



TRANSFORMATIVE IMPACT OF COVID 19 PANDEMIC ON THE URBAN PUBLIC SPACES

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Abstract

Urban areas attract population influx due to central economic, social, and technological growth. However, living in the city comes with an undesirable cost due to the scarcity of land area. People are forced to live in smaller housing without personal open space and lawns. Future urban population will opt for small living spaces and indirectly increase the need for public open spaces. Unfortunately, the Covid 19 pandemic outbreaks in 2020 have forced the urban community to be confined to their own home later negatively impacting the urban population's physical and mental health. This research aims to identify the possible long-term transformative impact of the covid 19 pandemic from the space and user context. Two types of approaches were adopted by the research, the Systematic Literature Review using the PRISMA method, and the questionnaire survey analysed using SPSS. The findings from SLR are coded and categorised into three themes: transformative impact on user behaviour and perception, the planning and design of space, and the Social-Political impact. Next, the survey was developed based on the themes of transformative impact. One of the most important conclusions is that the urban public space provision and accessibility vary according to the socioeconomic background of the community. By understanding the possible transformative impact of pandemics on urban public space, better policy and guidelines for planning and managing the public space can be made where the urban public space can be fully utilised, functional safely and conveniently and accessible for all in the post-pandemic era.

Keywords: Post-pandemic planning, Covid 19 Pandemic, public space, urban public space, planning policy, post-pandemic city, urban solution, urban quality

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INTRODUCTION

Historically, humans construct cities and metropolitan areas for social connection, economic gain, and interpersonal imperatives (Allam & Jones, 2021). Cities are the epicenters of technical and economic development worldwide (Afrin et al., 2021). Most of the world's population currently lives in cities, contributing to more than 80% of global GDP (Sharifi, 2019). In comparison to rural areas, the urban area is fast developing, and it now houses more than half of the existing world population (UNDP, 2016). Nowadays, more individuals want to live in the city because of a better chance to gain socioeconomic opportunities, such as job openings and high-quality infrastructure.

According to the UN, more than 70% of the world's population will live in cities by 2050. However, many aspects must be considered and tolerated to live in the city. Some things need to be sacrificed in some cases, such as owning a landed property with a private open space or houses with more than three bedrooms. Housing quality in highly urbanised areas has been associated with morbidities such as infectious diseases and injuries related to building conditions and cleanliness. In recent years, the morbidity factor in urban housing shows more mental health issues due to the size of housing space and lack of social facilities (Krieger & Higgins, 2002). Before the pandemic, small living space or "micro-apartment" was not a critical problem for city dwellers as the community coped with a more significant problem: affordable housing. The younger generation and poor people can tolerate the small living space. They have to accept this lifestyle to secure minimal living conditions with the appropriate sense of safety within a limited budget (Hernández, 2016). They could satisfy their social needs by accessing urban public spaces such as urban parks or public gardens, but this situation has changed after a pandemic outbreak struck the global population in early 2020.

COVID-19 stunned cities around the world, exposing the vulnerability of urban lives and functions (Mishra et al., 2020; Yang & Lo, 2021). Most cities were subjected to a catastrophic disruption that persisted for an extended period (Lak et al., 2020; Santos Vieira de Jesus et al., 2020; Sharifi & Khavarian-Garmsir, 2020). Cities are to blame for the greater pandemic transmission rate because of fast urbanisation, dense city spaces, massive population growth, and high levels of transportation usage (Sharifi & Khavarian-Garmsir, 2020). Physical distancing and restrictions on the use of public space have been significant policy measures in limiting COVID-19 transmission and protecting public health (Geary et al., 2021; Geng et al., 2021; Honey-Rosés et al., 2020; Olszewska-Guizzo et al., 2021). During the peak of Covid 19 infections, the world's population was instructed to stay at home and avoid many public locations (Honey-Rosés et al., 2020). The depth and breadth of risk-reduction measures implemented by the authority to contain the infection are unknown, particularly those relating to the future design, usage, and perceptions of public

space (Afrin et al., 2021; Bereitschaft & Scheller, 2020; Herman & Drozda, 2021; Nundy et al., 2021; Salama, 2020).

