THE HONG KONG INSTITUTE OF SURVEYORS
香港測量師學會

Property and Facility Management Division

Facility Management for the Elderly in Public and Subsidized Housing

Research Project 2009-10

香港城市大學
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Facility Management for the Elderly in Public and Subsidized Housing – A Focus Group Investigation

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PREFACE

The proportion of elderly within that population has consistently grown from 344,300 elderly people aged 65 and above (6.8% of the population) in 1981 to 907,000 (13%) in 2009, and is projected to rise to 24.3% in 2031 and 28% in 2039 (Census and Statistics Dept 2009a). In fact, eighty-five percentages of total elderly (767,225) in HK are living in domestic buildings in the community (Census and Statistic Dept 2006a), and more than 50% of them are living in public or subsidized housings.

Elderly people often suffer from poor health, or physical/mental disabilities, which affect their daily life. Hence, facilities and facilities management in public and subsidized housing play a significant role influencing the quality of life of elderly in HK. The HK government must be well prepared to provide the services that will be required for this dramatic increase in the number of elderly people within the total population (Chou 2008; Cheng 2004).

The Hong Kong Institute of Surveyors has entrusted the City University of Hong Kong to conduct a number of focus groups for investigating the facility management (FM) for the elderly in public and subsidized housing. The proposed study aims to improve the facilities management (FM) in public and subsidized housing through a preliminary study of post-occupancy evaluation of facilities management in Hong Kong. The objectives of the study include (1) to review the literatures of FM for elderly; (2) to identify the existing FM components in public and subsidized housing; (3) to understand the problems of implementing the FM components in public housing; and (4) to propose the major FM components expected in public and subsidized housing.

We are grateful to have Dr. Mei-Yung LEUNG of the City University of Hong Kong devoted her efforts to carry out this invaluable study with the support from Sr Gary YEUNG and Sr Daniel HUI. We are also thankful for the generous support from various governmental departments, private companies and non-governmental organizations who have provided all necessary information that was crucial for carrying out the qualitative analysis in the focus group.

We realise that the study is by no means exhaustive and requires further detailed analysis of the facilities management components for our elderly living in the public and subsidized housing. Any suggestions or improvements on the existing research project would be greatly welcome. Hopefully, the study in turn will improve the quality of life for elderly in the society finally.

Sr Dick KWOK
Chairman
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EXECUTIVE SUMMARY

1. In 2011, the elderly (aged 65 and above) population in Hong Kong (HK) was around 965,000 (Census and Statistics Department 2011), which was about one fifth of the total population. This proportion is expected to increase to around 27% in 2033 (Census and Statistics Department 2009). Among the 1,129,900 elderly people (aged 60 and above) in HK, more than 50% currently live in public and subsidized (P/S) housing (Census and Statistics Department 2009).

2. The aim of this project was to evaluate facility management (FM) in P/S housing accommodating elderly people in HK. The objectives of the study were as follows:
   1) to review the existing literature on FM for the elderly,
   2) to identify the existing FM components for the elderly in P/S housing,
   3) to understand the problems of implementing FM components in P/S housing, and
   4) to propose the major FM components expected in P/S housing.

3. The study investigated both expected and actual FM as perceived by elderly people currently living in P/S housing. Three components of FM, namely space management (distance, width, accessibility, and space planning), building services (ventilation, temperature, lighting, lift services, noise, fire services, safety, and security), and supporting facilities (colour and decoration, hygiene, recreational leisure, standard of staff, fixtures and furniture, signage, and medical and training facilities), were identified.

4. Three focus groups (FGs) were conducted with *construction professionals* from different organizations (FG1), *caregivers* for the elderly (FG2), and *elderly people* living in P/S housing in HK (FG3).

5. Various problems were found in the *space management* (e.g., difficult for the elderly to hang up their clothes to dry, poor ventilation in corridors, flats too small for family gatherings, and so on), *building services* (e.g., lift buttons too small and unclear, hard to get sleep at night because of neighbours talking loudly, heavy fire doors, and so on), and *supporting facilities* (e.g., steel chairs too hard and cold, difficult to identify signage, limited updated information, and so on) aspects of FM.

6. Based on the problems raised and the expectations shared in the FGs, many recommendations on the three FM components in P/S buildings are proposed in the study: *space management* (e.g., distance between an escalator and a lift should not exceed 30 m; corridors should be wide enough for two wheelchairs to go through at the same time; common areas should be clearly defined and have sufficient furniture, such as chairs and tables, for elderly residents, especially those who need more rest; and so on), *building services* (e.g., big lift buttons, automatic multi-beam door sensors on lifts, light switches at an appropriate level for elderly people in wheelchairs, and so on), and *supporting facilities* (e.g., fitness equipment for elderly people should not be close to a children's playground; strong colour contrast between tiles in different rooms, such as the toilet and kitchen; big signage with clear icons; and so on).

7. To further develop more comprehensive improvement works to housing for the elderly, it is strongly recommended that a large-scale questionnaire survey should be conducted for further analysis. It is also suggested that relationships between FM and quality of life for the elderly be further studied based on the post-occupancy evaluation (POE) method in order to enhance the elderly's quality of life efficiently. Nevertheless, the current study using qualitative research has established a good platform for further research.

