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Exploring the Market Requirements for Smart and Traditional Ageing Housing Units: A Mixed Methods Approach

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Abstract: The world's population is getting older these days. Frailty, a gerontologic health condition associated with ageing, has serious consequences. One crucial remedy for the elderly population is the development of ageing-in-place infrastructures. To better understand the market requirements for ageing housing units, the causes of downsizing and the governmental measures to ameliorate the situation, face-to-face in-depth individual and focus group interviews were conducted in this study. Elderly residents of two significant ageing-in-place institutions in Hong Kong, along with their caregivers, were interviewed. The method of methodological triangulation was used to combine interviews, records, and communication tools to increase the reliability and trustworthiness of the findings. The provision of facilities for the elderly has successfully established a pathway for creating and making housing spaces available to families who need larger homes, while the elderly typically downsize from larger homes and relieve their financial needs. It is also found that a digital divide exists; some respondents suggested that they do not know about computers and do not use smart facilities in their homes.

Keywords: ageing-in-place; facilities; downsizing; carers; gerontologic health; digital divide



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1. Introduction

The number of persons aged 60 and older worldwide climbed from 382 million in 1980 to 962 million in 2017, and that number is projected to increase to 2.1 billion by the year 2050 [1]. Most individuals, especially the elderly, believe that seniors in nursing homes are more likely to suffer from depression than those living outside nursing homes [2]. This may be because social support is an essential health construct [3]. Thus, most older adults prefer to grow old at home [4] rather than in a nursing facility. Previous research shows that up to 78% of the elderly population worldwide feel depressed when they stay in an elderly nursing home [5].

The idea of ageing-in-place has gained popularity in recent years as a widely adopted strategy for the ageing populations to “remain living in the community, with some level of independence, rather than in residential care” [6]. According to the Centers for Disease Control and Prevention [7], ageing-in-place is “the ability to live in one’s own home and community safely, independently, and comfortably, regardless of age, income, or ability level”. Additionally, older people have an abiding attachment to their homes.

Ageing-in-place is a broad concept, comprising different dimensions from personal to socioeconomics, including healthcare concerns [8]. When adopting ageing-in-place, the essential element is the integration of different stakeholders [9]. An efficient ageing-in-place coordinates the elderly and the community and establishes onsite and offsite services from the intermediate to long periods. The success of ageing-in-place can be summarized by assessing whether adequate effort is made to address health, information, practical assistance, finance, activities, community, transport, and safety [10,11].

Concerning clinical services provided to the elderly in Australia, for instance, ageing-in-place-related services with emphases on independence and security allow the elderly better adoption to changes [10]. The elderly prefer to live in their homes for many reasons. Clinical service providers must therefore pay special attention to the ageing-in-place policies for groups requiring special needs, such as the elderly with dementia. Thoma-Lurken, Bleijlevens [12] identified community-based care as necessary to address the unique needs of the elderly after interviewing a group of caregivers and experts. Specialized care emphasizes three problem areas: insufficient service providers, increased safety problems for the elderly with special needs, and decreased self-reliance [12].

In New Zealand, ageing-in-place satisfies the elderly by providing a sense of security and connectedness to the community [6]. In this aspect, supplementary care services are less important than the personal satisfaction of the elderly. Meanwhile, ageing-in-place in England and the United States is being systematically developed, as its mechanisms and approaches are well-defined and well-established. Burton, Mitchell [13] developed an assessment tool to facilitate the investigation of older adults' well-being by using the Neighborhood Design Characteristics Checklist. It suggests that considering the non-linear relationships between elderly people's emotions and neighborhood environments can have little effect on physical amenities [13]. Accordingly, the success of ageing-in-place implementation depends significantly on the amenities and services provided to support older people. However, the practices vary among regions. Indeed, such regional disunities should require different considerations regarding the needs of the elderly community during application.

In addition, the growth of senior care services has been significantly aided in recent years by the fourth scientific and technological revolution, which is defined by the Internet of Things (IoTs), information technology, big data, and cloud computing. The development of ageing-in-place has been facilitated by several developing technologies, one of which is smart home technology for elderly care. The goal of smart homes for senior care is to offer a range of affordable services that will suit the needs of the elderly in terms of safety, freedom, health, and help. To properly care for the elderly, smart home care seems to be crucial [14].

In the following, Section 2 is the literature review, Section 3 denotes data collection, and Section 4 is the case studies. Section 5 is the observations from the case studies. Section 6 describes the interview results and Section 7 concludes the research.

2. Literature Review

2.1. Challenges for Frail Older People for Ageing-in-Place

"Frailty" is an adverse, gerontologic health condition associated with ageing with serious repercussions [15]. It has become an increasingly used concept in the research on ageing and clinical care of old people [16]. The social standing of frail older persons is unstable [17]. As a frequent clinical syndrome in the elderly, various health risks are linked to health deterioration and frailty in older age [18], such as falls, disability, hospitalization, and mortality [15,19–25]. Generally, frailty refers to older adults who lose independence [26]. It also links to the experiences of losing dignity due to social and emotional isolation risk [27]. However, there are far fewer elderly home care services nowadays due to the ageing population problem and insufficient nursing workforce.

Given the above, ageing-in-place has gained importance in recent years [28]. Despite increasing frailty and complex needs, many elderly prefer to remain at home as long as

possible, that is, “ageing-in-place” [29]. Therefore, challenges for the provision of ageing-in-place services and accommodations for frail old people have become a critical need that has attracted academic researchers’ eyeballs. Nevertheless, most studies on frail older people focus on healthcare; studies investigated the issue of frail old people ageing in place in smart homes, for example, sense of safety [30], space, and residence [31–33], healthcare [15,34–38], social activities [39], smart technologies [40], cost of ageing-in-place [41], public administration, and policy-making [42–44].

Regarding Hong Kong, previous research on ageing-in-place focused on the neighborhood environment, rarely on the perception of ageing-in-place, and even less on traditional or smart ageing-in-place. For example, comparing the relationship between seniors’ health and the neighborhood environment in Hong Kong, Tokyo, and Singapore, Loo, et al. [45] stated the importance of the neighborhood environment; ageing-in-place should prioritize a walkable urban environment. Jayantha, Qian [46] evaluated the applicability and effectiveness of the aged-friendly home design and care amenities in renovated public rental housing (PRH) estates in Hong Kong to study the application of the ageing-in-place concept and found that the provision of common facilities for the elderly falls short of expectations. Shi [28] pointed out that older people placed a high value on landscape features that contribute to comfort and avoid risks. As a result, certain landscape aspects and features have been identified as essential for older people and should be prioritized in community landscape design. Chen and Chan [47] designed and tested a senior technology acceptance and reaction to gerontechnology, but theirs did not focus on ageing-in-place.

Ageing is an acute problem in Hong Kong [45]. The unsatisfaction with ageing-in-place in Hong Kong, studied by Jayantha, Qian [46], showcases a densely populated old Asian city, which offers light on how public housing (re)development might be managed to accommodate ageing-in-place. Apart from the supply side, people’s perception of smart and traditional ageing-in-place is of academic and practical importance, as it offers directions for frail old people’s demand-side concerns. Consequently, to ensure the successful implementation of ageing-in-place, a more comprehensive and sophisticated approach at the micro, meso, and macro dimensions is required [44].

