowerment.





2.3 Related Literature on the Use of Parks and Green Spaces during COVID-19

In order to examine existing evidences for design recommendations for parks and urban green spaces in relation to the pandemic, an online computer-based search was carried out. The search of the data bases includes Medline, PubMed, science Direct and Scopus. The search also included manual reference-checking (snowballing) to find additional sources. The search words were ‘parks and green spaces’, ‘impact of COVID-19’, ‘mental health’ and ‘design-recommendations’. Ten publications have been identified which contained the listed key words (Table 1).

Table 1: An overview of the short-listed related publications

No.	Publications	Source/ Year/ Country	Research summary	Method Used	Output/Recommendations
1	The COVID-19 pandemic: Impacts on cities and major lessons for urban planning, design, and management <i>Ayyoob Sharifi, Amir Reza Khavarian-Garmsir</i>	Science of the Total Environment/2020/ Japan	Literature on the impacts of COVID-19 on cities is reviewed. <ul style="list-style-type: none"> Evidence related to four thematic areas is synthesized. Existing evidence is mainly related to air quality and environmental factors. Significant improvements in air and water quality have been observed. Poor, marginalized, and vulnerable groups are disproportionately affected by the impacts of COVID-19. 	Literature Review	<ul style="list-style-type: none"> Research on the impacts of COVID-19 on cities is mainly related to four major themes, namely, (1) environmental quality, (2) socioeconomic impacts, (3) management and governance, and (4) transportation and urban design. COVID-19 crisis entails an excellent opportunity for planners and policy makers to take transformative actions towards creating cities that are more just, resilient, and sustainable There is a lack of empirical evidence on the effects of the design of streets and open/public spaces on the COVID-19 spread. Cities need to allocate more to active transport mode and open/ public spaces. Redesigning streets to accommodate the needs of pedestrian and cyclists better Provide ample green open space in order to meet the outdoor exercise and recreation demands of citizens
2	Public green spaces and positive mental health –investigating the relationship between access, quantity and types of parks and mental wellbeing <i>Lisa Wood, Paula Hooper, Sarah Foster, Fiona Bull</i>	Health & Place/2017/ Australia	This study uses a validated measure of positive mental health and data from RESIDential Environments (RESIDE) Project to investigate the association between the presence, amount and attributes of public green space in new greenfield neighborhood developments and the mental health of local residents (n = 492). The study demonstrates that adequate provision of public green space in local neighborhoods	A self-report questionnaire Positive Mental Health was measured using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS)	<ul style="list-style-type: none"> The result indicates that quantity of park matters. Another issue of particular conjecture about parks and public open space is the extent to which the size of the public green spaces matters. Provide a range of green spaces and infrastructure through the installation of parks of different sizes and functions, as this contributes towards the greenness of a neighborhood and the mental wellbeing of residents. The provision of parks in local neighborhoods and within walking distance is important also for positive mental health. The number of parks near to participants homes, and the total spatial area of accessible parks matters. The association with positive mental health was found to traverse parks of varying sizes, ranging from larger regional and neighborhood parks through to small local parks,



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			and within walking distance is important for positive mental health.		
3	<p>Pandemic stricken cities on lockdown. Where are our planning and design professionals [now, then and into the future]?</p> <p><i>Zaheer Allam</i> <i>David S. Jones</i></p>	Land Use Policy/2020 / Australia	This paper is a call for action for international architectural and urban organizations to include pandemics and similar in their disaster management strategies	Opinion paper	<ul style="list-style-type: none"> • Consider avenues like Bio-risk management, as proposed in 2014 by the International Federation of Biosafety Association (IFBA). • A need to expand the understanding of SDG 11 as it pertains to Sustainable Communities to 'Make cities and human settlements [even more than existing aims to be] inclusive, safe, resilient and sustainable'. This is to enable resilience strategies to not only in respect to addressing climate change, but also in addressing pandemic preparedness and mitigation
4	<p>Post-Pandemic Cities - The Impact of COVID-19 on Cities and Urban Design</p> <p><i>Sara Eltarabily</i> <i>Dalia Elghezanwy</i></p>	Architecture Research/ 2020/ Egypt	Literary review to study the relationship between the impacts of the epidemic on the city and urban design, historically and currently	Literature Review	<ul style="list-style-type: none"> • A change in the city's shape to integrate between community health practices and social thinking into urban design. • Opening more larger public spaces which provide a greater opportunity to connect with nature and reduce the feeling of isolation. • Social behavior and citizen's awareness are considered an important factor in dealing with this pandemic. • Visual access to nature • Designers may need to create more spaces and practices for individual use in planning green areas such as expanding running tracks • Paying attention to small neighborhood parks, as one of the new solutions that allow individuals to enjoy public parks doing what are called social distance circles. • Having a connected system of green areas. This system is more useful than scattered parks, and it means to have a network of different scales and uses parks through which residents can move easier and connect to nature. • The idea of park connected network. • Promote the concept of walkability in each neighborhood, in which containing homes, jobs, facilities, stores, etc. • Neighborhoods are changed to be more walkable, and placed services and jobs in those communities; cities can be able to mitigate the intense congestion and crowding that you have in various systems such as public transit • Incorporating the walkability index in the urban environment • Achieve the principle of social distancing and allow wider spaces among users. • Barring cars from some streets and providing more spaces for pedestrians and cyclists which turn the city into green and low carbon. • Increased pedestrian spaces and active mobility. • Closed some roads to increase the area for pedestrians and cyclists. • The new standards of using sidewalks should be considered. • Social distancing while queuing that requires providing wider sidewalks and paths, and leaving a safe distance about 1.5 m. • Adding more space to accommodate the queue at the entrances to public facilities, providing fixed seats for the elderly, and distinguish the individual's point with a sign on the ground. • Redesigning according to human needs and to be designed as pandemic-resilient and flexible spaces • The improper formation of the types of trees used can lead to a group of diseases and plants on causing allergies. • Inclusion of new elements in the landscape, for



					<p>example; temporary hand washing stations which can become a public culture</p> <ul style="list-style-type: none"> • Reconsider the untapped places and build rooftops • Designers should go back to nature in redesigning homes, or by using biophilic design approach. The presence of natural elements may be a useful way to reduce isolation stress and other psychological effects. • Maintaining veranda as an outdoor space has many benefits, such as connecting with nature, urban, and green view, and to offer a social connection between neighbors. • A lack of interest in the good design of patios and the ventilation of residential buildings leads to the possibility of spreading respiratory diseases. • The design of the low-rise building with separated ground floor access with pedestrian way may reduce the contagion risk. • The concept of a functional city is the city that was planned to achieve the best conditions and capabilities for the urban life of its residents and create conditions to achieve an enjoyable life and make life smoother for the residents within it. It is a city that provides high-quality services to all people in poor or rich neighborhoods alike. • Modern technology contributes to providing services efficiently and easily. • Governments in some countries have resorted to managing the crisis situation and tracking injuries using modern technology and sensors to collect data, providing students with electronic classrooms, providing digital cultural services to citizens to reduce the effects of social isolation, ensuring that older persons over 70 years of age have access to support in shopping, pharmacy, and main needs.
5	<p>Coronavirus questions that will not go away: interrogating urban and socio-spatial implications of COVID-19 measures</p> <p><i>Ashraf M. Salama</i></p>	<p>Emerald Open Research 2020, 2:14/ UK</p>	<p>Instigate a discourse about the potential contribution of architecture and urban design and planning in generating knowledge that responds to pressing questions about future considerations of post pandemic architecture and urbanism.</p>	Opinion paper	<ul style="list-style-type: none"> • That the future of cities will involve a renewed focus on developing architectural and urban solutions that enable people to socialize without higher densities and 'sardines-like' packing. • Post pandemic place attachment conception would involve reweighing many of these qualities with more emphasis placed upon on qualities related to healthy, hygienic, sanitized, and healing environments • In such a quest, they attempt to demonstrate the role of architecture and urbanism in developing healthy and healing environments and how design can be informed to allow critical human/nature associations to prosper. Social distancing measures may encourage less association with people in urban settings and may give further rise to biophilic design trends. • Active engagement, which represents the direct experience a person has with a place and the people within it, would be limited or directed more towards passive engagement that involves meeting the need for encounter without becoming actively involved. This includes watching the passing scene rather than talking or doing • Post pandemic urban design would need to emphasize factors relevant to spatial proximity as it relates to health in order to limit the potential spread of viruses or reacting to people's awareness of it. • Therefore, the development of healthy environments must be central to architecture and urbanism in the future



6	<p>Accessibility and allocation of public parks and gardens in England and Wales: A COVID-19 social distancing perspective</p> <p><i>Shoari N, Ezzati M, Baumgartner J, Malacarne D, Fecht D</i></p>	PLoS ONE/2020/UK	<p>We quantified access to public parks and gardens in urban areas of England and Wales, and the potential for park crowdedness during periods of high use</p> <p>we describe the availability, accessibility, and provision of publicly owned parks and gardens in urban areas in England and Wales, and consider policy options for their allocation and use</p>	<p>Data from the Office for National Statistics and Ordnance Survey to quantify (i) the number of parks within 500 and 1,000 meters of urban postcodes</p>	<ul style="list-style-type: none"> • Cities aiming to facilitate social distancing while keeping public green spaces safe might require implementing measures such as dedicated park times for different age groups or entry allocation systems that, combined with smartphone apps or drones, can monitor and manage the total number of people using the park. • Dedicated park access times for different age groups or different activities could serve to both maintain social distancing and facilitate access for more vulnerable groups. Examples include specific times for families and the elderly and or walkers versus runners and cyclists. Alternatively, officials could manage utilization, either based on weekly data to inform the community so that they can better spread their visits over the park's opening times, or dynamically using smartphone or drone data to monitor crowdedness and communicate this information to residents. • Cities closed streets to vehicles to increase space for pedestrian and cyclists. Similarly, in the UK, some local authorities in London, Manchester, and Brighton are restricting driving on certain roads to separate walkers from runners and cyclists. • Coordinating such an initiative would allow for longer routes and safer activities, provide alternative spaces for different activities (e.g., adult cyclists versus playing/running children), and potentially reduce congestion in parks. Opening up school green land, private parkland and golf courses to the public can provide additional space for exercising while maintaining social distancing.
7	<p>Green space configuration and its impact on human behavior and URBAN environments</p> <p><i>Carla Fernanda Barbosa Teixeira</i></p>	Urban climate/2014-2015/Brazil	<p>This research provides the result of higher urban temperatures where green spaces give impact on human behavior.</p>	Literature Review	<ul style="list-style-type: none"> • The method was verified the green spaces and vegetation id contribute to lower surface temperatures in squares and it influenced the microclimate. • Landscape design should include the cognitive processes of environmental perception by pedestrians (which may involve local variables) and the urban elements that can modify human behavior to promote better interactions between vegetation and humans.
8	<p>The impact of greenery on physical activity and mental health of adolescent and adult residents of deprived neighborhoods: A longitudinal study</p> <p><i>Jessica S. Gubbels, Stef P.J. Kremers, Mriel Droomers, Cees Hoefnagels, Karien Stronks, Clemens Hosman, Sjerp de Vries</i></p>	Health and Place/2016/Netherlands	<p>This result shows some indications regarding positive effects of greenery on health and behavior in certain groups.</p>	<p>Measured physical activity by asking respondents to think about a regular week in the pastmonth</p>	<ul style="list-style-type: none"> • By increasing the greenery, it can give high effects on leisure time cycling by adolescents in general, leisure time walking by maleadolescents and older adults. • Specifically addressed the perceived improvement and use of greenery in the living environment, as these could possibly function as mediators between improvements in green-ery and physical activity behavior and mental health.
9	<p>The impact of COVID-19 on public spaces: an early review of the emerging questions- design, perceptions, and inequities</p>	Cities and Health / 2020 / UK	<p>This paper aims to examine the emerging questions at the intersections of COVID-19 and urban life, how the pandemic will alter how we perceive, use and design public space.</p>	Literature review	<ul style="list-style-type: none"> • Large public spaces have provided citizens with a space to organize, form groups, come together throughout human history. • Intentionally by placing benches, fountain, or other permanent infrastructure in large squares to avoid for gatherings even if is infrequent (for the urban needs).



