

# Senior citizens' requirements of services provided by community-based care facilities: A China study

## Abstract

**Purpose:** This study aims to identify senior citizens' requirements related to *'Embedded Retirement Facilities (ERFs)'*, which are small-scale, multi-functional, community-based, care facilities for senior citizens in mainland China, and to discuss whether senior citizens' perceptions are influenced by their backgrounds.

**Design/Methodology/Approach:** A questionnaire type of research was administrated to gain senior citizens' rankings of services that should be provided by ERFs. Non-parametric statistical models were applied to analyse the collected data.

**Findings:** Results reveal that, health care services for senior citizens are considered the most important. Requirements regarding rehabilitation and entertainment, and daily life assistance are ranked second and third, respectively. Culture-related activities are the least important. Differences in the senior citizens' background also influence their choices.

**Research limitations/implications:** This research is based on a questionnaire survey completed in northeast China. Opinions from other areas of mainland China will be collected in the future study. Furthermore, the key items identified in this research, which was completed by participants from the built environment discipline, can be further elaborated by combining interdisciplinary feedback.

**Practical implications:** This study explores services that are supposedly provided by ERFs. Findings will provide useful perceptions from senior citizens and will enable decision makers to prioritise services for senior citizens.

**Social implications:** Although senior citizens are the end users of ERFs, their needs are easily overlooked. This study calls attention to their needs from ERFs, and the results are likely to serve as references for stakeholders in building improved facilities.

**Originality/Value:** ERFs have been provided in mainland China to cater to senior citizens' needs since 2014. However, few studies have identified senior citizens' requirements of provided services. The survey-based results of this work will serve as references for various stakeholders in making enhanced decisions.

## **Keywords**

Senior citizen, Community-based facility, ERF, Service, Briefing

## **1 Introduction**

Population ageing, with urbanisation, has become one of the greatest challenges throughout the world in the 21st century. The effects of China's 37 years of one-child policy, combined with significant improvements in health care services, have made the country's population grow more rapidly than those of nearly all other countries. Although the government has been facilitating social reform of the industry and service for the aged since 2011 to face the rapid ageing situation (that is, "9073" and "9064" retirement patterns: 90% of the senior citizens obtaining home-based care with the help of relatives or trained workers, 7% or 6% using community-based services such as day care, the 3% or 4% remaining staying in nursing homes (Beijing Municipal Commission of Planning and Natural Resources and Beijing Municipal Civil Affairs Bureau, 2015, The People's Government of Beijing Municipality, 2008, The People's Government of Shanghai Municipality, 2007), which have been formed during the past years), the Chinses government still has many difficulties in catering to senior

citizens' needs regarding ageing in place.

*Embedded Retirement Pattern* (ERP), a new model that combines home-based care with community-based care, aims to overcome the weaknesses of '9073' and '9064' retirement patterns and focuses on the advantages of home-based, community-based and institutional care services; the ERP model gradually emerged in 2014 from mainland China (Hu et al., 2015), together with its practical form, namely *Embedded Retirement Facility* (ERF), in the field of architectural design and construction. An ERF is a small-scale, multifunctional community-based care facility with a total construction floor area of no more than 800 m<sup>2</sup>, service radius not longer than 450 m and capacity of no more than 45 beds for senior citizens; given senior citizens' specific demands, an ERF can either offer day respite services, long-term residence or both; ERFs not only assist senior citizens in their daily lives but also help them maintain good health conditions by setting canteens, organising social and recreational activities and providing regular health examination service, among others (Xiang et al., 2017, Zhang and Zhao, 2017).

As suggested by Gopikrishnan and Paul (2018), considering user requirements regarding physical, functional and financial aspects is essential for building construction. Given that ERFs are built as an important supplement to cater to senior citizens' needs after retirement, people's opinions on provided services contribute a lot to the design stage. Briefing, known as 'Architectural Programming' in the United States, is the process of identifying and articulating requirements from clients as early as during the design process of a construction project. This process is crucial for the success of such projects (Yu et al., 2007). The importance of briefing has been highlighted in various studies (Hershberger, 1999, Kumlin, 1995, Salisbury, 1998), and architects in mainland China have begun to focus on briefing before pre-design, particularly during the past decade (Zhuang, 2015, Zhuang, 2017). By

identifying senior citizens' requirements during briefing, decision makers will know the kinds of services that should be provided by ERFs, and architects can make better decisions regarding functional divisions when dealing with limited floor areas. Thus, the fact that most Chinese communities lack sufficient access to professional services, including but not limited to health care, rehabilitation and social support, may be alleviated.

The aim of this study is to identify senior citizens' requirements related to services that should be provided by ERFs. Four main kinds of services that should be provided by community-based care facilities (daily life assistance, culture-related activities, health care, rehabilitation and entertainment) were first listed according to design guidelines and policies released by the Chinese government. Then, 22 detailed items under the four aspects were identified through a document analysis and brainstorming session; these items formed the basis for a questionnaire. The survey was completed in Heilongjiang Province, northeast China, to gain senior citizens' rankings regarding the main aspects and the detailed items. After data collection, Mann-Whitney U and Kruskal-Wallis tests were performed to analyse whether the senior citizens' choices differed by gender, age and other background factors. On the basis of the findings, from these procedures, the significance of the four aspects was evaluated. The results of this research will provide useful insights coming from the perspective of senior citizens, who are the most important end users of the built facilities. This study will enable decision makers to prioritise services according to the facilities' floor areas, availability of funds, and other salient factors during briefing or pre-design processes.

## **2 Literature review**

Physical environments significantly impact individuals of all ages, especially senior citizens who rely on their immediate locality for support and assistance. Age-friendly housing design,

supportive neighbourhoods and connections to families and communities are overarching themes that may help in dealing with the social isolation of senior citizens (Biggs and Carr, 2015, Buffel et al., 2012, Chan et al., 2016). Given that these individuals spend most of their time in homes and communities, they are likely to be sensitive to the services provided by community-based facilities.

