Towards Age-Friendly Built Environment

Reshma Shrestha, University of South Australia, Australia
Alpana Sivam, University of South Australia, Australia
Sadasivam Karuppannan, University of South Australia, Australia

The Asian Conference on Aging & Gerontology 2017
Official Conference Proceedings

Abstract
The population of aged people is increasing dramatically throughout the world and this demographic variation is generating different challenges for societies, families and individuals in many ways. One of the effective approaches for responding towards demographic ageing is to have more evidences on creating age-friendly communities. Despite of having number of researches on ageing, there is limited knowledge on identifying components for developing age-friendly communities and cities. This research therefore, aims at discovering the benefits of properly designed age-friendly communities and interrelationships of key related concepts. To accomplish this aim, relevant research papers have been reviewed and subjected to thematic analysis.
This study emphasizes on improving the overall wellbeing of elderly not only by finding out the improvement strategies on the health care facilities but also by finding strong evidences on benefits of designing their housing and immediate outdoor environment. Therefore, this study recommends future research directions on developing built environments responsive to the aspirations and requirements of aged population which can not only assist the adoption and maintenance of an active lifestyle, but it can also be beneficial to the physical and psychological overall well-being of aged population. More studies on planning urban environmental settings targeting aged population can be beneficial to not only aged people but for people from every age group. Thus, these settings will be advantageous for anyone with varying requirements with changing generational needs and lifestyles from a child to a couple to aged people.

Keywords: Age-Friendly, Built Environment, Neighborhood

1. Introduction

The increase in life expectancy over recent decades has led to substantial population ageing (Garin et al. 2014) occurring throughout the world. The global population aged 60 years and more is increasing (WHO 2007b) and growing at a rate of 3.26 per cent per year anticipated to increase more than double by 2050 and more than triple by 2100, from 901 million in 2015 to 2.1 billion in 2050 and 3.2 billion in 2100 [United Nations, Department of Economic and Social Affairs, Population Division 2015]. These demographic variations are generating social, economic and personal challenges for society, families and individuals (Sivam 2011).

One of the most effective policy approaches for responding towards demographic ageing is planning communities to be age-friendly (WHO 2007b). Age-friendliness can be obtained through various sectors; physical or built environment, social environment (Lee & Kim 2016) and economic environment. Improvements in these sectors can have direct impact on quality of life of aged population and their caregivers which will accordingly stimulate their physical and psychological health and overall wellbeing.

It is required to explore how ageing affects communities and whether age-friendly interventions need to be adjusted to ensure and determine what components of age-friendly interventions make them successful (Burton, Mitchell & Strides 2011). Regarding the worldwide situation of growing ageing population, exploration of a framework adaptable to the requirements of cities would be beneficial in evaluating age-friendly initiatives (Steels 2015) and planning of neighborhoods would be vital to enhance quality of life of aged people. Thompson et al. (2015) redefines the purpose of planning by allocating well-being as a significant part of spatial decision making as there is great diversity in the ways ageing occurs. The main challenges of ageing would be to redesign urban forms to increase the attractiveness and well-being in cities (OECD 2015). Hence, the advancement of urban planning and design schemes that maximize the quality of life can be the prospective research directions (Landorf, Brewer & Sheppard 2007).

2. Methodology

This paper is based on review of research papers on age-friendly cities as a guideline for future relevant research facilitating the critical evaluation of selected literature sources. The paper has employed a three-phase approach as shown in Figure 1 below.

Phase 1: Planning and Collection

Phase 1 develops research purpose, establishes research boundary and selects material. Once the research purpose and boundary are established, material selection is conducted. Primary search is based on journal article/ book chapter/ conference papers over the period of year 1987-2017 to ensure the up to date and quality information. The keywords searched are based on “title/keyword/abstract” using electronic database such as Google Scholar, Scopus, ProQuest, Web of Science, Science direct, etc.

