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Article

Public Space Usage and Well-Being: Participatory Action Research With Vulnerable Groups in Hyper-Dense Environments

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Abstract

The importance of neighbourhood-level public space and its benefits have been discussed at large during the Covid-19 pandemic. While demands for public space increase, restrictions imposed by the containment policies such as social distancing and public space use have made profound health impacts on the general public. Such impact may further widen the gaps of existing health and social inequalities and engender well-being issues in vulnerable populations living in dense urban environments. To better understand vulnerable groups' perception and experience of access to public spaces and its association with well-being, we conducted participatory action research during the pandemic (October 2020 to April 2021) via surveys, focus group discussions, mapping, and co-creation workshops in Sham Shui Po, a hyper-dense and poverty-stricken district in Hong Kong. Participants reported demands for public space use and its significance to well-being and pointed to several environmental and social factors that hindered their usage, including perceived safety, hygiene concerns, and issues between different genders and ethnic groups in the neighbourhood. Pandemic-containment measures and the fear of infections may contribute to heightened anxiety and stress to some degree among the participants. Directions for local interventions of spatial improvement were identified. Our study further highlights the strength of participatory action research for the development of more user-oriented planning solutions and the potential of community mapping and co-creation activities to empower vulnerable groups and enhance their spatial competence.

Keywords

Covid-19; high-density environment; Hong Kong; participatory action research; public space; urban planning; vulnerable groups; well-being

Issue

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1. Introduction

The impacts of the Covid-19 pandemic are devastating worldwide, with vulnerable populations (e.g., urban poor, unemployed, homeless) bearing the brunt of health, social, and economic inequalities to a great extent (World Health Organization, 2020). Such impact can be observed notably in Hong Kong with its rising socio-spatial inequalities (CUHK Institute of Health

Equity, 2021). While restricting social contact prevents the spread of infections, containment measures have subsequently led to the closure of or limited access to public amenities, welfare and recreational facilities, and schools. Such closure disproportionately impacts the vulnerable groups who heavily rely on these public spaces and their services. Furthermore, there is a rising concern over the impact of the pandemic on people's well-being as the prevalence and burden of mental

disorders appear to be ongoing and sustained since early lockdown (Ettman et al., 2022; Holttum, 2020).

Public space, ranging from parks to alleys, has widely proven to be vital for both individual and social well-being (Maas et al., 2006; Mehaffy, 2021; Thompson et al., 2016; UN-Habitat, 2020). Recent studies consistently indicate a great need for public space access among urban dwellers during the pandemic, especially for those residing in economically deprived neighbourhoods or those without private garden access (Hubbard et al., 2021; Larson et al., 2021; Poortinga et al., 2021). For many urban poor, public space is an essential living environment for everyday life, with economic, social, and well-being importance. Overall, the emergence of prior evidence highlights the significance of having nearby public spaces to mitigate stress, promote health and well-being, and maintain spatial and social connections in times of crisis.

While the importance of public space has gained increasing recognition during the pandemic, free outdoor public space is a limited resource in dense urban areas, and the situation is even worse in underprivileged districts. Hong Kong, characterised by its compact, high-density urban form, has long faced a dearth of urban public space, with an average of 29 sq. ft. of open space per person (Civic Exchange, 2018). Moreover, its urban public space is unequally distributed, designed, and managed, with a large proportion located closer to upmarket housing areas rather than densely populated low-income neighbourhoods (CABE Space, 2005; Tang, 2017). Previous studies have investigated arrays of socio-demographics, environmental-spatial attributes, and individual factors concerning public space usage, e.g., population density, neighbourhood affluence, proximity, accessibility, spatial equity of provision, and individual perceived quality, safety, and attitudes towards public space (Liu et al., 2017; Tan & Samsudin, 2017; Wan et al., 2020; Wang et al., 2021; Zanon et al., 2013). Socio-demographic factors of income and gender (Liu et al., 2017; Wang et al., 2021; Zanon et al., 2013) are shown to be associated with the frequency of park visits, in which women tended to report more barriers such as time constraints and fear of crime. Yet, significant knowledge gaps remain in the context of small neighbourhood public spaces in dense underprivileged urban areas and additionally, engaging socially disadvantaged groups in the study of public space and the planning process is rather limited.

There is an emerging trend of applying participatory action research (PAR) to the design field to enhance transferable knowledge, such as participants' experience of physical or perceived barriers to public space use, and to better address specific practical problems through bottom-up local interventions for improvements. In this study, the PAR approach was adopted to provide opportunities for empowerment, collective inquiry, and collaborations in practice where participants actively engaged as partners in the research process and benefited

from participation. The validity and effectiveness of this approach were documented in prior research (Ku & Kwok, 2008; Qi & Gu, 2020).

This study is a swift response to observations and concerns of a local charity (Caritas Hong Kong), which has long engaged in frontline mental health support to grassroots residents in Sham Shui Po (SSP), one of the poorest and densest districts in Hong Kong. Caritas' social workers observed their clients triggered mental health problems during Hong Kong's pandemic containment policies and suspected the relationship between clients' well-being issues and the difficulties in accessing public spaces and public resources. With such first-hand observation and the aforementioned research gaps, this study aims to understand the overlooked vulnerable groups' perception and experience of public space in a hyper-dense environment and to examine the degree to which its association with well-being during the Covid-19 pandemic using the PAR approach. Surveys, focus group interviews and community mapping activities were conducted to explore (a) participants' public space usage patterns, (b) encouraging and hindering factors from accessing or using public spaces, and (c) impacts of Covid-19 and containment measures on daily life and well-being.