2.2. Ageing-in-Place Facilities

The prevalent phenomena among the elderly are depression, medication, disabilities, behavioural abnormalities, debilitating illnesses, cognitive dysfunction or dementia [48]. This means specialized facilities are required to alleviate the elderly’s health deterioration and reduce caregivers’ subsequent burden and stress. Such specialized facilities include architectural design, and supporting aids such as intelligent gadgets [49]. The provision of building services facilities such as lighting, temperature control, and ventilation can affect the elderly population’s quality of life. These appropriate building services compensate for the deterioration of the older person’s sensory abilities; for instance, good lighting compensates for poor vision [50].

Secondly, the architectural building design should address the layout and design of the living space and the distances between rooms, fixtures, and furniture. An adequate space allocation supports older people’s activities, improving their health and physical functioning. Although the shorter distances within residential units aid their activities, limited space constricts wheelchair users. According to Bogataj, McDonnell [51], barrier-free facility management (e.g., buildings, communication, and transportation facilities) assists the elderly in achieving and maintaining an active ageing life. Among these is the use of appropriate colors in buildings to enhance older person’s activity and mood, thus offsetting sensory impairment, while good luminosity contrasts aid visual acuity. Considering spinal curvature and limited reach, fixtures and fittings (e.g., cabinets) can be designed to an appropriate adjustable height that fits the elderly. Leung, Famakin [50] asserted that there should be extra facilities such as non-slip flooring and handrails in elderly homes.

Thirdly, there is a growing elderly population concerns on age-friendly neighbourhoods [52]. Elderly neighborhoods should have healthcare facilities such as clinics, hospitals, and healthcare centres. This is reflected after COVID-19. During the pandemic, places such as Milan suffered from very poor accessibility to primary health services, and many elderly's conditions deteriorated even more because of limited services and activities [53].

Finally, the provision of smart gadgets such as panic buttons can assist care takers in monitoring the elderly person's health and can prevent falls even remotely [54]. Many intelligent home gadgets offer a sustainable built environment by improving living quality [53] and offer high practical value for the elderly. If the Hong Kong public housing sector provides suitable ageing-in-place rental units, it can cater to the needs of elderly people at home. In fact, several of these facilities have already been incorporated within the Hong Kong Housing Society (HKHS) units. The HKHS Senior Citizen Residences Scheme provides facilities such as libraries and sports centers to improve older adults' quality of life.

Previous research evidenced that elderly persons are reluctant to move away from their familiar living environment [55,56]. Due to current housing shortages, existing tenants are treated as new applicants and may not be explicitly allocated suitable flats [57]. Panel data collected from 1991 to 2008 on the elderly population in Germany indicate that homeowners resist downsizing their housing occupancy [53], as moving into smaller accommodations reduces their housing benefits [56]. However, such downsizing sometimes occurs: some of the lower-income elderly are dissatisfied with their housing size, finding that their house is unnecessarily large. Although there are cultural variations, the panel data successfully illustrate the housing occupancy patterns, showing that the elderly population seem less incentivized to move away from their existing home.

According to research conducted in 2016, many elderly persons remain in their homes longer than younger persons who need to work and thus have a higher requirement to move [58]. However, the elderly may consider downsizing if smaller housing is associated with better facilities, proximity to shopping areas, transportation, better household design [59,60], or a desire to live closer to familiar neighbors and relatives. This implies that intergenerational housing may be suitable for the elderly population [61]. Regarding motivations for older adults to downsize their residential units, households with higher loan-to-value ratios have a greater chance of being financially constrained and are more likely to downsize [62]. Silva-Smith, Feliciano [63] suggested that senior housing is an opportunity for older adults to downsize their housing units to upsize their lives by joining a community rich in resources, including health, cognitive, and psychosocial engagement benefits.

Living alone may have a more substantial detrimental impact on elderly Chinese than their Western counterparts [64], causing social exclusion; thus, intergenerational living may be a good choice for older adults. Previous research has demonstrated that co-residence with children is still common, and it is commonplace in Asian countries such as Myanmar and Vietnam. Intergenerational co-housing refers to the existence of younger citizens also living within that society [65]. Lim [66] suggested that the choice of location is affected by economic concerns. Nevertheless, as the generation gap is one of the significant problems, participants who live with their parents are more dissatisfied than those living in their own private or rented housing [67].

2.3. Smart Ageing-in-Place for Old People

The growing population of elders and their desire for ageing-in-place raise considerable healthcare and housing concerns. However, most homes lack the necessary design features to facilitate independent living in a safe and viable manner [68]. Technology has been proposed and investigated for its potential to help ageing-in-place while keeping active lifestyles at home safe and secure [47,69,70]. Recently, interest in the usefulness and acceptability of smart home technologies for ageing-in-place safely and independently has been surging [71–74]. There is evidence that the advancement of technology contributes to

elders, particularly those who live alone, to live independently and relieve caregiver pressure [75]. Therefore, it is significant to understand perceptions and use of gerontechnology in order to optimize design, application, and education strategies that can reduce caregiver strain, promote healthy ageing-in-place, and reduce healthcare costs [76].

Smart homes utilize intelligent environments projected to improve the residents' quality of life. They increase the independence of elderly individuals with impaired cognitive or physical capacity [77]. The purpose of designing smart homes for elders is to support their capacity to age-in-place while also controlling healthcare expenses [78]. Smart homes must be equipped to boost resident security and reduce the danger of falls, stress, fear, isolation, and other potential difficulties to achieve this goal [79]. Li, Yigitcanlar [80] investigated the motivations, barriers, and risks of smart home adoption and revealed that healthcare, energy efficiency, and home security are all superior technology services. Technology services include improved energy management, better home-based healthcare, potential financial savings and advantages, and improved quality of life motivation for adopting smart homes. The main barriers to adoption include distrust and resistance, finite perception of smart homes, financial worries, privacy and security concerns, technology anxiety, and negative social impacts. In addition, energy rebounds and wasteful usage, difficulties in domesticating technology, and destructiveness in domestic life are among the most significant risks.

Despite all the potential advantages that smart home technologies can bring, in contrast to younger folks, older adults are slower to adopt new technologies and tend to utilize them less regularly. It is commonly known that older persons use and have less access to modern technology than younger people. For instance, according to a recent national poll conducted in France, just 8.4% of older persons born before 1930 use the Internet, compared with 32.9% of those born between 1930 and 1949 and nearly 100% of those born after 1990. According to Rogers' "diffusion of innovations" hypothesis, older adults are classified as "laggards" because they are less innovative than other members of their social system. When confronted with advances, people in this category are said to be more traditional, conservative, skeptic, suspicious, risk-averse, and cautious [81]. While ageing-in-place in Hong Kong provides smart technologies, how the residents perceive it is unknown. As such, this study aims to fill this void.

2.4. Senior Citizen Residence Scheme (SEN)

Many Hong Kongers, including the elderly themselves and their caretakers, have little information about the senior housing units provided by the HKHS. The Senior Citizen Residences Scheme is an initiative by the HKHS to provide purpose-built housing for the elderly aged 60 or above in the middle-income group, allowing them to live independent lives through "healthy ageing" and ageing-in-place. Currently, most of the Hong Kong Housing Authority's (HKHA)'s elderly housing is now accommodating both the elderly and their younger generation family members (i.e., intergenerational living). This also helps the problems of the younger generation, who cannot afford the extremely high housing prices. Moreover, the younger relatives can take care of the elderly and help them manage their social activities. The Senior Citizen Residences Scheme adopts a "life lease" approach, comprising a comprehensive and holistic approach to its home care strategy. These services are further enhanced in a retirement community through agencies engaged by the HKHS. This demonstrates an essential characteristic: healthcare forms part of a composite model rather than a complete picture of the home care strategy [82]. Examples of the Senior Citizen Residences Scheme in Hong Kong are Cheerful Court and Jolly Place [83,84].