Phase 2: Practical Screening

Phase 2 decides the most suitable articles based on key concepts and assessment of articles and publishers. Articles which are not peer-reviewed, out of scope and related to duplication are rejected. After the primary screening sorted out 214 articles, only abstracts are reviewed first and then relevant publications are considered. Total numbers of 72 articles are selected at the end for full paper review.

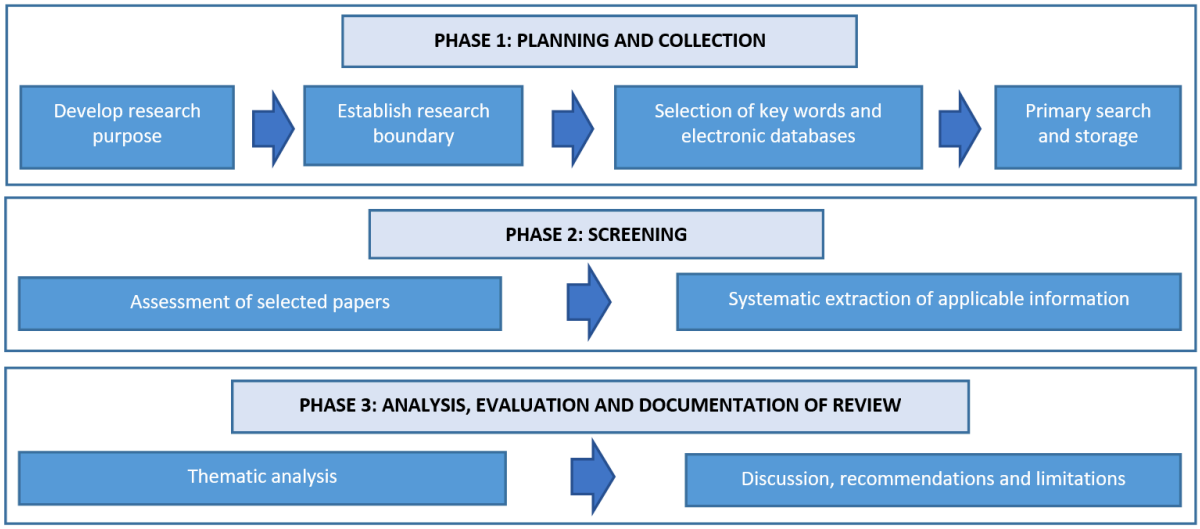

Figure 1: Approach employed for the methodology used

Phase 3: Analysis, Evaluation and Documenting the Review

The selected articles are subjected to two types of analysis. Firstly, descriptive analysis is conducted based on the research context, published year, methods and scope (Stone et al. 2008). Then in thematic analysis, a detailed evaluation is conducted based on the main results of the literature under several areas (Fereday & Muir-Cochrane 2006). This paper mainly discusses the results of the thematic analysis based on key areas on ageing and planning age-friendly communities and future research directions.

3. Analysis and Findings

Longevity is the result of socioeconomic and technological developments providing opportunities for growth. Unlike financial crises or natural disasters, ageing trends and its impact can be predictable; hence policies for ageing should be developed not only targeting present needs and opportunities, but also anticipating future population structure and pathways for the smooth transition (OECD 2015). Due to sensory and other modifications that old age brings, aged people face increasing challenges. Policies, communities, services and structures should be designed to enable them to live in security, relish good health and continue participation in society. Initiatives to enhance well-being of aged people will not only support them, but also the younger people. Consequently, policies to meet the challenge of demographic change will be significant to the construction of economically and socially resilient cities (OECD 2015). With the significant escalation in the world's aged population, understanding of their requirements is essential to anticipate and meet their varying needs (Luszcz

2007). Thus, based on previous studies on ageing, different themes have been explored related to ageing which are discussed further in this paper.

3.1 Active Ageing

The term advocated by World Health Organization (WHO) is "*Active Ageing*", also referred as 'healthy ageing', 'successful ageing' and 'positive ageing', concentrates on the issues that contribute to survival without loss of function and subsequent vulnerability to morbidity and disability (Luszcz 2007). WHO (2007a) has defined active ageing as the process of optimizing opportunities for health, participation and security to enhance quality of life as people age. Active ageing describes the desire and ability of aged people to integrate physical activity into daily routines, such as walking for transportation, exercise or pleasure only (Karuppannan & Sivam 2013).