2. Study Site: Sham Shui Po

The selected study site, SSP, characterised by a predominantly working-class population, a diverse mix of ethnicities, and hyper-dense urban habitation, represents a typical underprivileged area in Hong Kong. SSP has the second-highest poverty rate in Hong Kong; of 431,090 SSP residents, 96,800 (22.5%) were classified as "poor population" below the poverty line (Office of the Government Economist, 2020). The population density of SSP is 46,067/km², with increasing groups of ethnic minorities coming from South Asia and mainland China (Census and Statistics Department, 2021). The district's urban form is characterised by two main patterns: a dense urban street grid, and large urban blocks with public and private housing estates (Figure 1). Private permanent housing, mostly tenement buildings, is the dominant housing type in the district (59.0%), followed by public rental housing (35%; Kan et al., 2022). SSP has the second-highest concentration of subdivided units, mostly in dilapidated tenement buildings, with a median area of 107.6 sq. ft. per unit, which, on average, accommodates a median household size of 2.3 persons (Census and Statistics Department, 2018). Poverty, heavy workloads, and cramped living environments potentially arouse mental health concerns in the district, especially among middle-aged females (Hong Kong Young Women's Christian Association, 2021). Furthermore, the accessibility to public spaces and the social discomfort of using public spaces in SSP are widely reported as unsatisfying as compared to other districts in Hong Kong (Civic Exchange, 2018).

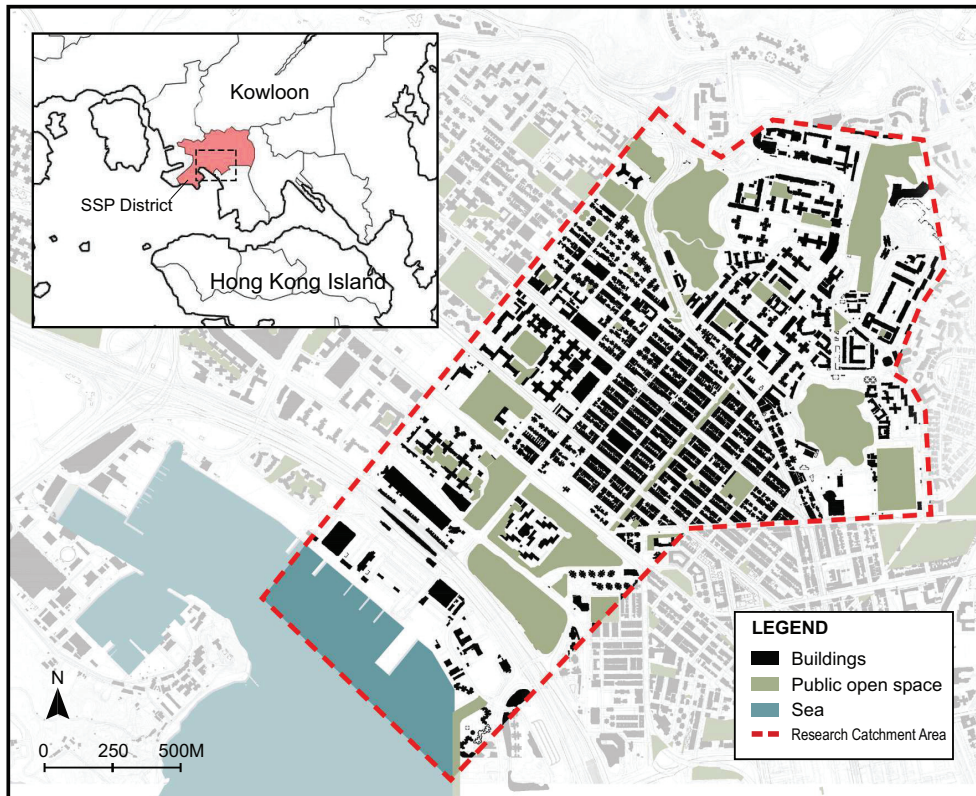


Figure 1. The geographical scope of the study. Note: Research catchment area is defined by participants’ residential neighbourhoods and locals’ correlation between neighbourhood boundaries.

3. Methodology and Research Design

3.1. Research Design

The research team was composed purposefully of members working in social work, public and mental health, architecture, and urban design to address the complex issues affecting the residents in the district. All members worked together to contribute to the research design using their expertise and related experiences in their fields.

The team adopted a PAR approach, which is “an iterative process in which researchers and practitioners act together in the context of an identified problem to discover and effect positive change within a mutually acceptable ethical framework” (Lingard et al., 2008, p. 461). The benefits of PAR include generating transferable knowledge to create effective local solutions, consciousness-raising, and community empowerment (Park, 1999), which the team deemed important for the here-involved vulnerable groups in the moment of pandemic crisis. It also permits the team to review and adjust the study to accommodate participants’ feedback at different stages (Stringer, 2007).

The PAR approach in this study includes quantitative (questionnaire survey) and qualitative methods (focus group discussion with mapping exercise and co-creation workshops; Figure 2). With a strategic relationship among the methods, this mixed method approach can

create greater insights than a single method could (Lingard et al., 2008) and is conducive to our interdisciplinary research. The questionnaire survey was designed for an overview of the participants’ self-rated psychological distress, daily routines, and patterns of public space usage during the pandemic and the degree to which the pandemic may impact participants’ livelihood and daily life. The development of the study survey and focus group was informed by related scientific literature and theory, the authors’ prior field study observation and spatial knowledge of the district, and the frontline working experience with the charity during the pandemic.

