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Abstract

In Indonesia, the number of older persons significantly increases every year. In 2017, there are an estimated 22.66 million older persons and will continually grow to 49.19 million in 2025. Government and society need to help older people regarding their vulnerability on experience chronic conditions, functional degradations and limitation to do daily activity. Government resolves it with providing an institution-based program for elderly through *Panti Wreda* [nursing home]. *Panti Wreda* aims to assist the older persons living in the personal, family, and community level. Food management is one arrangement from *Panti Wreda* that is needed to notice because it can affect older's health improvement, especially for their nutrition status. This study aims to explore an older's people food management in Salib Putih Independent Nursing Home (SPINH), Salatiga for the elderly long-term care improvement program. The study used Mini Nutrition Assessment Questionnaire to discovered elderly nutrition status in *Panti Wreda*, 24 hours recall observed nutrition intake, calculated Basal Metabolism Rate by FAO/WHO/UNU method, and observation. The results showed one resident has malnutrition on risk and other residents have a low deficit for protein intake. It occurred from limitation protein sources among residents. Food management was good enough but not meet appropriation standard for food allocation. Recommendations for *Panti Wreda* are *Panti Wreda* needs to has specific diet guideline for residents based on their needs and knowledge enhancement among caregivers to improve nutrition needs awareness by positive deviance approach.

Keywords: Elderly, Nursing Home, Nutrition Status, Salatiga

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Introduction

The Indonesian Ministry of Health categorizes the elderly age group into the early elderly (46-65 years), the final elderly (56-65 years) and the elderly (above 65 years). Meanwhile, according to WHO, the elderly are categorized as young elderly (60-69 years), middle-aged (70-79 years) and elderly (over 80 years). Furthermore, the very old age category according to WHO is centenarians (over 100 years) and supercentenarians (110+ years) (Badan Pusat Statistik, 2018; Depkes RI, 2017; WHO, 2018). However, certain age limits for categorizing this population segment are still important, as it is related to how the age limit will be used in developing programs that support the life of this segment population (Judith Brown, 2010).

The age limit in preparing program, mentoring or intervention related to determining the target of various activities. The obstacle faced is that the aging process itself does not occur at the same rate for each. So it is difficult to determine whether, with the same age chronology, the elderly still have the same functional status. Thus, the limits based on chronological age become less indicative, including in health aspects, to become the basis for determining the target of a program.

Regardless of how to define and determine the age limits of this population segment, it must be recognized that the elderly population segment continues to increase in the composition of the world's demographics. It is estimated that the segment of the elderly population in the global population is the fastest growing segment (Orla Collins, 2015). The growth of the elderly population also occurs in Indonesia. The elderly population in Indonesia increased from 4.5% in 1971 to 7.2% (2000) and 8.5% in 2015. The percentage of Indonesia's elderly population is projected to increase to 15.8% in 2035 and 23% in 2050. There has been a twofold surge in the period 1971-2017 and currently the elderly in Indonesia account for 8.97% of Indonesia's population. Five provinces have an old population structure with an elderly population reaching 10% of the population and Central Java occupying the second position (12.46%) (Badan Pusat Statistik, 2018).

Furthermore, the responsibilities of various parties including the government, communities, and households regarding the existence of this elderly population are how to respond to their specific needs appropriately. Elderly people need various potential support to support their lives because of the elderly experience chronic conditions, functional decline and limitations in carrying out daily activities. The direction of the elderly policy in the National Medium-Term Development Plan 2015-2019 includes strengthening the protection scheme for the elderly population. Protection of the elderly population will be more directed at providing Long Term Care (LTC) services. LTC services involve three components, the government in the form of providing an LTC insurance system and institutionally based services; the community provides community-based services; and households will receive services to strengthen household capacity so that they can provide services to the elderly using home-based services (Sulastri & Humaedi, 2014).

One of the main activities of the policy that prioritizes the implementation of social welfare for protection and rehabilitation of the elderly who are unable to meet physical, spiritual and social needs is the provision of regular institutions of nursing homes by the government (institution-based). The nursing home is supposed to

provide various assistance to replace the complementary functions of the family and home. Nursing homes should provide accommodation with appropriate conditions, health services, and food delivery.

The function of food service management in nursing homes needs to be considered because it will have an effect on improving the health status of the elderly in general and the nutritional status of the elderly in particular. Nursing homes to organize food for the elderly must provide food tailored to nutritional needs based on health conditions and the age of the elderly who settled in the nursing home. The food served can be said to be optimal if it meets the needs of nutritional and energy intake, safe, arouses appetite and is satisfying in the sense of meeting recommended portion standards (Damjan Zelenik, Tatjana Persuh, 2016). If the food service management in nursing homes fails to meet the physical needs of the elderly, the elderly in it indirectly remain physically displaced because they still cannot fulfill their needs even though they have been in nursing homes. Thus, it is necessary to study food service management in nursing homes in their function to meet the nutritional and physical needs of the elderly residents of the orphanage. Therefore, this research activity was carried out to see how the elderly food at *Panti Werdha Mandiri Salib Putih* (PWMSP) to ensure that food delivery in the PWMSP as an institution-based LTC can be carried out as well as possible to fulfill the function of meeting the physical needs of the elderly.

Methods

This research was study case research that used observation and quantitative method. The research conducted at *Panti Werdha Mandiri Salib Putih*. Participants of this study were 12 PWMSP's residents who had inclusion criteria are elderly (> 60 years), still able to do daily activities, cooperative and communicative.

Data were obtained through direct measurement and observation. Mini Nutrition Assessment Score was used for the Elderly's nutrition status assessment data by direct interview with participants. Data on food intake were obtained by 24-hour recall method and observation using the visual Comstock method. Supported data such as the general condition of PWMSP explored by interview PWMSP residents (participant), caregiver, and management staff in PWMSP. Data on basal metabolic rate (AMB) were calculated using the FAO / WHO / UNU method.

Results

General Description of Panti Werdha Mandiri Salib Putih Salatiga

Panti Werdha Mandiri Salib Putih, located on Jl. Merbabu 4 Salatiga, is a nursing home owned by the Salib Putih Christian foundation. Lately, there are 15 elderly who become residents, consisting of 10 men residents and 5 women residents. Eight residents are still healthy and able to do normal activities quite well, but 7 residents experienced various health problems that interfere with the residents' mobility.

PWMSP's operational is assisted by 4 women workers aged 40-55 years who are responsible for maintaining the cleanliness of facilities for nursing homes,

preparing food for residents, washing clothes and supervising also helping various activities. The existing work hour is divided into two-work shift; the morning shift is on duty from 6.45 to 12.00, while the day shift is on duty from 12.00 to 17.00.

The facilities at PWMSP consist of two separated buildings; the administrator's house and residents' dormitory. The dormitory generally L-shaped which includes 8 rooms, 1 laundry room and public toilet, 1 hall, 1 warehouse, and 1 kitchen. Also, there is a multipurpose field and a large enough yard planted with various types of plants, which can be used as food ingredients. The land contour tends to be flat so it is quite safe for the elderly.