Current studies have exerted effort to determine the kinds of services that should be provided in community-based care facilities for senior citizens and the means by which such facilities can benefit senior citizens and other age groups.

Under the western cultural and social background, researchers have been discussing community-based since the 1990s, after Canada and the United States began to reform long-term care facilities and focus on policies and programmes that would enable senior citizens to live in their homes for as long as possible. Through a questionnaire survey, Kelly et al. (1998) explored women's views on long-term care and found that community care was more positively perceived than institutional care. In the early 2000s, healthcare policy changes and the government's adjustment of investment in the United Kingdom also directed researchers' attention to community-based care facilities for senior citizens, especially those offering rehabilitation and intermediate care (Jacobs and Rummery, 2002).

Van Bilsen et al. (2008) divided the services and facilities provided in communities into five categories and found that senior citizens' uses of socio-cultural activities and restaurants were more satisfactory compared with the use of telephone circles, personal advisors and buddy projects in the Netherlands. Xia et al. (2015) performed a content analysis of facilities in 124 Australian retirement villages around rural and suburban areas. Results indicated that community centres, libraries and barbeque facilities were the most commonly provided to support senior citizens' quality lifestyles. Community-based care facilities will not only help

reduce the burden on seniors' families, but promote people's healthy ageing process (O'Shea and Monaghan, 2017, Spring, 2018).

Discussions about community-based care facilities in the east started slightly later than in western countries. Japan's amendment to *the Long-Term Care Insurance Act* in 2006 promotes the implementation of community-based integrated care systems and small-scale, multifunctional residential care facilities (Tsutsui, 2014). Unlike conventional care facilities, which offer all relevant services, such as daytime commuting, temporary lodging, emergency or night-time nursing care visits, and in-home service to senior citizens, small-scale multifunctional residential care facilities tend to understand and respond to the changing conditions of senior citizens' and support them without separating from their familiar environments (Katahira and Tsukasaki, 2016, Yamazaki and Kawahara, 2017, Yu, 2013). Considering cost and distance, people in Taiwan also rely on community-based long-term care facilities to take care of their family members, especially disabled seniors. Studies quantifying residents' care and service needs and determining their predictors have been conducted through descriptive and cross-sectional survey methods (Huang et al., 2008, Li and Yin, 2005). As the *Ministry of Health and Welfare* in Taiwan started to promote small-scale multifunctional services in 2015, such facilities also began attracting researchers' attention (Chien, 2015).

Researchers have also performed several studies to thoroughly understand community-based care facilities in the east. For example, through collecting data from behaviour observation and pattern examination in a small-scale elderly care facility, researchers clarified the actual conditions of an environment where individualised care was provided (Hishida et al., 2010, Hishida et al., 2012). The relation of neighbourhood environments to the physical and mental health of senior citizens, and means through which cities and communities can increase their

age-friendliness to encourage ageing in place were also discussed (Loo et al., 2017, Tao et al., 2018). Furthermore, culture was claimed to be an essential prerequisite for communities where senior citizens live (To and Chong, 2017). With specific facilities as examples, the actual use of multifunctional long-term care services and architectural spaces, as well as the roles of community facilities adjacent to small-scale multifunctional care facilities for senior citizens were identified (Kim et al., 2016, Nakashima, 2013). The relationship between the spatial compositions of small-scale care multifunctional facilities and how senior citizens spend their time in such facilities were investigated (Imura et al., 2008). Moreover, potential methods of converting residence in old communities to small-scale multifunctional care facilities in China were explored (Hu et al., 2018). Regional differences in the management modality and nursing needs of these facilities were also examined (Yamada and Satoh, 2008).

Given that user satisfaction is considered a parameter in evaluating the performance of any facility, involving users during briefing is essential (Jiboye, 2012). Designing new facilities in accordance with sponsors' needs and intentions, learning from the advantages and disadvantages of existing facilities and ensuring new facilities' acceptance and appreciation among users were identified by Jensen (2006) as the most important reasons behind user involvement in the briefing process. During the past decade, briefing has evolved from being an initial stage of a project to being a continual and interactive process due to the development of universal and inclusive design concepts (Jensen and Pedersen, 2009). As suggested by Chrysikou (2018), designing for the vulnerable and senior citizens should be in harmony with these people's perception and physiology. Therefore, user participation has become an increasingly significant means of understanding people's requirements, and numerous studies have been conducted, especially in the field of facilities for people's wellbeing (Barnes et al., 2011, Chrysikou et al., 2017, Khandokar et al., 2009).

Chinese researchers have explored the significance of ERFs and analysed problems related to design, construction, operation and management on the basis of existing facilities in economically developed areas (Shanghai, Beijing, Nanjing, etc.) in mainland China and experiences from Japan (Hu et al., 2015, Kang, 2017, Ming et al., 2016, Yao, 2016, Zhang and Zhao, 2017, Zhu, 2017). However, few have concentrated on identifying senior citizens' requirements on services that should be provided by ERFs. To bridge this gap, this study explores the service requirements of senior citizens and preliminarily discusses factors that may influence their perceptions.

### **3 Research methods**

#### **3.1 Document analysis and brainstorming session**

A targeted literature review was conducted to thoroughly understand ERFs and similar facilities. 'Small-scale elderly care facility' and 'community-based care facility for older people' were utilised as the retrieval keywords in *Web of Science*, whereas the Chinese term for ERFs was applied in searching for Chinese papers in *China National Knowledge Infrastructure*. ERFs in mainland China share similarities with the small-scale multifunctional residential care facilities that the Japanese government promoted vigorously in 2006. Moreover, Japan is a typical eastern country and has been facing ageing society issues for a much longer time than China. Therefore, studies and experiences from practical projects of small-scale multifunctional residential care facilities in Japan also assisted in identifying senior citizens' requirements. Firstly, a session for identifying services was conducted after the retrieved documents were reviewed and suggestions were gathered from three senior managers of care facilities for senior citizens. An initial list of services that should be provided by ERFs was then created.



