

Development of Urban Park Public Seating Design Strategies in the Post-pandemic Era

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Abstract. Urban parks have the characteristics of a relatively concentrated population. Seating as products with a high frequency of public use, they have significantly influenced residents' activities in the epidemic environment. The current design of public seating in parks during the pandemic needs to meet the needs of different people. Thus, the purpose of this research is to meet the needs of the different populations in many aspects of urban park seating objects during the pandemic. This paper integrates literature to develop an urban park seating object strategy in the post-pandemic era. This paper analyses the design factors and design strategies of urban park seating from four aspects based on the current situation of the post-pandemic social environment. The four areas are function, aesthetics, materials, and safe social distance. The results show that the seat's functional design is crucial. However, aesthetics, materials, and safety cannot be ignored. In addition, people are more concerned about seat safety in the post-pandemic period. Therefore, public seating design strategies for urban parks in the post-pandemic era are developed based on these four aspects.

1 Introduction

The current COVID-19 pandemic has captured global attention, causing changes in living habits and urban use. The city and public Spaces were deserted entirely during the blockade, and the new cityscape replaced the old cityscape, changing the private landscape of the public space[1,2]. Parks and other urban green spaces are growing increasingly well-liked as necessities for preserving physical and mental wellness. As a result, COVID-19 transmission rates are lower outside than inside[3,4]. Public health needs to use open and green areas [5]. However, when many parks remain unusable, overcrowding is common, and residents in most metropolitan areas lack opportunities for outdoor activities. The government implemented several regulations and policies to lessen the risk of the virus spreading among the populace in response to an increase in visitors to newly opened parks[6].

In urban parks, furniture is an indispensable part of the park. The seat is the park's most widely distributed public facility and the closest contact with users. Users have higher and higher requirements for urban park furniture, and simple park furniture can no longer meet people's needs. During this epidemic, there will be significant changes in how people use seats daily [7,8].

However, seating as part of urban landscape design, such as seats that limit viral transmission to some extent, has yet to be thoroughly studied. In addition to providing

social resilience and promoting urban vitality, improved urban park design has the potential to increase social interaction.

2 Problem Statement

In 2020, COVID-19 came out of nowhere, and modern urban design, indoor and outdoor environment design, and public facilities, which people were once proud of, fell into a dilemma due to the lack of preparedness for the epidemic, exposing many serious problems that cannot be fixed[9].

During the pandemic, traditional urban furniture was unable to help people adapt to the new lifestyle[10]. For example, during the current COVID-19 pandemic, people must maintain social distancing from each other. However, when they sit around their chairs, these social distancing rules can be ignored, resulting in a lack of safety and functional design. At the same time, the city park seat is difficult to meet the needs of different groups of people, resulting in a decline in residents' enthusiasm. As the pandemic spread, these seats did not work correctly and were left unused [11]. Currently, the materials used to make park benches are difficult to sanitize, and the colors do not help the public relax during a pandemic. [10]. To sum up, these problems adversely affect people's physical and mental health.

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3 Research Method and Limitations

This paper integrates literature to develop an urban park seating object strategy in the post-pandemic era. The researchers combined the previous studies and reports on urban park fixtures with the factors influencing the spread of epidemics on urban furniture design. They analysed and summarized the strategies to further improve the design of urban park seating during the pandemic. However, there are some limitations to this study. There needs to be comprehensive data collection and analysis in combination with the specific social conditions of different regions. In the face of different user groups and cities, specific design strategies will have certain differences. Therefore, the researcher suggests further combining this topic with the survey data on user satisfaction in the following research to determine specific design standards further.

4 Research Aim

To meet the new requirements of the environment, it is necessary to summarize the design and factors of urban park seating from the perspective of function, aesthetics, materials, and safe social distance, respectively, to update the design strategy of public seating in urban parks to provide safer and meet the needs of use seating in the post-pandemic particular context—the conceptual framework (See Fig. 1).