Each room in a dormitory is filled with one to three residents. Room space has varying sizes but still looks quite comfortable and not overcrowded. The size of the room is also adjusted to the number of residents that occupy the room space. Each room is equipped with a bathroom, a clothing storage area and a bed consisting of cots and a single bed foam mattress.

The condition of the kitchen is good with an adequate kitchen area when compared to the number of workers and the production load. The cleanliness of the kitchen is quite maintained, the kitchen is cleaned every morning and after meal's time. The process of preparing and processing food is done in the morning shift for all meal's time. Workers who work on the second shift will only do a few processing and serving tasks. Meals are set at 7.30 for breakfast, 11.30 for lunch and 17.00 for dinner.

Food menu that is served to residents is regulated by one of the personnel who has been given authority. The people who manage the meal menu are considered able to understand menu planning because they have been considered to understand the operations of PWMSP, especially related to the budget for eating in PWMSP and have been briefed by existing health workers regarding dietary restrictions on the elderly. The menu is adjusted to the existing budget, availability of food ingredients in the market and special requests from residents. The menu provided is quite varied in terms of processing although the frequency of menus with fried processing looks more often than other cook methods. While in terms of food ingredients it is also quite varied for vegetable food groups. Whereas, for side dishes food is often limited with types of protein, such as limited kind of vegetable, tofu; tempeh and animal protein eggs. The animal protein group derived from animal meat is rarely used because of budget constraints. Meal budget of each resident is 5,000,00 rupiahs for providing three meals a day. Food for the residents are considered to have limited the use of salt, sugar, and oil, but there is no provision of a special menu for residents, which has a disease with special dietary needs such as diabetes. The food menu has also monitored by health workers who are in charge of the independent salatiga nursing home.

Nutritional Status Assessment of Residents in PWMSP

Measurement of nutrition status assessment measured by Mini Nutrition Assessment (MNA) score. The data of MNA measurement showed that one resident has malnutrition on risk status [Tabel 1].

Table 1. Residents' Nutritional Status Assessment by MNA Measurement

No.	Screening Score	Status	Assessment Score	Total Score	Status
1	12	Normal	-	-	normal
2	10	Malnutrition on risk	8.5	18.5	normal
3	12	Normal	-	-	normal
4	13	Normal	-	-	normal
5	11	Normal	-	-	normal
6	12	Normal	-	-	normal
7	12	Normal	-	-	normal
8	11	Normal	11	22	normal
9	8	Malnutrition on risk	7	15	Malnutrition on risk
10	10	Malnutrition on risk	7	17	normal
11	12	Normal	-	-	normal
12	10	risiko malnutrisi	9	19	normal

NB: Screening score < 11, continue to assessment stage

Food Intake of Residents in PWMSP

Food intake of residents in PWMSP is calculated using the 24-hour recall method. Recall 24 hours is done two days on Saturday, June 9th, 2018 and Wednesday, June 27th, 2018. The participating respondents are 15 residents. Residents in PWMSP has different food intake from each other despite getting the same meal menu every day. The difference in food intake related to different food portions in each time.

The nutritional needs of PWMSP are calculated based on calculations using the FAO / WHO / UNU method and pay attention to dietary restrictions for the elderly. Then, the nutritional needs of each resident were compared with the average intake of calories based on the results of the 24-hour recall that has been done. Based on these data, it can be evaluated how much the nutritional needs of each resident have been fulfilled through the calculation of the percentage of nutrient adequacy [tabel 2].

Table 2. Nutrition Adequacy of Residents In PWMSP

No	Nutrition Requirement				Average of Nutrition Intake				% Intake			
	Energ y (kcal)	Kh (gr)	P (gr)	L (gr)	Energy (kcal)	Kh (gr)	P (gr)	L (gr)	Energ y (%)	Kh (%)	P (%)	L (%)
1	1668.5	250.2	62.5	27.8	1207.0	144.6	70.3	47.8	72.34	57.7	112.4	172.0
	5	8	7	1	5	5	5	5	7	3	7	7
2	1896.7	284.5	71.1	31.6	1304.5	165.6	71.8	47.8	68.78	58.2	101.0	151.3
	0	1	3	1	5	5	5	5	1	2	7	7
3	1756.3	263.4	65.8	29.2	1135.8	153.3	66.7	35.1	64.67	58.2	101.2	120.0

	0	5	6	7	5	5	5	1	7	8		
4	1949.3	292.4	73.1	32.4	1296.6	163.7	71.4	47.5	66.52	55.9	97.67	146.4
	5	0	0	9	8	3		9		9		8
5	1317.5	197.6	49.4	21.9	801.38	87.38	43.6	37.4	60.82	44.2	88.35	170.6
	5	3	1	6			5	8		1		8
6	1493.0	223.9	55.9	24.8	805.6	82.1	61.4	34.9	53.96	36.6	109.6	140.4
	5	6	9	8				6		6	6	9
7	1773.8	266.0	66.5	29.5	1161.9	133.4	69.5	47.3	65.50	50.1	104.5	159.9
	5	8	2	6	5		5			4	6	9
8	1457.3	218.6	54.6	24.2	966.95	91.4	66.5	47.3	66.35	41.8	121.7	194.7
	0	0	5	9			5			1	8	4
9	1129.7	169.4	42.3	18.8	799.4	52.35	63.7	46.7	70.76	30.8	150.3	248.0
	0	6	6	3						9	6	3
10	1389.0	208.3	52.0	23.1	966.95	91.4	66.5	47.3	69.61	43.8	127.7	204.3
	5	6	9	5			5			7	6	1
11	1598.3	239.7	59.9	26.6	966.95	91.4	66.5	47.3	60.50	38.1	111.0	177.5
	5	5	4	4			5			2	3	6
12	1949.3	292.4	73.1	32.4	1207.0	144.6	70.3	47.8	61.92	49.4	96.24	147.2
	5	0	0	9	5		5	5		5		8

Discussion

Nutritional status assessment is an important element as a basis for providing interventions or mentoring programs for the elderly. In this study, assessments of the nutritional status of the elderly were carried out using MNA through interviews. The result showed that one resident had a risk to have malnutrition.

Interviews with MNA are considered to be suitable methods and instruments to look at the nutritional status of the elderly because they cover many aspects including anthropometric measurements, questions about eating habits and perceptions of health. Thus, the data obtained will illustrate the overall condition of the elderly better. MNA not only measures anthropometry but also functionally (Thomas, 2008).

MNA is an instrument developed to assess malnutrition in the elderly. MNA does not depend on a single type of anthropometric measurement but consists of anthropometric measurements such as height, weight, upper arm loop, calf circumference, and weight loss, questions about food intake, general assessment (mobility, stress events, lifestyle) and personal judgments (knowledge). MNA is estimated to be able to categorize the nutritional status of the elderly correctly up to 75%. MNA specifically has been validated for long-term health services such as nursing homes and is the most suitable as an instrument for assessing nutritional status in nursing homes or other nursing homes (Agustina, 2007; Thomas, 2008).