Contents

1. INTRODUCTION

In 2011, the elderly (aged 65 and above) population in Hong Kong (HK) was over 965,000 (Census and Statistics Department 2011), which was about 13.6% of the total population. This proportion is expected to increase to around 27% in 2033 (Census and Statistics Department 2009). To tackle the increasing housing demands of the elderly, the HK government has focused on a pilot scheme for elderly housing (HKSAR 2010). Nonetheless, among the 1,129,900 elderly (aged 60 and above) in HK, more than 50% are currently living in public and subsidized (P/S) housing (Census and Statistics Department 2009). Housing quality directly influences the quality of life of elderly people.

This project aims to improve facility management (FM) in P/S housing through a preliminary FM study in HK. The objectives of the study are as follows:

1) to review the existing literature on FM for the elderly,
2) to identify the FM components for elderly in P/S housing;
3) to understand the problems of implementing FM components in P/S housing, and
4) to propose the major FM components expected in P/S housing.

To achieve the above objectives, three focus groups (FGs) involving professionals, caregivers, and elderly people were conducted. The study also provides critical data for a large-scale survey and case study in society to establish guidelines for the FM of P/S housing for the elderly in HK in the future. This, in turn, could eventually improve the quality of life of the elderly in society.

2. CARE SERVICES CLASSIFICATION AND AVAILABILITY

In HK, care services for the elderly are categorized into two domains, namely community support services and residential care services, both of which are guided by the "aging in place" mission. These domains can be further classified into various types based on the level of care provided (see Figure 1). The community support services aim to assist the elderly to remain living in the community and to give support to carers, while the residential care services mainly provide residential care and facilities for those elderly people who cannot be adequately taken care of at home.

In total, there are 30,520 residential care beds for the elderly in HK (Hong Kong Council of Social Service 2012). However, there are approximately 965,000 elderly people in HK (Census and Statistics Department 2011), which is far more than the number of beds provided by these residential care homes. Thus, living in P/S accommodation is a wise choice for most elderly people in HK.

Due to the growing number of women participating in the workforce and the inability of family members to cope with the intensive care required by some elderly people, many elderly people in HK are living by themselves. These frail elderly people are thus highly dependent on the FM in their living environment to support their daily life. The aging trend and social changes have stimulated not only the growth of the number of frail elderly people requiring help with their daily living but also the need for facilitating advanced residential care services for the elderly in HK.

Figure 1 **Level of Care** (Social Welfare Department 2012)

3. FM COMPONENTS IN PUBLIC AND SUBSIDIZED HOUSING

In their daily lives, the elderly rely heavily on the facilities provided for them (Brawley 2001). FM is defined as the coordination of the *environment* and assets with the *people* in an organization to achieve its strategic objectives.

Building environment, facilities, and FM significantly influence the well-being of residents in domestic building settings (Barnes 2002). Hence, a Universal Design Guidebook (home safety, barrier-free access, detailing practices, etc.) has been produced for use in residential building design in HK (HKHS 2010). However, studies have generally focused on building design (Parker et al. 2004) or the built environment rather than on holistic FM for the elderly during the post-occupancy stage. In this study, FM in P/S housing is divided into three categories: *space management* (e.g., bedrooms, bathrooms, function rooms, landscape, distance, and space planning), *building services* (e.g., lighting, ventilation, temperature, noise, safety), and *supporting facilities* (e.g., kitchen, fixtures, signage, chairs, cleanliness, staff, recreation facilities) in both private units and common areas (Cheung and Leung 2007; Leung et al. 2009, 2012).

3.1 Space Management

3.1.1 *Space*

Space management is a professional discipline that incorporates the planning and management of operating environment features in many business operations to achieve corporate goals and objectives (Cho and Fellows 2000). It not only includes the allocation of rooms but also considers work or activity areas and traffic patterns (Senter and Charles 2002). In other words, allocation, density, and the flexibility to be able to make changes quickly with relatively little effort or cost should all be considered.

3.1.2 *Distance*

Distance is an essential element in space management. Physical aging alters the amount of energy that human beings can mobilize (Atchley and Barusch 2004). Furthermore, walking long distances increases the chances of falling as a result of elderly impairment (Torrington 1996). Therefore, elderly people may not be willing to walk to a room far away when they have inadequate energy, poor mobility, and reduced coordination in their muscles.

3.1.3 *Accessibility*

The accessibility of environment is of vital importance to all citizens and particularly to elderly and disabled people's participation in society (Mollenkopf and Walker 2007). As people grow older, their mobility becomes progressively worse and they often experience difficulties in negotiating the environment (Regnier et al. 1995). Therefore, housing for the elderly must be designed taking into account the physical limitations of its occupants.

3.2 Building Services

The elderly usually spend a large proportion of their time in their homes and are highly dependent on the built environment to compensate for their physical or cognitive frailties (Parker et al. 2004). Building services, which deal with the main functions of a building, play an important role in enhancing the quality of life of the elderly.

3.2.1 Ventilation

Ventilation includes both natural and mechanical methods. Generally, natural ventilation, which mainly comes from openings through windows and doors, is preferred. The position and size of windows induce natural ventilation, which can be further enhanced by the stack effect due to doors. On the other hand, mechanical ventilation in general P/S housing is commonly created by fans or exhaust fans (Liauw 2001).

3.2.2 *Temperature*

Temperature affects the thermal comfort of the elderly (Koken et al. 2003). There are two types of temperature: 1) ambient temperature, which is the air temperature of the surrounding environment, and 2) effective temperature, which is an individual's perception of the ambient temperature (McAndrew 1993). The elderly's perception of temperature affects their emotions and can induce hypothermia.