3. Research Method and Data Collection

Face-to-face in-depth individual and focus group interviews were selected as an appropriate method to explore the market requirements of elderly housing units. The interviews were conducted with existing elderly tenants, caretakers, and show-flat visitors in their homes. As the Senior Citizen Residences is a unique and new type of elderly

housing, respondents with no or limited prior knowledge had difficulties commenting on the market needs. Site visits were also conducted as a case study, like Filomena, Verstegen [85], to study the actual use of the facilities, as it was speculated that the elderly might not use all the provided facilities. The methodological triangulation process was adopted to enhance the reliability and credibility of the findings [86]. This approach involves multiple research methods, including numerous interviews, documents, internal archival records, and communication tools [87].

One of the great strengths of methodological triangulation compared with other methods is that evidence can be collected from multiple sources. Triangulation uses evidence from different sources to corroborate the same fact or finding. In addition to the interviews conducted for this study, video clips of two elderly housing estates, Tanner Hill and Cheerful Court (Senior Citizen Residences Scheme), were produced to inform interviewees about these projects before they made any comments. The video of Cheerful Court (Senior Citizen Residences Scheme) showed the traditional indoor facilities, such as handrails and emergency call buttons. In contrast, the video of Tanner Hill focused more on the smart facilities, such as the sensors used to record whether the person has been out for one day, or blood pressure recording systems. The video elicitation interviews would facilitate the investigation of participants' thoughts and feelings on a specific topic [88,89]; in this case, the elderly's market needs either traditional or smart elderly facilities and the differences in rent between these two markets' products. During the interviews, participants were encouraged to pause the recorded video clips if the video triggered a comment or thought [89]. Although the videos are more time-consuming than standard qualitative methods such as face-to-face interviews [88], they help interviewees comprehend complex issues [90] and gain insights while prompting discussion in interviews [91].

4. Case Studies Results

4.1. Case of Tanner Hill and Cheerful Court

Tanner Hill is one of the housing projects HKHS provides for the elderly. Designed as a hub of heartfelt and holistic services and care, it aims to provide residential units that allow the elderly to age-in-place with dignity and joy. Tanner Hill offers features for ageing-in-place in smart homes. To make sure that the residents within the apartment are awake and alert, a smart device monitors the door movement every 24 h. If not, the control center will get a notification requesting emergency assistance. Tenants can check and record their body temperatures, pulse rates, and blood pressure daily. When a tenant's health information deviates from the pre-set personal parameters, an alert will be sent, and the duty nurse will take appropriate action after reviewing the results. There is a sensor that monitors the unit's motion status to determine if the tenants have remained inactive continuously for eight hours before sending a request for emergency assistance to the control center.

Additionally, it incorporates elderly-friendly features in its architecture and interior design, ensuring that most facilities and equipment (air-conditioner, washing machine, clothes dryer, microwave, and refrigerator) meet the individual requirements of the elderly occupants and their caretakers. This project provides convenient facilities for senior occupants in independent living residential and common areas. Since the elderly may have some health problems which are not conducive to traditional homes, Tanner Hill provides facilities that assist with health issues, including convenient transportation services [92].

Tanner Hill offers an alternative for older adults who cannot rent housing units. There are two types of leases available at Tanner Hill. The long-term lease allows residents to live there until their demise. Others can renew the lease once or five times in ten years. There is a sanatorium nearby with immediate care services for the sick. A residential card is also provided to access facilities such as the library. There is annual maintenance for all the emergency settings in the room.

Launched in 2004 by HKHS, Cheerful Court is near Ngau Tau Kok. The recreation and ancillary facilities in Cheerful Court include three unique features. Firstly, rehabilitation-

oriented occupational therapy has activities such as muscle strengthening for those elderly occupants who are considered of frail status. Secondly, treatment and pressure mapping are provided to care for stroke and traumatic brain injury patients to alleviate problems associated with ageing and the proliferation of elderly health issues. Thirdly, physiotherapy is another highlighted feature that can attract some elderly to provide post-stroke rehabilitation treatments to improve patients' mobility, electrical nerve stimulation and modern acupuncture for pain relief [93]. Research has established that group activity intervention in occupational therapy is one of many positive methods of supporting elderly patients discharged from the hospital back home [94]. Thus, the initiatives mentioned above and the program itself are hugely beneficial.

Furthermore, the living area of Cheerful Court has adopted elderly-friendly safety features. Each unit has specially designed wooden flooring to prevent accidents caused by wet or slippery floors. Such thoughtful features are suitable for the elderly with an imbalanced posture. Moreover, the emergency nurse call system is another vital feature available in the event of a domestic accident or medical emergency. Hence, Cheerful Court offers a private living area, as well as medical and frailty care to its occupants. Residents can also enjoy priority in using the services provided by the Cheerful Court Care Home—a residential care home service in the same estate [93]. As Table 1 shows, according to the Senior Citizen Residences scheme, a one-bedroom unit costs merely HKD 1.3–1.7 million for those aged 60–64 years, with slightly reduced prices available to the older age groups. In contrast, similar units in a nearby location are priced at HKD 3.5 million, demonstrating a vast difference from the private market, 60% less than the latter [93]. Detailed prices of Cheerful Court can be found in the following table.

Table 1. Required contribution for Cheerful Court (Adapted from Ref. [83]. 2020, Hong Kong Housing Society).

Age	Studio	One-Bedroom
60–64	HKD 924,800–HKD 1,175,800	HKD 1,399,800–HKD 1,811,800
65–69	HKD 832,800–HKD 1,059,800	HKD 1,256,800–HKD 1,628,800
70–74	HKD 783,800–HKD 1,000,800	HKD 1,189,800–HKD 1,542,800
75 or above	HKD 739,800–HKD 939,800	HKD 1,117,800–HKD 1,451,800

Located adjacent to the North Point MTR Station, Cheerful Court is within walking distance of major shopping malls and recreational areas. It offers convenience and tranquil accommodation for the retired and is located in a lush green zone with scenic walking trails along the Aroma Walk [92].

Reasons for Moving to Ageing-in-Place Residential Units

In the case of Tanner Hill, there were 2 participants with different backgrounds, Miss A and Miss B.

Miss A came from overseas prior to living in Tanner Hill. Miss A has suffered a minor stroke and considered other housing. There are two reasons for choosing Tanner Hill. Firstly, she owns a flat but does not want to stay alone. She wishes to have somebody care for her, as it can comfort her emotionally. The other reason is that renting the Tanner Hill unit did not require asset assessment.

She had wished to buy an elderly home but failed to pass the asset assessment and stated that:

“I wanted to go to another estate, like the elderly estate in Ngau Tau Kok. Thus, I stayed here temporarily and waited to move to other places. I moved to Tanner Hill involuntarily since I am not eligible for other places. The choice of living in Tanner Hill is suitable at the moment. However, the rent is adjusted every two years. The financial situation may bar me from continuing to live here in the future.”