Then, a brainstorming session was conducted with participants, which included (1) three master's students in architecture or urban planning who were working on ERF research projects, (2) twelve research students majoring in architecture or urban planning but were not working on said projects and (3) one professor with more than 20 years and two associate professors with 10 years of teaching and practical experiences in construction. All of the participants had at least 1.5 years of experience in practical cases in architectural design or urban planning. These participants were encouraged to write their opinions on the services that senior citizens may need to enjoy a high-quality retirement life without leaving their original communities. Subsequently, a question-and-answer session was conducted to ensure that everyone's opinion was fully understood. Criticism was not allowed, and the list of services that should be provided by ERFs was revised during this stage.

After the brainstorming session, comprehensive document analysis was conducted, including design guidelines implemented by the *Ministry of Housing and Urban-Rural Development of the People's Republic of China* (MOHURD, 2014) and the latest policy documents published by the *Ministry of Civil Affairs of the Peoples Republic of China* (MCA, 2017a, MCA, 2017b). All services that were identified through the two former steps and also considered mandatory by the design guidelines and policy documents were confirmed. For the remaining requirements, another voting round was held with the members of the brainstorming session; factors which were supported by more than half of the participants were confirmed, and the rest were eliminated. Afterwards, services provided by community-based facilities that may contribute to a high-quality retirement life for senior citizens were divided into four main aspects, namely, (1) daily life assistance, (2) culture-related activities, (3) health care and (4) rehabilitation and entertainment. Twenty-two detailed services under these four aspects were also obtained (Table 1) were obtained, and formed the basis of the questionnaire (Appendix).

### 3.2 Questionnaire design and survey

A questionnaire survey was administrated in Heilongjiang Province, northeast China. This survey targeted senior citizens living in their original communities to enjoy retirement lives. Three sections were included in the questionnaire, namely, (1) background information of the respondents (gender, age, physical condition, educational level and living pattern), (2) ranking of the four main aspects of services and (3) ranking of detailed services related to each main aspect (given that each main aspect contains different detailed services that could be provided to senior citizens inside ERFs).

The questionnaire was designed as a five-point Likert-type scale, a technique for the assessment of attitudes. All services were measured as follows: 5 for ‘very important’, 4 for ‘important’, 3 for ‘neutral’, 2 for ‘unimportant’, and 1 for ‘unimportant at all’. However, a preliminary survey answered by 10 targeted participants showed that they tended to choose 3 for more than 90% of the 22 items. The same outcome happened for the questionnaires filled out by the investigators after asking for the senior citizens’ ideas. Given that ‘3’ indicated a neutral feeling, identifying the participants’ real needs was difficult. Thus, the questionnaire was adjusted by prioritising questions. Firstly, the participants were asked to rank the four main aspects according to their preferences and then rank the detailed item under each aspect. Another preliminary survey was answered by the former 10 targeted participants, and improved results were obtained.

The survey was administrated during a one-month period from May 2017 to June 2017. Given the physical conditions and educational levels of the participants, most of the questionnaires were filled out by the investigators after conducting an approximately 20 min interview with each participant to explain the questions and ask for ideas. A total of 98 responses were

collected, of which 82 were deemed valid through data screening.

### 3.3 Data analysis

The mean priorities of the four main aspects and of the detailed services were calculated and accordingly ranked (Table 2). In this questionnaire survey, the smaller the value of mean priority, the more important the item meant to the participants. A normality test conducted via *IBM SPSS Statistics 25* revealed that the data were not normally distributed. Then, non-parametric statistical tools were applied to explore the level of agreement among the respondents and correlations between their backgrounds and their opinions towards the different aspects of services.