Focus group discussions were conducted to add more depth to the quantitative findings to enhance a comprehensive understanding of space meaning, facilitators and barriers to access and its relationship with well-being. Mapping is a common method used in delineating spatial relationships with open space (Qi & Gu, 2020). Mapping enhances the dialogue by encouraging the participants to “think aloud” about spatial factors and helps researchers efficiently identify the spatial aspects and boundaries in the discussion (Rohrbach et al., 2018). In this study, the focus group discussion, together with the mapping exercise, allowed further understanding of participants’ public space experiences, use patterns, rationales behind everyday usage, and the impacts of the pandemic on usage and well-being.

Due to the swift set-up of the project in response to the frontline social workers’ observations during the

pandemic, the research team used convenience sampling from Caritas’ client database of its community-based project on mental wellness. Fifty participants were recruited, and each signed a written consent form. Participants were informed about their right to withdraw from the research at any time, and all agreed to participate in the survey and focus group session. Upon completion of the focus group discussion, participants were each paid a cash voucher of HK\$250 (equivalent to US\$31.85). Among them, 23 participants further took part in the co-creation workshops. The study was approved by the university’s Survey and Behavioural Research Ethics Committee.

The project was set up by the research team and the social workers from Caritas. In the first stage, the social workers acted as coordinators in facilitating participant recruitment, survey conduction, focus group discussion, and finding consolidation. After the research team decided to launch the second stage, the co-creation workshops, the social workers again helped to facilitate workshop activities with the research team. The long-standing relationships between the research team and Caritas, and Caritas’ trustful relationship with vulnerable groups in SSP, effectively facilitated the implementation of the PAR approach.

3.1.1. First Stage: Survey and Focus Group Interviews

After identifying the research questions collaboratively, the first stage took place in October 2020 with 10 sessions conducted, each including survey-filling, semi-structured focus group discussion and mapping exercises. Each session hosted five participants. The small group size responded to the tight pandemic regulations at that time. After filling out the surveys, participants joined the focus group discussion, accompanied by a mapping exercise where study participants mapped out their daily routes and identified their frequently used public spaces. This led to a discussion about their motivations for visiting these spaces and their experiences.

3.1.2. Research Design Iterations

The first stage revealed three unforeseen issues. First, many participants did not pay attention to their daily routes or did not have any regular routes. Second, participants found it difficult to comprehend the maps, so

facilitators had to take the role of mapping instead. Third, many participants discovered new places during the focus group discussion and learnt new information from other participants about their neighbourhoods. Such observations led to corresponding iterations and adjustments to the research design. The unfamiliarity and the interest in learning about public spaces among study participants motivated the decision to iterate and adjust the study to accommodate participants’ feedback, which has subsequently enriched both research methods and outputs. Regarding output, the team decided to co-create a map of local public spaces with the study participants to build up their spatial competence and relationship to the neighbourhood.

3.1.3. Second Stage: Co-Creation Workshops

Three engagement co-creation workshops were organised in April 2021 to collect feedback from study participants regarding (a) key public spaces which were not represented on the map, (b) suggestions for useful additional map content, and (c) the recommended distribution of the map after its completion. The participants also discussed the map layout design and size. Finally, a co-created community map was produced in the format of a double-sided, foldable 50 cm × 70 cm leaflet with a PDF version (Figure 7).

3.1.4. Finding Analysis

Upon completion of the first stage, the focus group discussions were transcribed, and the mapping outputs were digitalised. The transcriptions were analysed according to general and place-specific concerns. Recurring themes were uncovered, and, within each of them, further content analyses were performed. The result was categorised into encouraging and hindering factors of public space usage, while specific influences related to the pandemic were identified as well. Such qualitative outcomes were mapped onto digitised spatial results of the mapping exercise to corroborate findings and present an understanding of neighbourhood-level public spaces. They were also cross-checked with the findings of the quantitative survey to deduce further relationships between usage patterns and demographic details. The co-creation workshops’ facilitated discussions were recorded as researchers’ notes, with findings

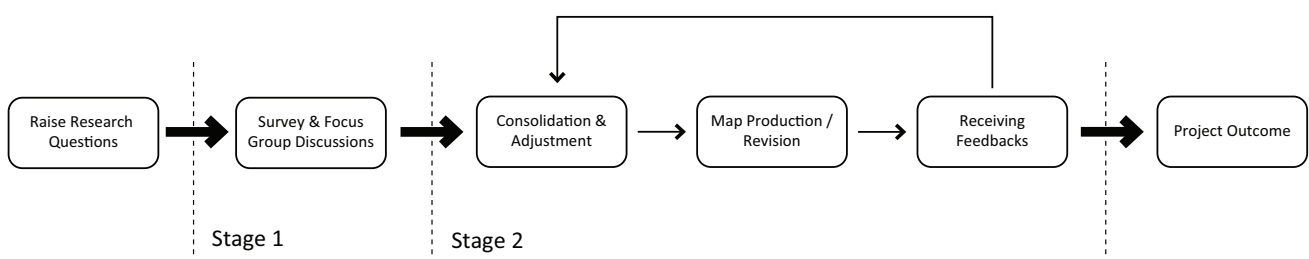


Figure 2. The two-stage approach.

directly integrated into the map production process, and other insights regarding participants' preferred information channels and spatial knowledge learning collected.