	<p><i>Jordi Honey-Rosés, Isabelle Anguelovski, Vincent K. Chireh, Carolyn Dahere, Cecil Konijnendijk van den Bosch, Jill S. Litt Vrushti Mawani, Michael K. McCallh, Arturo Orellanai, Emilia Oscilowicza, Ulises Sánchez, Maged Senbela, Xueqi Tank, Erick Villagomez, Oscar Zapata I Mark J Nieuwenhuijsene</i></p>				<ul style="list-style-type: none"> • Public space is the key feature of a resilient city, in part because of their ability to be transformed for emergency health purposes. • Demonstrated the value of flex spaces. • Micro-mobility and mobility sharing were booming prior to be pandemic, and their widespread adoption was leading to major disputes over sidewalks, curbs, parks, and other urban places • Individual transport, these smaller devices might be welcome in the world of post-pandemic world and could benefit from street re-designs that allow for wider sidewalks or enlarged cycling lanes. • It will also be valuable to track where mobility conflicts increase or decrease because of the changes to street designs and mobility patterns. • Some residents also have managed to make greater use of community ground floors and playgrounds. • Fears of contagion in closed indoor spaces may increase demand for more exterior spaces and improved ventilation. • Closed roads to give more space to pedestrians and cyclists • Liberate more street space for pedestrians and cyclists, moving us closer to greener cities and a low carbon economy • Widening of sidewalks, 35km of new bike lanes, and the removal of lanes for vehicles • In efforts to direct physical distancing while queuing, sidewalks leading to shops have been marked with yellow circles a meter and a half apart. • Online shopping and home food delivery have taken off, creating a huge demand for drop off and delivery space. This increased demand for curb space may force us to revisit our ideas about curb side street parking, not only to meet new delivery needs, but also to free space for pedestrians. • Demand for smaller green spaces or neighbourhood parks which serve as places of refuge from the loud and bustling city. • Running trails and paths might be widened. • Need new or expanded exercise infrastructure given that existing green spaces may not be able to absorb the influx of people at the revised levels of appropriate density. • From a biodiversity perspective, continuous networks of green spaces with large parks as important hubs will still be more valuable than isolated patches (Forman 1995). • Community gardens represent another aspect of the urban green fabric and are particularly adaptable to health policies regarding physical distancing while allowing for meaningful social and emotional connection. (as open-air refuges for stress relief, recreation, cultural activities, and social connection).
10	<p>Recommendations for keeping park and green spaces accessible for mental and physical health during COVID-19 and other pandemics.</p> <p><i>Sandy J. Slater, MS; Richard W.</i></p>	<p>Public Health Research, practice, and study (Vol.17, E59) / 2020 /US</p>	<p>This paper proposes some short-term and long-term solutions that can provide access to green space, while allowing for physical distancing.</p>	<p>Literature review</p>	<ul style="list-style-type: none"> • Exposure to green spaces even in limited setting is benefit for health as that of visiting natural setting or large public park. • COVID-19 pandemic has highlighted these long-known deficiencies in walking, biking, and recreational infrastructure that contribute to health disparities. • Keep parks open. • This could include structured schedules, time slots, or sign-up sheets either in person or online



	<p><i>Christiana, Jeanette Gustat, MPH2</i></p>				<p>for smaller parks or monitoring by park staff in larger parks.</p> <ul style="list-style-type: none"> • During shelter-in-place orders, maintain transit routes to parks and green space. • To increase access to parks and green spaces, streets surrounding or connecting them could be designated as open or slow streets. • Adopt open street and slow street initiatives. • Create built environment for all. • Ensure that including green space is prioritized on streets in neighbourhoods that lack them. • Install protected bicycle lanes (i.e., provide physical barriers between cars and bicyclists) or pedestrian connections to local trails, paths, parks, and green spaces. • Increase parking for bicycles at parks and green spaces. • Plan for maintenance and regular improvements of green spaces and parks. • Consider where to locate park and green spaces. • Conduct ongoing monitoring and evaluation.
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As a summarization of the findings from the publications, a list of recommendations and suggestions concerning the design of parks and urban green spaces post-COVID-19 have been identified. The list served as a basis for the open-ended section of the questionnaire. The recommendations are:

- i- Create sanitization facilities
- ii- Bigger green spaces
- iii- Multipurpose spaces in the park
- iv- Flexible spaces
- v- Facilities catering for different age group
- vi- Increase monitoring in the park to maintain social distancing
- vii- Wider pedestrian walkway
- viii- Longer route for bicycle lanes
- ix- Create smaller pockets in the park
- x- Shorter distance to travel to urban green spaces



PART 3

THE RESEARCH PROCESS





PART 3- THE RESEARCH PROCESS

3.1 The Instrument

An online self-administered questionnaire (using Google Forms) was developed to be distributed to the general public. The survey was designed using a combination of open-ended and closed-ended questions. A link was provided with information on the researchers conducting the survey, the type of data that would be collected, how the data would be stored, analyzed, reported, and respondents' rights regarding the provided data. Participation was voluntary. The questions consisted of dichotomous scale, categorical scale, and a positive 10-point Likert scale format (response from 1- strongly disagree, 5- neutral and 10- strongly agree). The questionnaire was divided into four sections and contained 27 questions.

The survey consists of three parts, 1- The demographic profile, 2- the use of green spaces prior and during the pandemic, 3- Open-ended questions on the respondents' suggestions and preferences in the design improvements for urban green spaces post COVID-19. All the questions were derived to cover the parameters of the study which was the public's usage on urban green spaces prior and during the COVID-19.

3.2 The Sampling Size

The research obtained 415 respondents using the convenient sampling. The sample size is considered sufficient for a very large population size, assuming the 95% confidence level, 0.5 standard deviation, and a margin of error (confidence interval) of +/- 5% (Gill et al., 2010). The data collection began in May 2021 and ended in July 2021. Distribution of the online questionnaire initially started through the authors' network of professional and personal contacts, as well as through social media (Facebook, WhatsApp, etc.). Participants were asked to fill in the questionnaire and distribute further to their contacts. The distribution proceeded according to a snowball effect, and did not allow for personal information of individual respondents to be identified.



3.3 Analysis of Data

The datasets were analyzed by performing descriptive analysis and content analysis. The descriptive analysis employed was conducted using IBM SPSS Statistic V23 to extrapolate the demographic result, public usage patterns and public preferences for after pandemic urban green spaces' design using percentage and mean chart. Whereas for the open-ended question, respondents were invited to share their thoughts on the problems faced when using the park during the MCO period and what they would like to see improvements on. Meanwhile, the content analysis employed NUD-IST or Nvivo 10 Qualitative Package software to identify significant theme and findings from the open-ended questions, i.e., the public suggestion for post COVID-19 design improvements and their usage constraints during the COVID-19 at urban green spaces.





PART 4

THE FINDINGS





PART 4- THE FINDINGS

4.1 Demographics

4.1.1 Respondents' Age, Gender and Race

The final sample consisted of 415 responses distributed all over Malaysia. The highest number of respondents were from the age between 20 to 29 years old (49.6%), followed by respondents in age group of 40 to 49 years old (14.9%) and 13.5% with ages between 30 to 39 years old. The rest of the respondents were from the age group of below the 19 years old (10.8%), 50 to 59 years old (7.7%) and 60 years old and above (4.7%- **Figure 1**).

Majority of the respondents were female (62.9%- **Figure 2**).

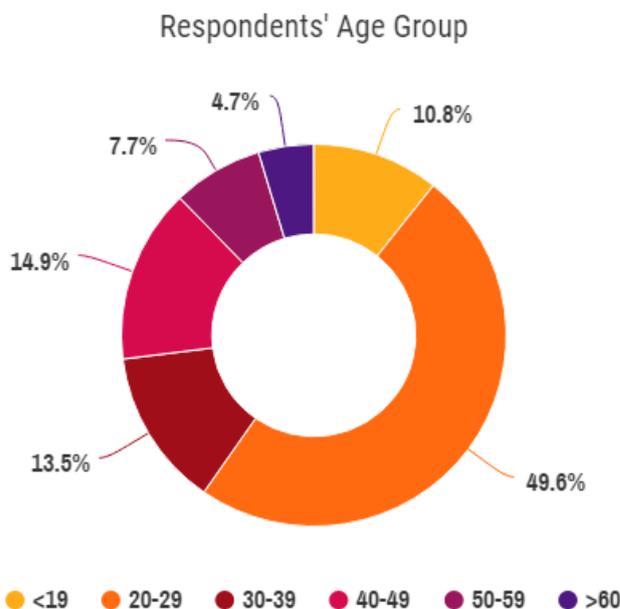


Figure 1: The respondents' age group involved in the study.