Biological aging might cause various physiological changes that cause the elderly to have difficulty in getting the various nutrients they need. The changes included loss of tasting and smelling ability, changes in body composition and bone density, basal metabolic rate and changes in the digestive system (ILC-UK, 2010). Therefore, providing nutrition for the elderly, including how to process food for the

elderly, need to get more attention to ensure that elderly fulfill their nutrition requirement.

Elderly have decreased the ability to taste and smell through increased sensitivity to sour and bitter taste (Volkert Dorothee, 2002). This change in the ability to taste and smell can cause the elderly to feel that their food is not arousing, which in turn affects them to reject the food and end up reducing the overall food intake (Schiffman, 1997). Other changes that affect appetite and absorption of nutrients in the elderly are changes in the digestive system associated with aging. Changes in the digestive system in the elderly cause the elderly to feel bloated or sick in the abdominal area (Donini, L. M., Savina C., 2009; Guyonnet D, Chassany O, 2007). Also, the elderly are also susceptible to hypochloridria, the condition which reduced gastric acid secretion. Hypochloridria will cause reduced bioavailability and absorption of some nutrients such as calcium, iron, folate, and vitamins (De Groot, 2001; Gariballa SE, 1998; Hurson M, Corish C, 1997) Decreased sense of sight is believed to also affect sensual pleasure from eating activities (Amy Brown, 2002). Overall a decrease in the ability of various senses in the elderly will also reduce the pleasure of older people's eating. Thus, in addition to paying attention to the nutritional needs of the elderly in general, the provision of food for the elderly must at least pay attention to the management of sour and bitter taste, the selection of food with higher bioavailability value of nutrients, prioritize nutrient-dense foods and display or presentation of food. The expectation of providing appropriate food for the elderly is to ensure and maintain the nutritional status of the elderly at the desired level.

Food management in PWMSP has been good in the management of sour and bitter taste and selection of nutrient-dense foods. During the observations, the selection of food menus that were served to residents in PWMSP had avoided the menu with a strong sour taste and avoided food ingredients that had a strong enough bitter taste such as papaya leaves and bitter melon. Food service management at this point can be said to run well which is also evident from the good acceptance of food by residents in PWMSP. Based on the results of the 24-hour recall and the visual Comstock, it was found that all of them could still accept the food provided. No food returned to the kitchen in a full portion. At a minimum $\frac{1}{4}$, the portion of the food is still eaten by residents.

Food service management in PWMSP has also give attention to the appearance of the menu that is served. Although simple, serving the food has noticed the shape and composition of the color of the food menu given. Some side dishes are given with the same pieces and also some foods are processed and served using food molds like flower shapes to enhance the appearance of food. Repetition of color can be said to rarely occur during serving food. The frequency of color repetitions occurs around 2 to 3 times a week.

Another thing to be considered of food service management in PWMSP is related to the bioavailability value of the food served. The concept of bioavailability, nutrient use level, or nutrition ease in these foods is absorbed by the body, still untouched in the implementation of food in PWMSP. The application of choosing foods with high bioavailability values, especially for protein-based foods, seems quite difficult to live due to the limited budget for food supply. Sources of animal protein

that have high bioavailability values are certainly more expensive than vegetable protein sources. PWMSP in meeting protein requirements is limited to using protein sources, namely tofu, tempeh, and eggs. The use of meat is limited to very small portions of chicken meat and frequency. However, this can still be overcome by choosing food ingredients with high bioavailability values from the choices available. For example, the use of tempeh with more frequent than tofu because tempeh's protein is more easily absorbed.

The administrators have indirectly carried out the selection of nutrient-dense foods in PWMSP. Variations in vegetable ingredients used to increase the variation in nutrient intake in PWMSP. However, what needs to be considered is the processing of these food ingredients. Processing by frying is still the most frequently used processing. Processing by frying can damage the nutritional content of food and change food ingredients that were originally nutrient-dense to be at risk of causing diseases such as carcinogenic properties. Based on observation, the cooking time of vegetable is often too long. The long processing or cooking time for vegetable ingredients will damage the nutritional content associated with the nature of most vitamins in vegetables that are not heat resistant.

The optimal food service management useful to ensure that every food served can be maximally beneficial in nourishing the body. Appropriate food processing will at least prevent the loss of nutrients in food ingredients and increase the acceptance of these foods by consumers. If the implementation of food is carried out optimally, it certainly will support the nutritional status of consumers, in this case, the PWMSP, so that in the end it will improve health status.

Optimal food service management by workers involved in PWMSP Salatiga plays a very important role in maintaining nutritional status in PWMSP. Eating ability from elderly to try to eat and drink by them has certainly decreased due to the decline in anatomical and physiological functions. Besides, the ability to define satiety and thirst in the elderly also decreasing. Based on the data in table 2, it was found that the average level of energy, carbohydrate, protein and fat adequacy in PWMSP cases were 65.15% (heavy deficit), 47.11% (heavy deficit), 110.18% (normal) and 169.42% (excess). These figures indicate that protein requirements can still be adequately fulfilled even though food choices for protein sources are limited due to budget constraints. But what is still considered is the state of heavy energy and carbohydrate deficits and excess fat intake.

The absence of portion standard of carbohydrate-source foods can be one of the consequences of a heavy deficit in carbohydrate intake in PWMSP. Also, the lack of motivation to eat the food given can also affect the state of severe deficits as indicated by the average data on energy and carbohydrate adequacy. Meanwhile, excess fat intake can be caused by the frequency of processing by frying which is too high considering that this type of processor can absorb oil in large proportions. Therefore, PWMSP needs improvement to overcome things such as being stated before to achieve better nutritional status for the elderly in PWMSP.

Conclusion

Elderly's health status needs to be considered including monitoring nutritional status. Assessment of nutritional status becomes the first thing that must be done to achieve a better health status of the elderly. The problem of assessing the nutritional status of the elderly comes from the sensitivity and validity of the instruments used in assessing the nutritional status of the elderly. MNA is considered to be the most suitable instrument to date. Based on the MNA score, it was found that 11 of the 12 samples in PWMSP had normal nutritional status and there were 1 with the risk status of malnutrition.

Furthermore, elderly nutritional status is influenced by the elderly's nutritional intake. In the elderly, there are various decreases in biological functions including sensory function, which causes decreased control of satiety and thirst and a decrease in appetite. Elderly who are in the long-term services institution such as PWMSP, the process of organizing food is one of the keys to overcoming this biological decline problem to achieve a better nutritional status. The facts in PWMSP, the average percentage of energy and carbohydrate adequacy of the PWMSP residents still exists in the category of heavy deficits while the percent of fat adequacy falls into the category of excess. This can be overcome by better adjusting residents' portion of eating and choosing a more suitable method of processing. Also, education for residents through their caregivers is important to increase awareness of the importance of a balanced diet. Therefore, this study also provided output in the form of a PWMSP diet guide file and an elderly nutrition poster.