3.2. Demographics of Study Participants

Study participants were predominantly females (86%), with a higher concentration (32%) of age 35–44 years old (Table 1). Participants were all ethnically Chinese. A majority (60%) of the participants reside in subdivided units. Approximately, two-thirds (62%) live in a flat smaller than 200 sq. ft., and the average household size is 2.6 members. More than half (58%) were not employed at the time of the survey, being either unemployed (28%) or housewives (30%). Furthermore, many participants did not grow up in the district. The survey

included the Kessler Psychological Distress Scale (K10; Kessler et al., 2002) to assess participants' self-rated psychological distress. The scale has 10 screening questions to measure emotional state using a five-point scale from one (*none of the time*) to five (*all of the time*). The summary score ranges from 10 to 50, with higher scores indicating greater levels of psychological distress. A cut-off of the summary score is used to identify the likelihood of having a mental disorder: 10–19 likely to be well, 20–24 likely to have a mild disorder, 25–29 likely to have a moderate disorder, and 30–50 likely to have a severe disorder. In this study, of 50 participants, 33 (66%) endorsed experiencing a substantial likelihood of psychological distress, with 12 (24%) likely to have a mild disorder, three (6%) likely to have a moderate disorder, and 18 (36%) likely to have a severe disorder (Table 1).

Table 1. Demographics of study participants (n = 50).

Gender	No. of participants n (%)
Male	7 (14%)
Female	43 (86%)
Age	No. of participants n (%)
18–24	1 (2%)
23–34	4 (8%)
35–44	16 (32%)
45–54	9 (18%)
55–64	11 (22%)
65–74	9 (18%)
Property Type*	No. of participants n (%)
Private Property (Individual Unit)	9 (18%)
Private Property (Subdivided Unit)	30 (60%)
Public Housing	7 (14%)
Subsidised Housing	1 (2%)
Transitional Housing	2 (4%)
Living Area*	No. of participants n (%)
Below 100 sq. ft.	14 (28%)
100–199 sq. ft.	17 (34%)
200–299 sq. ft.	8 (16%)
300–399 sq. ft.	5 (10%)
400–499 sq. ft.	3 (6%)
500 sq. ft. or above	2 (4%)
Occupation Status	No. of participants n (%)
Housekeeper	15 (30%)
Unemployed	14 (28%)
Salaried	20 (40%)
Retired	1 (2%)
Results of Kessler Psychological Distress Scale (K10)	No. of participants n (%)
Under 20 (likely to be well)	17 (34%)
20–24 (likely to have a mild mental disorder)	12 (24%)
25–29 (likely to have moderate mental disorder)	3 (6%)
30 and over (likely to have a severe mental disorder)	18 (36%)

Note: * One participant did not answer the question.

4. Results

4.1. Usage Patterns of Public Spaces

Seventeen frequently used public spaces were mapped by the participants during the mapping exercise (Figure 3). Large parks (five out of 17), indoor public spaces (five out of 17), and playgrounds or sitting-out areas (four out of 17) rank the top three among all the categories of public spaces. Nearly all of the district's large parks and indoor public spaces (e.g., municipal services buildings and shopping malls) were identified as popular public spaces by the participants, indicating a preference for spaciousness, greenery, and diverse facilities. Moreover, the frequently used public spaces are mostly concentrated in the district's centre. Many participants emphasised convenience as a key factor influencing daily routes and the use of space amid their heavy workload and long working hours. Findings further illustrate clear point-to-point travel patterns between necessary destinations, such as home and market (see Figure 4 for a travel route example extracted from the mapping analysis). Few participants would go beyond their utilitarian daily routines to visit new places. There is a general negative sentiment regarding the serious lack of public space in crowded SSP. Meanwhile, several spaces were seldom mentioned by the participants, such as the waterfront promenade and small sitting-out areas (see Figure 5, for example).

4.2. Encouraging Factors of Public Space Usage

4.2.1. Space and Nature

The mere presence of space is an attraction for most participants who live in a very small unit. Their desire to use public spaces is driven by depressing indoor personal space conditions. In some cases, participants only have a bed space where it is difficult for them to turn around or stretch their legs properly while seated. Going out is necessary and sometimes regarded as an emotional refuge. With space also comes the possibility to exercise and play. For children, open spaces are important for them to release energy. For adults, parks give them a space to pursue both active and passive activities, e.g., tai chi and dance.

Some public spaces allow access to nature, such as hills and larger recreation areas away from the urban centre. Participants enjoy better air quality, sunshine, and greenery in these open areas and express that such areas provide a place to breathe and rest, help calm their minds, and release stress amidst the “concrete jungle” (hyper-dense urban environment). Many participants mention that public spaces make them “feel better” and “happier”:

You feel different when you are outside, you can at least calm your mind, not only the birds, you can also hear the wind. I spend more time on the hill than at