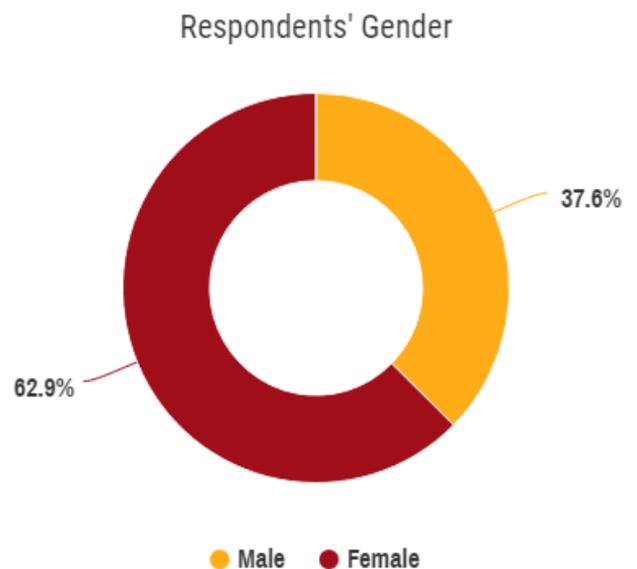


Figure 2: Respondents' gender



Based on **Figure 3**, the largest group of respondents' races were the Malay (61.9%), and followed by the Chinese (24.8%). Another minority group of races were the Indian (6.5%) and others (6.8%) which made up of Sabah and Sarawak native.

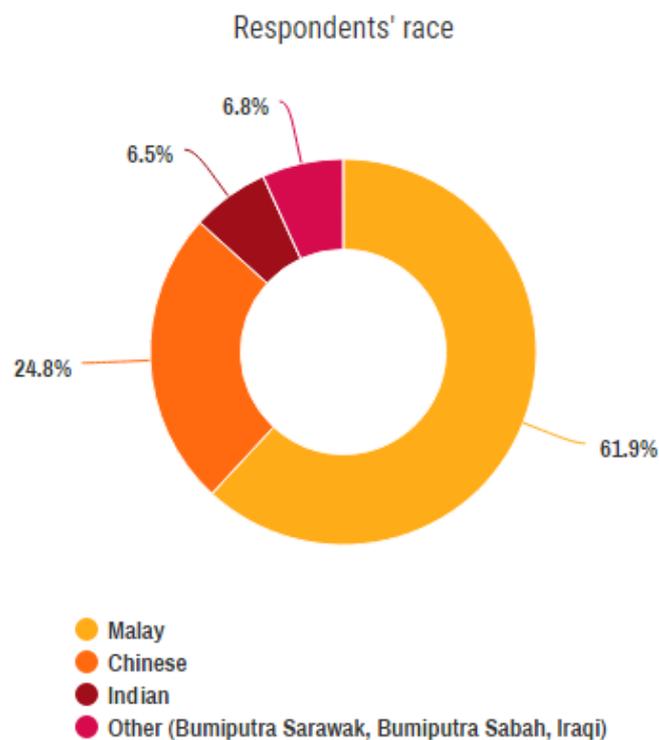


Figure 3: Respondents' race



4.2 State of Reside

Most respondents were from Selangor (28.2%), Kuala Lumpur (14.7%), Negeri Sembilan (13.5%) and Perak (13%). There were also respondents from Sarawak (7.2%), Putrajaya (5.1%), Johor (4.2%) and Kedah (4.6%). The remaining respondents were from Kelantan (2.4%), Penang (1.9%), Melaka (1.4%), Pahang and Terengganu each with 1.2% and Sabah and Perlis each 0.7% (**Figure 4**).

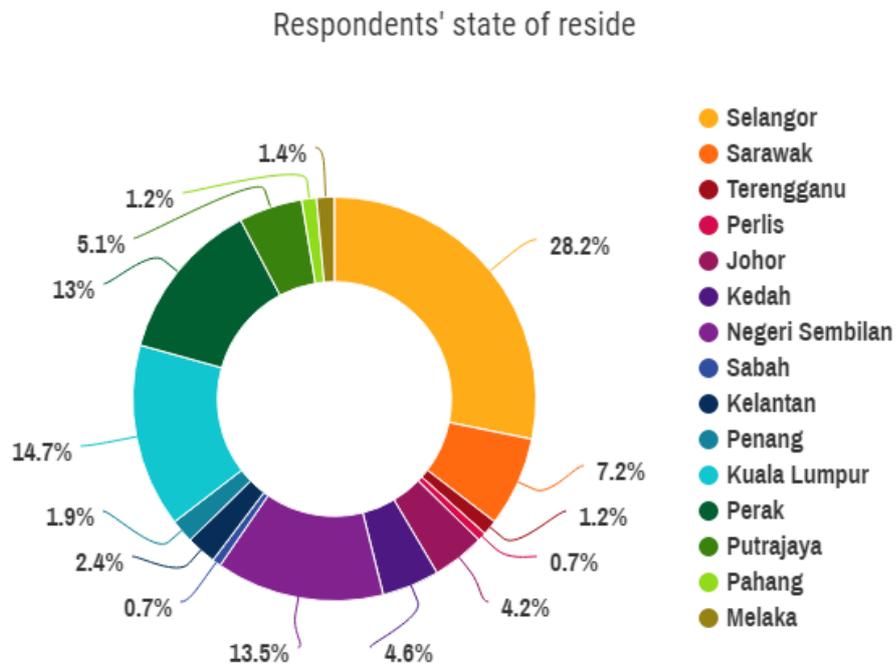


Figure 4: Respondents' state of resides



4.3 The Use of Parks and Green Spaces Prior/ During the COVID-19 Pandemic

4.3.1 The Distance of Respondents' Home to the Green Spaces

A total of 50.4% respondents stated that they live within 10 minutes of walking distance to their nearest urban green spaces (Figure 4). Whereas the remaining 49.6% respondents live outside the urban green space's proximity, which was further than one kilometer to their current living area (Figure 5).

The Distance of Respondents' Home to Green Spaces

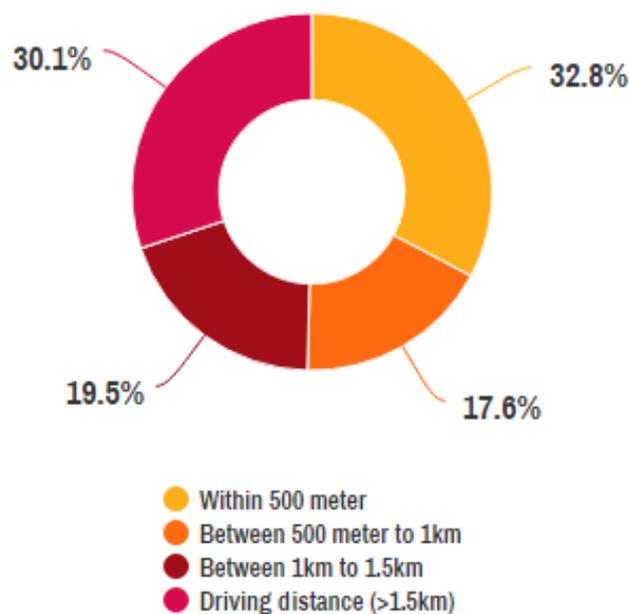


Figure 5: The distance from respondents' home to the nearest urban green space



4.3.2 Mode of Transportation

A majority of the respondents (49.7%) went to visit the urban green spaces by car. While the other 28.4% respondents walked, 11% use motorcycles and 9.5% cycled to visit the urban green spaces. However, only 1.4% respondents used the public transport to the urban green spaces (**Figure 6**).

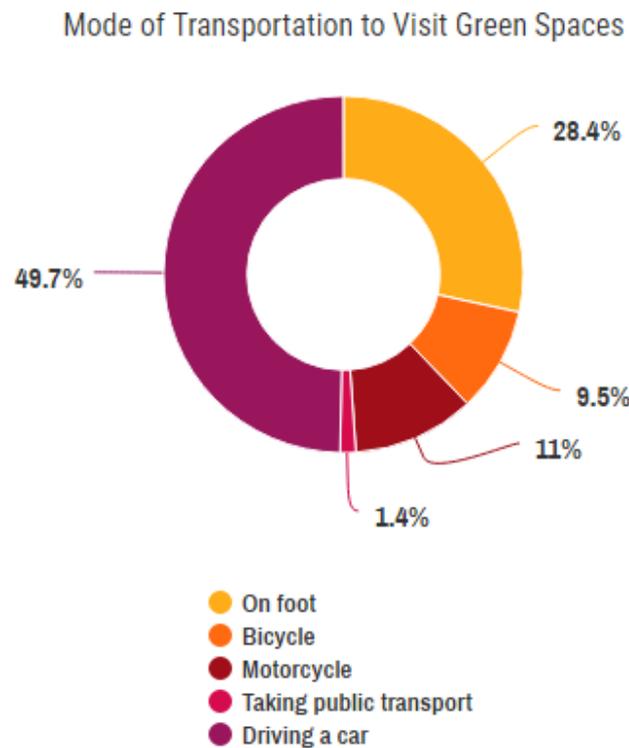


Figure 6: Transportation mode used by respondents to visit urban green spaces



4.4 Comparative Analysis on the Respondents' Usage of Parks and Urban Green Spaces

4.4.1 Frequency of Visit

The respondents' frequency of weekly visits has dropped drastically during the Covid-19 pandemic (**Figure 7**). The most glaring result of the findings was the high percentage of 54.9% of the respondents who did not visit the urban green spaces during the imposed COVID-19 movement control order.