Miss B, before moving in, was a homeowner of a flat with about HKD 20 million (including cash, silver bonds, and mutual funds). The flat was more than 900 square feet. She wished to get some cash by selling her flat. She subsequently looked for some flats of around 400 square feet. Her housing unit was one of her major assets, accounting for 80% of the total. Her main reason for downsizing was to achieve better future financial planning. In addition, the need to find somebody to take care of her was another factor that drove her to Tanner Hill. As she stated:

"If I had good economic status, I would choose to live in a bigger place. My majority asset was my housing unit. I had no choice but to buy a long lease in Tanner Hill." "If I continued to live in my own house, who would take care of me? I cannot rely too much on my siblings. Living in an elderly home, we can take care of each other, as we are of the same age group and know each other's concerns."

In the case of Cheerful Court, there are 3 participants with different backgrounds, Mr. C, Mrs. D, and Miss E.

Mr. C and his wife came to Hong Kong after living overseas for many years and have lived in Cheerful Court for more than 15 years. Although he is in the 85–89-year-old age group, he is the healthiest and has the best perceived economic well-being among all the respondents in the Cheerful Court case studies. Initially, he lived in a retirement village with similar facilities to Cheerful Court, but that was a house instead of an apartment. He claimed he had roughly HKD 3 million at retirement age.

Mrs. D, like the other cases, lives alone and wishes to have somebody care for her: "I used to live with my elder brother. He would not be able to take care of me. My friend told me I could apply for the estate I lived in for those who are over 60 years. That is why I have moved in now." She downsized her flat from 500 to 230 square feet.

Miss E is Catholic and attends church. She lived in a district close to Cheerful Court before migration. She encountered many difficulties at that time securing job opportunities since her profession was air conditioning services. She then returned to Hong Kong. She had suffered a minor paralyzing stroke by this time and had no children but was sometimes catered to by her nephew. She moved into a 200-square-foot apartment with an open kitchen at Cheerful Court after leaving her 400-square-foot residence in Quarry Bay. She indicated that most of the elderly in this estate had chronic diseases, including chronic stomach illnesses and heart disease, with no one to care for them. The Hong Kong Housing Society offered no time limit for staying in this unit.

4.2. Tanner Hill and Cheerful Court Residents' Perceptions Analyses

4.2.1. Perception on Smart Facilities

Most of the previous literature highlights the importance of smart facilities for ageing-in-place. The availability of smart devices, such as panic buttons, helps caregivers to monitor the old person's health and avoid falls even from a distance [54]. Smart homes increase the independence of elderly individuals with an impaired cognitive or physical capacity [77]. However, the interview result shows that none of them cared about smart home facilities, nor shows the urge for better smart facilities. A common reason that hinders older people from benefiting from smart facilities is that they do not know how to use them. For example, Miss B and Miss D stated:

"I just know there is an energy-saving facility. Nevertheless, I am not familiar with the smart system. The elderly facilities such as the blood pressure measurer and the auto alarm are convenient for us".

"For my generation, we do not use computers as most of us are not familiar with them".

The other reason that prevents the elderly from adopting smart facilities is that the design is not reasonable enough for them. In the Tanner Hill case, Miss B stated:

"In my case, my eyes are not good."

In addition, according to Miss A, the current system is enough for her:

“There is a good intercom system to ensure security. If an older adult is out of contact for 24 hours, they will call the police immediately.”

4.2.2. Older People Are More Concerned about Traditional Facilities Provided

The elderly people’s main concern about facilities for ageing-in-place remains the traditional aspects, such as space and services, healthcare services, and economy.

Space and Services

Concerning space and services, the current status of Tanner Hill could satisfy their needs. For example, Miss A stated that “facilities offered to be very useful to her, as Tanner Hill provides services to take care of us. Also, there is sufficient space for us to exercise”. Miss B commented that she only needs a unit with available elderly facilities. There is a brighter lighting system than the one in her house. There is a wider staircase with fewer steps. She needs to live in an environment with many elderly facilities, such as the 24 h Call and Care Service. All in all, living in Tanner Hill is better than her house for the elderly.

In the Cheerful court case, Miss E confirmed that the main reason that drove her to move in was the facilities provided by the housing providers. She expected fully facilitated elderly housing, but she is not happy with what she has been provided now.

“Ten years ago, there was a bus to take us to the recreational area to reach; it had a gymnasium, swimming pool, library, shopping mall, and so on. It was very convenient for us, so I decided to stay here. I love swimming a lot. Nevertheless, the swimming pool is too small, so I do not swim here. I also do not use the gymnasium since I had a painful experience, I will not use it. I sometimes read newspapers in the library but do not read books there.”

Healthcare Services

Previous research suggested that the ageing-in-place policy needs to address the traditional health domain [95]. Regarding health services, 80% of the respondents in this study expressed their concerns about it. For example, Miss A indicated that she “had to go to eastern hospital regularly. The Chinese clinic of Hong Kong Baptist University opens this September. As my leg was hurt during the typhoon, I went there once . . . However, as I can take care of myself, I sometimes think it is annoying. Since I have a high blood pressure problem, I have a blood measurer. Some nurses are staying in Tanner Hill for any emergency. I am sure that they have a blood measurer as well. Also, I know there is a blood measurer in the common room”.

While Miss E is satisfied with the living environment and building structure, she raised concerns regarding the high medical charges inside the housing estate and suggested providing a shuttle bus service.

“The building structure is excellent, as well as the living environment. The building structure is even better than the ones in the private market. However, it lacks a good-quality doctor’s clinic. As there are many older people with a poor economic background in this housing estate, they cannot afford high medical expenses. Alternatively, some have already made appointments with medical doctors outside this estate. Sometimes, I must see the doctor in another district. I liked the shuttle they had before, which cost only two dollars. It was reasonable and convenient. However, there was a low attendance rate, and the service was cancelled due to high maintenance costs.”

Miss B pointed out that the clinic service in Tanner Hill is convenient for her to use, so she does not need to go to the clinic in another District. It is convenient and has all her previous history to offer better clinical service. Indeed, clinical services are a significant expense amongst older adults, as the charges are pretty high. Moreover, Tanner Hill is an excellent place to live, as it is very close to Pamela Youde Nethersole Eastern Hospital where service is provided.

According to Mrs. D, the medical services at the facility, on top of the Call and Care services, were not much in use to provide extra services, since they were concerned more

with emotional issues than the actual cures of the ailment. Serious illnesses would have to be referred to medical doctors.

Miss E also pointed out that some services, such as the Call and Care service, have not always been reliable and would be appropriate if tenants had direct access to the ambulance department. The cost of meals for the restaurant on site was also quite expensive.

Medical Costs

As people age, they typically face increased prices and expenditures while frequently dealing with several health-related ailments. Although ageing-in-place is favored by senior citizens, and is frequently argued by politicians to be more cost-effective than residential care, little study has been conducted on the actual cost of ageing-in-place for senior citizens [96]. This study reflected the costs of enjoying healthcare services as one of the main concerns. Miss A commented that:

"The charges for the Chinese clinic in Tanner Hill are slightly higher than other Chinese clinics. However, it was much higher than the Tung Hwa mobile Chinese clinic services. It charges me around 900 dollars for 10-day medicine. However, other Chinese clinics only charge around 600 to 700 dollars."

Mr. C, who suffered from slightly high blood pressure and a back pain problem at the age of 80–84 years old, has nevertheless never utilized the health services provided by the housing estate. He considers that

"the fee is unacceptable amongst the elderly, who would seek for any cheaper substitute therapy rather than ask for help from the in-house health service."

As a result, his last back pain problem required physical or acupuncture therapy, but he did not consider the in-house health service as an option.