Assessing the impact of Covid 19 from the perspective of the built environment helps to reduce the disparity that still exists in urban areas, particularly in terms of socioeconomic position and access to green spaces. As a result, this research has led to the question, "What are the built environment aspects that need to be transformed as a result of the Covid 19 pandemic in order to improve the accessibility of urban public spaces to diverse socioeconomic classes?" The purpose of this study is to identify the potential long-term disruptive impact of the covid 19 pandemic in terms of space and user context. In this paper, we focus on assessing covid 19 impact on urban public space by comparing data from two sources. The macro-level sources are the collection of findings from different countries, while the micro-level sources are from the questionnaire survey of local urbanites in Kerinchi, Kuala Lumpur. The findings are expected to help researchers develop pandemic-resilient urban strategies (response, mitigation, and preparedness phase) by analysing published literature and local community feedback.

LITERATURE REVIEW

Before the pandemic hit in 2020, there were already arising concerns among health practitioners, academicians, and decision-makers on non-communicable diseases due to physical inactivity among urban populations (Barbarossa, 2020; Hernández, 2016; Krieger & Higgins, 2002; Kyriazis et al., 2020; Labib et al., 2021; López-Bueno et al., 2020; Parlapani et al., 2020; Schwendinger & Pocecco, 2020). Various research has shown strong evidence on the relationship between physical inactivity with comorbidity diseases such as obesity and cardiovascular health (Gichu et al., 2018; Gomes et al., 2017; Schwendinger & Pocecco, 2020; Tcymbal et al., 2020; Yuan et al., 2021). During the Covid 19 pandemic, many countries imposed movement restrictions order to mitigate the spread of Covid 19. The moves, however, have indirectly contributed to a remarkable decrease in physical activity among urban dwellers, resulting in the increasing non-communicable disease rate (Labib et al., 2021; López-Bueno et al., 2020; Schwendinger & Pocecco, 2020). Covid 19's preventive measures have also been shown to contribute to the rising number of incidences of mental health disorders. The world now sees how being imprisoned in one's home with no access to open space has harmed people's mental health (Li et al., 2020; Olszewska-Guizzo et al., 2021). Without question, Covid 19 has negatively impacted mental health, social wellbeing, and economic prosperity (Afrin et al., 2021). Many countries are presently witnessing a rapid decline in population mental health. Those who survive the infections are more likely to develop mental health problems (López-Bueno et al., 2020). The disconnect between people and natural space has resulted in several mental breakdowns, particularly in densely populated areas and low-

income communities (Geary et al., 2021). Loss of income due to confinement and inability to leave the house has increased suicide and domestic violence incidents (Ghosh et al., 2020; Labib et al., 2021; Nundy et al., 2021). Covid 19 exposes the open truth of socioeconomic disparity among urbanites, in which the low-income class has little to no access to green space (Barbarossa, 2020; Gupte & Mitlin, 2021; Nundy et al., 2021). The community's easy access to green space areas led to a high-quality living lifestyle. (Geary et al., 2021) stated that communities that live near high-quality urban green space and blue outdoor spaces have favourable health outcomes and lower health inequality due to low income.

These findings conclude that communicable/non-communicable diseases and population living quality have an essential urban character. (Afrin et al., 2021; Mishra et al., 2020; Sharifi & Khavarian-Garmsir, 2020; UN-Habitat, 2021). Recently, UN-Habitat emphasised infectious disease's urban-centric nature. In 210 nations, the pandemic has hit over 1430 cities, with metropolitan areas accounting for well over 95 per cent of all cases (UN-Habitat, 2021). The scientific community has been examining the virus, its socio-environmental implications, regulatory/adaptation policies, and plans from the beginning of the COVID-19 crisis. However, most of this research has concentrated on the virus's detection, treatment, and cure rather than the aetiology, causes, and long-term impact on society (Afrin et al., 2021). The study of the pandemic from the standpoint of the built environment aids in determining the unsolved aspects of it. The appearance of COVID-19 has refocused attention on the vulnerability of cities to pandemics.