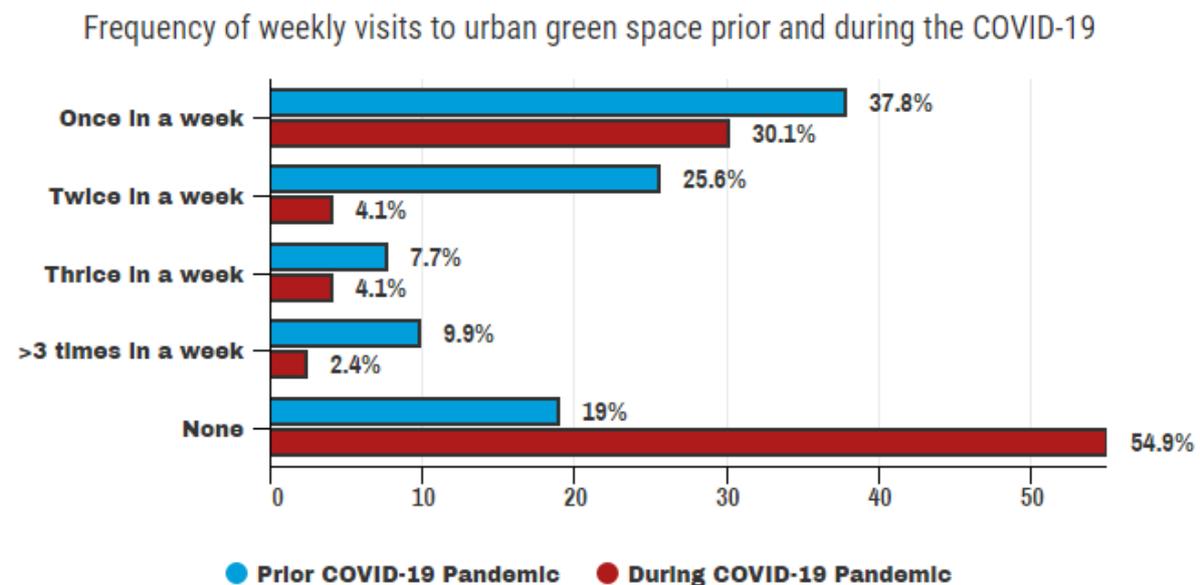


Figure 7: Frequency of weekly visits to urban green space pre and during the COVID-19



4.4.2 The Distance to Parks and Urban Green Spaces

From the results obtained on the distance of visited urban green spaces, it can be deduced that 6.5% respondents have diverted their visitation of urban green spaces to the nearest urban green spaces available to them during the COVID-19. There is also a huge increase in the number of respondents who did not visit the urban green spaces during the MCO by 22.9% (**Figure 8**). This may imply that the restriction enforced during the MCO has limited the accessibility of respondents who lives far away from urban green spaces from accessing the urban green space during the MCO.

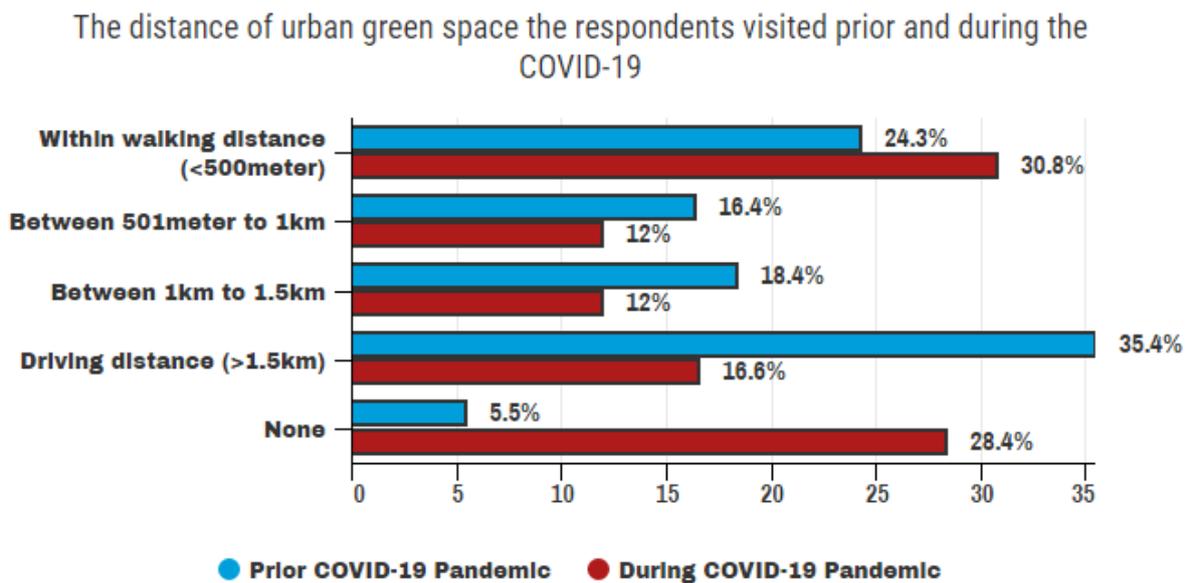


Figure 8: The distance of urban green space the respondents visited pre and during the COVID-19.



4.4.3 The Type of Visited Parks and Urban Green Spaces

The number of respondents who visited the urban green space during the MCO has dropped by 10.4%. Following a similar digressions trend were the green area outside the city (dropped by 6.9%), lake, river and wetlands (dropped by 7.6%), community garden (dropped by 4%) and playing field (dropped by 3.4%). Apparently, 28.5% respondents indicated that they used the green space within their living compound during the MCO. There was also a positive increment by 2.4% for the residential garden usage during the MCO (**Figure 9**). In addition, the figure also showed that 15.9% of the respondents did not visit any green space during the MCO.

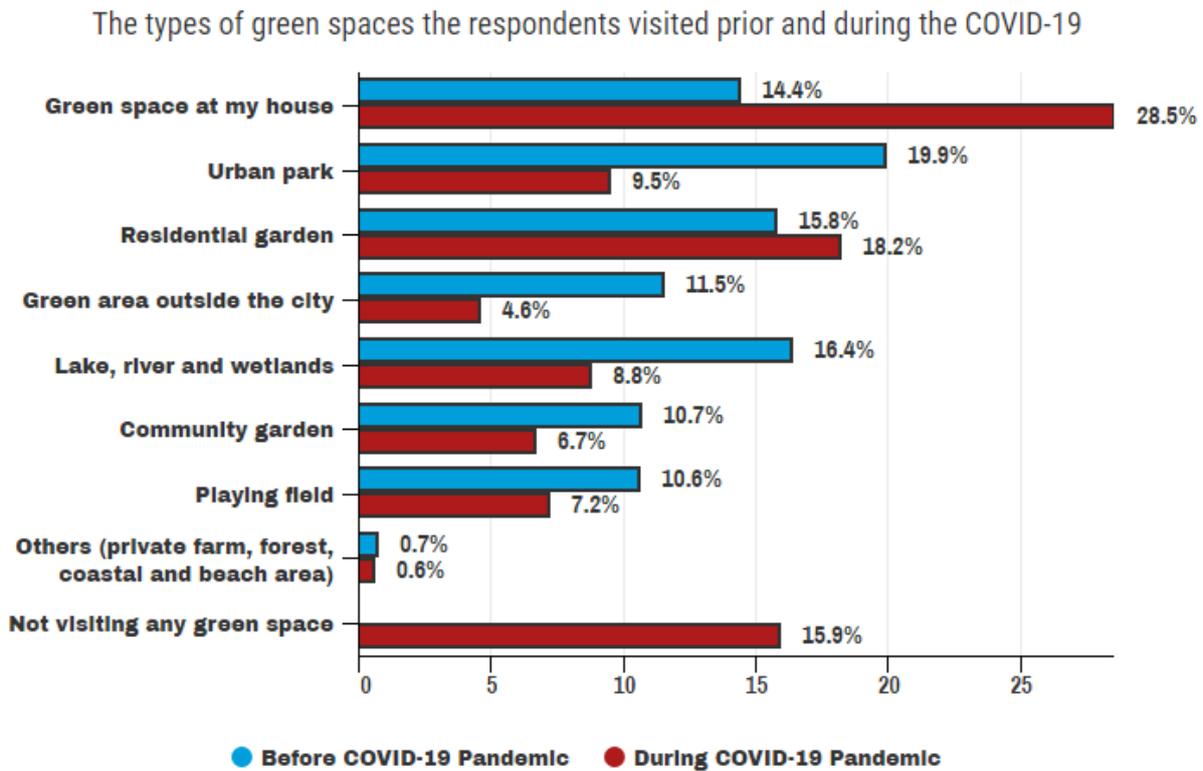


Figure 9: The types of green spaces the respondents visited prior and during the COVID-19.



4.4.4 Preferences in the Type of Visitations to Parks and Urban Green Spaces

The number of respondents who visited the parks and urban green spaces on their own increased by 12.3% during the COVID-19 lockdown (**Figure 10**). The number of respondents who didn't visit the urban green space during the COVID-19 also increased by 29%. In addition, the number of respondents who used to visits the urban green space in a pair or in groups has declined with 17.1% and 24.2% respectively. The results gave indication that the constraints from the limitation on the number of persons per private vehicle during the COVID-19 has also indirectly affected the chances of public to access the urban green spaces in groups.

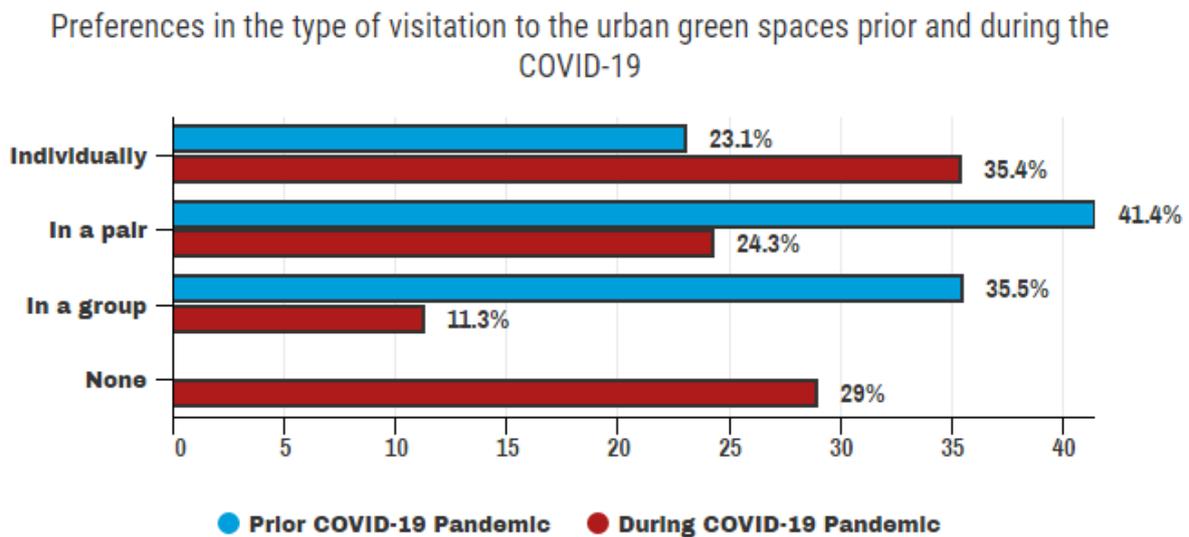


Figure 10: Preferences in the type of visitation to the urban green space prior and during the COVID-19.