Mrs. D seldom visited the doctor at her current location due to high service costs, unlike her previous residence in Shau Kei Wan where she visited the doctor at very low costs of HKD 200 per consultation. She added that since there is a hefty financial burden after retirement, she would seek assistance from other government departments before the landlord began forcing the elderly out to other places. Mrs. D scored the Hong Kong Housing Society 70 out of 100 points, mainly due to the relatively low cost of living, despite the space being just about 200 square feet. The unit provides her with the necessary environment for daily activities.

High Rent and Service Charges

The high expense of accommodation is another concern that interviewees raised. 60% of interviewees expressed the burden of charge, and 40% claimed a high expense of accommodation. For example, Miss A said:

"[The housing estate] is fine, as I like living in a quiet place. I also like the close relationship with neighbors. The only thing I dislike is the rent ... After two years, the rent will increase significantly. Initially, there were few people with a short lease on this estate. After adjusting some policies, the short lease now attracts many older people to apply to live here, as the rent is near market price while providing extra facilities and delegated people to take care of you. However, the rent increase is so significant that the elderly cannot afford it".

Mrs. D indicated that if she had some savings, she could have purchased the unit where she currently lived. The apartment was a studio unit with a big bedroom. This unit in the private market costs around a few million Hong Kong dollars, which is why she thinks the price is acceptable for her. A 200-square-foot unit is suitable for one person to live in. As an older adult, the home that can be of satisfaction is simply a unit consisting of a bed, a dining table, and so on. She also complained that cleaning services cost around HKD 80 per hour."

Mrs. D also raised her concern that the miscellaneous expenses, including the Call and Care services, cost more than HKD 2500 per month, which is quite expensive. Since she had no children, it was a significant burden for her without any subsidy. Additionally, unlike other respondents, Mrs. D provided suggestions regarding the provision of a meal subsidy, reducing the management fees, and excluding the payment of rates:

“If possible, I suggest the Hong Kong Housing Society provide more meal subsidies. Hong Kong Housing Society provides fair services, including regular health checks without any charge. However, Hong Kong Housing Society is increasing its management fees significantly. I hope it can relieve the pressure on us by increasing fees at a lower rate. Also, it would be better to exclude the rate charged for the rates . . . The Hong Kong Housing Society can show their sympathy and waive the management fee if the residents encounter huge financial obstacles. I hope they can accommodate some special services or facilities to take care of the elderly who live alone, without charging too much.

In brief, the provision of traditional facilities providing such as space and healthcare concerns the elderly more than the provision of smart facilities.

4.2.3. Housing Option

In the Tanner Hill case, both interviewees mentioned other housing options or, in other words, close competition remains a common issue for both interviewees despite their different considerations.

When asked about the perceptions of Tanner Hill and other elderly homes, Miss A said she had only been to another one in the Kowloon district before. She believed that both units were fine, as the previous one is like a 4-star hotel. Compared with other options, Tanner Hill had an excellent reputation as an elderly home.

When it comes to Miss B, regarding the reverse mortgage, it provided only 60–70% of the total value of her housing unit, and she does not think it was worth adopting. The dividends would have been higher if she had bought a mutual fund after selling her housing unit. If she does have the option in Tanner Hill, she would sell her housing unit and buy a smaller unit for about HKD4 to 8 million in eastern Hong Kong Island. Although she knew there were elderly homes on the mainland, her major concerns were safety and facilities especially catered to the needs of the elderly people. The elderly homes on the mainland did not give her confidence in these two aspects.

In the Cheerful Court case, Mr. C also clarified his reason for moving and downsizing. Mr. C moved to Cheerful Court to minimize his housing expenditure and save his remaining money for retirement living. He lived in a house of around 1000 square feet before moving to a flat of around 500 square feet in Cheerful Court. This is relatively small for him; however, he is currently living alone and is satisfied with the flat size compared with the large size he had overseas for two people. Another important reason to move back to Hong Kong for retirement was the financial burden of the health service overseas: thus, the fear of incurring colossal health expenditure in the future. In addition, the political environment overseas there was unstable. After considering the financial and security problems, he decided to move back to Hong Kong and “buy” a flat as the last home of his life.

4.2.4. Other Concerns about Quality of Ageing-in-Place

The interview result found other major concerns for ageing-in-place, which concentrated on relationships with others, activities, home repair, and low food quality.

The first concerns is the low food quality issue. In total, 60% of participants complained about it during the interview.

In the case of Tanner Hill, regarding the catering services, Miss A complained that, *“the food is of low quality. However, the price is reasonable.”*

In the case of Cheerful Courts, Mr. C claimed that the only leading service he has used is the restaurant; nevertheless, he complained about the deteriorated food quality. Hence,

he often dines outside Cheerful Court. Mrs. D was not satisfied with the catering services at Cheerful Court, indicating a reduction in the quality of meals served at the dining outlets.

“At first, the meals from the restaurant were quite good. However, the quality was not maintained at a high standard. I would not expect too much since it can provide more care services. At night, dinner costs around 40 dollars at nearby restaurants. The [Cheerful Court] restaurant costs 50 dollars, which is reasonable, but the service is not that good. The meals and drinks are not hot enough and not tasty at all. The quality is not stable either, which lowers the attractiveness of dining at that restaurant. It would be better if the food and drink were much hotter.”

For relationships with other tenants, Miss A stated that having a good neighborhood relationship with the other tenants is one of the most important reasons for staying in elderly housing. We did observe that some residents have successfully built friendly relationships with others: for instance, Miss A said, “I have built up friendships in Tanner Hill, whether with the staff on the 3rd or 5th floor or with the neighbor.”

The viewpoint of Miss A regarding the activities organized by Tanner Hill shows that it is also a point of ageing-in-place quality:

“Before hurting my leg, I went swimming and to the gymnasium daily. I also love singing and dancing. The karaoke room has opened only twice. After that, you have to book a room to enjoy your singing here . . . I seldom join their interest classes, as I think they are unsuitable for me. As for me, I like Tai Chi a lot. However, there are different styles of Tai Chi, so I did not join the class offered by the management office. Nevertheless, I like to attend talks or seminars, as I want to acquire more knowledge.”

Miss A also claimed a home repair issue.

“I would like to raise the problem of responsibility for the repair work. The owner should take responsibility for repairing the facilities, not the tenants. I think the Housing Society should raise a concern about that. The owner took charge of repairing facilities such as the heating system in the United States. There are adequate facilities in Tanner Hill. Nevertheless, I cannot use all of them, like the blood measurer, since the measurer is sometimes not functioning. There are some points I want to criticize. A few months ago, the pump in the toilet was out of order, and the Housing Society said I had to share the responsibility of fixing it. I had no choice but to fix it with my money to continue living. Also, the water heater has been out of order sometimes, especially when there is a typhoon. They refused to repair it at first, but at last, they helped me to replace the starter of the water heater. I think this kind of request is absurd, as I am not the owner of this unit. I just rent it.”

Personal issues such as Miss E’s case should also be counted. Due to personal problems, the respondent was not satisfied with the current housing unit. Firstly, due to the lack of money, she was financially supported by her nephew. She has employed a domestic worker to take care of her. Other personal problems causing her dissatisfaction with Cheerful Court include chronic disease and medical expenses, low self-esteem resulting from financial burden, the enthusiasm to live independently, and the lack of trust in medical doctors stationed at Cheerful Court.