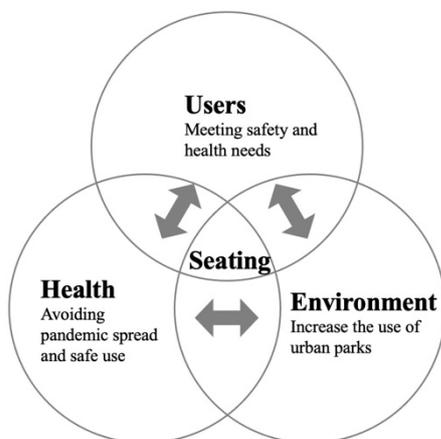


Fig. 1. Concepts of public seating design in post-pandemic urban parks.

5 Analysis of design factors of the public seating in the urban park

5.1 Function

In the context of the post-pandemic situation, the primary function of public seats is to provide a place for people to rest, where people can sit down to talk and think easily, reflecting its functional value[12]. Function refers to the effective utilization of functions of public seats in parks[13]. In addition, the seating function of the park should include both availability and convenience, with

convenience referring to wheelchairs and walkers accommodating the disabled without hindering pedestrians [14]. Moreover, some scholars suggested that functional interaction should be enhanced. Especially in the post-pandemic environment, the layout mode that guarantees safety while considering diversity is more conducive to people's communication and interaction[12,15].

Moreover, an essential functional design factor is the additional design of multiple functions, such as USB charging, wireless WIFI, and small workstations[16]. Finally, comfort is a part of ergonomics, considering the needs of different people. Especially for the elderly, the body function of the elderly degrades, and the comfortable design of the seat is mainly manifested in the ergonomics. Only a seat with a comfortable size (width and height) and comfortable structure (armrest and backrest) will be popular[17]. To meet the functional requirements of the seating, designers should think more about how to relieve the mental stress of residents through inclusive and friendly interaction[11].

5.2 Aesthetic

The principle of aesthetics mainly refers to designing furniture products with harmonious proportions, colors, materials, and other matching factors by aesthetics, colour matching, and texture matching, so that users can enjoy and satisfy the beauty mentally[18]. Firstly, a study found that colour is essential to satisfy aesthetic needs and a significant part of visual perception[19]. Secondly, in a recent study, users' bad moods were relieved during the COVID-19 pandemic with the suitable form, bright colors, and correct colors ratios. At the same time, it is emphasized that seats provide urban residents with emotional pleasure that cannot be ignored, and the research results reflect users' psychological and spiritual needs in the context of the pandemic[10]. Lastly, texture in aesthetics is considered an essential influencing factor, and texture and form of texture are firmly linked[19,21].

Similarly, Erturk proposed that the aesthetic design of the seat should also assume the responsibility of alleviating people's emotions during the pandemic, such as reducing sadness, disappointment, anxiety, and confusion and helping people cope with stress[22]. Gehl believes that seat design style influences whether people choose to sit down and how long they will stay after sitting down, again emphasizing the importance of aesthetics[21]. According to the literature assessment, the preliminary designs for public seats are bionic design, traditional classic, modern minimalism, and avant-garde fashion[22].

5.3 Material

According to a study, cleanliness is a concern for post-pandemic users. As public facilities with high utilization rates, urban furniture, and its surrounding environment have an increased incidence of virus retention and transmission, requiring much disinfection works with disinfectants with active ingredients. Non-porous materials that are easy to clean and disinfect are

recommended after a pandemic, as viruses generally have a shorter lifespan on porous materials than on non-porous materials such as metals and plastics[12]. Use antimicrobial materials that are easy to disinfect. Use high-standard, non-porous materials to replace traditional materials. Common traditional seat durability materials are wood, stone, concrete, metal, and plastic. Stainless steel, polyester rattan, compact high-pressure heat-curing panels (HPL), and wood-plastic composites are recommended. Its properties determine not only the form of the product's appearance and clean way but also affect the people in a visual and tactile with enthusiasm and experience quality. Therefore, it should be used to fight bacteria, viruses, dampness, mildew resistance, easy to clean, and high hygiene standard material to replace traditional materials. In addition, the high incidence of the epidemic also puts forward higher requirements for environmental protection. Sustainable seating materials are more conducive to healthy environmental development[10]. Because of the potential for carbon absorption by timber trees and the value of carbon offsets at the end of the life cycle of a wood product, wood is often regarded as a sustainable material. Wood may be used to make outdoor seating that is sustainable. These sustainable woods are the most sustainable: redwood, bald cypress, western red cedar, douglas fir, bristlecone acacia, white oak, and bamboo[12].