4.4.5 Time Preferences

The numbers of respondents who visited the parks and urban green spaces in the daytime during the COVID-19 lockdown has declined as compared to before the lockdown. There was also a slight increase in the number for respondents who visited the urban green spaces in the evening even though the limitation for after-hours park usage was imposed during the lockdown. The numbers of respondents who didn't visit parks and the urban green spaces at all also increased by 26% during the COVID-19 lockdown (**Figure 11**).

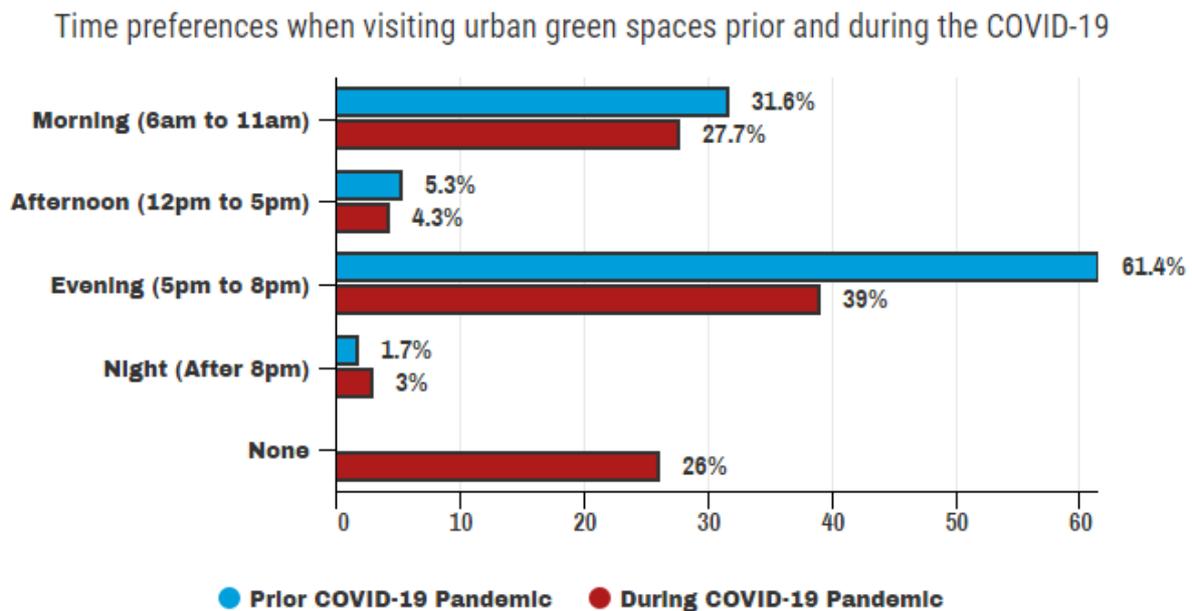


Figure 11: Time preferences when visiting urban green space prior and during the COVID-19.



4.4.6 Duration of Time Spent in Parks and Urban Green Spaces

Respondents spent shorter time in parks and urban green spaces during the COVID-19 lockdown. The result corresponds to the imposed limitation of time enforced by the local authority that restricted the usage. There was also a reported 26.3% of respondents who did not spend time at parks and urban green spaces during the COVID-19 lockdown (**Figure 12**).

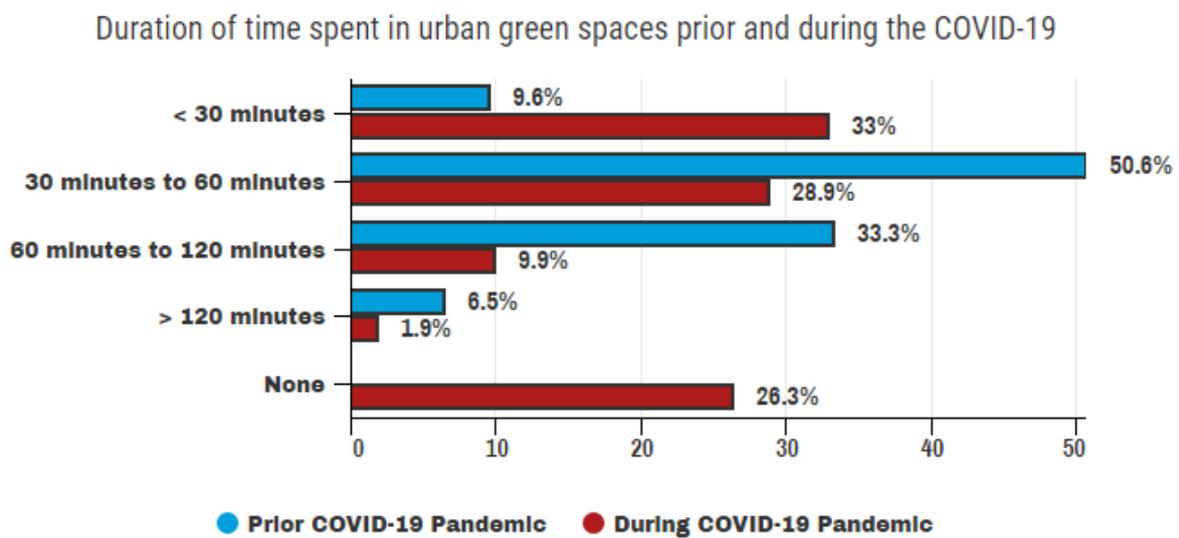


Figure 12: Duration of time spent in urban green space prior and during the COVID-19.



4.4.7 Activities Carried Out by Respondents

Majority of the activities carried out at parks and urban green spaces during the pandemic COVID-19 had shown a decreased with the most prominent are related to the activities that involved social engagement, i.e., meeting with people (a decline of 6%) and bringing kid for a stroll or to playground (a decline of 2.8%).

The activities carried out by respondents at urban green spaces prior and during the COVID-19

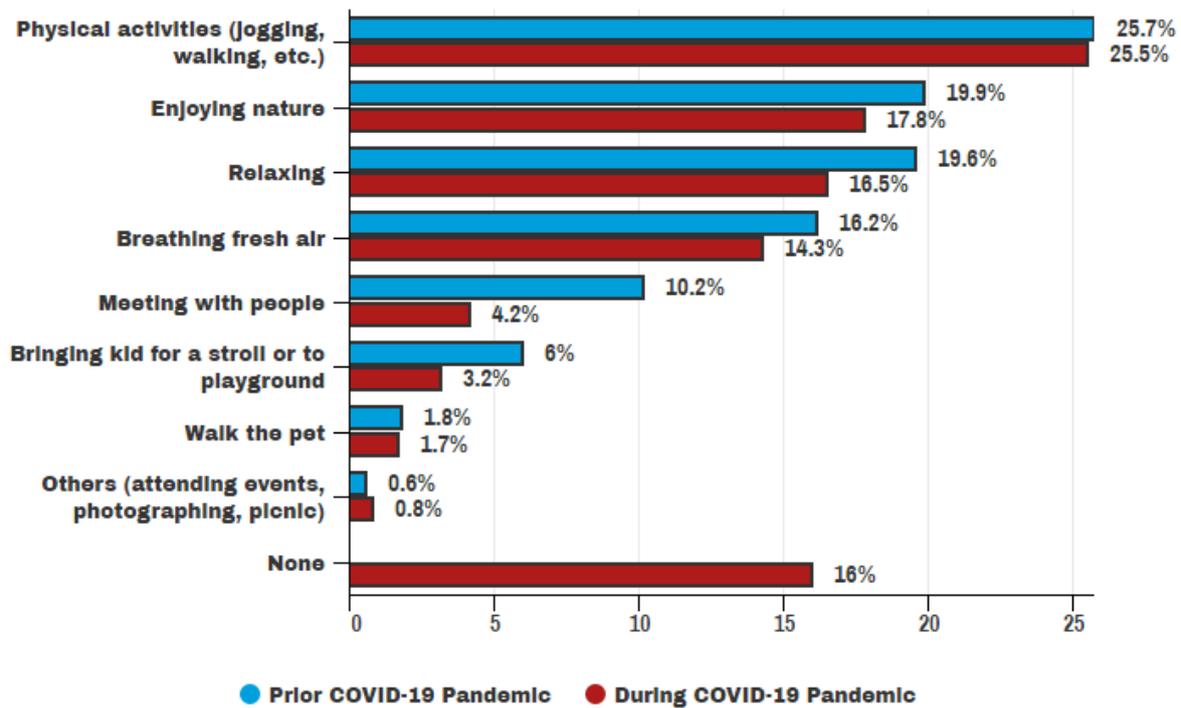


Figure 13: The activities carried out by respondents at urban green space prior and during the COVID-19.



4.5 Stress Level among Respondents when visiting Parks and Urban Green Spaces

The stress level of respondents was asked in order to compare the state of mental health prior and during the lockdown. The mean for respondents' stress level when visiting parks and urban green space prior and during the COVID-19 lockdown was using the Likert scale format (1-being the worst; 10- being the best). The result has shown that there was a slight decrement on the respondent's stress level when visiting the urban green spaces during the COVID-19 lockdown as compared to before the MCO was imposed.