To conclude, in both the Tanner Hill case and Cheerful Court cases, the in-depth interview results show that smart homes are not a main consideration for the elderly, and it was mainly due to the digital divide and fit for elderly people use. Therefore, the residents do not often use the smart gadgets provided by the HKHS. The main concern of ageing-in-place remains traditional issues such as charge, healthcare, service, etc. The above-mentioned situation may affect the elderly’s decision makings when choosing alternative residences for ageing-in-place.

4.3. Observations from the Individual Case Studies

It was observed that many respondents moved to Hong Kong from other countries before living in elderly housing estates. Some older people did not use the facilities provided by the estates for various reasons. Their primary concern was the high rent, which bars many older people from enjoying the services. Although the restaurant is among the major facilities used by the elderly, some of them expressed their dissatisfaction with the food quality. In addition, though some of them stated that they had health problems, some used outside clinics; thus, they could easily find substitutes outside.

Regarding the indoor facilities, the health recorder was a helpful tool. Some of the case studies also illustrated the importance of a holistic view regarding housing services. For example, in one of the case studies, respondents said their dissatisfaction mainly comes from financial dependency. Another raised concerns regarding their religious needs. To a certain extent, many of those who move into elderly housing are afraid to live alone without mental support. Thus, religious facilities may help in this regard.

4.3.1. Perspectives on Elderly Housing Needs and Aspiration

Some respondents considered that basic elderly housing facilities such as handrails were essential for the elderly. A respondent indicated that older people might have accidents, mainly from slips and falls. The Call and Care service provides convenience for the elderly to gain medical assistance during injuries. Even though the tenants considered the brilliant home facilities useful, they did not consider them practical. An example is that even though there is a detector to help report accidents, it could be too late when an accident happens. Others demanded that the gadgets are made simpler and easier to use. The results also illustrated the possibility of downsizing from bigger apartments to elderly homes to reduce the need for cleaning. One of the respondents said,

"If I live alone, perhaps about 300 square feet is ok. It is spacious enough to have a bedroom and a living room, which is sufficient for me. Otherwise, it will be hard for me to do the household chores in a large house. One without a bedroom is also fine."

Another suggested that conflict between family members may be a reason for downsizing. Although there are some elderly homes which the government organizes, the waiting time is too long.

4.3.2. Market Rent for Elderly Housing with Traditional Facilities (Public Tenants)

The research results show that the respondents have low expectations for the flats: because they no longer earn money, they think they should not expect too much. The choice of a particular flat was because the structure and design of the facilities in the flat seemed quite simple. Moreover, the maintenance cost of these facilities could not be too high. Nowadays, housing units provided by the HKHA for one person cost only around HKD 500 on average, including those specially designed for the elderly. Some of them have already been equipped with universally design handrails. Moreover, flats in the older estates cost even less. Residents may think HKD 1000 for elderly housing estates' monthly rent, which is double the cost of HKHA units, is acceptable. Yet, the cost of running the elderly housing could be more than double due to the provision of special facilities and services.

4.3.3. Market Rent of Elderly Estates with Smart Facilities (Public Tenants)

Smart homes for the elderly have attracted much attention lately and conclude as the most updated development and challenges in this area. Smart facilities lead to higher rent, and many of the elderly cannot afford them. One said,

"I will not pay more than 2000 dollars. Due to lack of income, I may be unable to afford higher rental payments when I become much older or live alone."

4.3.4. Costs Are Care Takers' Main Concerns for Elderly Housing

Previous studies have emphasized the benefits of assistive technology in helping caregivers manage their workload and providing a consistent, non-intrusive way to record and track their charges' health and sleeping habits [97]. Many of these have not mentioned the costs. Regarding the caretakers' perspectives, one interviewee thought the government should increase tax deductions, so the demand for elderly homes would be lower. Moreover, an allowance should be given to the elderly to improve household facilities such as shower cubicles to replace bathtubs and household products such as heated mattresses, bathroom floor mats, bannisters, and even a wheelchair.

A respondent in the 75–79 age group suggested that *“in-home cleaning services are good since the elderly cannot clean their house . . . As for me, I have previously suffered a stroke, and it is difficult to walk.”*

Several older adults agreed that a reason for selling their current housing and moving to a less favorable one, i.e., the elderly housing, was lack of money. There may also be other concerns; for instance, cleaning smaller residential units may be better for the elderly.

5. Findings from the Interviews

The study used both the individual and group focus type of interviews. The individual interviews consisted of 36 participants, whereas the focus group interviews were organized with 12 participants in the panel. The first part of this section presents the findings of the individual interviews, followed by the observations made during the focus group interviews.

5.1. Elderly Housing Policy

Regarding housing and home care policies around the world, there is a growing trend of retirement housing provision with healthcare services to cater for the ageing population. The experiences of Japan, Singapore, and the US indicate that older adults can downsize their flats if, and only if, their needs for healthcare, AIP facilities, and so on are well-fulfilled (see Silva-Smith, Feliciano [63], Banks, Blundell [57], Soon, Tan [98], Toyota and Xiang [99], and so on). In the US for instance, a wide variety of elderly housing is designed to cater to the needs of different groups of elderly people. The findings showed a general concern about the dilapidating conditions of the housing facilities with the lack of emergency alarm systems and safety facilities, especially for tenants who live alone. This observation was similar to that of Bosch-Farré et al. [100], who found that the elderly tenants had to conduct renovation works at their homes, such as installing handrails in the bathroom.

Some of the interviewees pointed to the supply of land and housing shortages as a driver of the problem:

“Some flats are vacant. If the government can deal with the problem of tenancy abuse cases, more housing units can be provided to the elderly, and elderly housing can be improved.”
[Respondent in 90–94 age group]

“Reclamation or development of country parks to increase the land for housing can improve the housing for elderly people. Utilizing rural farmland is the best possible solution to tackle the housing shortage, as that affects the least number of shareholders”
[Respondent in 60–64 age group]

Furthermore, some respondents pointed out the issue of intergenerational conflicts in the housing facilities, which often ensues among different generations under the same roof. Weakening intergenerational relationships affect the improvement of care services for elderly parents, as also observed by Wang and Luo [101]. Studies have shown that positive and harmonious intergenerational relationships can contribute to the psychological well-being of senior people [102,103].

The above comments and observations suggest the revamping of old buildings as public housing for the elderly and an available budget for housing refurbishment to enhance the living environment of older people. The provision of improved care services through

creating more elderly-friendly entertainment and recreational facilities can reduce the issue of conflict.

The interviewees indicated that their homes were extremely dilapidated and suggested the government should revamp the old buildings as public housing for the elderly. It was, therefore, suggested that the government should provide a budget for housing refurbishment, allowing the older people to enhance their living environment. The findings also showed the importance of the government setting up more emergency alarm systems and safety facilities, especially for tenants who live alone. Furthermore, some respondents deemed that the government should provide a separate room for each older adult, as this can reduce the conflict between different generations under the same roof. The interviewees suggested that the government should embark on the creation of elderly-friendly recreational facilities.

A reasonable and understandable proposition was that the elderly could no longer work and may suffer from financial strain. Therefore, some respondents said that the government should provide financial subsidies to allow the poorer elderly to pay their rent.

The first reason for the elderly deciding to sell or relocate from their existing building was to provide financial support for their children. This led to selling their current flat and moving to a smaller one. After their children moved out, the fear of being alone forced many to settle into smaller flats in elderly homes. Some pointed out that they were willing to move to a less desirable unit to prepare for retirement.