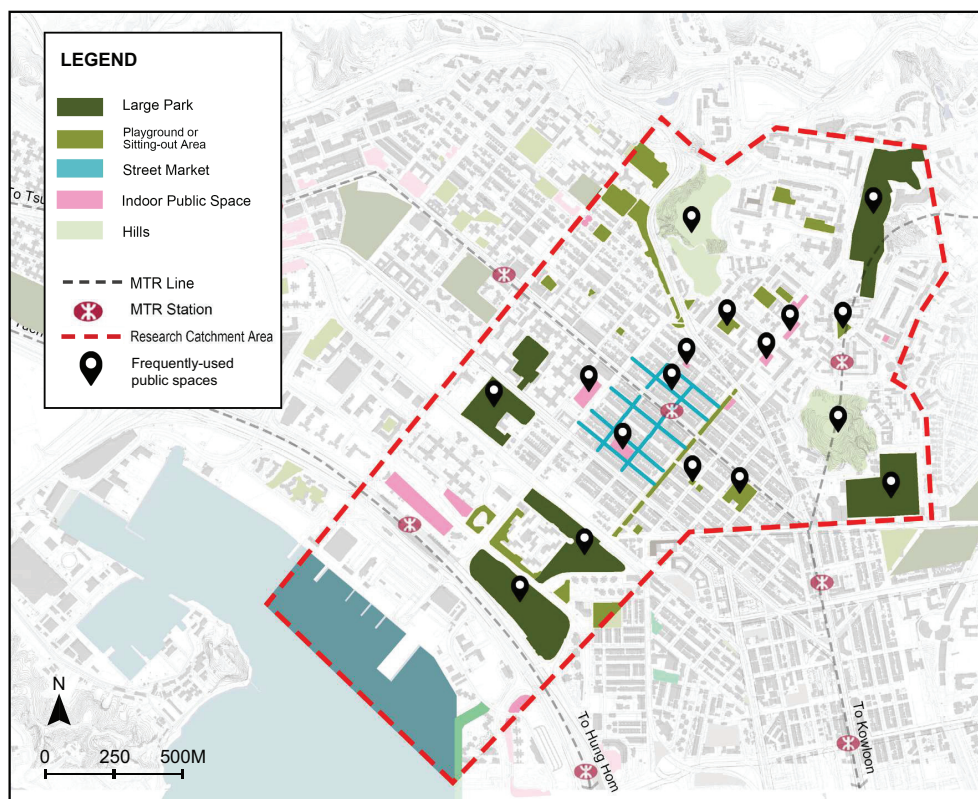


Figure 3. Map of public spaces in the research catchment area. Note: Black pins indicate 17 frequently used public spaces mapped by study participants during the mapping exercises.



Figure 4. An example of a daily routine.



Figure 5. Example of an underutilised small sitting-out area.

home. The air is better and it's spacious. My mood is better if I take a walk there. I feel bad when I stay home because my legs can't stretch....It's 60–70 sq. ft.

4.2.2. Caretaking and Socialising

For many participants, usage and choice of public spaces are driven by the needs and preferences of their children and senior family members. For instance, spaces with ball game facilities are preferred for children, while the availability of shaded seating and fitness equipment is important for the elderly. As for companionship matters, participants express the need and hope to enjoy public spaces with others, such as friends and grandchildren; it is unlikely for some to visit places alone, especially further ones. Public spaces facilitate socialising and meeting new friends, who potentially become part of participants' support networks.

4.3. *Hindering Factors of Public Space Usage*

4.3.1. Sense of Insecurity

Many participants feel insecure in the district and recall sightings of smoking, fights, illegal gambling, cigarettes and drugs trade, and sex businesses. Many female participants raise issues of male-dominated spaces, which they generally avoid. Middle-aged and senior local men often gather in groups and occupy huge parts of public spaces for a prolonged period of time to play chess, gamble, or smoke, leaving the impression of being unhygienic, sexually intimidating, ignoring rules, and engaging in illegal activities. A few participants recall accounts of being approached, intimidated, or harassed:

My hands would turn cold; I'm so scared....I don't look at the pavilions where they play chess and smoke. I look at the exit in front of me....One day I went in by mistake. You must dash all the way to the end, so we kept running even though we were carrying a lot.

Participants (all ethnically Chinese) show strong concerns about the South Asian community. They observe that public spaces and streets in the study neighbourhoods are often occupied by big groups of South Asians and therefore feel scared and uncomfortable getting close to them. Some are particularly uncomfortable at night as the number of South Asian groups would increase, and many shops would be closed. Additionally, drug users and the homeless community also arouse mixed feelings. Some feel a sense of insecurity and try to avoid places where the drug users gather, but others are not intimidated.

4.3.2. Poor Hygiene and Management

The issues of rats, littering, dirty facilities, stinks, fleas, and bugs bother many participants. Public toilets are gen-

erally seen as unhygienic, and participants would rather rush home when needed. Insufficient cleaning in the parks, lack of management over users' behaviours, and the difficulty of seeking help are mentioned too. The high density of the district population and spaces amplify these issues, particularly during weekends with the influx of visitors.

4.3.3. Insufficient Accessibility

In addition to access to space, access to relevant information about the public spaces and facilities in the neighbourhood is an important issue. Many participants did not grow up in SSP, but they moved here for lower rents. Many are not aware of the available places and facilities in the area and have no idea where to find such information despite their need for space. Affordability also poses a concern for some participants who prefer free facilities and services.

4.4. *The Impacts of Covid-19 and Related Containment Measures on Participants' Daily Life and Well-being*

4.4.1. Livelihood

Thirty participants encountered a salary reduction during the pandemic, and of them, 19 shared that they faced economic pressure due to the loss of jobs (Table 2). The decrease in salary was mainly due to the reduction of part-time job opportunities, insufficient working hours, and the higher priority and time needed for childcare as schools were closed. Participants who worked as janitors reported a strong increase in workload due to a cut in the overall labour force and a heightened need to sanitise during the pandemic.