3.2.3 *Lighting*

It is essential to provide sufficient lighting, both natural and artificial. Natural lighting usually comes from skylights or windows, which should be positioned so as to give good general illumination but also to avoid glare in the rooms (Lehman 2001). Artificial lighting is usually provided by electric incandescent lamps, fluorescent lights, and so on. Light fittings should reduce glare which causes the elderly to confuse images.

3.2.4 *Lift Services*

Due to the deteriorated physical health of the elderly, it is necessary to install lifts for vertical transportation in buildings. Generally, lifts are very frequently used and should be sited in the best location (e.g., in the middle of the building). Moreover, the size of the lifts must be large enough to allow wheelchair access.

In addition, as an ongoing process, lifts should be regularly inspected, tested, and upgraded (Marberry 1997).

3.2.5 *Noise*

Noise is a psychological concept which is defined as an unwanted sound and is considered to be a source of stress (McAndrew 1993). For the elderly, excessive noise can cause various health problems, such as depression and dizziness (Robson et al 1997). It is therefore necessary to control noise. There is a need to develop a higher level of sound insulation and to control background noise in common areas in buildings (Templeton 1997).

3.2.6 *Fire Services*

Fire safety is one of the most important criteria in every building for both people and property. Due to their limited mobility, the elderly can barely escape in the event of a fire. Thus, the fire safety awareness of the elderly should be raised by providing high quality fire hazard alarms and fire-fighting systems (Robson et al. 1997).

3.2.7 *Safety and Security*

Since the environment may pose great threats to the elderly, the highest priority of them is to live in a safe and secure environment. However, buildings need to simultaneously respect the freedom of individuals (Parker et al. 2004). The security measures in buildings should secure the safety and health of all elderly people by protecting them against loss by theft, vandalism, personal attack, or intrusion as well as protecting their individual privacy; for instance, CCTV equipment can be used in P/S housing to improve the security of the elderly.

3.3 Supporting Facilities

3.3.1 *Colour, Decoration, and Art*

The colour and decoration used in a living environment can provide a friendly, relaxing atmosphere and allow the easy identification of features (Atkinson 1998). Blues, greens, and neutral colours on floors should be avoided as the elderly find it difficult to distinguish these colours. In addition, contrasting colours on doors and elsewhere (e.g., dormitory doors, handrails, toilet doors, stair nosing, and changes in level or gradient) act as aids to recognition and identification.

3.3.2 *Hygiene*

Hygiene is an important concern because it not only affects the physical and mental health of the elderly but also reduces risks, such as infections and falls (Wellings 1991). Tile flooring should be easy to clean. However, from the day-to-day maintenance perspective, carpet flooring is more suitable in lobbies, hallways, and lower floor entrances because it can trap dirt from outside (Greeley 2001). In addition, all floor finishes, chairs, beds, and toilets should be cleaned regularly (Torrington 1996).

3.3.3 *Recreational Leisure*

Increased time for leisure, which can be a meaningful activity, is a positive factor associated with age (Robert 1999). Specific leisure activities for the elderly, such as self-checking their physical and/or mental condition, continuing to learn, exercising their mind, testing their memory, and reminiscing, could be good choices for their recreational leisure time. Apart from these ordinary leisure activities, there are many other activities that elderly people can participate in (e.g., playing chess, using a gym, gardening, and so on).

3.3.4 *Quality of Staff*

Quality of staff is one of the significant impact factors on FM as most of the tasks involved in serving the elderly are undertaken by the staff. It is necessary to promote a better understanding of the various roles and skills of multidisciplinary team members in order to maximize the support provided to staff. Therefore, a good quality service and adequate resources must be allocated and well managed to maximize the outcomes provided by a well-educated workforce (Okafor 2001).

3.3.5 *Fittings and Fixtures*

Providing good quality and appropriate fixtures or furniture not only ensures the comfort of the elderly in their homes but also reduces the occurrence of risks (Lee et al. 2007). For example, installing grab bars on both sides of toilets and bathrooms and handrails on both sides of corridors can minimize the risk of falling, especially for those elderly with unilateral weakness (Leibrock 2000). In addition, reclining chairs, both electric and manual, can enable elderly people to sit and stand with minimal effort.

3.3.6 *Signage*

The use of signs or graphics for the elderly should also reflect consideration of the normal visual changes that occur with aging. Signage along routes can improve way-finding clues for the elderly and help those with blindness to function independently (Robson et al. 1997). However, too many signs and unclear signs are confusing to the elderly and increase the problem of getting lost (Morgan and Stewart 1999). Hence, important guidelines for using signage in housing for the elderly should be applied: for example, simple and large lettering, signs on a contrasting background, and so on (Buildings Department 2008).

3.3.7 *Others*

Supportive facilities involve multiple elements and include much more than the above-mentioned items. For instance, catering can enhance the physical and mental health of the elderly if the food is of good quality and taste, whereas poor catering influences the emotions and causes behavioural disorders (McInnis-Dittrich 2005) and physical exercise can promote regular exercise and train the body.

4. MODEL DEVELOPMENT

A comparison between current FM problems and the expectations of construction professionals as well as staff and elderly residents in P/S housing was the main mechanism of this research (see Figure 2 for the Research Model). To improve FM in P/S housing, both existing problems and the expectations of the elderly were explored in this study.