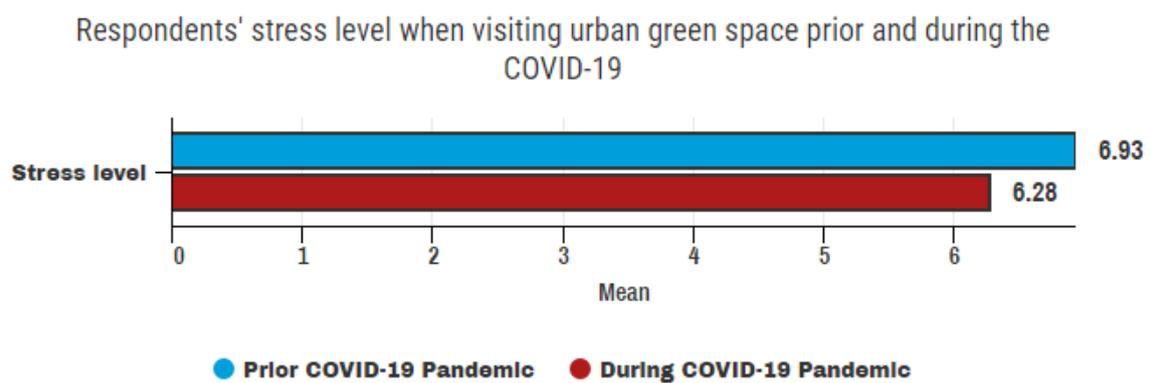
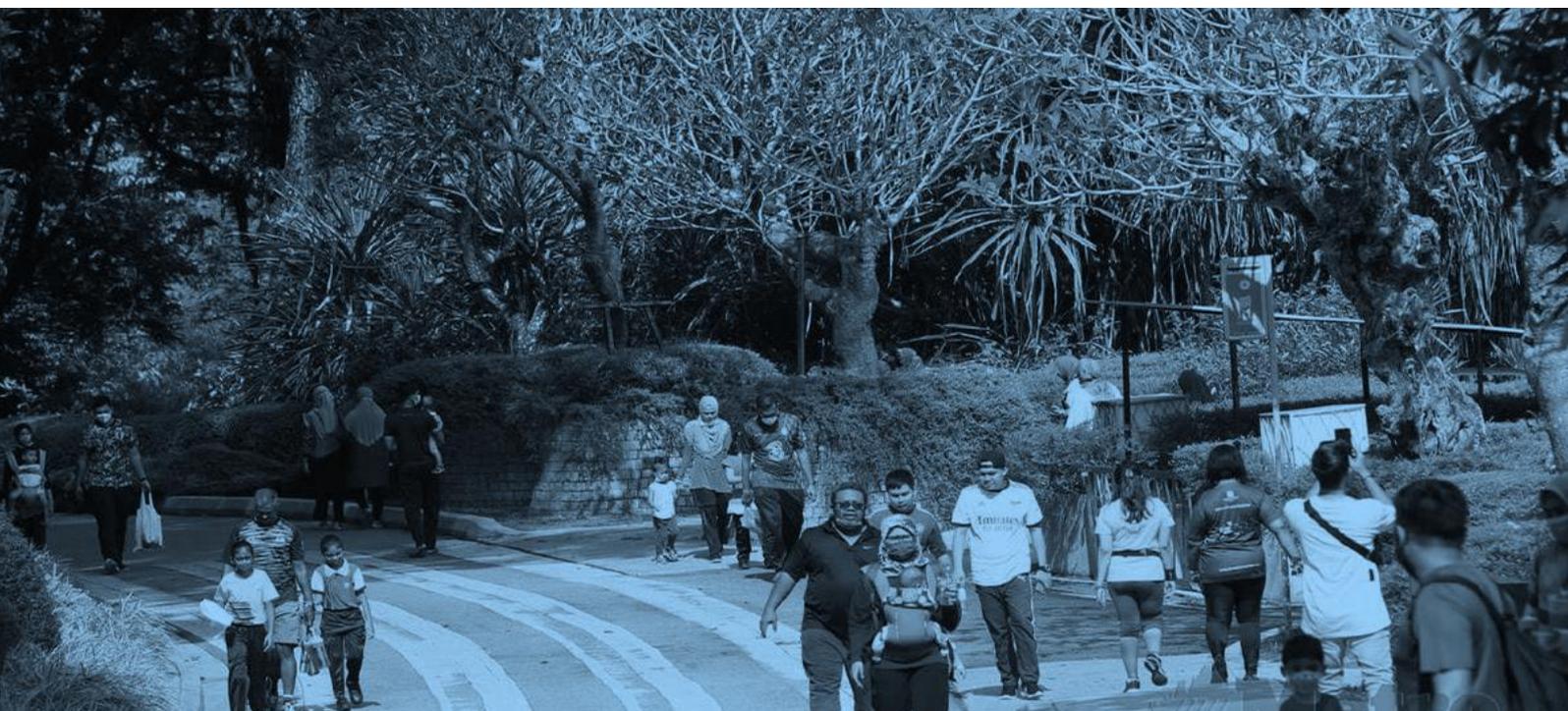


Figure 14: Respondents' stress level when visiting urban green space prior and during the COVID-19.





4.6 Restrictions and Constraints

The applied SOP due to the COVID-19 pandemic has definitely influenced how future parks and green spaces are to be designed in order to control the spread of the disease. Respondents involved in the survey expressed the need for design improvements in the parks. Four aspects of constraints were identified using the open-ended questions in the online survey.

1 Inconsistence and Confusing Standard Operating Procedure (SOP)

The first aspect highlighted by the respondents was the inconsistency and confusion from the imposed Standard Operating Procedure (SOP) enforced by the Malaysian government and local authorities regarding parks and green space usage. Unclear regulations have left many reducing their visitation to the parks.

2 Limitation of Access

The second aspect emphasized on the limited access of the facilities provided at the parks. Entrance limitations enforced by the local authorities, restricted recreation spaces, and partial activities allowed have reduced the interest for park visitation.

3 Safety, Well-being and Comfort

The respondents were concerned on their safety, well-being and comfort when visiting urban green spaces. Many were hesitant to do other activities like enjoying nature or breath fresh air due to the COVID-19. Respondents also mentioned of being uncomfortable with the presence of patrolling police and surveillance when enjoying their activities at the park. Crowded parks were also a concern among the users – seeing other park users not maintaining social distancing instilled worry and has also dampened the visit to parks.



4 Location and the Quality of the Facilities

The fourth aspect stated by respondents was in relation to the conditions in which the parks were located at and the quality of the facilities provided. The short distance between residential areas and the green spaces has been revealed to play an important factor in encouraging park usage among the public.

Added facilities which are fitting to the current situation of COVID-19 such as sanitization area, and multipurpose area are among the items mentioned under the section for park improvisation. Facilities for different groups of age were also mentioned in this section as some of the changes that users would like to see in post- COVID-19 urban green space design.





4.7 Preferences and Suggestions

4.7.1 Respondents' Preferences

The mean of ten items using Likert scale format (1-strongly disagree; 10 - strongly agree) is presented in **Figure 15**. The items were in regards to the preferences of design improvements for urban green spaces post COVID-19. Nine out of the ten items' mean score were greater than 5 (neutral), which indicate positive responses.

The five most preferred design improvements were: sanitization facilities (mean of 6.84), bigger urban green spaces (mean of 6.65), multipurpose and flexible spaces (mean of 6.55-6.57) as well as facilities for different ages group (mean of 6.54). Meanwhile, the less preferred item was smaller urban green space (mean of 3.72). This highlighted the need for a bigger, flexible and multipurpose spaces complete with sanitizing and universal-designed facilities that are more fitting with the current situation of COVID-19.

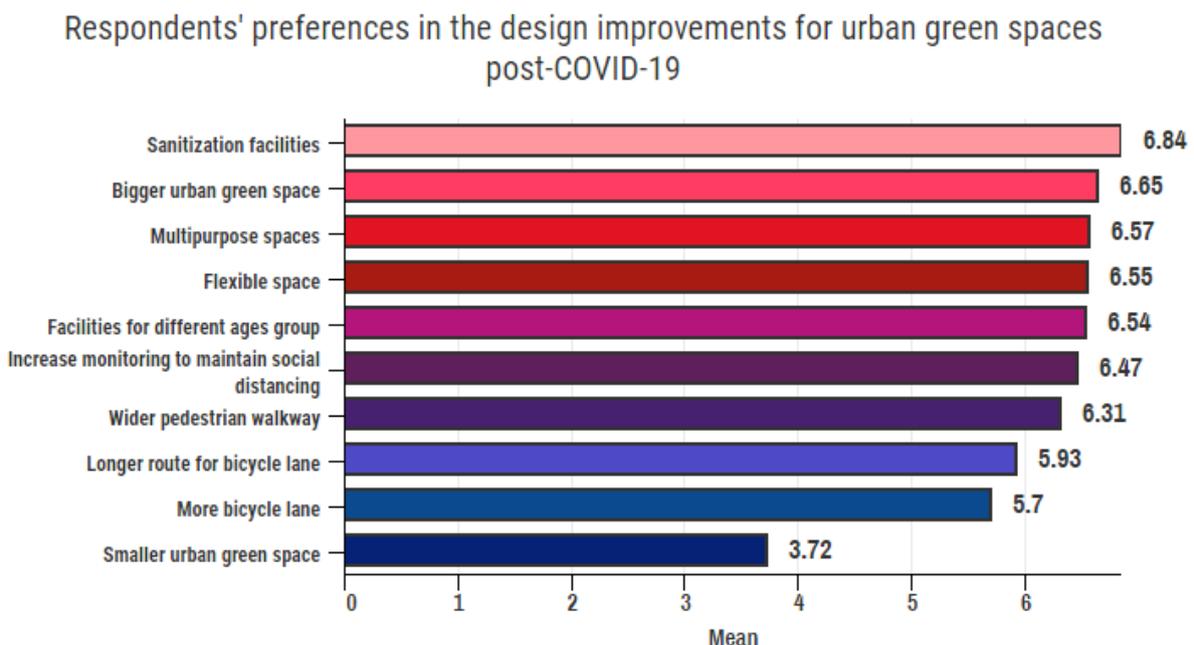


Figure 15: Respondents' stress level when visiting urban green space prior and during the COVID-19.



4.7.2 Respondents' Suggestions

The applied SOP due to the COVID-19 pandemic has definitely influenced how future parks and green spaces are to be designed in order to control the spread of the disease. Respondents involved in the survey expressed the need for design improvements in the parks.

The summarization of the suggestions raised by the 415 respondents can be summarized into six areas (**Figure 16**).