<Table 2 Ranking of services provided by ERFs>

## 4 Analysis results

### 4.1 Characteristics of respondents

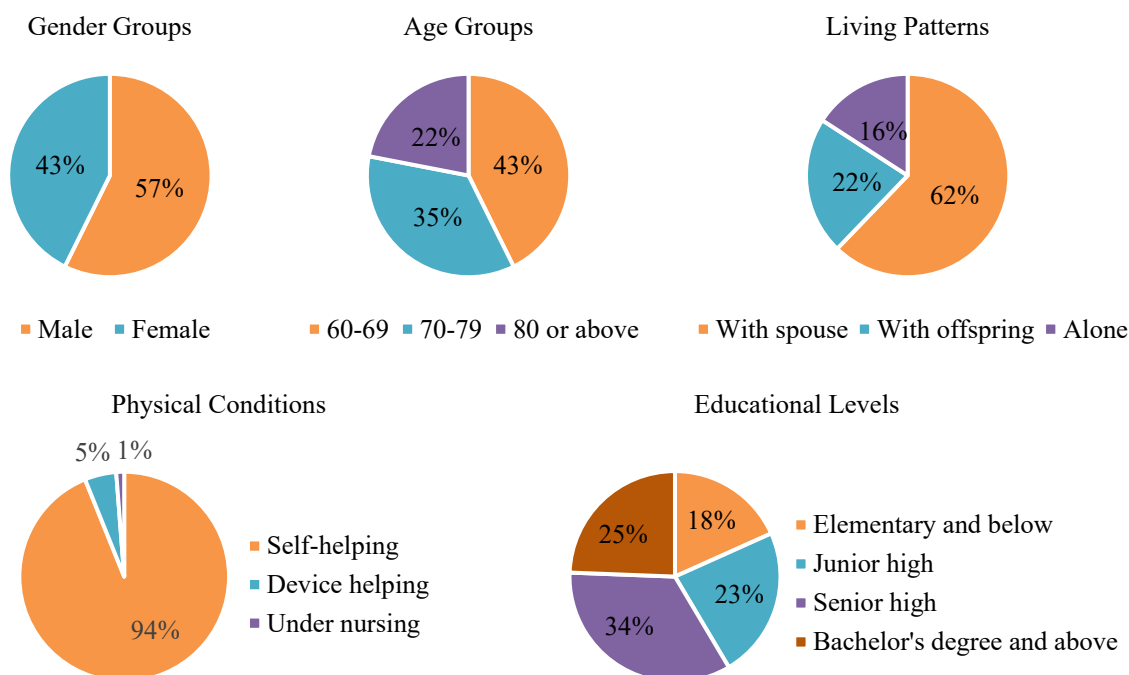


Figure 1 Characteristics of respondents

Among the 82 valid responses, 47 are from male respondents (57%), and 35 are from females (43%). Thirty-five of the participants (43%) are in their 60s (60 to 69 years old), 29 (35%) are in their 70s (70 to 79 years old) and the 18 remaining (22%) are aged 80 years and older. In terms of physical condition, 77 (94%) are self-helping senior citizens (can take care of selves), 4 (5%) are device-helping senior citizens (need help from others or certain supporting facilities) and 1 (1%) is under nursing (cannot finish daily routines by himself and needs others to take care of him). In addition, 15 respondents (18%) finished elementary school and below, 19 (23%) completed junior high school; 28 (34%) graduated from senior high school and the 20 remaining (25%) hold bachelor's or higher degrees. Finally, 51 respondents (62%) live with their husbands or wives; 18 (22%) live with their offspring and 13 (16%) live alone. Characteristics of respondents are illustrated in Figure 1.

## **4.2 Level of agreement among respondents**

Given that the senior citizens were asked to give mutually exclusive responses in the survey, the questionnaire was reliable (Gopikrishnan and Paul, 2018). Kendall's coefficient of concordance test was conducted to measure the level of agreement regarding the participants' ratings of the main aspects and of the detailed items of services provided by community-based facilities.

Table 3 shows that Kendall's coefficient of concordance (W) for the rankings of the main aspects is 0.082, whereas those for the detailed items under the four main aspects are 0.369, 0.236, 0.450 and 0.488. The computed W values indicate a relatively low level of agreement, despite the statistical significance of all the rankings (0.000). Mann-Whitney U and Kruskal-Wallis tests were conducted to further explore the correlations of the respondents' perceptions and their backgrounds.

### 4.3 Correlations of respondents' perceptions and backgrounds

Given that the collected data were not normally distributed, non-parametrical techniques were applied to explore the correlations. A Mann-Whitney U test was conducted to test whether the male and female groups had different views on rankings of the services provided by ERFs. The following hypotheses were formulated and tested:

$H_0$ : Rankings of services provided by ERFs are the same from the male and female groups.

$H_A$ : Rankings of services provided by ERFs differ from the male and female groups.

At the 95% confidence interval,  $H_0$  would be rejected if the test significance level (presented as p-value in Table 4) was less than 0.05. Under such circumstance,  $H_A$  would be accepted.

The Kruskal-Wallis test is similar to the Mann-Whitney U test, but the former can compare variables for three or more groups (Pallant, 2016). In this research, Kruskal-Wallis tests were performed to investigate whether differences other than gender among the respondents would affect their choices. Hypotheses were also formulated according to age, physical condition, educational level and living pattern.

$H_0$ : Rankings of services provided by ERFs are the same across age groups / physical conditions / educational levels / living patterns.

$H_A$ : Rankings of services provided by ERFs differ across age groups / physical conditions / educational levels / living patterns.

#### 4.3.1 Results of Mann-Whitney U test

Results of the Mann-Whitney U test indicated that rankings of the detailed services provided by ERFs are not influenced by gender, whereas rankings of two main aspects, namely, daily life assistance and cultural related activities, differ between the two gender groups (Table 4).

The average rank of ‘daily life assistance’ showed that the female group cares more about this aspect than does the male group, whereas the male group pays more attention to culture-related activities. According to Pallant (2016), *IBM SPSS Statistics* does not provide effect size statistics for the Mann-Whitney U test; however, an appropriate value of  $r$  could be calculated using the  $z$  value by Eq. (1). The computation results revealed a small to medium effect size in both services provided by ERFs according to the following criteria: 0.1 = small effect, 0.3 = medium effect and 0.5 = large effect (Cohen, 1988).

$$r = \frac{Z}{\sqrt{N}} \quad \text{..... Eq. (1), where } N = \text{total number of cases}$$

**<Table 4 Mann-Whitney U test results on services provided by ERFs regarding gender groups>**

#### **4.3.2 Results of Kruskal-Wallis test**

Results of the Kruskal-Wallis test showed that rankings differ not only in the main aspects but also in detailed items when the various characteristics of the participants were considered. The respondents not younger than 80 years tend to prioritise ‘daily life assistance’ and care more about ‘postoperative nursing’ service than the other age groups. People in their 70s show considerable interest in ‘chess and cards playing’, whereas people in their 60s have a moderate attitude toward the activity. Apart from ‘general practitioner’ service, the average rank of functional requirements they gave seldomly came to the first or the last among three age groups (Table 5).

**<Table 5 Kruskal-Wallis test results on services provided by ERFs regarding age groups>**

**<Table 6 Kruskal-Wallis test results on services provided by ERFs regarding physical conditions>**

The senior citizens’ choices are influenced by their physical conditions in several detailed items (Table 6). ‘Day care’ and ‘massage’ services are important for the device-helping senior citizens, whereas places for ‘singing and dancing’ are a critical factor for the self-helping participants. For the only under-nursing respondent who was injured in a vehicular accident

many years ago and is still undergoing recuperation therapy, care services related to post-operative nursing are the first consideration.

**<Table 7 Kruskal-Wallis test results on services provided by ERFs regarding education levels>**

Education levels also impact the senior citizens' considerations among the main aspects and the detailed items (Table 7). 'Daily life assistance' is the first concern for the senior citizens who hold bachelor's or higher degrees but the last for the participants who graduated junior high school at most. For the 'chess and cards playing' places, the seniors who graduated elementary and below are the most interested, whereas those with bachelor's or higher degrees are the least interested.