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Neighbourhood Environment and the Elderly's Ageing-in-place Experiences in Singapore Public Housing – A Case Study of Boon Teck Neighbourhood

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Abstract

Neighbourhood is where the elderly's daily needs and preferences are accommodated. As people age, neighbourhood environment becomes more and more important. Although there are large volumes of literature about Age-in-place (AIP), the majority are divorced from places of ageing. Taking Boon Teck neighbourhood as a case study, this paper aims to investigate the interactions between neighbourhood physical and social environment and the elderly in Singapore's high-rise high-density context and how neighbourhood environment contributes to the elderly independent living. Field observation and interview are conducted in Boon Teck neighbourhood. As an ongoing research, this paper summarizes the results of 72-hour observation and 30 interviews. Direct observation is conducted for 2 days, followed by semi-structured observations of the elderly's primary destinations from 5:00 am to 9:00 pm. Semi-structured interviews are conducted with 16 elderly persons (female=8, male=8), covering different age groups (i.e., 55-64, 65 & above) and different ethnicities (i.e., Chinese, Malay, Indian). The preliminary findings indicate that factors associated with high-rise high-density environment, such as proximity and accessibility of amenities, play an important role in the elderly's independent living. Except from the built environment, the software, such as programming and management promotes social support networks, which promotes independence and interdependence. Besides, neighbourhood spaces have the potential to not only promote independence, but also promote the elderly's active ageing process.

Keywords: ageing-in-place, neighbourhood environment, out-of-home activities, independence & interdependence, high-rise high-density

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Introduction

Population ageing and urbanization are two global trends that bring challenges and opportunities to human beings in the coming decades. As one of the most rapidly ageing countries in Asia, Singapore's older residents (aged 65 & over) account for 13.7% of the resident population (DOS, 2018) and are expected to be 23.2% in 2030 (Department of Economics and Social Affairs, 2002). Ageing-in-place (AIP), defined as "ability to live in one's own home and community safely, independently and comfortably, regardless of age, income, or ability level" (Centre for Disease Control and Prevention, 2013), is preferred by the elderly and policy makers worldwide. Neighbourhood is a very important spatial scale for research about elderly persons (Lawton & Nahemow, 1973) as it is where the elderly's everyday activities take place and where the elderly's needs and preferences are accommodated. Considering decreasing old-age support ratio and increasing number of women entering labour force, to AIP gracefully, neighbourhood not only needs to provide amenities and services for functional purposes, but also needs to promote the formulation of social support networks that partly takes the role of traditional family for providing care (Kong, Yeoh, & Teo, 1996).

There are extensive volumes of literature about AIP, however, studies focusing on neighbourhood as places of ageing are limited (Gardner, 2011). For what is an age-friendly environment for AIP, various frameworks have been proposed, such as WHO AFC Checklist (WHO, 2007), AdvantAge Initiative (Feldman & Oberlink, 2003), AARP Liveable Communities (AARP, 2005). However, these descriptive studies from western countries are presented in the form of guidelines and specifications, which are divorced from ageing context and provide limited information about how these guidelines influence the elderly's AIP in the neighbourhood. Also, the majority of the existing literature about age-friendly environment target at western countries with low-rise context (Steels 2015, Feldman and Oberlink 2003, Zaidi 2014). As high-rise high-density environment has the capacity to accommodate a larger population within certain land area, promoting accessibility, proximity to amenities and services and urban vitality (Cheng 2009, Yeang 2002). However, if not well planned, dense environment is associated with crowdedness (Alexander 1993), limited open space and congested cityscape, traffic congestion, conflicts and competitions for amenities, and psychological stress due to unwanted social contacts (Cheng 2009, Wang and Chien 1999). High-rises with poor designs may become standardized buildings and create boring and homogeneous cityscape (Yeang 2002). It remains unclear how high-rise high-density environments influence the elderly's AIP, especially the elderly's out-of-home activities in the neighbourhood.

Meanwhile, the concept of "place" has been discussed considerably by geographers (Massey et al., 1984; Rowles, 1983; Rowles & Bernard, 2013). According to Rowles (1978), elderly persons would develop physical and psychological attachments to the places after long-term residency. This "insideness" makes the elderly fully aware of the environment's physical configurations, local services and social networks, which promote mobility and independence (Rowles, 1978). Built upon the Rowles (1983)'s theory, Kong et al. (1996) explore how emotional attachments to place, or physical, social, and autobiographic "insideness", contribute to the elderly's sustenance of personal identities, continued participation, and adaptation to changing circumstances in Singapore. However, studies about places of ageing from geographical perspective

focus on experiences and meanings of place instead of design and planning aspects (Gardner, 2011; Kong et al., 1996; Rowles & Bernard, 2013). Since the majority of the studies about places of ageing focus on private settings such as home and residential care facilities, neighbourhood has received less attention (Gardner, 2011; Kearns & Andrews, 2005). Therefore, taking a qualitative research approach (i.e. observation, photography, interview), the objective of this paper aims to explore the following two issues: 1) how the elderly's everyday activities are carried out in the neighbourhood, especially out-of-home activities; 2) what is the impact of high-rise high-density environments on the elderly's out-of-home activities. Built upon WHO's framework (WHO, 2007, 2015), out-of-home activities in this paper focus on the elderly's access to food and shops, access to healthcare, access to physical activities, access to social interactions, access to socio-cultural activities, access to volunteer activities, access to paid employment, and access to information and technology.

Context and Method

More than 80 per cent of Singapore residents live in public housing estates, which are developed by Housing and Development Board (HDB). A typical town is planned to have a total land area of 625 ha, with 40,000 dwelling units accommodating 200,000 people. Town centre is usually equipped with supermarkets, food places, a branch public library, banks, shopping malls, bus interchanges and mass rapid transit (MRT) stations. Each town is made up of five to six neighbourhoods of 4000 - 6000 units, housing 20,000 to 30,000 people. Neighbourhood centre, with 360-meter service radius (planned as maximum 400 meters), is planned with a hawker centre (an open-air complex housing many stalls selling affordable food), a market for fresh and cooked food, shops for daily needs, and clinics. The service radius is resulted from the compromising considerations of being as large as possible to "ensure adequate patronage" and not being too large to extend beyond 5 minutes walking distance. To promote social interactions and community ties, each neighbourhood is further divided into six or seven precincts, each with 4-8 blocks for 400-800 families. A precinct is designed to be easily recognized by residents with a clear boundary and a precinct centre with all blocks facing towards. Playgrounds, exercise corner, precinct garden and some commercial facilities are located at the precinct centre. Public housing in Singapore is governed under HDB's policies and ordinances. As a multi-ethnic and multi-religious country, racial quota has been implemented to balance ethnicity in Singapore's public housing estates. Regular maintenance and cleanliness are carried out by town councils. Estate upgrading programs are carried out by HDB every 20-30 years to enhance the living environment and services in the older estates. The permitted and prohibited activities at public spaces are also clearly prescribed (Field, 1992; Liu, 1975; Tan, Tong, An, Cheong, & Kwok, 1985).