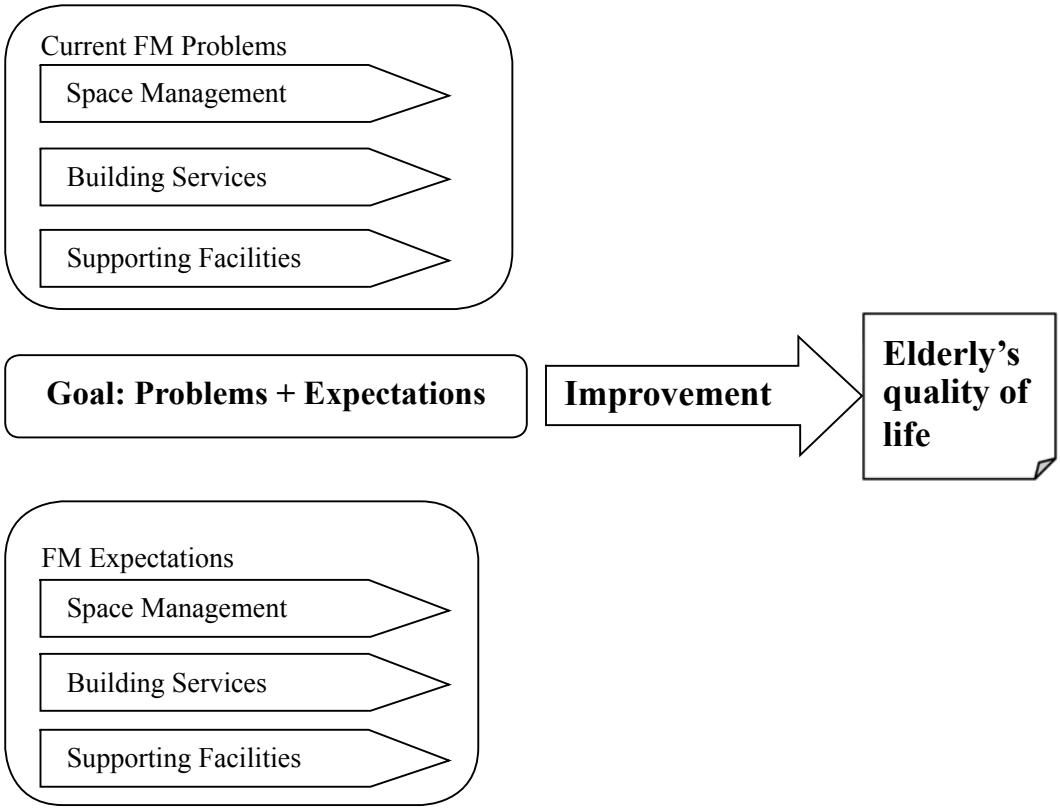

Figure 2 Research Model

5. RESEARCH METHOD

To collect qualitative data, three FGs involving 23 participants were conducted; the groups were respectively composed of construction professionals from different organizations (FG1), caregivers for the elderly (FG2), and elderly people living in the P/S housing (FG3) in HK (refer to Table 1).

Table 1 Background Information relating to Qualitative Data

Basic Information	Subcategories	Group No.			Total No.
		FG1(Construction Professionals)	FG2 (Caregivers)	FG3 (The Elderly)	
No. of Participants in each group		8	7	8	23
Age	≤ 30	0	1	-	1
	31-35	1	3	-	4
	36-40	1	0	-	1
	41-45	3	1	-	4
	46-50	2	0	-	2
	51-60	1	2	-	3
	61-70	-	-	0	0
	71-80	-	-	3	3
	81-90	-	-	4	4
	≥ 91	-	-	1	1
Gender	Male	7	3	2	10
	Female	1	4	6	5
Position	Architect	3	-	-	3
	Property Manager	2	-	-	2
	Bldg Services Mgr	2	-	-	2
	Interior Designer	1	-	-	1
	Superintendent	-	1	-	1
	Social Worker	-	2	-	2
	Nurse	-	0	-	0
	Occ. Therapist	-	1	-	1
	Physiotherapist	-	1	-	1
	Visitor	-	1	-	1
	Senior Manager	-	1	-	1
Working Experience in Current Organization	< 6yrs	2	3	-	5
	6-10	1	2	-	3
	11-15	1	1	-	2
	16-20	1	0	-	1
	21-25	1	1	-	2
	26-30	1	0	-	1
	31-35	1	0	-	1
Marital Status	Single	2	2	-	4
	Married	6	5	-	11
Education ^	No education	0	0	4	4
	Primary school	0	1	2	3
	Secondary school	0	0	0	0
	High school	0	0	0	0
	University	8	6	1	15
Care services related Qualification	Nurse	0	0	-	0
	Accredited Assessor	0	0	-	0
	MDSHC Assessor	0	2	-	2
	Occ. Therapist	0	1	-	1
	Physiotherapist	0	1	-	1
Mobility	Independent	-	-	4	4
	Assistance Device	-	-	2	2
	Wheelchair	-	-	2	2

Note: ^ - One elder in FG3 did not report education background.

Theoretically, each group consisted of 7 to 8 respondents in order to ensure that the discussion provided a wide enough range of opinions rather than just particular situations. To enable systematic qualitative data collection and analysis, the group discussions were organized under a similar structured framework:

1) problems of current FM and
2) expectations of FM in P/S buildings for the elderly.

6. RESULTS AND FOCUS GROUP DISCUSSIONS

6.1 FM Problems in Public and Subsidized Housing

6.1.1 *Space Management*

Distance

Distance problems between elderly people's homes and public facilities such as the market were mentioned by FG3 members. One elderly person in FG3 complained, *"The market is so far away that I have to ask my daughter to buy food or vegetables for me"*. The physical impairments of elderly people increase the chances of their falling when they have to travel too great a distance (Torrington 1996). Thus, they normally do not want to leave their home/house, and this, in turn, reduces their social relationships.