“My husband and I do not need such a big space for living. We can move to a smaller flat, decrease our expenditure by selling our original flat, and prepare for retirement”, said a respondent in the 65–70 year-old age group.

Meanwhile, another respondent in the 80–84 age group commented,

“if the government can subsidize the elderly, for example, with a transport allowance, then I would move to a less desirable unit further away from the urban area. The government could provide food for the elderly every day for them living in a rural area”.

5.2. Downsizing Decisions

Downsizing is often assumed as inevitable or necessary in housing and urban policy as a response to the ageing population. However, research into downsizing has overlapped significantly with residential mobility in later life. Moving at older ages does not certainly imply that downsizing of housing is occurring. Generally, downsizing can be considered as moving from one household into smaller-sized units (physical downsizing) or one that has a lower value (financial downsizing), or both. The specificity of the type of downsizing is needed because a “new property” may have a lower value but is larger, especially for homes in rural areas.

The findings from the interviews showed that the elderly people were very concerned about the cost of rent. A reasonable and understandable proposition was that the elderly could no longer work and may suffer from financial strain. However, there were varying opinions on the issue of rent and the possibility of downsizing. Not all interviewees were considering moving into smaller units or ones with less value. The provision of financial support for immediate relatives was one of the reasons for the support of downsizing units with a lower value. For example, a respondent in the 80–84 age group stated:

“If the government can subsidize the elderly, for example, with a transport allowance, I would move to a less desirable unit further away from the urban area. The government could provide food for the elderly daily for living in a rural area.”

Others are forced to consider smaller flats in elderly homes and prepare for retirement after their children move out for fear of being alone. This led to the perception of the underutilization of housing units, as highlighted here:

“My husband and I do not need such a big space for living. We can move to a smaller flat, decrease expenditure, and prepare for retirement” (respondent in the 65–69 age group).

From another perspective, some were sure they would move out of their existing flats due to the high cost of the rent. This observation is similar to Howe [104], who found that remaining in the neighborhood was very important to most elderly people. Proximity to services and local shops was key in their decision. Some of the reasons are highlighted here:

“I will not move out because my husband and I are old. We cannot move out of the [existing] apartment now. I like the apartment I am living in right now” (respondent in the 80–84 age group)

“I will not move out because my husband and I are old. We cannot move out of the [existing] apartment now. I like the apartment I am living in right now” (respondent in the 80–84 age group). *“I am not willing to move out since I am familiar and satisfied with the current place. Being so old, I do not want to move out”* (respondent in the 90–94 age group).

The above observations confirm the high cost of rent in Hong Kong and the need or the provision of financial subsidies to allow less financially stable elderly people to pay their rent. The high cost of rent could also be due to the scarcity of ageing-in-place housing projects provided by the Hong Kong Housing Society. By increasing the supply of land and providing more housing opportunities for the elderly housing, elderly people can live with lower and more stable rent.

5.3. Combating Housing Shortage

Previous research suggested that the existence of housing shortage implied that it is unrealistic to meet the older people’s housing needs [105]. Most interviewees acknowledged the issue of housing shortages; however, the elderly people rejected the idea of Homeownership Schemes and Tenant Purchase Schemes to allow renting out space in their building to others as this could alleviate the housing shortage for other older people. Even without the payment of a land premium.

It was surprising to realize that the respondents who did not want to downsize or relocate from their buildings to elderly homes also did not want to rent out empty rooms. The reasons are discussed in the following subsections.

5.3.1. Conflict Avoidance

The majority considered that renting a room to strangers could lead to conflicts and problems such as arguments about personal hygiene, daily activities, and rest schedules. Such problems can be linked to the physical and cognitive decline associated with old age. The interviewees prefer to avoid the health problems and mental health problems of people they were unfamiliar with, as highlighted by a respondent in the 80–84 age group.

“Renting out a spare room to the elderly would easily create conflicts due to different living habits . . . it would be better to build more small housing instead of living in a big house with others. This is because they may have arguments. It would be better to live alone quietly.”

Some respondents, mainly those over 80, thought renting rooms to strangers would lead to safety problems, which would mean providing extra safety requirements for the new tenants in the housing units. However, one respondent mentioned that her friends of similar ages are more willing to rent out to people they are familiar with. This is similar to Fingerman and Charles [106], who indicated that personal relationships appear to improve with age, and older adults typically report more supportive friendships, less conflict, and closer ties with social network members. Only a few of the interviewees thought that they could rent their remaining rooms to strangers and be able to get along with them. For example, a respondent in the 70–74 age group stated:

“It is possible for me. People my age have seen many kinds of people and can tolerate others. It might need some time to get used to it, just like living in a nursing home. We have to adapt to the environment.”

5.3.2. Family Unit

Others considered keeping their house and the rooms for their children, who have left temporarily. A respondent in the 65–69 age group claimed she would never rent the remaining rooms in her apartment, as she still hopes that her children will return to live with her. Thus, she preferred to keep the spare rooms for her children. The phenomenon of inter-generational households is a norm in many Asian cultures. It is common for the elders and the youth of a family to live together. The socio-economic issues such as scarcity of land, high population density, and persistent rise in property rent or purchase have made this trend more prevalent and acceptable.

5.3.3. Mistrust of Housing Shortage Information

Most of the interviewees thought that renting out available spaces in their housing units was not going to diminish the housing shortage problem. However, some older adults over 60 thought this solution could only temporarily alleviate the housing shortage but was not a long-lasting method. They went on to indicate that the empty rooms in these housing units were not the main reason for the housing shortage problem because the queue of those waiting for public government housing is too long.

A respondent in the 60–64 years old age group claimed that “high property prices was the main reason for the housing shortage. Controlling housing prices would be more effective. The long-term solution to alleviating the housing shortage was for the government to increase the housing supply.” This observation was similar to that of CSH [105].

5.4. Results of the Focus Group Interviews

This section discusses the focus group interviews conducted with the aid of the video clips, as mentioned in Section 3. In this section, the video of Cheerful Court (Senior Citizen Residences Scheme) showing the traditional indoor facilities is referred to as House A, whereas the video on Tanner Hill, which focused on the smart facilities, is referred to as House B. The interviews were conducted in groups to capitalize on the communication between the elderly participants. This method is not only a quick and convenient way to generate data but also a helpful method to observe group interactions. This method is now widely used to examine people’s experiences of something and is an effective way to explore the participants’ perceptions. It is particularly important when exploring the participant’s knowledge and experiences as it can help to examine why and how the participant has certain conclusions.

5.4.1. Facilities

House A (the traditional elderly residential unit) in the video clip was preferred because the electronic buttons were low enough for the elderly to reach. Some respondents mentioned that facilities such as cushions and armrests could prevent them from slipping. One of the interviewees commented that it was confirmed that many facilities are favorable and suitable for the elderly in house A, such as low electronic buttons. However, the size of the bathroom was too small for an older adult in a wheelchair. It seems better if the caregiver has enough space to accompany the older adult in their wheelchair.

Regarding the smart elderly residential unit, three older people who chose House B mentioned that it is more technically advanced. When asked about facilities in detail, nearly all of them liked the “Call and Care service bell”. Some older people prefer facilities that can allow them to connect to the outside world and help them during an emergency. Those who chose flat B stated that they particularly liked the blood pressure measurer and static detector, as they are suitable for health and can save lives. One of the respondents commented that:

“house B would be better . . . Yet, house B is too electronic. The elderly may not know how to use it. But living in house B is safer, as there are instruments to detect the movement of the older adult. If the person faints suddenly, the instruments can also alert nurses.”