Boon Teck is in the town of Toa Payoh, in the central region of Singapore (Figure 1). Defined by the administrative boundary, Boon Teck is bounded by Lorong 4 Toa Payoh (Lor 4), Lorong 1 Toa Payoh (Lor 1) and Lorong 6 Toa Payoh (Lor 6). Boon Teck covers 42 hectares of land with 13,600 people, of which 22.9% are aged 65 years old and above and 40% are 55 years old and above (DOS, 2018). Boon Teck is located next to Toa Payoh town centre with bus interchange in Toa Payoh HDB Hub built on top of MRT Station, ground-level shops, food places and Toa Payoh Public Library. Toa Payoh Town Park is located to the south of the town centre, together with a swimming complex and a sports hall. Boon Teck is surrounded by

neighbourhood centres with hawker centres at Lorong 1, Lorong 4, Lorong 7 and Lorong 8. It has a neighbourhood centre with Lorong 5 hawker centre and market, with Toa Payoh Sensory Park located to the north. This paper focuses on the public housing area within Boon Teck, which accommodate 98.3% of Boon Teck residents. Except for several rental blocks with unknown information, lease¹ start dates of HDB blocks in Boon Teck range from 1967 to 2019. As for flats type, 35.8% of HDB residents live in 1-2 room flats, 28.6% in 3-room flats, 9% in 4-room flats and 26.7% in 5-room and executive flats (DOS, 2018). This shows the socio-economic status of Boon Teck residents are lower than Singaporean residents in general because 5.4% of HDB residents live in 1-2 room flats, 18.6% in 3-room flats, 42.3% in 4-room flats and 33.7% in 5-room and executive flats (DOS, 2018).

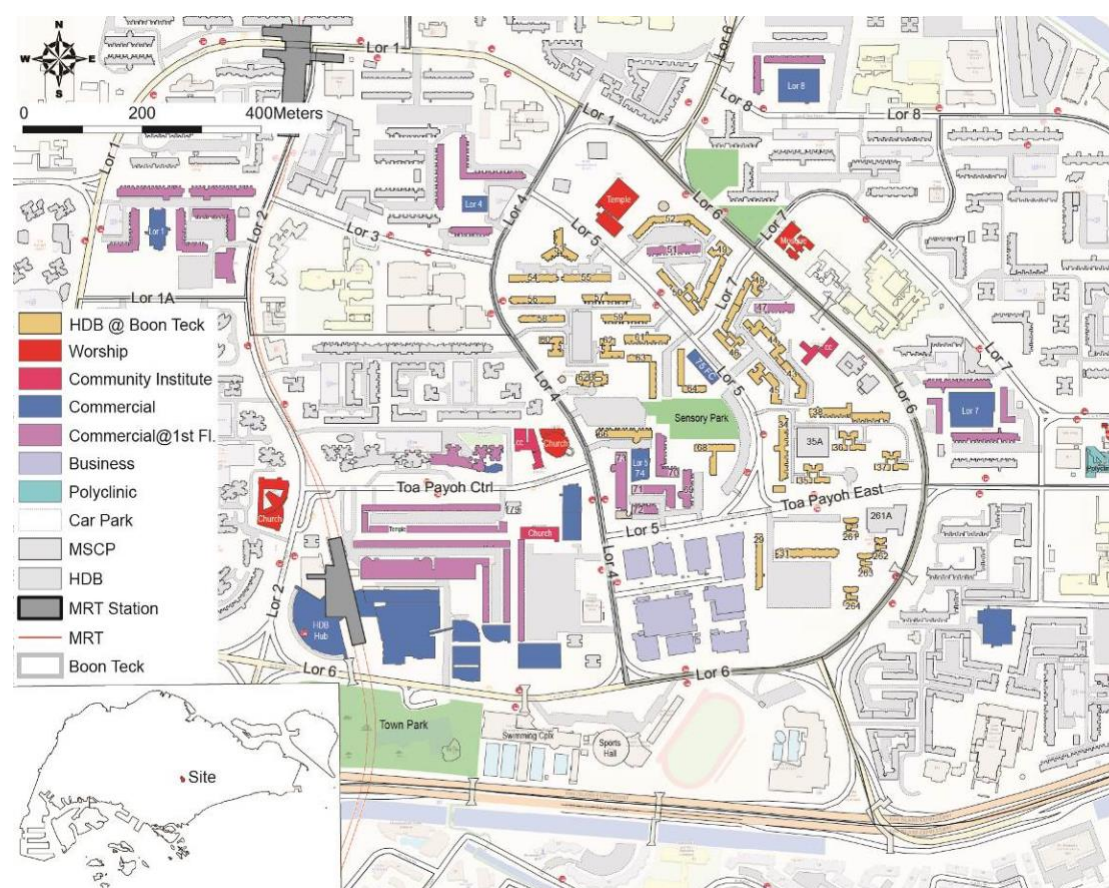


Figure 1: Location and site plan of Boon Teck neighbourhood

Field observation and interview were conducted in Boon Teck from July 2018 to May 2019. After direct observation was conducted for 2 days to have a general understanding of the elderly's activity patterns and neighbourhood environments, 27 neighbourhood spaces (including the public library and shopping streets in the town centre) were selected as observation spots. Considering limited resources and time period, observation period for each spot is 10 minutes per two hours from 5:00 am to 9:00 pm, for one weekday and one weekend day. Field notes were written as soon as possible after each observation period. Photographs were taken when arriving at each

¹ HDB sells its flats with 99-year leases so that when they expire, the Government can redevelop the land and build new flats for future generations.

neighbourhood space, and when some interesting activities happened. In total, 72-hour observation has been finished. Besides, 16 elders were randomly approached for semi-structured interviews. The participants (female=8, male=8) cover different age groups (55-64=3, 65-74=6, 75-84=7) and different ethnicities (Chinese=13, Malay=2, Indian=1). Informal interviews were also conducted with a storekeeper and 2 hawkers in Lorong 5 hawker centre. Prior to data collection, ethical approval for the study was obtained from NUS IRB.

Results

Participant Information. Among the 16 semi-structured interview participants, all the participants have lived in the neighbourhood for more than 10 years, and more than half (n=10) have lived here for more than 30 years. However, instead of the administrative boundary of Boon Teck, participants tend to consider broader area (e.g. Toa Payoh from Lorong 1 to Lorong 8) as their neighbourhoods. Two participants live a little bit outside the boundary, but they visit Lorong 5 hawker centre and market in Boon Teck regularly. Ten participants live in 1-2 room flats, three living in 3-room flats, one living in 4-room flats and two living in 5-room flats. Five participants have secondary education, and the others have primary education (n=7) or no formal education (n=4). Four participants need walking aids and the others are mobile. Nine participants live alone, three living with one family member (i.e. child, grandchild and brother), three with 2 family members (one with children and two with spouse and one child), and one living in an extended family with household size as eight including one domestic helper.