Width of Doors, Corridors, and the Like

The elderly people in FG3 stated that the width of the corridors in their buildings was basically fine: *"We are satisfied with the doors and corridors"*. However, a staff member in FG2 reported that *the width of doors in general was too narrow*; this could cause inconvenience to elderly people who rely on walking assistance or a wheelchair and increases the difficulties of getting *a shower bed into an individual's flat*.

Accessibility Problems

As the residents in P/S housing get older, they become more sensitive to the surrounding living environment, especially in terms of accessibility. The elderly people in FG3 had many complaints on this issue: for example, "*Curbs are very common around our buildings and most of us have experienced being injured as a result of these curbs*" (refer to Picture 6a).

Space Planning for Daily Activities

Various space planning problems were mentioned in all three FGs. The elderly participants in FG3 made the following complaint: "*The flats in P/S housing are too small to hold family gatherings and we have to go out to enjoy these events*". The space between blocks was also criticized. According to one staff member in FG2, *it is very difficult for elderly people to hang up clothes to dry due to the short distance between their balcony and their neighbour's kitchen*. A park or garden was regarded as a vital component in space management. However, one professional in FG1 commented that *a general public garden may not be very suitable for the elderly as young children may run around or play basketball around them*; hence, it limits the daily activities of the elderly.

6.1.2 *Building Services*

Ventilation

A staff member from FG2 stated that "*ventilating the corridor in a unit is usually hard if individual room doors are closed*" (refer to Picture 1). Poor quality ventilation could cause an accumulation of airborne contaminants and the spread of germs which could affect the elderly's sleep or rest and also induce dizziness, distraction, tiredness, or even illnesses.

Picture 1 No Ventilation in Corridor

Picture 2 Poor Lighting in Corridor

Temperature

It is necessary to keep a constant temperature for the elderly in their living environment (Torrington 1996). However, it is not practical to install central air conditioning in P/S buildings as this involves high costs to the elderly. One elderly person in FG3 stated, "*The air conditioner is high power consumption and is costly for me ….. It causes air-condition disease*". This situation needs to be solved properly as the elderly easily get heatstroke in a hot environment.

Lighting

Lighting issues associated with building services were a great concern among the participants in this study. The elderly participants in FG3 generally complained about the *difficulty of plugging in or unplugging things because the sockets were positioned at a very low level and were too tight* (refer to Picture 8a). In fact, such a situation existed not only in their rooms but also in the common areas; for example, one participant from FG3 complained that the "*lighting in the corridor is insufficient and so I cannot distinguish people*" (refer to Picture 2). Thus, poor lighting can easily cause accidents and affect the visual abilities of the elderly (Robson et al. 1997).

Lift Services

Lifts are very important for the elderly to be able to travel vertically either in or out of P/S buildings and also outside P/S buildings where there is a level difference. In this study, lift buttons were found to be worn out after long usage or too small or unclear, problems that cause much inconvenience to elderly residents. Thus, caregivers who participated in the study reported that they *constantly receive complaints about the small size of lift buttons and the dim lighting in lifts (FG2). These problems mean that it is really difficult for the elderly to select the floor level button in lifts* (refer to Picture 3).

Noise

Noise can affect the health and daily life of the elderly by impacting on the quality of their sleep at night or their living conditions (Robson et al 1997). An elderly person in FG3 stated, "*It is very hard for me to get sleep at night because of the loud talking of my neighbour …… This really is a severe noise to me*". This type of noise problem may be ascribed to poor sound insulation in the walls. Moreover, windows in P/S housing were also a big concern for the elderly participants in this study (e.g., the noise of the wind can be annoying when there are strong winds, a situation which is more serious in winter).

Fire Services

All three FGs mentioned fire services in the discussions. It is interesting that the elderly participants in this study did not give any opinion about these services owing to their very limited knowledge. However, fire services following the government regulations may still cause many other problems for the elderly, such as *fire doors that are too heavy for them* (comment by staff member from FG2); in fact, the greater the age of the elderly person, the more difficult it is for him or her to open a fire door.

Safety

Safety features either inside or outside the living environment might result in personal injury if proper facilities are not installed or precautious are not taken. Hence, a professional in FG1 reported that the traditional *steel security doors used in P/S buildings are very heavy and could easily cause falls among the elderly*. An elderly person in FG3 also complained that in the case of elderly people who have a visual impairment, *"Only when a caregiver gives a blind elderly person sufficient instructions can he/she go out."*

Security

With a security or safeguard patrol and a counter located close to the main entrance, security is extended to the whole building. However, a lack of adequate patrols can lead to problems such as theft (as reported by an elderly person in FG2). However, there are some conflicts between security and convenience in the daily lives of the elderly. For example, as one professional in FG1 commented, *"Steel sliding doors are usually too heavy for the elderly in P/S housing, and some elderly people have changed the steel doors to aluminium ones, which may cause security problems."*

Picture 3
Too Small Lift Buttons

Picture 4 Difficult for the Elderly to Clean

6.1.3 *Supporting Facilities*

Hygiene

An unclean environment could create a negative impression of the elderly and facilitate the spread of diseases. Due to their frail condition, cleaning their rooms thoroughly becomes more and more difficult for the elderly. An elderly person from FG3 complained, "*It is very hard for me to clean the high places in my room …… I have no extra money to hire a housekeeper to clean*" (refer to Picture 4). In addition, cleaning higher places can cause injuries to elderly people.