Urban planning plays a critical role in responding efficiently to this crisis and enabling rapid functional recovery in the post-disaster era (Afrin et al., 2021). Because the Covid 19 virus has the ability to spread from one individual to another, infection rates and patterns vary depending on the spatial location. A certain level of health safety must be maintained, and a new spatial design must be implemented. The steps include rethinking unsustainable urban patterns, risks, and socioeconomic disparities in order to be ready for emergent cases or developing pandemic-resilient city planning and management. This can be accomplished by examining the effects of various disasters in urban settings and the appropriate planning, adaptation, and design for greater resilience (Afrin et al., 2021; Sharifi, 2019; Sharifi & Khavarian-Garmsir, 2020).

METHODOLOGY

Two stages of research approaches are adopted to achieve the research aim, which is to identify the possible long-term transformative impact of the covid 19 pandemic from the space and user context. The first stage focused on the qualitative method. The PRISMA method was adopted to examine the result and findings from previous related research from 2020 to 2021. The data from this analysis are later coded and categorised into different themes. These identified

themes of transformative impact were used to formulate a questionnaire survey for the second stage. The second stage utilised the quantitative method, where data was collected on-site to get first-hand information on the user's perception.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method collected secondary data by narrowing the literature search based on the research purpose and scope. The PRISMA model is selected for this study because it is proven to be an evidence-based method that extracts relevant data sources for analysis purposes. Before beginning with the identification and screening process, eligibility and exclusion criteria related to the impact of Covid 19 on urban public space were established. These criteria include the type of data documentation, the data collection and publication date, the stage of data publication, and the language used to represent the data. The timeline of the data is from 2020 to 2021. Although the period is short, the Covid 19 pandemic is a relatively recent occurrence at the end of 2019. World Health Organisation only declared Covid 19 as a pandemic in early 2020. Despite the difficulties for researchers in collecting tremendous data, many researchers from different countries have come out with reliable data findings based on their local context. Therefore, this research was conducted based on the published data in Journal Articles, books, Chapters in books, and Conference Proceedings. Table 1 shows the summary of the inclusion and exclusion criteria.

Table 1: The inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Timeline	2020-2021	2019 and before
Document type	The article, Chapter Book, Book Chapter, Conference Paper, Review	Erratum, Book, Conference Review, Editorial, Proceeding Paper, Book Review, Early Access, Review, Discussion, Meeting Abstract, Note, Art Exhibit Review, News Item, Correction, Correction Addition, Data Paper, Item about an Individual, Letter and Retraction
Source type	Journal, Book, Conference and Conference Proceeding	Book Series, Trade Journal
Publication stage	Final	Article in press, Varying levels of completeness, Incomplete, Accepted Manuscripts
Language	English	Non-English
Access type	Open Access	Other

Source: Author (2022)

The second part of this research involves questionnaire survey. From May 2021 to September 2021, online surveys were disseminated to get user input on how the Covid 19 epidemic has influenced their relationship with the natural environment in the context of an urban park. The quantitative method was used

at this stage to obtain first-hand information on the user's perception. The respondents' participation was optional, and they were fully informed about the research's aim, process, and procedure and their right to withdraw from participating in the questionnaire survey at any time. The questionnaire was divided into three portions, each containing 25 questions. The random sampling technique was employed to collect responses from people of diverse socioeconomic backgrounds near Bukit Kerinchi Forest Park in Kerinchi, Kuala Lumpur. Data cleaning and validation have been conducted to validate the sample size of 215 respondents with a 90% confidence level.

FINDINGS

The data mining procedure began in October 2021 with the identification of significant keywords relevant to the research purpose. The data was gathered from a few scientific journal databases, Scopus, Web of Science, Google Scholar, and public reports from reputable government bodies. These sources yielded a total of 93 documents. The second stage was screening, in which seven items were eliminated based on defined eligibility and exclusion criteria. 86 full-text publications were evaluated during the eligibility stage. Following a thorough review, a total of 16 full publications were removed due to their lack of relevance to the research's purpose. The final round of the evaluation yielded a total of 45 articles for the qualitative analysis. Figure 1 shows the summary of PRISMA process.