Intention to age-in-place. All the semi-structured interview participants are planning to age in place. Although some participants feel they have to because they have no choices or no money to move to private properties (i.e. condos and landed properties), a majority of the participants are very satisfied with their neighbourhoods due to familiarity, built-up social networks with friends and neighbours, convenience, multiple hawker centres and markets, good location and connectivity to other places in Singapore. For example, an 80-year-old man said: "I know Toa Payoh very well, very very well... I want to die here". His satisfaction is further evidenced when he shared he actually moved twice but never left Toa Payoh, from a 3-room flat in Blk3 (about 160m away from Boon Teck at Lorong 7) to a 4-room flat in Blk10 (about 200m away at Lorong 7), and finally to the current 5-room flat. Another Indian female said: "Many places cannot be Toa Payoh", and further explained: "You got all these friends, every office man all good, hello hello auntie, auntie hello, makan (to eat) or not? Children also never ask." The long-term residency gives elderly persons a sense of familiarity and the confidence to go out even with reduced physical capacities. Some participants do not mind going out on rainy days because they know how to avoid getting wet via sheltered walkways and void decks (vacant spaces on the ground floor, typically designed within an HDB residential block). At the same time, because of the high ageing population percentage, the respondents call their neighbourhood "zone for older people".

Access to food and places. Lorong 5 hawker centre and market in Boon Teck open early in the morning around 5:00 am and close around 2:00 pm in the afternoon. For some elderly persons with restricted mobility, they walk around in the neighbourhood centre to have breakfast, do grocery shopping, sit for a while, chat with friends and go

back home at noon when the weather gets hot. A hawker said: “We open from 5:30 am to about 2:00 pm. Open hours are a little bit different every day”. When asked about why he closes the stall so early, he explained: “There are few people in the afternoon. How to open? Few people are here. You see? We will lose the business if we open”. Because of the opening hour, for dinner, the elderly participants eat at home, go to the coffee shops (like hawker centres but privately owned) in the neighbourhood, or food places in the town centre. Because Lorong 5 hawker centre is quite small, residents get tired due to long-term residency. Elderly persons with better mobility eat all over the places, from Lorong 1 to Lorong 8. Said a 70-year-old female, who lives in Blk69 and visits Lorong 8 hawker centre once or twice a week: “It is not this one (Lorong 5) is not good, but it is too small with only a few stalls. Lorong 8 has various choices, like chicken rice, mixed vegetable, yong tau foo. Here (Lorong 5) has, but in the coffee shop, costing S\$ 4-5. There is only S\$ 3.”

Residents also go to supermarkets (Figure 2), including Sheng Siong, Giant, and FairPrice (also called NTUC, a co-operative of the National Trades Union Congress). One participant in her 60s living on Blk46 said: “Supermarkets I usually go to Giant or NTUC at Toa Payoh Hub. If Giant I walk, (and) if NTUC I take 235 (a bus route). I prefer Giant because there are so many people at NTUC, very long queues, taking at least half an hour.” The long queue is because Pioneer Generations (Singaporeans born on or before 31 December 1949 and obtained citizenship before 31 December 1986) can enjoy a 3 per cent discount on Mondays and Thursdays and seniors above 60 years old can get a 2 per cent discount on Tuesdays when shopping at FairPrice supermarkets and hypermarkets². Many young adults take their mothers to the supermarkets on a weekly basis to get the discount. Besides, provision shops at the precinct level play an important role for the elderly’s independent living, which is illustrated by a mini-mart at the ground level of Blk51. A coffee shop is located next to it. The Malay shop-owner and her husband also live in the same block and they take turns to manage the business. The mini-mart opens from 8:00 am to 11:00 pm every day. She said her shop serves about 3-4 blocks nearby, with a lot of customers coming daily. Some elderly customers come in and out because they always forget to buy something. Her shop provides enough goods for everyday use, including newspaper, cigarette, drinks, bread, oil, noodles, rice, sauce and dry fruits. If the elders want to buy fresh vegetables or fish, they will go to the market or Sheng Siong, which is 5 to 10 minutes’ walk. The mini-mart is also a social space, evidenced by the shop-owner: “The elders gonna come to me or go to the coffee shop (next to the mini-mart). They find people drinking coffee, they will go sit down (and) talk to them. Some aunties, they like to come (and) stand here (in front of the mini-mart counter), talk to me. They just talk, I also talk, any topic can talk. After that, they are happy, (and) they buy their things, they will slowly walk back home”. Sometimes, her husband also helps some seniors carry heavy grocery carts back home.

² <https://www.channelnewsasia.com/news/singapore/ntuc-fairprice-extends-pioneer-generation-discount-scheme-by-6-11066026>

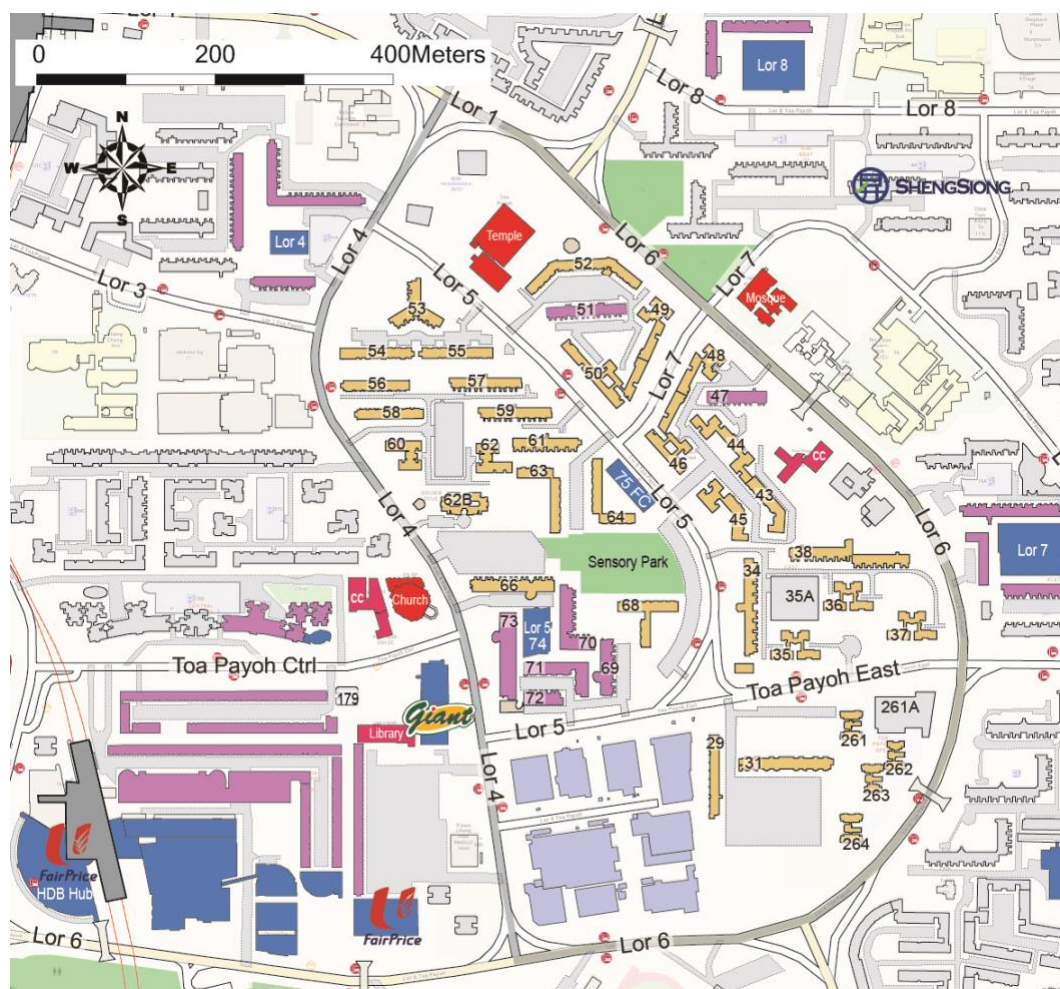


Figure 2: HDB blocks in Boon Teck and supermarkets in the surroundings.