**<Table 8 Kruskal-Wallis test results on services provided by ERFs regarding living patterns>**

Living patterns affect senior citizens' choices among the detailed items (Table 8). The participants who live with their offspring tend to need 'full time nurse' and 'purchasing' services, they are also more interested in handmade activities than those who live alone or with husbands/wives.

## **5 Discussions**

### **5.1 Senior citizens' requirements of services provided by ERFs**

According to the 82 valid responses of the questionnaire survey, health care services in ERFs are considered the most important. Requirements regarding rehabilitation and entertainment, and daily life assistance are ranked second and third, respectively. Meanwhile, culture-related activities are the least important.

For health care services, the senior citizens can clearly recognise their physical conditions through 'regular health examination' and thus care most about it than the other services. Several of the senior citizens believe that having doctors in ERFs offering medical advice

may help them deal with the difficulty and high cost of accessing medical service, which have long been issues in mainland China, to some extent. As many challenges hinder the assignment of general practitioners and companions for seniors in going to hospitals, most senior citizens therefore hold wait-and-see attitudes. Only a few senior citizens prioritise ‘psychological counselling’ service, and this finding reflects the insufficient attention currently given to the psychological health of the seniors.

Regarding rehabilitation and entertainment-related places that ERFs can provide, the senior citizens’ focus tends to concentrate on fitness exercises, as well as chess and cards playing spaces. They also need special places for singing and dancing to avoid disturbing the younger people who live in the same community. Massage and post-operative nursing services are mentioned only by a small number of people (those who had just undergone surgeries shortly before participating the questionnaire survey).

Regarding daily life assistance, the senior citizens’ needs mostly focus on canteens, room cleaning and meals-on-wheels services. Most people who rely on their original communities after retirement are self-helping ones; that is, they can finish daily routines without day care or full-time nursery services. Moreover, senior citizens tend to eat less and may lower their required taste of meals overtime; thus, canteens and meals-on-wheels services will be convenient, especially during weekdays, when their children are not home. However, housework becomes more difficult as seniors age, thereby gradually increasing their need for room cleaning, laundry and purchasing services.

Results from the questionnaire survey showed that senior citizens normally engage in culture-related activities of reading and listening to seminars. Some may continue to enjoy their hobbies after retirement, such as drawing, calligraphy and photography, to make their retirement lives rich and colourful. According to the standards released by MCA (2017a),



ERFs should contain spaces that can be used for the abovementioned activities. Although current ERFs or community centres in mainland China provide such spaces, the areas are always quite limited and not well-utilised by senior citizens (Xiang et al., 2017, Yao, 2016). In addition, organising culture-related activities is difficult due to limitation in facility managers' focus on senior citizens' cultural needs and in the time and money needed (Jin, 2018). Communities may consider cooperating with local collages for senior citizens and encourage the holding of culture-related events, such as developing study groups among senior citizens who share similar experiences or hobbies. Thus, these seniors will benefit increasingly from the communities they live in.

## **5.2 Factors affecting senior citizens' choices**

According to the results of the Mann-Whitney U and Kruskal-Wallis tests, gender, age, physical condition, educational level, and living pattern influence the choices of the senior citizens.

Opinions on main aspects differ by gender. The women prefer 'daily life assistance' more than the men, whereas the latter focuses more on culture-related activities than the former. However, the effect size is not large; thus, differences between gender groups should not be decision makers' priority when allocating spaces in ERFs for senior citizens. This phenomenon may reflect the traditional gender role differentiation in Chinese culture; that is, men handle matters that occur outside the family, and women are in charge of things in the family (Shek, 2006).

Age and educational level impact the seniors' choices not only among the main aspects but also among the detailed items, such as 'daily life assistance' (main aspect), and 'chess and cards playing' (detailed item). Physical conditions and living patterns influence the senior citizens' choices on the detailed items, but their effects do not share similarities in a certain

item. Such results are expected, given that age causes sensory, physical and psychological changes in individuals. Moreover, the levels of *Activities of Daily Living* gradually influence senior citizens' requirements of services provided by care facilities in communities. Richard et al. (2009) stated that in Canada, senior citizens' access to private transportation has become limited, and they may rely on walking and participate in community-based activities more than before; the participants also mentioned this concern when the questionnaire survey was administrated.

Several respondents, especially those who are young, have higher educational levels and good physical conditions, tend to try more types of rehabilitation and entertainment-related activities than what the questionnaire listed and what an ERF can provide, such as winter swimming, ice-skating, skiing and golf-playing. For the seniors who have just entered their 60s and those who are in good health, the needed leisure activities are normally not largely different from those of younger citizens. Such seniors are encouraged to participate in wide-ranging activities organized by communities instead of focusing only on activities specially designed for senior citizens.

### **5.3 Social participation of senior citizens 'ageing in place'**

Traditional Chinses culture and senior citizens senses' of belonging together have made the term 'ageing in place' increasingly popular. Policies that set ageing in place make sense from the economic and social perspective (Lui et al., 2009). Although discussions related to this practice mainly focus on the home, the growing awareness has revealed that the community is also crucial for people's ability to stay put (Wiles et al., 2012). Such trend is consistent with a statement from Davey et al. (2004): ageing in place means 'remaining living in the community, with some level of independence, rather than in residential care'.

Amenity factors and social influences always affect people's expectations to move or age in

place (Schiamberg and McKinney, 2016). Present studies point out the need to promote policies targeting communities and policy makers with urban planners should provide senior citizens supportive environment for social interaction and participation (Richard et al., 2009). ERFs and other outdoor spaces in communities can encourage senior citizens to go out, to participate in leisure activities and to communicate with others. Such activities are always associated with successful ageing and senior citizens will enjoy better quality of life in their communities (Desrosiers et al., 2004).