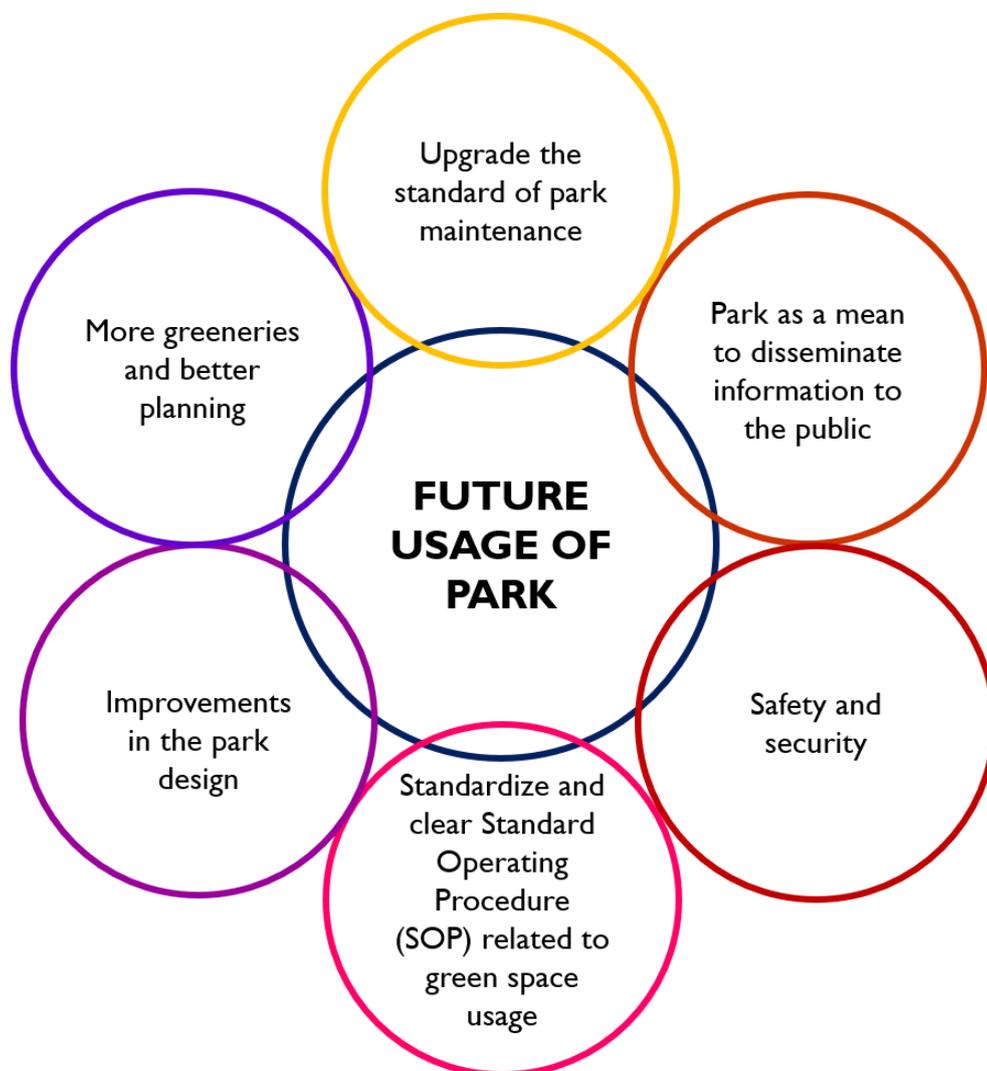


Figure 16: Summary of Respondents' suggestions for improvements in urban green spaces post COVID-19



4.8 Recommendations – Basic Requirements

Sanitization Facilities

The installation of sanitization center of facilities can create awareness and as a reminder for park users on the importance of maintaining cleanliness and keep practicing proper SOPs. These facilities can be installed at the park entrance, exit or at the focal point in the park where most social engagement and interaction happened, e.g., nearby the children’s playground, playfield, square, or pavilion.



Sanitization Tunnel



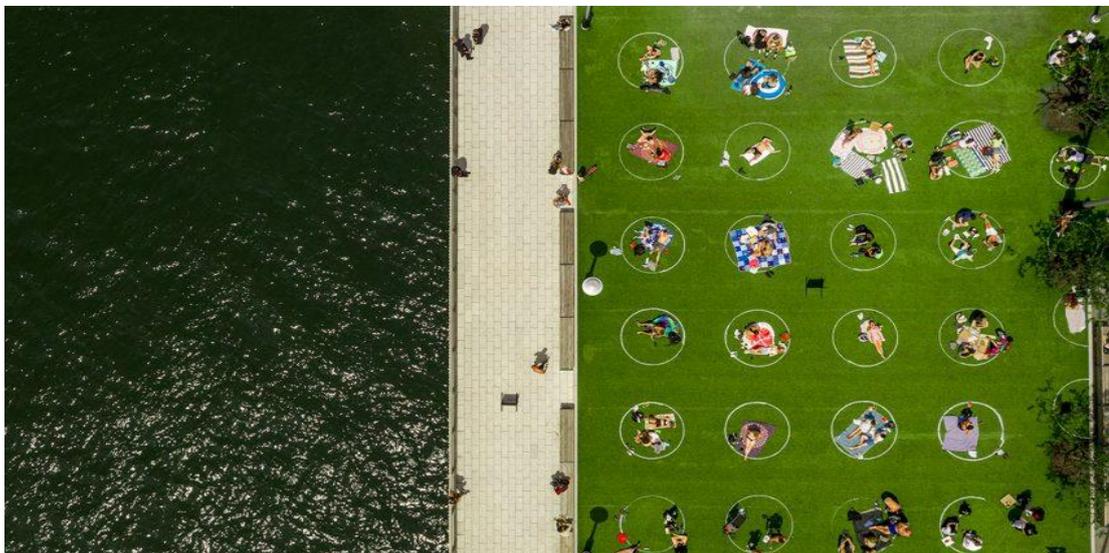
Portable sanitization station

Examples of sanitization facilities



2 Social Distancing Circles

Social Distancing Circles can encourage people to use parks post-COVID-19 in a safe manner. This approach is cheap, quick and environmental friendly as chalk paint can be used to paint the circles. It can be adopted by any parks or green spaces with spacious grass field, at squares or plazas. The suggested size for each circle is 2.4 meters in diameter (8 feet) and should be apart from another circle by 1.2 meter at minimum to accommodate the standard one-meter physical distancing (Cogley, 2020). The Social Distancing Circles can be used to fit groups, or for individual use for any leisure activities.



Aerial view of Social Distancing Circles applied by Domino Park, New York.



Untapped New York by Aaron Asis

Social Distancing Circles applied by Domino Park, New York
(Source: Global Parliament of Mayors)



3 COVID-19 Signage / Information Board

Installing health and safety related signages, creating announcement systems (e.g., weatherproof outdoor loudspeaker), and improved surveillance systems such as drones to monitor the activity and secure the surrounding around the park are essential. These facilities can provide an occasional reminder to every park user to maintain their activities in parks or green spaces according to the new norms as imposed by the local authorities.



Examples of COVID-19 signage used to remind the visitors at Disneyland.
(Source: *Orlandosentinel*)



4.9 Applications of the Results – Final year Landscape Architecture Project

Proposed Master Plan at Manjalara Park by Ng Poh Yee



Perspective of the Proposed Manjalara Park for Post-pandemic Park Design

Idea development

Goal

To integrate nature into the lifestyle of users by enhancing a connection with nature to accommodate the new norm.

Objectives

- To engage a new synergy and connectivity between the local neighborhood and green spaces in post-pandemic recovery period to improve health and wellbeing.
- To create safe spaces whilst being able to interact with one another at a recommended distance.
- To provide green spaces that can support users' mental and physical health

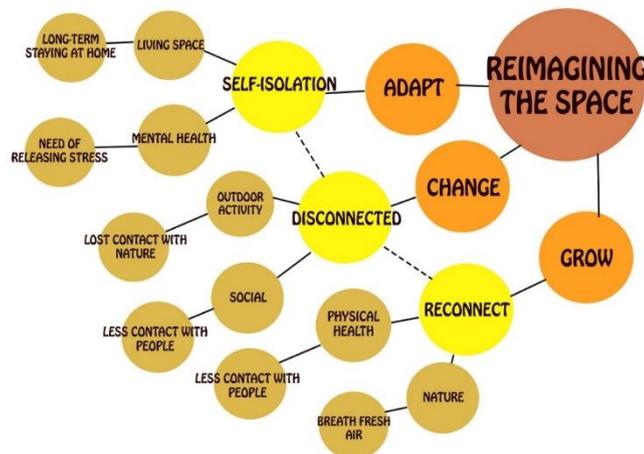


Design Strategy

- Large scale activities can be carried out in bigger urban green spaces without the concern on social distancing.
- Multipurpose and flexible spaces using different design elements as barriers between people.
- Increasing monitoring to maintain physical distancing.
- Installation of sanitization facilities (such as handwashing, sanitizer station and social distancing signages).

Design Concept

REIMAGINING THE SPACE - Pandemic is an unfortunate alliance that affects people globally. Thus, 'Reimagining the space' brings a new dimension to the park users by practicing the new norm and enjoying nature at the same time. Creating an environment that people can gather safely to reflect on the existing character of the surrounding neighborhood. People only need to 'ADAPT, CHANGE AND GROW' to rejuvenate the norm life.



Mind Map for the Concept 'Reimagining the Space'



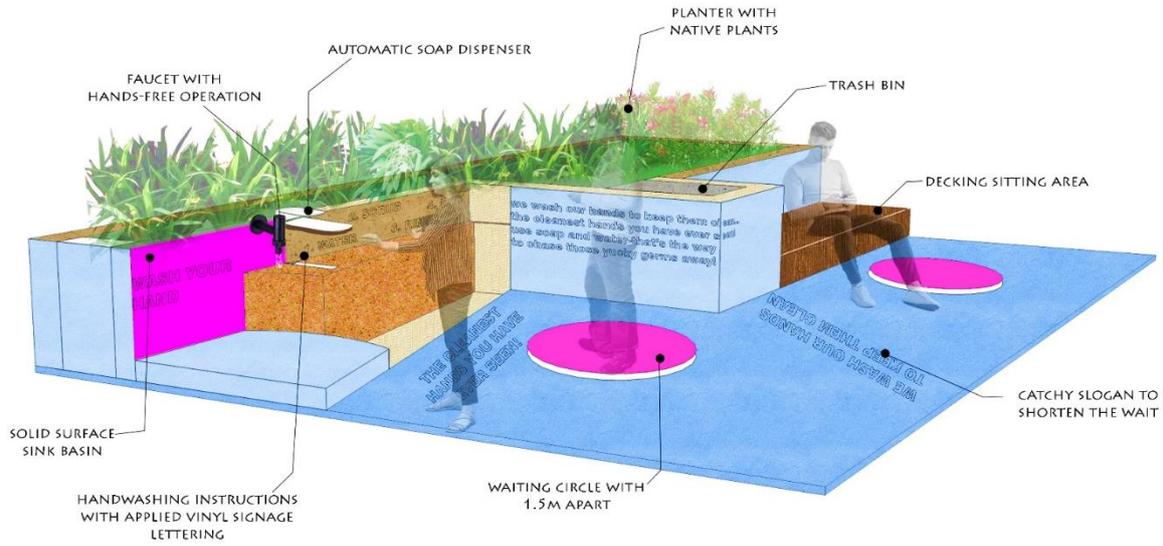
Diagram showing how different elements are needed to rejuvenate the post-pandemic life back to normal.