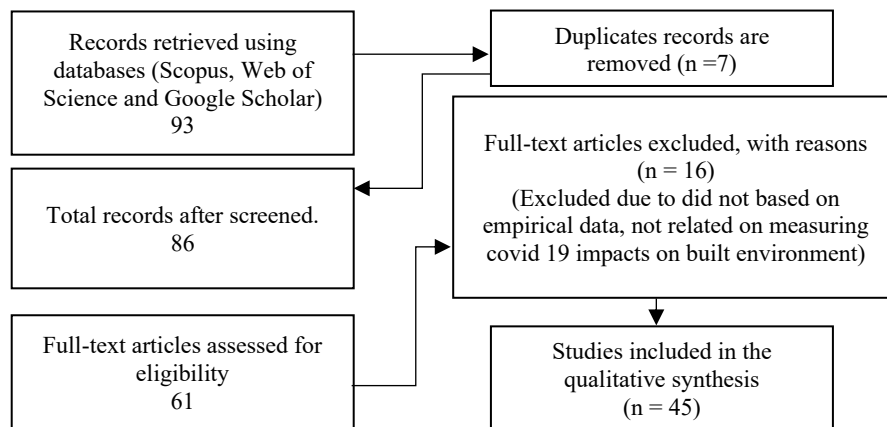


Figure 1: PRISMA
Source: modified from (Shaffril et al., 2018)

The remaining 45 papers selected for qualitative analysis were thoroughly evaluated and analysed. Efforts were focused on certain studies that addressed the paper's stated goal: The purpose of this study is to determine the potential long-term disruptive impact of the covid 19 epidemic in terms of space and user context. Following that, qualitative analysis was carried out by collecting information from the abstracts, methods, and data findings. The gathered data was then conceptually organised into themes. The most prominent impact of the covid 19 epidemic on the urban space and its people was then investigated using content analysis techniques. As mentioned earlier, the findings from the PRISMA method were coded and categorised into three themes: (i) space planning and design, (ii) transformative impact on user behaviour and perception, and (iii) Social-Political impact (refer to Figure 2). These three themes of transformative impact were used as a basis for formulating a questionnaire survey for the second stage.

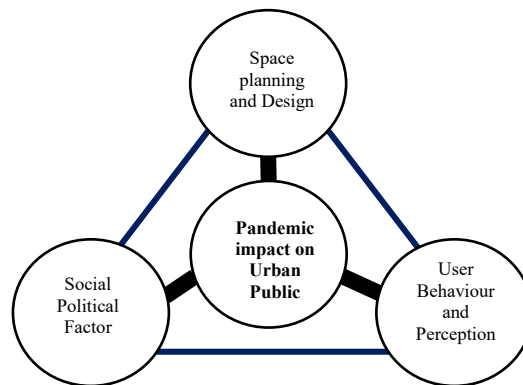


Figure 2: Pandemic impact on urban public spaces
Source: modified based on the model of significant features influencing social interactions in urban areas (Sanei et al., 2018)

Based on the conducted survey, it was found out that most of the respondents in this research lived near Taman Rimba Bukit Kerinchi, with 82.4% being residents are from Bangsar South and Kerinchi, Kuala Lumpur, while the remaining 17.6% are from Petaling Jaya, Selangor. The respondents were mainly female (57.3%) compared to male respondents (42.7%) and consisted of young adults and adults (87.8%). The majority of the respondents are also from the lower-middle-income group.

Based on the survey, the respondent was approached by using different types of placemaking where planning and design intervention of the spaces are presented. From the survey, the majority of the respondents are interested in the tactical type, with 48.8%. It is followed by standard type (45.1%), creative type

(29.3%), and strategic type (20%). A majority agree on a tactical placemaking program proving the solid need for urban planning and design reforms.

Since most of the respondents are from lower-middle-income groups and tactical placemaking programs scored the highest percentage, it is proven that the current public space and green area provision are not inclusive enough for all societal classes. Many people have less access to public spaces even before pandemic outbreak, and the situation gets worse after. Refer to Table 2.