Apart from top-down policies and strategies, senior citizens' bottom-up participations in the construction process of ERFs may result in useful interventions. Senior citizens and their families, carers and friends are the end users of ERFs. Such participation and involvement will not only encourage these end users to voice their concerns but also define the characteristics of ERFs and identify the kind of service that should be provided (Buffel et al., 2014, Buffel et al., 2012, Chan and Cao, 2015, Lui et al., 2009). Stakeholders become increasingly likely to build enhanced facilities for senior citizens by taking the latter's requirements into consideration.

In the coming decades, senior citizens in urban areas in China will not only be healthier but also be wealthier and better educated than today, thereby resulting in a rapid growth in their usage of the Internet (Chan and Cao, 2015). Unlike teenagers, who tend to build larger social networks with friends of similar ages, senior citizens normally have smaller social networks with a broader age range (Jung and Sundar, 2016). After retirement, individuals rely on the social networks they have built to share feelings and to keep in touch with families and friends living in distant places. Future ERFs are likely to adopt digital technologies and to develop virtual components, including but not limited to WeChat groups, VR and AR entertainment products. Compared with the mere provision of traditional leisure spaces in

ERFs for activities such as chess and cards playing, these digital elements may benefit senior citizens' wellbeing more by keeping them productive and connected to the rest of society.

## **6 Conclusion**

Population ageing results in an increasing demand for services meant for senior citizens. From the perspectives of humanities and political economy, promoting senior citizens' participation in building ERFs not only fosters quality and social justice but also ensures that public policies safeguard the rights of senior citizens. Although senior citizens are the end users of community-based facilities, their needs are easily overlooked by decision-makers and facility managers. In addition, senior citizens in China are predominantly passive and relatively silent in formal and informal civic participation because they normally hope that policy-makers can notice and satisfy their requirements.

This study aims to identify senior citizens' requirements related to ERFs in mainland China and to discuss whether senior citizens' perceptions are influenced by their backgrounds. Results from the questionnaire survey revealed that, health care services for the seniors are considered the most important, among the four main aspects. Requirements regarding rehabilitation and entertainment, and daily life assistance are ranked second and third, respectively. Culture-related activities are least important. Differences in senior citizens' background also influence their choices. This survey-based study calls on attention to senior citizens' needs from community-based facilities, and the results are likely to serve as reference for various stakeholders in working together in the briefing process of ERF projects. By knowing the services that senior citizens need from ERFs, decision makers can consider the aged when implementing design guidelines. In addition, architects and investors can make improved decisions when working with limited spaces or investments.

459    **Acknowledgement**

460    The authors wish to express their sincere gratitude to all the participants who shared their  
461    opinions through the questionnaire survey.

## Appendix: Survey Questionnaire

### Senior citizens' requirements on services provided by ERFs

This questionnaire survey is carried out to identify your needs on community-based care facilities in urban cities of mainland China. It takes about 10 minutes to complete this questionnaire survey.

#### Part 1 Background information

1. What is your gender?      A. Male    B. Female
2. What is your age?      A. 60~69    B. 70~79    C. 70~79
3. What is your physical condition now?  
A. Self helping    B. Device helping    C. Under nursing
4. What is your highest educational level?  
A. Elementary school and below    B. Junior high    C. Senior high  
D. Bachelor's degree and above
5. What is your living pattern now?  
A. With spouse    B. With offspring    C. Alone

#### Part 2 Rankings of main aspects

If your community can provide the following four aspects of services, please give ranks to them in the order of importance from **1 to 4**, where 1 is the most important and 4 is the least important to you.

Daily life assistance

Culture-related activities

Health care

481 **Part 3 Rankings of detailed items**

482 1. Please give ranks to the detailed items under the main aspect of ***“Daily life assistance”*** in  
 483 the order of importance from **1 to 8**, where 1 is the most important and 8 is the least  
 484 important to you.

Full time nursery

Room cleaning

Day care

Laundry

Meals on wheels

Purchasing

Canteens for senior citizens

Legal assistance

485 2. Please give ranks to the detailed items under the main aspect of ***“Culture-related activities”***  
 486 in the order of importance from **1 to 4**, where 1 is the most important and 4 is the least  
 487 important to you.

Reading

Handmade activities

Painting and calligraphy

Seminars

488 3. Please give ranks to the detailed items under the main aspect of ***“Health care”*** in the  
 489 order of importance from **1 to 5**, where 1 is the most important and 5 is the least important  
 490 to you.

Regular health examination

Health counselling

General practitioner

---

Going to the hospital with someone accompanied

Psychological counselling

- 491 4. Please give ranks to the detailed items under the main aspect of ***“Rehabilitation and***  
492 ***entertainment”*** in the order of importance from **1 to 5**, where 1 is the most important and  
493 5 is the least important to you.