Proposed Master Plan for the Post-pandemic Park Design at Manjalara Park, Petaling Jaya (Source: Ng Poh Yee)

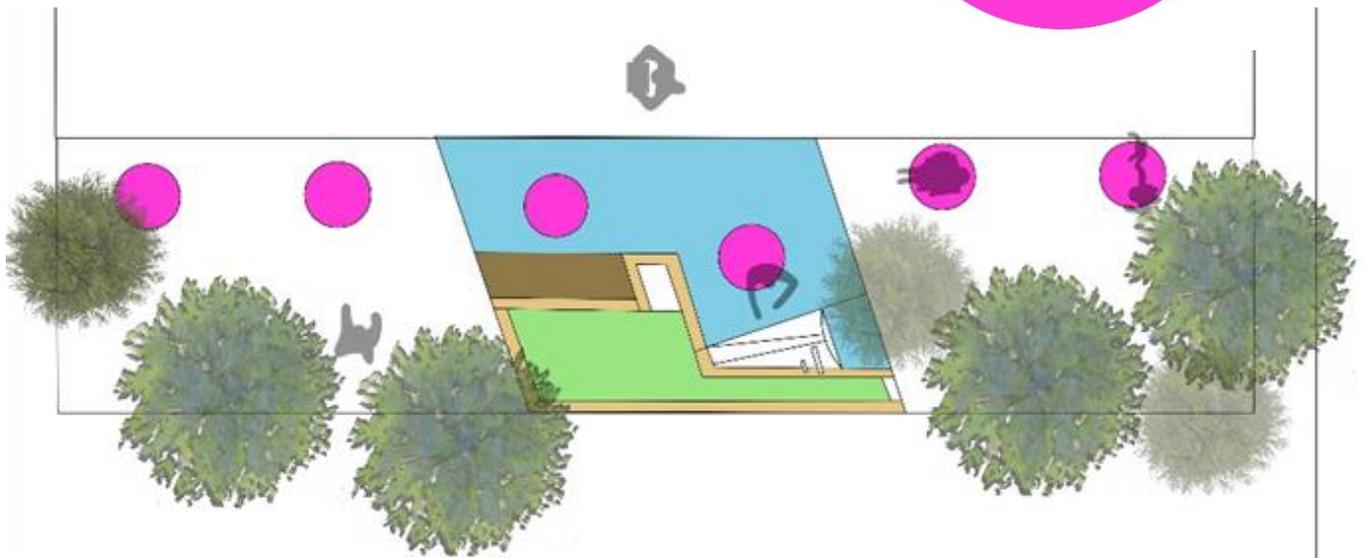


Detail Area for the Post-pandemic Park Design at Manjalara Park, Petaling Jaya (Source: Ng Poh Yee)

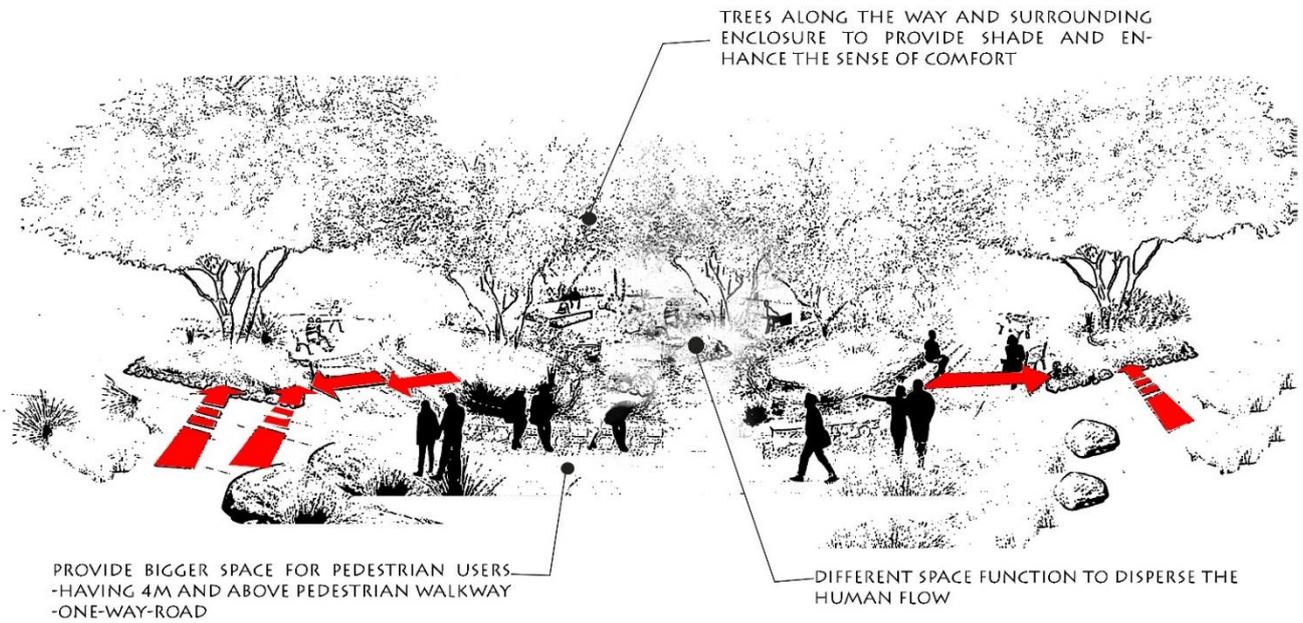


Sanitization facilities design (Source: Ng Poh Yee)

Physical distancing marker (Source: Ng Poh Yee)



Plan View of Sanitization Facility Area (Source: Ng Poh Yee)



Provide bigger urban spaces for activities (Source: Ng Poh Yee)



Wider pedestrian for walkway and bicycle lane (Source: Ng Poh Yee)



CONCLUSIONS

This study was motivated by research in other countries on the use of urban green spaces and the social isolation that was imposed during the COVID-19. A study by Ugolini et al. (2020) identified the changes in the behavior and attitude related to the visitation of urban green spaces in six European countries. In terms of travelling long distance to reach urban green spaces, the Europeans are willing to go within or beyond the city. As shown in the results of this study, Malaysians were willing to drive to urban green spaces beyond 1.5 kilometers prior to the pandemic but resorted to a walking-distance (less than 500 meter) to the green spaces during the pandemic. Ugolini et al. (2020) also stated that there may be an approach to create green spaces within the urban fabric. This is in line with the findings from this study where the respondents have given higher percentages of visiting green spaces within their living areas (example- own garden, residential garden). The provision of parks in local neighborhoods and within walking distance is important for positive mental health as mentioned by Wood, et al. (2017).

In terms of green space use, in Italy and Spain, the two largest countries studied in the survey by Ugolini et al. (2020) which were also the two hardest hit by the pandemic, nearly two-thirds of those who previously visited urban green spaces on a regular basis responded that they simply stopped going. In this study among Malaysians, a total of 54.9% respondents indicated that they have not visited any green spaces during the pandemic. While this can easily be attributed to the government restrictions on personal mobility during the period of containment, 28.5 % of respondents in Malaysia did continue making their way to urban green spaces as compared to the 36 % in Italy and Spain. This indicates that the need for greenery and open air certainly did not disappear with the legal restrictions to access to such place.

The suggestions by the respondents in this study that urban planning and design should consider a diverse mix including large parks, together with smaller pocket parks and gardens were in line with the suggestions from other related research (Ugolini et al., 2020; Honey-Roses et al., 2020; Freeman and Eykelbosh, 2020; Eltarabily & Elghezanwy, 2020 and Wood et al, 2017).

Community gardens also provide an alternative to public parks, and may develop rules on safe distancing (Honey-Roses et al., (2020) and from this study an estimated 11% of Malaysians have indicated that they visited community garden during the pandemic as compared to 6.7% prior to the lockdown.



Large public gathering areas were mentioned as one of the solutions for post pandemic urban green space design (Honey-Roses et al., 2020; Freeman & Eykelbosh, 2020; Shoari et al., 2020 and Wood et al., 2017). In the open-ended answers, there was 20-hits on the suggestions of having bigger urban green space in order to increase comfort during the MCO.

Having flexible spaces and area to cater for different type of users have been mentioned in the suggestions given by the respondents. These suggestions bear similarities with other research findings (Honey-Roses et al., 2020; Freeman & Eykelbosh; 2020; Shoari et al., 2020 and Wood et al., 2017). Public spaces served a variety of purposes for different demographics and are particularly important for socially vulnerable residents. Dedicated park-access time for different age groups or different activities could serve both in maintaining social distancing and facilitate access for more vulnerable groups (Freeman & Eykelbosh, 2020). Public spaces are often the only recreational outdoor spaces for low-income residents and can provide relief from cramped living conditions (Honey-Roses et al., 2020). Additionally, it was also suggested for a range of green spaces and infrastructure to be provided through the installation of parks of different sizes and functions, as this contributes towards the greenness of a neighbourhood and the mental wellbeing of residents.

Inclusion of new elements in the landscape, for example; temporary hand washing stations which can become a public culture were mentioned in the suggestion section by the respondents. A study by Eltarabily & Elghezanwy (2020) suggested similar facility in green spaces in order to increase comfort and usage among green space users.

The suggestions to keep parks open and plan for maintenance and regular improvements of green spaces and parks were among the improvements highlighted by the respondents. Similar suggestions by Slater et al. (2020) were also put forth in their study. The respondents in this study also mentioned the inconsistency and confusion from the imposed SOP enforced by the government and local authorities regarding parks and green space usage. The unclear regulations have left many to reduce their visitation to the parks.



CLOSING

Urban green spaces will remain a valued place for health, socialization, community building, and identity formation in a post-COVID-19 world. Given the transformation we are witnessing, in the ensuing months it will be critical to measure the changes in use and perceptions of public spaces in order to inform urban planning and design. The findings from this study have shown many similarities with other parts of the world. The use of green spaces has been drastically changed in the pattern and preferences among the users. Improvements in terms of the facilities and accessibility to accommodate the social distancing can be seen as an important aspect to be taken into considerations among designers and local authorities alike.





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Report
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Report prepared by:

Assoc. Prof. Dr. Shureen Faris Abd. Shukor
Department of Landscape Architecture
Faculty of Design and Architecture
Universiti Putra Malaysia, 43400 Serdang
Selangor

Tel: +6014-6463 760 / +603-9769 4092
Email: shureen@upm.edu.my