Table 2: Favourable placemaking intervention program

Type of Program	Yes		No	
	Freq.	(%)	Freq.	(%)
Standard (events in public spaces)	37	45.1	45	54.9
Tactical (pop-up cafes, parking space conversions into parklets, community park/garden)	40	48.8	42	51.2
Creative (outdoor concerts, public art contests)	24	29.3	58	70.7
Strategic (provision of recreational amenities and cyclical events targeted to talented individuals)	20	24.4	62	75.6

Source: Author (2022)

Based on the survey conducted for this research, A Chi-Square Test was performed to assess the relationship between socio-demographic background and involvement with the community association. The chi-square results showed a significant relationship between age ($p = .005$), educational level ($p = .001$), and involvement with the community association. Refer to Table 3.

Table 3: Chi-square Test on Respondents' Socio-demographic Background and Respondents' awareness to practice self physical distancing in public spaces.

Variables	Value	Asymp. Sig. (2-sided)	Contingency Coefficient
Age	12.834 ^a	.005	.368
Gender	2.280 ^a	.131	.164
Ethnicity	7.234 ^a	.065	.285
Religion	.651 ^a	.722	.089
Education Level	29.195 ^a	.001	.512
Marital Status	4.419 ^a	.220	.226
Employment Status	4.469 ^a	.724	.227
Household Income	4.645 ^a	.795	.232

Source: Author (2022)

The respondents with higher educational qualifications and mature age are more willing to practice physical distancing in public spaces and more open to abiding by the rules. However, respondents from the lower-middle income group with less opportunity to have a high educational background are less likely

to practice physical distancing due to a lack of awareness. Therefore, the public spaces should be planned and designed to educate people from all social classes where the arrangement within the public spaces can increase their awareness and influence their behaviour and interaction (Kyriazis et al., 2020).

DISCUSSION

The global pandemic crisis has caused dread and tension in the community, mainly when the disease has caused humans to stop socialising. Suffering from the covid 19 pandemic is a novel experience for our generation, but epidemics and pandemics have always shaped the urbanisation process (Afrin et al., 2021). There is much ambiguity regarding how COVID-19 will influence future public space design, use, and perceptions. In the world of public space and design, a significant question is how long these effects will be felt and how transformative they will be. It may take years to determine how the global epidemic has affected public space planning and design (Honey-Rosés et al., 2020). The covid 19 outbreak has highlighted the crucial need to rethink urban public spaces. As a result, this research identified the potentially transformative impact of the covid 19 pandemic on urban public spaces.

Public spaces and green space areas are widely recognised to provide significant public benefits, especially in times of health emergency. The requirement for self-quarantine and physical distancing negatively impacts the population's mental health driven by fears of infection, frustration, boredom, and inadequate facilities and infrastructure in their living environment, emphasising the importance of public spaces like these parks and green areas. As a result of the disease's emergence and the government's response, the public has begun to recognise some previously overlooked park functions (Bereitschaft & Scheller, 2020; Fabris et al., 2020; Geng et al., 2021). It is widely assumed that higher infection rates will occur in high-density areas because people are unable to practise physical distancing due to space constraints, Afrin et al., (2021) discovered in their studies that there is no link between high population density and infection rates; instead, infection rates increase in high-density areas due to a lack of proper planning and design.

According to Herman & Drozda (2021), tactical urbanism interventions in public and green spaces during the COVID-19 pandemic are most effective because they immediately impact the shape and use of public spaces today. This study shows that many people have less access to the public spaces. This finding supports the findings by Eltarabily & Elghezanwy, (2020), who found that present urban developments have not been very successful in urban planning and health field. As a result, it is critical to emphasise the necessity of paying attention to how cities and the urban environment are designed in order to provide a healthy environment for people. The interdependence of city features such as buildings, streets, public parks, and infrastructure substantially impacts the quality and

effectiveness of life for city residents. The public spaces should be inclusive and accessible to all types of social class.