Chess and cards playing

Singing and dancing

Fitness exercises

Massage

Postoperative nursing

494



## 495   **References**

- 496   Barnes, S., Torrington, J., Darton, R., Holder, J., Lewis, A., McKee, K., Netten, A. N. N. &  
497       Orrell, A. 2011. Does the design of extra-care housing meet the needs of the residents?  
498       A focus group study. *Ageing and Society*, 32, 1193-1214.
- 499   Beijing Municipal Commission of Planning and Natural Resources & Beijing Municipal Civil  
500       Affairs Bureau 2015. Subject plan on elderly care facilities in Beijing. Beijing.
- 501   Biggs, S. & Carr, A. 2015. Age- and child-friendly cities and the promise of intergenerational  
502       space. *Journal of Social Work Practice*, 29, 99-112.
- 503   Buffel, T., McGarry, P., Phillipson, C., De Donder, L., Dury, S., De Witte, N., Smetcoren, A. S.  
504       & Verte, D. 2014. Developing age-friendly cities: case studies from Brussels and  
505       Manchester and implications for policy and practice. *Journal of Aging & Social Policy*,  
506       26, 52-72.
- 507   Buffel, T., Phillipson, C. & Scharf, T. 2012. Ageing in urban environments: Developing  
508       ‘age-friendly’ cities. *Critical Social Policy*, 32, 597-617.
- 509   Chan, A. C. M. & Cao, T. 2015. Age-friendly neighbourhoods as civic participation:  
510       implementation of an active ageing policy in Hong Kong. *Journal of Social Work*  
511       *Practice*, 29, 53-68.
- 512   Chan, A. W. K., Chan, H. Y. L., Chan, I. K. Y., Cheung, B. Y. L. & Lee, D. T. F. 2016. An  
513       age-friendly living environment as seen by Chinese older adults: A "photovoice" study.  
514       *International Journal of Environmental Research and Public Health*, 13.
- 515   Chien, H.-J. 2015. Comprehensive community care: small-scale and multifunctional service.  
516       *Journal of Chang Gung Institute of Technology*, 15-22.
- 517   Chrysikou, E. 2018. Why we need new architectural and design paradigms to meet the needs  
518       of vulnerable people. *Palgrave Communications*, 4, 116.
- 519   Chrysikou, E., Tziraki, C. & Buhalis, D. 2017. Architectural hybrids for living across the  
520       lifespan: lessons from dementia. *The Service Industries Journal*, 38, 4-26.
- 521   Cohen, J. 1988. *Statistical Power Analysis for the Behavioral Sciences*, Hillsdale, N.J., L.  
522       Erlbaum Associates.
- 523   Davey, J. A., de Joux, V., Nana, G. & Arcus, M. 2004. *Accommodation Options for Older*  
524       *People in Aotearoa/New Zealand*, Citeseer.
- 525   Desrosiers, J., Noreau, L. & Rochette, A. 2004. Social participation of older adults in Quebec.  
526       *Aging clinical and experimental research*, 16, 406-412.
- 527   Gopikrishnan, S. & Paul, V. K. 2018. Validation and ranking of user requirement related  
528       building performance attributes and sub attributes for government residential buildings.  
529       *Facilities*, 36, 638-656.
- 530   Hershberger, R. G. 1999. *Architectural Programming and Predesign Manager*, New York,  
531       N.Y., New York, N.Y. : McGraw-Hill.
- 532   Hishida, K., Matsumoto, M. & Ueno, J. 2010. Types of human gathering in small-scale  
533       elderly care facility. *Journal of Asian Architecture and Building Engineering*, 9, 415.
- 534   Hishida, K., Matsumoto, M. & Ueno, J. 2012. Study on the support environment of the  
535       elderly care facilities from the viewpoint of human gathering. *Journal of Architecture*  
536       *and Planning (Transactions of AIJ)*, 77, 291-300.
- 537   Hu, H., Wang, Y., Wang, X. & Zhang, L. 2015. Situation evaluation and improving path of  
538       embedded retirement pattern. *Social Security Studies*, 10-17.
- 539   Hu, H., Xu, Z. & Che, G. 2018. A methodological exploration of converting residences into  
540       residential care facilities for the elderly in old communities - A case study of

541 Chaoyang District, Beijing. *Journal of Asian Architecture and Building Engineering*,  
542 17, 409-416.

543 Huang, J. J., Lin, K. C. & Li, I. C. 2008. Service needs of residents in community - based  
544 long - term care facilities in northern Taiwan. *Journal of Clinical Nursing*, 17, 99-108.

545 Imura, R., Yamada, A., Matsumoto, M. & Ueno, J. 2008. A study on the current state and  
546 relationships between staying aspects and spatial composition of the small-scale  
547 elderly care facilities based on day service. *Journal of Architecture and Planning*  
548 (*Transactions of AIJ*), 73, 2091-2098.

549 Jacobs, S. & Rummery, K. 2002. Nursing homes in England and their capacity to provide  
550 rehabilitation and intermediate care services. *Social Policy & Administration*, 36,  
551 735-752.

552 Jensen, P. A. Continuous briefing and user participation in building projects. IASS  
553 International Conference on Adaptability in Design and Construction, 2006 Eindhoven,  
554 Netherlands. Eindhoven University of Technology, 119-123.

555 Jensen, P. A. & Pedersen, E. F. 2009. User involvement and the role of briefing. In: Emmitt,  
556 S., Prins, M. & Otter, A. d. (eds.) *Architectural Management: International Research*  
557 *and Practice*.

558 Jiboye, A. D. 2012. Post-occupancy evaluation of residential satisfaction in Lagos, Nigeria:  
559 Feedback for residential improvement. *Frontiers of Architectural Research*, 1,  
560 236-243.

561 Jin, Y. 2018. Spiritual and cultural life of the elderly in urban and rural China. *China Social*  
562 *Work*, 26-27.

563 Jung, E. H. & Sundar, S. S. 2016. Senior citizens on Facebook: How do they interact and why?  
564 *Computers in Human Behavior*, 61, 27-35.

565 Kang, Y. 2017. The progress of the community-based integrated care system for the elderly in  
566 Japan and its experiences. *Journal of Beijing University (Humanities and Social*  
567 *Sciences)*, 15, 110-117.

568 Katahira, N. & Tsukasaki, K. 2016. Nursing care in multifunctional small group homes  
569 providing day, visiting and overnight services for older people living at home.  
570 *International Journal of Nursing Practice*, 22, 605-615.

571 Kelly, L. E., Knox, V. J. & Gekoski, W. L. 1998. Women's views of institutional versus  
572 community-based long-term care. *Research on Aging*, 20, 218-245.

573 Khandokar, F., Price, A., Austin, S. & Paranagamage, P. 2009. Briefing: User-perspectives on  
574 walkable neighbourhoods. *Proceedings of the Institution of Civil Engineers - Urban*  
575 *Design and Planning*, 162, 155-158.

576 Kim, S., Takemiya, K. & Tamamitsu, S. 2016. Use of multifunctional services and  
577 architectural space in a small-scale multifunctional long-term care facilities for the  
578 elderly: a 20-year analysis in Takurousho Y. *Journal of Architecture and Planning*  
579 (*Transactions of AIJ*), 81, 2595-2604.

580 Kumlin, R. R. 1995. *Architectural Programming : Creative Techniques for Design*  
581 *Professionals*, New York, New York : McGraw-Hill.