5.4 Safety of seat social distance

The term "social distancing" has received much attention during the COVID-19 pandemic as a justification for keeping our distance from others while participating in outdoor activities. Still, research shows that if this phenomenon persists, it will have long-term adverse effects like isolation, loneliness, depression, and other communication-related issues. A scale of social distance was developed by Hall many years ago based on the dominance of social conduct, and the range from 120 cm to 350 cm was regarded as the category of social distance[23]. Physical distance is a critical public health strategy to reduce the spread of COVID-19. People need to spend more time outdoors, increase the importance of sitting, and distance needs to conform to public health guidelines[12]. The required distance should be considered when designing the seat since, occasionally, the general public requires assistance in keeping a clear perception of this distance. It will make it easier to guarantee that people are safe and secure. Increase the flexible mobility of the seats, the number of people to use, and flexible changes in the seat layout. In addition, the facility should follow an adaptable strategy that allows people to choose the orientation of the seating, employing plants as an ideal physical barrier to provide viable options for implementing physical distance[24]. According to the literature review, the safe social distance of the seat is the most concerning factor in the use [25,26]. It is also emphasized that it is crucial to design seating to manage safe social interactions and distances while establishing balance.

5.5 urban park seating design strategies in the post-pandemic era

In terms of functions

- i. Usability. To provide effective and convenient functional design for the needs of different groups.
- ii. Interactivity. Diversified layout patterns are adopted to meet the daily needs of the public for communication and interaction.
- iii. Convenience. While meeting the primary rest function, it also provides a multi-functional additional design with a high frequency of use.
- iv. Comfort. Based on ergonomic standards, more comfortable seat sizes are adopted according to the characteristics of different people.

In terms of aesthetic

- i. Reasonable colour design. Use an appropriate form and bright colors with a ratio of the correct colors.
- ii. Coordinated application of texture aesthetics. The texture structure of different materials is scientifically integrated with texture aesthetics.
- iii. Diversified design styles. According to the aesthetic characteristics of different users to provide different seating design styles.

In terms of materials

- i. Materials that can extend the service life: Outdoor furniture has particular material needs because of the climate in which it is used. These materials must be waterproof, corrosion-resistant, and withstand the sun. 5–10 years are the average lifespan of seating materials.
- ii. Easy to disinfect antibacterial materials: Use high-standard, non-porous materials to replace traditional materials. Common traditional seat durability materials are wood, stone, concrete, metal, and plastic. Stainless steel, polyester rattan, compact high-pressure heat-curing panels (HPL), and wood-plastic composites are recommended.
- iii. Sustainable and environmentally friendly materials: Recyclable materials are more conducive to developing a green ecological environment.

In terms of safety

- i. Seat design to maintain a safe social distance, or use a partitioned design.
- ii. Use plants as physical partitions in the seating environment to reduce the spread of viruses.
- iii. Increase the seat design's flexibility to give users a safe and flexible interaction (See Fig. 2).

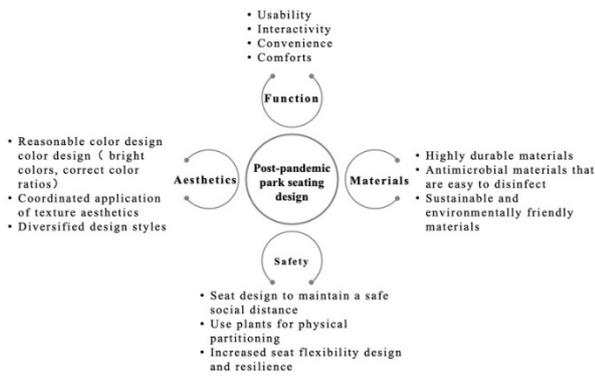


Fig. 2. Urban Park public seating design strategies in the post-pandemic era

6 Conclusion

The impact of the pandemic changes the design emphasis and seating standards and thus adapts to the user's needs for seating in the pandemic environment. The seating in the post-pandemic urban park should be designed according to function, aesthetics, materials, and safety. Meanwhile, safety is essential in encouraging users to use the seats. The new strategies for public seating in urban parks in this research can provide guidance and reference for new demands for seating in post-pandemic situations.

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