There is a silver lining to the Covid 19 outbreak. It has emphasised the vital need to reframe urban design and planning to reduce unsustainable urban development patterns. Responsive planning and design in creating a new trend of private and public spaces within the context of thoughtfully built environments that are described as healthy, epidemic-resistant, and inspiring a balanced existence are becoming more significant nowadays (Afrin et al., 2021; Alraouf, 2021). Public spaces will be treasured in the post-Covid period for their chances for socialisation, enjoyment, community development, and identity creation. Furthermore, public spaces are an essential aspect of a resilient city because they have the value of flexibility where public spaces can be changed for emergency health purposes. During the pandemic, many large green spaces and convention centres have been converted into emergency field hospitals (Honey-Rosés et al., 2020). Cities and towns must reformulate residential neighbourhood construction rules and regulations to develop human spaces rather than merely a quantitative intervention controlled by real-estate developers (Bereitschaft & Scheller, 2020). Urban planners must identify and promote residential and public space infrastructure that incorporates the required community facilities (Alraouf, 2021; Eltarabily & Elghezanwy, 2020; Mishra et al., 2020).

Several studies have emphasised the importance of planning and designing public areas to foster and preserve physical distancing. People must be allowed to spread out in public spaces, reducing crowding in less desirable areas. For example, green space planners may need to offer more locations for individual and introspective use instead of team sports. Trails and routes for running may be widened. In addition, new expectations about social distance may necessitate rethinking where people might exercise in green places (Geng et al., 2021; Honey-Rosés et al., 2020; Song et al., 2021; Wortzel et al., 2021; Yang & Lo, 2021). Streets may also be upgraded and used to offer additional public spaces to the public (Rahayu, Buchori & Widjajanti, 2019). The development of the public spaces should also be inclusive (Esfandfard, Wahab & Amat, 2018). Thus, the street design must be adaptable and not solely intended for motorised vehicles. Barbarossa, (2020) has emphasised the importance of creating greater spaces for bikes and pedestrians, particularly in highly populated urban areas, in order to reduce public transportation overcrowding and the usage of private cars. According to (Krellenberg & Koch, 2021), streets and pathways might be rebuilt to make alternative transportation more appealing and limit access to public and open spaces in order to meet current Covid-19 standards. To aid the movement in reimagining urban spaces and mobility, tactical placemaking interventions such as the provision of more cycling lanes, pedestrian and traffic calming areas, and sharing mobility programmes are extensively promoted (Sepe, 2021; Sharifi & Khavarian-Garmsir, 2020; Ugolini et al., 2020). Another excellent suggestion

is to develop green infrastructure, which is a network of connected green places. This concept is more helpful than isolated parks, and it entails a network of parks of various scales and purposes through which citizens may walk more easily and connect to nature (Eltarabily & Elghezanwy, 2020; Labib et al., 2021; Leng et al., 2020). The implementation of eco public art would also contribute to place making in many public spaces (Zakariya, Azhari, 2017).

Public spaces play a significant role in educating people and shaping their behaviour. A recent study by Geng et al., (2021) replicated and concluded that people's awareness of protecting themselves against pandemic infection by understanding and practicing social-distancing rules has gradually increased. On the assumption that today's people are aware of and adhere to physical-distancing rules, parks and green spaces can be used as a platform to educate and shape the behaviour of individuals and society. Martínez & Short, (2021) in their research have mentioned that pandemics and their repercussions have impacted cities throughout history. The city is a resilient organism, and each crucial episode has provided an opportunity to shape and rethink urban planning to maintain health and cleanliness, demonstrating a strong ability to develop following critical events.

CONCLUSION

The pandemic has shaped the development of urban areas in the past. As a result, instead of "returning to normal," future development should focus on adapting and responding to the current needs of sustainable and resilient cities. Because cities are at the forefront of these adaptive changes, this study highlights the potential transformative impact on our public spaces, allowing authorities and professional stakeholders to take appropriate action to mitigate negative connotations associated with the Covid 19 pandemic outbreak. This research is limited by data collection and information acquired during the movement control order (MCO), where most of the respondents answer the survey online, and the systematic literature review conducted lacks resources (publication from 2020-2022). As a result, we propose that future research focus on implementation of transformative policies that adhere with the people needs in the "new normal" era to ensure that urban public spaces are fully utilised and inclusive of all socioeconomic classes.

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