Recreational Leisure

A staff member from FG2 commented that *through socialization, the elderly can feel the support from their friends and relatives*. Seats in common areas aid socializing and interaction among the elderly; they can chat, play games such as chess and cards, and gather with their families in these areas. An elderly person from FG3 said, "*I like the seats in the common area very much, and I am usually relaxed and happy when I sit there and chat with my friends*".

Fittings and Fixtures

Fittings and fixtures can create a harmonious atmosphere in which the elderly can live freely and happily; for example, a mirror in the bathroom allows them to look at themselves more and admire their own appearance. Not everything that is suitable for adults is suitable for the elderly; for example, the steel seats downstairs in some P/S buildings. As one elderly person from FG3 complained, "*The steel chairs around my building are too hard and cold for me, especially in the winter and spring*".

Signage

Signage plays a useful guidance and caution function for the elderly. However, some elderly people may not know the exact meaning of various signs. As one elderly person from FG3 stated, "*I usually have difficulty identifying the signage and its functions*".

Medical and Training Facilities

The importance of hospitals, dentists, and clinics was confirmed by the participants in both FG2 and FG3. There should be some clinics around or near P/S housing so that the elderly can get there easily. However, in this study, some medical facilities were found to be too expensive for the elderly. An elderly participant in FG3 complained that "*dental care is available in the community but it is too expensive.*"

Others

There are many other factors that influence the convenience of elderly life; for example, safety bells could help the elderly to live more conveniently. The elderly participants in FG3 commented that *due to the limited information available, many elderly people have no idea about the safety bells policy in their buildings.* Issues such as this directly affect the daily lives of elderly people.

6.2 Expected FM Components in Public and Subsidized Housing

6.2.1 *Space Management*

Distance between Rooms and Facilities

Due to the problems of distance in P/S housing, many participants expressed their expectations with regard to the improvement of these distance issues. These comments mostly focused on public areas. A professional from FG1 suggested that *in shopping malls, the distance between an escalator and a lift should not exceed 30m.* Considering the frail health of the elderly, *male and female toilets in public areas should be close together in order to ensure that caregivers whose gender is different to that of those they care for do not have to travel too far* (suggestion made by a staff member in FG2). Poorly designed facilities cause many inconveniences to both the elderly and their caregivers which, in turn, decrease their incentive to engage in social events.

Width of Doors, Corridors, and the Like

Some elderly people living in P/S housing use wheelchairs. To ensure their mobility, it is necessary to ensure that the elderly living in P/S housing can move about freely without any barriers; for example, *the width of corridors should be sufficiently obstruction free for two wheelchairs to go through at the same time* (suggestion of a professional in FG1; refer to Pictures 5a and 5b).

Accessibility Problems due to Access and Level Differences

Most of the participants from FG1 and FG2 expected buildings with a barrier-free living environment to be provided for the elderly. One professional in FG1 made the following suggestion: "*During the design stage, we should avoid level differences or curbs in front of the lobby, at the entrance to each flat, and also inside the flat …… If this is not possible, ramps or disabled lifts should be provided*" (refer to Picture 6b). These elderly-friendly measures can ensure the elderly's safety and convenience and, in turn, increase how frequently they go out.

Picture 5a Narrow Corridors

Pictures 5b Wide Corridors

Picture 6a No Ramp at Entrance

Pictures 6b Ramps for Different Levels

Space Planning for Daily Activities

Space planning should take account of the needs of the elderly in wheelchairs, and this was confirmed by FG1 and FG2. A professional from FG1 suggested that *at turning places, the space should be big enough to allow a wheelchair to enter and exit the room*. Staff from FG2 also suggested having large enough toilet rooms and wide toilet doors *to facilitate the use of wheelchairs or shower beds by the elderly*. Furthermore, considering the needs of the elderly in public areas can help them to maintain their self-esteem and interests in society. Participants from FG1 expressed their expectation that a *clearly defined common area with sufficient furniture, such as chairs and tables, should be provided for the elderly for their daily social gatherings* (refer to Pictures 7a and 7b).

Picture 7a
No Furniture in Common Area

Picture 7b Furniture in Common Area

6.2.2 Building Services

Ventilation

Of the three groups in this study, FG1 and FG3 expressed their expectations of how ventilation in P/S housing should be improved. Ventilation in P/S housing is always affected by the partitions inside the rooms. One elderly participant in FG3 emphasized that *rooms should not be divided with partitions due to the ventilation issue*. In order to ensure good ventilation, a professional in FG1 proposed that *air circulation should be considered at design stage* to enhance the living environment of the elderly.

Lighting

As the elderly get older, their flexibility and vision weaken. They cannot continue their daily life as normal. Hence, facilities such as switches should be positioned carefully and properly (refer to both FG1 and FG3); for instance, *light switches should be neither too high (e.g., over 1.5 m) nor too low (e.g., above skirting) for the elderly, especially those in wheelchairs. Also, the size of switches should be as large as possible* (suggestion of a professional in FG1; refer to Picture 8b).

Picture 8a Switch at Low Level

Picture 8b Switch at Appropriate Height

Lift Services

Due to the inconvenience of finding the way to the lift and the long waiting time for the lift, the elderly going out to shop in the malls usually prefer to use the escalator. However, an escalator is generally more dangerous than a lift, especially for the elderly. To ensure their *safety, the distance between lifts and escalators should not be too far. An audio system and tactile tiles should be installed / fixed in front of escalators in order to remind the elderly of the need to be careful when taking the lift or escalator* (suggestion of professionals in FG1).