There is also free food in Boon Teck. Volunteers from Willing Hearts, a secular, non-affiliated charity organization, deliver free food to the elderly, the disabled and low-income families at 10:30 am every day at the void deck of Blk62 (Figure 2). One day around 12:00 pm, an elderly in her 70s was approached at a pavilion near Blk56 when she was carrying a cart with free meals and sending them to the disabled who cannot walk to Blk62. She said has done this volunteer job for more than 4 years. She refused the accompany of the researcher because she felt the disabled recipients tend to feel ashamed of themselves and a stranger may make them uncomfortable. Later that day, a 77-year-old female living alone on Blk29 (a rental flat) shared that volunteers from Willing Hearts give her free meals twice on weekdays and once on weekends. She was approached when walking in the rain with a walker, covering her head with a red-colour plastic bag, on the way to the market to buy bananas for digestion. This case shows clearly that elderly persons with reduced mobility and health issues need community and social services to live independently in the neighbourhood if there are no family members providing care. Except for Willing Heart, Free Food for All, provide free halal meals to the less fortunate at the pavilion next to Blk63 on a weekly basis. Both charity organizations serve different locations in Singapore island wide.

Access to healthcare. Figure 3 shows the provision of CHAS clinics, which are the General Practitioners and dental clinics participating in Community Health Assist

Scheme (CHAS) that provides Singapore Citizens from lower- to middle-income with subsidies for medical and dental care. According to the respondents, they usually go to the clinics in the neighbourhood such as Blk66 for minor illness, Chung Hwa in the town centre for Chinese medicine, the polyclinic at Lorong 8 for cheaper medical services and regular check-ups, and hospitals such as Tan Tock Seng far beyond the neighbourhood boundary for major illnesses and surgeries. Some participants need to depend on family members to a certain extent for medical services, due to physical and language barriers. An 80-year-old female living on Blk61 with reduced mobility depends on her grandson, her sister's child indeed as she has no children, to take her to the polyclinic on Lorong 8. She said: "May 8th, my grandson will take me to Lorong 8. He is busy on May 2nd (original appointment date)." An 80-year-old man went to another polyclinic: "Every four months I go to polyclinic at Outram (about 16 minutes' drive from his residence). I take MRT, very convenient." He still drives but chooses to take MRT because parking at Outram is very expensive.

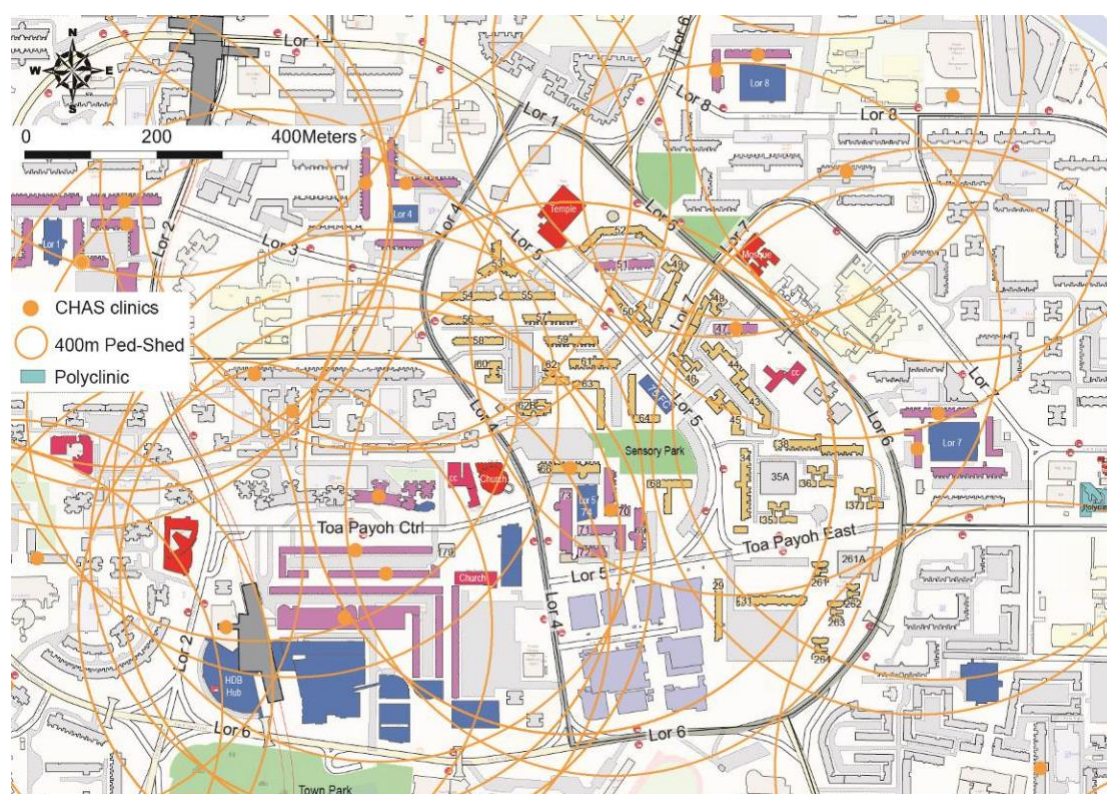


Figure 3: Provision of CHAS clinics in Boon Teck and its surroundings. Source: <https://data.gov.sg/dataset/chas-clinics>

Access to physical activities. For some elders, especially those with weak legs or feet, walking is their main physical activities. While walking around, they can also meet friends and neighbours. Field observation finds that 4 group exercises take place at three neighbourhood spaces in Boon Teck in the morning between 7:00 am to 8:00 am, the playground next to Blk53, the open space in the community club and Toa Payoh Sensory Park (Figure 2 & Figure 4). Majority of the group exercise participants are female. Some elders prefer to do individual exercise in the Sensory Park, Toa Payoh Town Park (below the town centre) and exercise corners near their residential blocks. For example, one popular exercise corner (Figure 4) is located at the edge of the Sensory Park next to the sheltered walkway connecting residential

blocks to the neighbourhood centre. After grocery shopping and having meals, elders may stop and use the facilities for a few minutes before going back home. Its convenient location and good visibility make this neighbourhood space very lively.