4.4.2. Reduced Outdoor Activities

As shown in Table 2, 80% of the participants' daily routine was affected by Covid-19; most of them reduced outings and frequency of grocery buying; instead, they preferred takeaways, avoided crowded spaces, and stayed home. About two-thirds (62%) of the participants reflect that the closure of public spaces affected the daily routines of themselves and their family members, with a great proportion agreeing that it led to the lack of recreational and personal space. Very few attempted to go to alternate public spaces. Participants are very concerned about hygiene and infection. Parents in this study generally did not allow their children to go out or would otherwise bring their own toys to avoid touching public facilities. Most public play equipment in parks and playgrounds was cordoned off anyway.

4.4.3. Personal Mood and Social Relationship

As mentioned previously, a substantial proportion (66%) of study participants endorsed psychological distress

Table 2. Impact of Covid-19 on participants’ livelihood and daily life (n = 50).

Questions	Answers	Sub-Questions	Answers
Was your salary reduced?	Yes (n = 30, 60%)	Did you lose your original job during Covid-19?	Yes (n = 19, 63%) No (n = 11, 37%)
		Did you encounter the issue of inadequate working hours during Covid-19?	Yes (n = 19, 63%) No (n = 11, 37%)
		No (n = 20, 40%)	
Was your daily routine affected by Covid-19?	Yes (n = 40, 80%)	Reduce outings	Yes (n = 36, 90%)
		Avoid crowded public spaces	Yes (n = 30, 75%)
		Go to an alternate type of public space	Yes (n = 9, 23%)
No (n = 10, 20%)	Stay at home mostly	Yes (n = 31, 78%)	
Did the closing of public spaces affect your family and personal routines?	Yes (n = 31, 62%)	Lack of play space and recreational space	Yes (n = 24, 77%)
		Lack of space for leaning	Yes (n = 17, 55%)
		Lack of assistance to take care of children	Yes (n = 4, 13%)
		Lack of personal space	Yes (n = 20, 65%)
		No (n = 19, 38%)	

during the pandemic. In particular, 62% experienced negative impacts on “relationships with family and friends,” and 54% felt “loneliness” during the pandemic (Table 3). Many participants experienced huge fear of infection, the main reason why they reduced outings. Particularly, as schools and playgrounds were shut down, parents lost their only time to rest. They accumulated great stress concerning their children’s learning progress, increased workload, and lack of rest. Moreover, participants expressed that the prolonged stay at home led to other problems, including boredom, uncontrolled eating, weight increase, dizziness, and lack of rest space.

4.5. Findings and Knowledge Production of the Co-Creation Workshops

During the co-creation workshops, group discussions revolving around the draft of the community map encouraged study participants to share information regarding where and how to access valuable public spaces and facilities. This experience-sharing helped establish participants’ awareness of the relationship between the environment and well-being and enabled them to recognise, describe, and evaluate public spaces in their neighbourhood. The research team also planned to organise walking tours guided by the study participants to further

empower them and spread spatial knowledge. Due to Hong Kong’s ongoing restrictions on group gatherings in public spaces, this idea could not yet be realised.

In addition, feedback collected during the workshops provides insights related to information deemed useful and important by the participants and their preferred information distribution methods. Information regarding available facilities such as public toilets, Wi-Fi, charging stations, and charities were added to the map. Details of each public space (e.g., opening hours, facilities), descriptions of special streets, and historical assets were also added to the back side of the map. Participants mentioned that digital communication channels (e.g., WhatsApp), community centres, municipal buildings, and district councils are suitable places to distribute such information.

5. Discussion

5.1. Discussion of Results

5.1.1. Significance of Neighbourhood-Level Public Spaces

Study findings reveal that neighbourhood-level spaces play an important role as a living environment for the

Table 3. Overall impacts of Covid-19 on participants (n = 50).

Effects/number of participants N (%)	Exercising self-isolation/ social distancing	Loneliness	Buying daily necessities	Relationship with family and friends	Exercise
Positive	12 (24%)	2 (4%)	5 (10%)	3 (6%)	8 (16%)
Neutral	15 (30%)	13 (26%)	25 (50%)	13 (26%)	9 (18%)
Negative	18 (36%)	27 (54%)	18 (36%)	31 (62%)	23 (46%)
Not applicable	5 (10%)	8 (16%)	2 (4%)	3 (6%)	10 (20%)

studied vulnerable groups. Many participants mentioned that public spaces helped with stress relief and provided a place to breathe, rest, socialise, and pursue both active and passive activities as they generally cannot afford economically and timewise to venture further. Specifically, part of the improved mental well-being was a result of the different roles public spaces played in participants' daily life. However, during the pandemic, stringent social distancing rules meant that study participants had fewer options and thus more often stayed at home. Many participants reported that staying in cramped home living conditions all the time had led to detrimental effects on health, caused loneliness, and negatively affected the relationships with family and friends. While no direct and quantifiable relationship can be drawn, given the vulnerable group's undesirable living conditions and hence heavy reliance on public spaces for well-being purposes, the containment measures placing public space and facility access under strain might partially contribute to participants' heightened stress and anxiety during Covid-19. There is a need to factor in the significance of public spaces and their impacts on the mental health of vulnerable groups in future pandemic closure policies.