582 Li, I. c. & Yin, T. J. c. 2005. Care needs of residents in community - based long - term care  
583 facilities in Taiwan. *Journal of Clinical Nursing*, 14, 711-718.

584 Loo, B. P. Y., Lam, W. W. Y., Mahendran, R. & Katagiri, K. 2017. How is the neighborhood  
585 environment related to the health of seniors living in Hong Kong, Singapore, and  
586 Tokyo? Some insights for promoting aging in place. *Annals of the American*  
587 *Association of Geographers*, 107, 812-828.

588 Lui, C. W., Everingham, J. A., Warburton, J., Cuthill, M. & Bartlett, H. 2009. What makes a

- community age-friendly: a review of international literature. *Australasian Journal on Ageing*, 28, 116-21.
- MCA 2017a. Basic requirements for services of community day-care centers for the elderly. Beijing: General Administration of Quality Supervision, Inspection and Quarantine of P.R.C.; Standardization Administration of the People's Republic of China.
- MCA 2017b. Configuration of facilities and equipment for community day-care centers for the elderly. Beijing: General Administration of Quality Supervision, Inspection and Quarantine of P.R.C.; Standardization Administration of the People's Republic of China.
- Ming, S., Yuezhi, Q. & Lulu, Y. 2016. The exploration of a new mode of centre for community age service based on the construction of Beijing Vanke community care service centre named Jiayuan. *Architecture & Culture*, 88-89.
- MOHURD 2014. Design code for buildings of elderly facility. Beijing: China Architecture & Building Press.
- Nakashima, M. 2013. Study on the community facility adjacent to the small-scale multi-functional care facility for elderly people in Omuta city.
- O'Shea, E. & Monaghan, C. 2017. An economic analysis of a community-based model for dementia care in Ireland: a balance of care approach. *International Psychogeriatrics*, 29, 1175-1184.
- Pallant, J. 2016. *SPSS Survival Manual : A Step by Step Guide to Data Analysis Using IBM SPSS*, Maidenhead, Berkshire, England, McGraw-Hill Education.
- Richard, L., Gauvin, L., Gosselin, C. & Laforest, S. 2009. Staying connected: neighbourhood correlates of social participation among older adults living in an urban environment in Montreal, Quebec. *Health Promotion International*, 24, 46-57.
- Salisbury, F. 1998. *Briefing Your Architect*, Oxford, Architectural Press.
- Schiamberg, L. B. & McKinney, K. G. 2016. Factors influencing expectations to move or age in place at retirement among 40- to 65-year-olds. *Journal of Applied Gerontology*, 22, 19-41.
- Shek, D. T. L. 2006. Chinese family research: Puzzles, progress, paradigms, and policy implications. *Journal of Family Issues*, 27, 275-284.
- Spring, A. 2018. Short- and long-term impacts of neighborhood built environment on self-rated health of older adults. *Gerontologist*, 58, 36-46.
- Tao, Y., Gou, Z., Lau, S. S., Lu, Y. & Fu, J. 2018. Legibility of floor plans and wayfinding satisfaction of residents in Care and Attention homes in Hong Kong. *Australasian Journal on Ageing*, 37, E139-E143.
- The People's Government of Beijing Municipality 2008. Guiding opinions on accelerating the development of elderly care service organizations. Beijing.
- The People's Government of Shanghai Municipality 2007. The 11th five-year plan for the development of civil affairs in Shanghai. Shanghai.
- To, K. & Chong, K. H. 2017. The traditional shopping street in Tokyo as a culturally sustainable and ageing-friendly community. *Journal of Urban Design*, 22, 637-657.
- Tsutsui, T. 2014. Implementation process and challenges for the community-based integrated care system in Japan. *International Journal of Integrated Care*, 14.
- Van Bilsen, P. M. A., Hamers, J. P., Groot, W. & Spreeuwenberg, C. 2008. The use of community-based social services by elderly people at risk of institutionalization: an evaluation. *Health Policy*, 87, 285-95.
- Wiles, J. L., Leibing, A., Guberman, N., Reeve, J. & Allen, R. E. 2012. The meaning of "aging in place" to older people. *Gerontologist*, 52, 357-66.

- Xia, B., Skitmore, M., Zuo, J. & Buys, L. 2015. Review of community facilities in Australian retirement villages: A content analysis. *Australasian Journal on Ageing*, 34, 144-8.
- Xiang, L., Zou, G., You, H. & Shang, D. 2017. A new choice for aging in place: analysis on design strategies for embedded retirement facilities. *Urbanism and Architecture*, 24-26.
- Yamada, A. & Satoh, E. 2008. Differences of management and nursing needs of small scale caring home for the elderly according to regionality. *Journal of Architecture and Planning (Transactions of AIJ)*, 73, 2355-2363.
- Yamazaki, A. & Kawahara, T. 2017. The structure of family practices in multifunctional long-term care in a small group home in Japan. *Home Health Care Management & Practice*, 30, 30-34.
- Yao, D. 2016. Community-based integrated senior facility: an innovative model for aging in place in metropolis. *New Architecture*, 68-72.
- Yu, A. T. W., Shen, Q., Kelly, J. & Hunter, K. 2007. An empirical study of the variables affecting construction project briefing/architectural programming. *International Journal of Project Management*, 25, 198-212.
- Yu, H. 2013. *Research on Japan's Endowment Facilities Construction and Develop*. Master, Southwest Jiaotong University.
- Zhang, S. & Zhao, Y. 2017. A study on the design of small care facilities for the elderly embedded in urban communities. *Architectural Journal*, 18-22.
- Zhu, Q. 2017. Research on the development of embedded pension service in Shanghai community. *Scientific Development*, 103-109.
- Zhuang, W. 2015. Architecture programming in China. *Design Community*, 7.
- Zhuang, W. 2017. Architecture in transformation: a rethinking on architectural programming and architecture. *New Architecture*, 18-22.