Noise

Excessive noise should be avoided for the elderly due to the bad effect it has on them. In this study, only the staff in FG2 expressed the need to install *fitness facilities free from noise and to separate the fitness equipment for different ages in landscaped areas*.

Safety

Safety was focused on by all three groups. Features of an unsafe living environment such as curbs and slippery floors can easily cause falls. It is therefore no surprise that the staff in FG2 suggested *demolishing curbs at all entrances and keeping the floor in toilets dry* (also suggested by a professional in FG1). *To assist safe walking, it is necessary to fix handrails of the proper shape, size, and height to the walls along corridors and in toilets* (suggestion of professionals in FG1) (refer to Pictures 9a and 9b). The safety of the elderly in wheelchairs should also be considered and ensured; adding *safety protection bars along the foot of walls can avoid wheelchairs knocking against the walls or any injury to the elderly*.

Picture 9a No Handrail in Corridor

Picture 9b Handrails along Corridor

Security

Due to the importance of security for residents, especially the elderly, high quality security was requested by all three groups. In this study, both FG1 and FG2 shared their expectations on security issues. Although there is some security provision in all buildings, this provision is not good enough. *Security services should be continuously improved* (expectation of a professional in FG1). To keep a sense of security for the elderly, FG2 suggested that *guards and a CCTV system* should be provided in each building.

6.2.3 *Supporting Facilities*

Colour and Decoration

Most of the elderly people and staff who participated in this study made no adverse comments about the colour of the walls and floors in their buildings as they thought that the simpler the colour scheme, the better. In this study, all three groups confirmed the role of colour contrast in helping the elderly to live safely and conveniently. *Tiles in different rooms, such as the toilet and the kitchen, with strong contrasts in colour can indicate the nature of a particular area and remind the elderly to be careful* (expectation of a professional in FG1; refer to Pictures 10a and 10b).

Picture 10a No Contrast in Floor Colours

Picture 10b Contrast in Floor Colours

Hygiene

The living environment of the elderly in P/S housing should be designed for the elderly to be able to easily and conveniently keep hygienic. Compared with other elegant shapes, *U-shape toilet bowls should be easy to clean* (suggestion made by a professional in FG2; refer to Pictures 11a and 11b). Hence, it is expected that U-shape toilet bowls should be installed for the elderly in P/S buildings.

Picture 11a Square-shape Toilet Bowl

Picture 11b U-shape Toilet Bowl

Staff

The attitude and competence of staff are important criteria in care services. Lack of an assessment standard for the services of caregivers could cause more conflicts between the elderly and their caregivers. Therefore, a professional in FG1 suggested that *a standard assessment for measuring the quality of elderly care services should be established*.

Signage

Due to the importance of signage for the elderly, there should be sufficient signage provided to inform the elderly of edges, dangers, and escape instructions (suggestion of professionals of FG1). In fact, signage should be designed properly and carefully so that the elderly can easily understand its meaning.

Medical and Training Facilities

Medical or therapy services in the community are quite limited, while the physical status of the elderly is getting worse and worse. An elderly person in FG3 said, "*A service centre in the community with a clinic and sports centre would be helpful to us.*" By providing them with healthcare, the elderly will have more chances to exercise and, in turn, improve their physical health.

7. RECOMMENDATIONS

The participants in the three FGs shared their views on current problems and their expectations with regard to FM in P/S housing. Based on this study, some recommendations can be made to facility managers and designers regarding elderly people living in P/S housing.

Space Management

Mobility is one of the essential components of quality of life for the elderly. Therefore, the government of Hong Kong has been announced to install lifts to all footbridges for elderly's accessibility (Mingpao 2012). This study is further suggested to provide lift or escalator for all different platform levels. In public areas, the distance between an escalator and a lift should be no greater than 30 m, while male and female public toilets should be close together (this is especially important when the caregiver's gender is different to that of the elderly person he or she cares for). In order to encourage the elderly to walk independently, it is recommended that all curbs be replaced with ramps around P/S buildings and that easily foldable bench seats are provided along corridors. Handrails should be fixed in P/S buildings, especially along long corridors and ramps, so that the elderly can walk more safely and satisfactorily. To ensure the convenience of the elderly in wheelchairs, corridors must be wide enough for two wheelchairs to go through at the same time.

Considering the complaints made in this study about narrow doors, it is recommended that the doors in current P/S buildings should be widened to accommodate the elderly in wheelchairs and the shower beds that some elderly people use to bathe. Moreover, toilets should be big enough to accommodate a wheelchair (FG2). To allow the elderly can hang up clothes to dry on the balcony in P/S buildings, the kitchens in each individual flat should not be positioned close to the balconies or the laundry rooms at the design stage. Due to their flats being small, the elderly expect to have some furniture, such as chairs and tables, in common areas on every floor for their daily activities and occasional family gatherings.

Building Services

In order to improve the ventilation and lighting in corridors (FG2), it is suggested that long corridors without openings in the wings of P/S buildings should be avoided. Perhaps some openings (e.g., windows, doors to staircases, etc.) with green plants in the middle of long corridors could be designed to allow the penetration of natural light and the circulation of fresh air. LED motion sensor lights could be installed to provide lighting automatically in public areas of the buildings.