5.1.2. Gender and Ethnicity-Related Safety Perception of Space Use

While concurring with previous studies' emphasis on safety concerns (Liu et al., 2017; Zanon et al., 2013), our research further highlights gender and ethnicity-related safety perceptions of public space use. Apart from the quantity and quality of public space, the social fabric and environment, influenced by the intricate interaction and negotiation between different user groups, is a significant attribute to public space usage in an underprivileged area. This situation is even more salient in SSP as it is home to many disadvantaged people, mainland Chinese immigrants and ethnic minorities. There is also little sense of belonging as the district has a large transient community; many come for lower rents while waiting for public housing. Some participants felt inferior to others in the city and perceived they did not belong in nice parks and facilities. Gender concerns revealed in this study attest to how females are more often inhibited by safety concerns than males when using public spaces. This pushes them to a more vulnerable position regarding mental and physical health as they are less willing to spend time outdoors. Overall, our study findings indicate that, in addition to the spatial dimension, there appear underlying social norms affecting gender and ethnic groups' dynamics concerning study participants' public space use and experience.

5.1.3. Street Design

Overcrowding is another reason for the uncomfortable public space experience, a common problem in dense environments worldwide. With high density, city streets

play a critical role in providing public open spaces and easing the crowdedness through strategies like traffic calming (Wen et al., 2020). Participants in this research often use public spaces along their utilitarian route. Enhancing street space, such as sidewalk widening, street greening, and micro-parks, might satisfy the need for a better sense of spaciousness and access to nature. Street space improvement has been applied as an affordable way to alleviate open space shortage (Do et al., 2018). Despite the long-lasting impacts of the pandemic, effective street design can limit the exacerbation of existing inequalities and challenges magnified by the pandemic (National Association of City Transportation Officials, 2020).

5.2. Discussion of the Participatory Action Research Process

PAR's ongoing nature facilitates communication, obtains an in-depth understanding of participants' thoughts, and enables trust-building among researchers, partner organisations, and study participants. This, in turn, leads to effective feedback on the research. The actual adoption of comments and iteration further enhances trust among the parties and improves coordination. Upon consolidation of information collected from the focus groups, a community map of public space was created to spread useful but often inaccessible and overlooked information about available open spaces and facilities in the district (Figures 6 and 7). It provided added values to foster explorations of co-created vision across a diverse group of participants using their different experiences and increasing their awareness of public space and services usage. A similar approach has been applied in other studies (Carpenter et al., 2021; Falco et al., 2019). In this project, the co-creation workshops were designed to share useful information about the local public space and empower the participants in mastering their surroundings through knowledge sharing and awareness building. Collaboration with Caritas was essential in conducting this study. Social workers' day-to-day contact with the clients and their frontline work led to unique observations, which set a foundation for research questions and design formation, enabled the recruitment of suitable participants, enhanced trust establishment with study participants, and facilitated focus group meetings and co-creation workshops.

Places undergoing remodelling and renewal often face state-led gentrification, displacement of vulnerable groups (La Grange & Pretorius, 2016), and elimination of the sense of community (Sullivan, 2007). Amid large-scale government-led renewal projects in SSP, the adoption of the PAR approach is of particular importance to engage overlooked vulnerable groups throughout the study to help cultivate a sense of community and collective action. Additionally, unlike case study research, PAR allows significant participation, in turn, raising awareness of public space, provoking participants to think



Figure 6. The co-creation workshop. Note: All participants provided consent for publishing their photos during the research activities.

about this seemingly unfamiliar issue, recalling experiences in urban environments, and envisioning their ideal public spaces. Empowerment also comes in the form of new knowledge and relationships, as participants become more familiar with their residential neighbourhoods and their spatial resources. We also observed information exchanges and bonding among the study participants during focus group discussions. This may encourage them to explore more of their neighbourhood surroundings and strengthen their sense of belonging and social capital.

Additionally, sharing in groups has led to confidence enhancement. Some participants expressed their joy of being listened to and felt surprised that their opinions were valued. Active participation in map co-creation offered an opportunity for participants to shape the output and enhance spatial competence and knowledge sharing. Participatory approaches play a crucial role in developing a sense of transformative agency among disadvantaged groups (Cameron & Grant-Smith, 2005). We believe that this study contributes to such agency formation of the participants. Overall, the concrete space-specific inputs build a solid foundation which may transfer as a cornerstone for further bottom-up spatial intervention in the neighbourhoods.

5.3. Study Limitations and Recommendations

Several limitations of this research should be noted. Primarily, all participants are Caritas' service clients prone to or affected by mental health conditions, and

thus the results might not represent the general vulnerable population in SSP. Additionally, females comprise a predominant proportion of the sample and study participants were all ethnically Chinese. Opinions from male residents and other ethnicities would be of great importance for future research.

Our preliminary finding unveils insights that point to future research directions. First, study findings reveal the impact of inter-group tension in public space usage, raising questions about gender, ethnicity, and the competing interest and territoriality in space. Further investigation is suggested to gain a more thorough understanding of these groups' dynamics and their effects. Secondly, while our study demonstrates the application of using the PAR approach, its long-term impacts on disadvantaged urban dwellers with regard to implementing improvements and enhancing well-being are of great interest for future research. After discovering hindering and encouraging factors of public space usage in the study, we plan to continue building the relationship with study participants and Caritas to further co-design and implement improvements for SSP's neighbourhood-scale public spaces and enhance participants' spatial competence and knowledge sharing. Thirdly, although our research scope did not specifically focus on the challenges faced by families with underage children amidst the pandemic impact, with childcare being one of the main activities and concerns reported by the participants, future studies utilising the information of families with children would be very important as it influences participants' frequency and experience of public space