Figure 4: One group exercise in the Sensory Park (left) and an exercise corner (right)

Access to social interaction. According to HDB (2013), almost all residents engage in different kinds of interactions with neighbours – the proportion declined with the intensity of interactions from exchange greetings (98.6%) to provide/receive financial help (2.5%). HDB (2013) also finds that 75.6% of the respondents meet neighbours within the block (i.e. common corridor, lift lobby/lift, void deck), 17% within the neighbourhood or precinct and 7.4% within the town. Field observation finds that while casual conversations tend to take place along the routes, residents prefer to meet friends for longer conversation at void decks, open spaces next to sheltered walkways, coffee shops, hawker centres, those places with seating, in proximity to their residences, shaded and windy, with good visibility and view of passers-by. Meanwhile, elderly persons prefer to use flexible chairs to personalize their social spaces (Figure 5), which give them a sense of control and make them feel more comfortable. Although few people mind about the personalization of public spaces such as neighbourhood centres, disputes may take place among neighbours if such behaviour happens around the residential blocks. An Indian female shared how she dealt with her neighbours' complaints via talking to the MP (Members of Parliament) and got approval for putting flexible chairs along the common corridor (Figure 5).



Figure 5: Personalized public space in the market (left) and at common corridor (right)

Access to socio-cultural activities. For socio-cultural activities, residents tend to form groups based on their own interests. For example, at Blk179 void deck (Figure 2), there are a group of 20-30 male elders playing chess on a daily basis. The newspaper

corner in the public library is usually full of people, the majority being elders. Some participants shared that the library with free aircon is a comfortable place not only for reading newspapers but also for sleeping or just spending time. As for religious activities, there are Chinese temples, churches, a mosque and a Hindu temple in Boon Teck and its surroundings. However, some participants tend to go far away beyond Toa Payoh, to the ones they joined at younger ages and the ones they believe in.

Two of the sixteen respondents attend activities arranged by community institutions such as Community Clubs³ (CCs) and Residents' Committees⁴ (RCs). The low participation rate is further evidenced by Chan et al. (2018), whose study shows that 83.1% of Singaporeans aged 60 years old & above do not attend any committee or neighbourhood events. CCs consist of various facilities (e.g., dance studio, multi-purpose hall) and provide venues for courses, interest groups and communal events. According to the staff, there are no specific programmes for elderly persons and some programmes, such as cooking, tai-chi, folk singing, are more attractive to the elderly. RCs are grassroots organizations, whose functions include disseminating information, giving feedbacks on behalf of the residents and arranging activities and programmes such as recycling day and health promotion talks for the residents within their respective RC zones. According to the participants, the reasons for non-participation are various: health problems (e.g. knee pain), language barriers (e.g. speaking dialect only), feel trouble and want to enjoy freedom after retirement, get away from gossip, and arrogant attitudes of staff and other participants. The elders with lower income and education tend to feel marginalized and have nothing to say because they do not speak English or Mandarin, or they have nothing to share with pride.

Access to volunteer activities. There are various volunteer opportunities in the neighbourhood, such as help to run activities and events and visiting people. For example, Silver Generation Ambassadors⁵ are volunteers under the Agency for Integrated Care who help explain government policies to seniors, connect seniors to health services and activities, and help them apply for assistance. The participants are aware of the volunteers in Boon Teck who inform them of activities and events (usually with free meals) and help transport the elderly with restricted mobility to the event venues. One participant among the 16 semi-structured interview participants engages in formal volunteering, who is a 62-year-old female living in a 5-room flat. She befriends 7-8 elders every Saturday and helps to run activities and take elders out meals occasionally. Like community activities, elderly persons engaged in volunteering tend to have higher socio-economic status and good health.

Access to paid employment. Field observation finds that there are a few elderly persons working as hawkers, cleaners and shopkeepers in the neighbourhood. Some participants mention that Singaporeans need to work at very old ages for financial security, which is probably because there is no universal pension system in Singapore. Some elders with financial inadequacy cannot work because of health issues. For example, one female in her 80s said: "How to work? My feet are weak, even walking is inconvenient, how to work... There is an uncle, used to sell plants in the market, from morning to late night. Then, he got spiral pain. After getting treatment, his children do not allow him to work anymore. If he falls, is it worse? who takes care of

³ <https://www.pa.gov.sg/our-network/community-clubs>

⁴ <https://www.pa.gov.sg/our-network/grassroots-organisations/residents-committees>

⁵ <https://www.aic.sg/for-seniors-and-caregivers/silver-generation-office>

him?” Some seniors wanted to continue working but the workplaces do not hire them anymore. An uncle who was a technician said when asked about where to go shopping: “I do not go shopping, not working, how to go shopping, out of money already ... I apply (for the job) after I retire, they do not want anymore, too old already.” Participants who are still working mention about both advantages and disadvantages. One 76-year-old female mentioned that life was boring when staying at home alone every day but working leaves her no time for meeting friends: “I work as a cleaner for more than 20 years. Every day, I start at 8 am and finish at 3:30 pm. I live by myself, day by day, very boring. Working is better, also earning some money...” Another 73-year-old man shared he only has time to walk around on weekends because he helps his son manage an eyeglasses store on weekdays.

Access to information and communication technology (ICT). The elderly’s access to ICT influences their everyday life in all aspects. The elderly can access information via friends, neighbours, volunteers, newspapers, TVs, phones, HDB block bulletin boards, and posters on the walls around the lifts. Oral communication is necessary because of the language barriers and literacy level of elderly persons in Boon Teck. For instance, the researcher was approached by a female in her 50s who cannot understand the poster informing the temporary disruption of water. Except for computers and the Internet in the public library, there are free wireless spots in Boon Teck provided by Wireless@SG, a government initiative aiming to provide free Wi-Fi in public spaces all over Singapore. Workshops teaching how to use digital devices are organized in the public library and community. While elderly persons appreciate that they can read news and contact friends via phones, one participant mentioned that technology makes the world full of liars and people need to be careful about phone messages. Other participants mentioned about safety issues because people look at mobile phones when walking.

Conclusion

Although and neighbourhood activities account for only part of everyday life, this study shows neighbourhoods still play a critical role for elderly persons, especially for those with poor health and reduced mobility. The preliminary results show that besides personal factors (e.g. health, personality, socio-economic status, family roles) and regional factors (e.g. government policy), the elderly’s out-of-home activities are influenced by various environmental factors, especially quality and programming of neighbourhood spaces, familiarity and weather. Neighbourhood factors associated with high-rise high-density environments, such as proximity of amenities and services and well-covered walking facilities, bring convenience and multiple choices for the elderly and promote social interactions, which play an important role in the elderly’s independent living. Except for the built environment, the software, such as place programming and management, facilitate the formation of formal and informal social support networks, which further promote independence. Besides, neighbourhood spaces have the potentials to not only promote independence and interdependence but also promote the elderly’s active ageing process via encouraging the elderly’s out-of-home activities such as physical activities and social participation.

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