Due to the frail health of the elderly, it is necessary to enlarge the size of lift buttons, install automatic multi-beam door sensors in lifts, and use automatic fire doors to replace the traditional heavy fire doors to ensure the safety of elderly residents. To improve security in P/S buildings, apart from CCTV systems, the number of security guards and daily patrols should also be increased in the living environment of elderly people.

Good sleep quality plays an important role in the quality of life of elderly people. To avoid noise disturbances, fitness exercise equipment around P/S buildings should be free from noise and the windows and doors in each individual flat should be sound insulated. It is also suggested that sockets should be repositioned to seating or table level instead of skirting level or that the elderly should be encouraged to use power strips so that they can plug and unplug sockets conveniently. Light switches should be big enough to see and positioned at a convenient level for elderly people in wheelchairs.

Supporting Facilities

Fitness equipment for the elderly should be allocated in a separate area from playgrounds for young children because young children may run fast in parks. Fixing handrails to walls and safety protection bars along the foot of walls can facilitate walking and avoid wheelchairs knocking against the walls, respectively. Due to the visual impairment of some elderly people, it is recommended that big signage with icons or pictures rather than words only should be designed (FG3). Tiles with contrasting colours in different rooms, such as the kitchen and the toilet, could help to remind the elderly to be careful in these rooms. Traditional U-shape toilet bowls are better than elegant ones in terms of cleaning, while handrails on walls are a basic facility required in toilets for the elderly.

Since some elderly people have difficulties getting enough information (e.g., news and government policy), it is suggested that a television be installed in the common area on each floor (FG3). Iron seats are not comfortable for the elderly to sit on for long periods, and so it is suggested that cane seats of a suitable height should be placed in common areas.

Finally, to ensure the provision of good services to the elderly in their daily activities, it is also suggested that a standard assessment scheme be designed for measuring the quality of care services for the elderly.

8. LIMITATIONS OF RESEARCH

This study focused only on P/S housing, which accommodates about 50% of the aged population of HK. Elderly people living in private residences and in care and attention (C&A) homes were not considered in this research.

A total of only 23 participants in three groups took part in the study. This relatively small sample size may affect the representativeness of the study's results. However, a large sample size is not necessarily beneficial for focus group studies because it does not facilitate the sharing of deep and intimate experiences among group participants (Breakwell et al. 2006). Furthermore, the validity and reliability of the study's results were ensured by a number of credible data collection and analysis procedures: 1) only elderly people with sound cognitive ability were invited to participate because the large group of elderly people whose cognitive ability is slightly worse than the required level or even seriously impaired due to dementia would have found it very hard to express their expectations and perceptions; 2) all of the participants in this study were selected very carefully and covered various kinds of situations (e.g., different backgrounds, different types of buildings, and so on).

9. FURTHER STUDIES

To identify the most effective FM, both in general and specifically, it is suggested that a *large-scale questionnaire survey* to assess the generalizability of the results should be conducted at a further stage of this study. A comprehensive, reasonable, and accurate data analysis can then be conducted based on a large population.

An in-depth study of FM options should be conducted to eliminate the restrictions of current practices and provide more choices for enhancing the elderly's quality of life. Nowadays, the Universal Design Guidebook, which provides *new guidance for future buildings*, is becoming more and more popular; its aim is to avoid some of the problems that have occurred in P/S buildings. What the real effects of this guidebook will be and what new problems may arise have yet to be predicted. It is recommended that the application of the guidebook in post-occupancy evaluation (POE), especially for the elderly in the residential housings, should be studied further.

In addition, this study found that the *quality of life* of the elderly is affected by FM in P/S housing. Therefore, it is recommended that the relationships between FM and quality of life should be further studied to identify the key FM factors significantly related to the elderly.

10. CONCLUSION

The dissatisfaction of the elderly in P/S housing, as illustrated in this study, calls for an improvement to be made in FM. This study reviewed the literature on FM for the elderly, and three FM components (space management, building services, and supporting facilities) in P/S housingwere then identified. Three FGs were conducted in this research to identify the problems associated with these FM components and the FM components for the elderly that are expected in P/S housing.

Through the FG study, a number of problems were found in all three aspects of FM: space management (e.g., difficult for the elderly to hang up clothes for drying because balconies face the neighbour's kitchen, flats too small for family gatherings, and so on), building services (e.g., identifying the lift button takes time, no ventilation in corridors, heavy fire doors, and so on), and supporting facilities (e.g., steel chairs too hard and cold, difficult to identify signage, limited updated information).

Based on the problems raised and the expectations shared, this study has proposed many recommendations covering all aspects of FM in P/S buildings: *space management* (e.g., distance between an escalator and a lift should not exceed 30m; corridors should be wide enough for two wheelchairs to go through at the same time; common areas should be clearly defined with sufficient furniture, such as chairs and tables, for the residents, especially the elderly who need more rest; and so on), *building services* (e.g., big lift buttons, automatic multi-beam door sensors on the lifts, light switches at a suitable level for elderly people in wheelchairs, and so on), and *supporting facilities* (e.g., fitness equipment for the elderly should not be close to children's playgrounds; tiles in different rooms, such as the toilet, should be in strong contrasting colours; big signage with clear icons; and so on).

To further develop more comprehensive improvement works to housing for the elderly, it is strongly recommended that a large-scale questionnaire survey should be conducted for further analysis. It is also suggested that relationships between FM and quality of life for the elderly should be further studied based on the POE method in order to enhance the quality of life of the elderly efficiently.

The recommendations proposed in this study may be simple, but we believe that they will be a big help to the elderly in terms of enhancing their quality of life.

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