One of them, however, commented that living in flat B would be like living in prison because of the monitoring system.

5.4.2. Rent

When asked about their desired size for an elderly flat, only one answered 1000 square feet; the others mostly replied that around 200–300 square feet, with one room, is enough for one person. The majority claimed that a spacious flat creates problems regarding household chores. One of them even complained that a large flat means the older adult has to walk further and quickly gets tired. Regarding the question of rent, it seems that most respondents were unaware of market rental prices. The majority thought they would be willing to pay less than HKD 2000 in rent; four considered paying less than HKD 3000. The highest rent mentioned by the respondents was HKD 4000. Older people have no income, so they wish to pay little or nothing.

In addition to the facilities provided by the elderly flat, other factors that the elderly considered in choosing a traditional or smart elderly home included the neighborhood, environment, transportation, and connection with the younger generation.

6. Discussion and Recommendations

6.1. Digital Divide and Usefulness of Smart Homes

The assumption behind a citizen-centered smart city is that its residents will be tech-savvy and proactive. However, the assumption that only tech-savvy people reside in smart cities is overly optimistic. Disadvantaged groups could easily be excluded from the advantages and opportunities that a smart city can offer due to their relative lack of knowledge and expertise with modern technology [107]. The research participants reflected that they do not know about computers in their generation. Thus, many of the smart home facilities are idled. This suggests that the ageing-in-place providers may have to use some innovative means to educate the elderly. Smart home providers also need to reduce the steps and procedures in using the smart facilities so that more people can enjoy the benefits. Government policies may also include expenses in engaging the users when the smart home companies design the products. When consumers become designers, the technologies will be used and achieve the goals of benefiting the elderly to live independently.

6.2. Universal Housing Design

The issue of how to deal with an ageing population has long attracted significant interest in many professions. Many senior citizens live apart from their adult offspring, creating an increasing number of “empty nest” families [108]. As such, interior design that caters to the needs of older people has gained importance if the older adults would like to live in their homes. This reflected the results of this research: most older people consider that the housing design should be improved to fit their needs. Firstly, bathroom design should be improved. Those aged over 60 emphasized the importance of convenience. One respondent, in the 60–64-year-old age group, suggested lowering the shower so he could use it easily. Meanwhile, those over 80 emphasized the importance of safety. Some of them suggested installing armrests in the bathroom for their safety. One respondent, in the 80–84-year-old age group, claimed that “When we fall, we can hold onto it. If we have the armrest, it will be much safer.”

Secondly, other housing facilities should also be improved. For example, an interviewee in the 60–64-year-old age group suggested that the cabinets would be better placed nearer the floor so he could use them efficiently. Another interviewee, in the 80–84 age group, suggested a camera should be installed in the living room. She said that “... the worst case would be falling in the toilet, but as no one would know about it, it is much more important ...”

Thirdly, most older adults over 80 consider an emergency alarm system (EAS) necessary for the housing design. One respondent in the 80–84 age group said that the EAS

could inform the service center that the older adult is experiencing an emergency. Hence, the staff at the center could call the older adult or call the police.

6.3. Barrier-Free Access Facilities

A previous study reported that older people who did not have access to barrier-free facilities were more likely to experience depression [109], highlighting the importance of facilities in ageing-in-place. Older adults over 80 in this research considered that barrier-free access facilities should be improved. For instance, most thought that ramps should be provided in the house. One respondent in the 80–84 age group also suggested that the doors in the house should be expanded so that wheelchairs could pass through easily.

6.4. Medical Services

Older adults claimed that their decisions on caregiving are influenced by the rising cost of healthcare in previous research [108]. Most older adults in the 60–69 to over 80 year-old age groups suggested that the number of hospitals and clinics should be increased, and the medical services should be improved. Some of them claimed that the public hospitals are usually very busy, and they need to spend a long time waiting. An interviewee over 60 years old suggested that “the government should add more medical centers.” An older adult over 80 considered that arranging medical home visits could improve the medical service:

“It will be much more convenient to have doctor’s visits. Sometimes there is no one to take care of me. Therefore, it would be inconvenient if the elderly have to stroll to the hospital and then wait for several hours.”

6.5. Elderly Health Care Voucher Scheme

The provision of financial resources via voucher intervention enables older people to feel more in control if they could choose and manage different healthcare products and services. It is an application of empowerment theory to a public health model that empowerment would lead to more happiness and better health outcomes [110]. Most of the elderly in this research, including those over 60 and those over 80, considered that the subsidy of the Elderly Health Care Voucher Scheme should be modified. Older adults consider the medical fee too expensive, so the subsidy allowance of the Elderly Health Care Voucher Scheme should be increased. A respondent in the 80–84-year-old age group suggested adding dental treatment to the Elderly Health Care Voucher Scheme, since dental fees are costly and many of the elderly cannot afford such a high cost. One respondent in the 60–64-year-old age group said:

“... the Hong Kong government has recently provided an Elderly Health Care Voucher Scheme. However, the value is not enough, in my opinion.”

7. Conclusions

An ageing population has almost become a norm in the developed world. As many elderly do not want to stay in nursing homes and prefer ageing-in-place [108], various gerontechnology such as sensors and smart blood meters are helpful to overcome the decline in health conditions and inform caretakers in a timely manner. Yet, participants in the study acknowledged that their generation was not raised with computers. As a result, many of the smart home amenities are not in use.

From the market perspective, it is beyond a doubt that the “gray hair” housing market will have great potential shortly, given the ever-increasing ageing population. Thus, the Senior Citizen Residence Scheme (Cheerful Court), the Elderly Persons Priority Scheme, and Tanner Hill have been built to provide holistic services that are specially designed for these people. It has become necessary for older people to downsize their accommodation. This shortens the long queues for elderly homes and can also address the acute housing shortage in Hong Kong. Previous analysis has shown the importance of the elderly downsizing their current apartments, given appropriate ageing-in-place facilities and resources that cater to the elderly’s needs. Relieving the financial burden for the elderly is also another

motive to downsize. For example, the Welfare Department offers residential care homes where the elderly downsize their residential units to beds, thus rendering their original home available to the younger generation.

The failure of elderly housing programs is often due to low applications from the elderly, which lead to the termination of elderly housing. Despite the older people's willingness to pay less as they no longer earn money, the ageing-in-place facilities demand higher costs or rental prices. Many older people are concerned about health services, but the provision of a clinic raises the costs of the housing providers; thus, one possible solution is to build elderly housing near existing hospitals. Additionally, financial products such as reverse mortgages in Hong Kong provide an alternative for the elderly, allowing them to solve their financial problems without moving out of their current unit.

This research has its limitations. The study focuses on the highest costs of a residential site in Hong Kong, which might have substantial differences as compared with other cities. In the future, the research might be expanded to other places so that we can compare with the smart elderly housing in Hong Kong. Second, given AI is one of the main developments in many different studies, future research might shed light on the state-of-art research of applied AI in enhancing smart homes for elderly living quality. Third, as laypersons had a complex conceptualization of “successful ageing” that includes social engagement, attitudes, and well-being [111], the future study may review the smart home's success in ageing among older people. Finally, while patient satisfaction is a comprehensive measurement of patients' happiness [112], by applying a similar analogy, older people with different kinds of health problems' satisfaction can be a comprehensive measurement of the elderly's happiness, and this can be another future research direction.

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