深水埗 公共空間 社區地圖 Sham Shui Po Public Space Community Map

2021 深水埗 公共空間 社區地圖 Sham Shui Po Public Space Community Map

深水埗特色街道 Sham Shui Po Street Culture

深水埗在過去數十年來，一直以其獨特的街道文化而聞名。這些街道不僅是居民生活的場所，也是社區文化的載體。本圖介紹了深水埗的九條特色街道，包括：

- 福祿街 (Fuk Luk Street)**: 歷史悠久的街道，充滿了傳統建築和商店。
- 福祥街 (Fuk Hang Street)**: 以傳統茶樓和食肆為特色。
- 汝州街 (Yu Chau Street)**: 著名的「汝州粉」發源地。
- 基隆街 (Ki Lung Street)**: 以傳統麵食和點心店為特色。
- 寶雲街 (Poi Yuen Street)**: 以傳統茶樓和食肆為特色。
- 寶雲街 (Poi Yuen Street)**: 以傳統茶樓和食肆為特色。
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- 寶雲街 (Poi Yuen Street)**: 以傳統茶樓和食肆為特色。

項目簡介 Project Introduction

高質素的公共空間是城市發展的重要一環。特別是在深水埗人口密度極高的地區，如何善用公共空間，提升居民的生活質素，是我們一直關注的焦點。本圖是根據「深水埗公共空間社區地圖」計劃的成果而編製的，旨在為居民提供有關公共空間的資訊，並鼓勵大家參與改善公共空間的工作。

The recent pandemic has highlighted the role of public spaces worldwide, particularly in dense neighbourhoods like Sham Shui Po. Hence, the School of Architecture at the Chinese University of Hong Kong started a study to understand the perceptions, habits of use and the condition of public spaces by conducting focus groups with over 50 residents of Sham Shui Po and Shek Kip Mei. An in-depth, well-structured information about available public spaces in the neighbourhood, so that those who need these spaces most can enjoy larger access and eventually, quality time in the community. This project, funded by CUHK Development Fund, and would not be possible without the generous help of the participants of the focus groups.

深水埗地標 Landmarks of Sham Shui Po

深水埗地標是該區歷史和文化的縮影。本圖介紹了深水埗的九個地標，包括：

- 榮華樓 (Mei Ho House)**: 具有歷史意義的建築。
- 高第街花園中心 (Garden Centre)**: 提供綠化空間和休閒設施。
- 英皇閣 (Tin Hau Temple)**: 具有宗教和文化意義的建築。
- 關帝廟 (Kwan Tai Temple)**: 具有宗教和文化意義的建築。
- 三太子廟 (Sam Tai Tze & Pak Tai Temples)**: 具有宗教和文化意義的建築。

深水埗街坊的公共空間 Public Space for Locals

本圖介紹了深水埗街坊的17個公共空間，包括：

- 福昌公園 (Fuk Cheung Park)**: 提供綠化空間和休閒設施。
- 禧街公園 (Fung Chau Street Park)**: 提供綠化空間和休閒設施。
- 深水埗公園 (Sham Shui Po Park)**: 提供綠化空間和休閒設施。
- 西九龍中心 (Dragon Centre)**: 提供綠化空間和休閒設施。
- 北河街市政大樓 (Poi Ho St Municipal Services Building)**: 提供綠化空間和休閒設施。
- 石硤街綠化花園 (Shek Kip Mei Street Red Garden)**: 提供綠化空間和休閒設施。
- 楓樹街遊樂場 (Maple Street Playground)**: 提供兒童遊樂設施。
- 黃金電腦商場 (Golden Computer Arcade)**: 提供購物和休閒設施。
- 元州街圖書館 (Un Chau Street Public Library)**: 提供閱讀和學習設施。
- 花園山 (Garden Hill)**: 提供綠化空間和休閒設施。
- 大坑復興遊樂場 (Tai Hang Tung Recreation Ground)**: 提供兒童遊樂設施。
- 石硤街新發展大樓 (Shek Kip Mei Estate Ancillary Facilities Block)**: 提供綠化空間和休閒設施。
- 石硤街中央遊樂場 (Shek Kip Mei Central Playground)**: 提供兒童遊樂設施。
- 石硤街公園 (Shek Kip Mei Park)**: 提供綠化空間和休閒設施。

Figure 7. Community map. Urban Planning, 2022, Volume 7, Issue 4, Pages 75–89

usage. Lastly, insights in this study are mostly drawn from individual experiences in some public spaces. There is a need to further examine neighbourhood public space networks in their entirety, particularly the street spaces.

6. Conclusions

This participatory action research explores vulnerable groups' experience of public spaces and the impacts of Covid-19 in Hong Kong's dense grassroots district SSP. Public spaces prove to be essential for vulnerable groups from a well-being perspective. This is particularly true for those suffering from cramped and undesirable living conditions. However, factors like perceived safety related to gender and ethnicity, and the lack of information about available public spaces and facilities hinder the usage of public spaces, all overlooked issues in the neighbourhood. The adoption of PAR fosters awareness-building, confidence enhancement, and empowerment of vulnerable groups, which is fundamental for creating transformative agency and ownership. The production of a tangible outcome and the community public place map in this research significantly enhanced study participants' understanding of the research and its relevance, and facilitated their engagement in the group discussions. This study provides implications for public space and street planning in an Asian dense urban environment and points to future research directions in the dynamics of gender, ethnicity, and self-esteem, and the possible synergies within public space networks.

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Conflict of Interests

The authors declare no conflict of interests.

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