The active ageing approach is based on the principles of independence, participation, dignity, care and self-fulfillment acknowledging the significance of gender, earlier life experiences and culture on how individuals age. It considers the biological, psychological, behavioral, economic, social and environmental aspects that function over the course of an individual's life to determine health and well-being in old age (WHO 2016). According to WHO, active ageing is a lifelong process shaped by numerous factors and the approach to active ageing is to engage cities to become more age-friendly to tap the potentials of aged people. Active ageing functions as one of the most effective approaches to maintain quality of life and prosperity in an increasingly older and more urban world (WHO 2007b). Therefore, communities, policies, services and structures should be planned to empower aged people to age actively.

3.2 Ageing in Place

Remaining in familiar surroundings as people age represents a more economically, environmentally and socially sustainable alternative to institutionalised care (Landorf, Brewer & Sheppard 2007; 2008). Aged people have strong connection between their home and neighbourhood which assists them in their well-being that relates to ageing in place (Wiles et al. 2009) allowing them to stay in their home or neighbourhood for longer period (Chappell et al. 2004). Many studies advocate that majority of the aged people choose to live independently and age in place (Chappell et al. 2004; Karuppannan & Sivam2013; Sivam 2011). However, it is often restricted due to provision of facilities that vary with age (Treas 1995) and its attainment will rely on the degree to which occupants are contented with the physical components of their house, neighbourhood and social environment (Karuppannan & Sivam 2008).

"*Ageing-in-place*" underpins many policies and programs to support older persons' desire to continue living independently in their own homes, maintain their relationships and continue their connections with their local community. Ageing in place attempts to maximise people's choice about where they want to age (Alidoust & Bosman 2016; McNelis et al. 2008) allowing them to remain in the place of their choice for as long as possible (Alidoust & Bosman 2016) whether in a particular dwelling, public housing, social housing, private rental housing, non-private dwelling such as a rooming house, a private hotel, a boarding house or in a local neighbourhood, in a particular community or a residential facility (McNelis et al.

2008). As changes occur in circumstances, capacities and functioning of old people, it is the responsibility of the services to adapt their environment to meet their needs. Ageing-in-place recognises that undertaking tasks of daily living is not just a function of the individual but also a function of their environment (Alidoust & Bosman 2016).

Alidoust and Bosman (2016) explain that 'ageing-in-place' has brought some important debates about housing and older people such as scope of the environment to be adapted, values and preferences of older persons, respective responsibilities of housing providers and support providers and relationship between independent housing with appropriate community care and residential aged care. Ageing in place has conventionally referred to individuals getting old in their homes emphasizing on modification of the home environment to compensate for limitations related with ageing.

3.3 Ageing and Mobility

According to Winters et al. (2015), mobility is the ability to move about in one's neighborhood and maintain independence which is essential for seniors' wellbeing. As people age, they become more dependent on their local communities, especially when they are no longer able to drive. Uneven or discontinuous sidewalks, heavy traffic and inaccessible public transportation are some of the built environment characteristics that can create barriers for outdoor mobility in later adulthood (Clarke, Ailshire & Lantz 2009). Difficulties in mobility tends to increase and one chronic health condition will tend to double the odds of mobility disability in older age.

Neighborhood environments affect mobility especially as health declines and physical vulnerability increases with age (Winters et al. 2015). Clarke, Ailshire & Lantz (2009) suggest that the built environment can exacerbate mobility difficulties for seniors. To minimize disability as the population ages, simple changes in the built environment may be easier to implement than to change risk factors at the individual level. Thus, linkages between mobility and planning are keys to design age-friendly neighborhoods with destinations that encourage elders to get out and be physically active. Seniors living in highly walkable neighborhoods will be very mobile and will frequently use active transportation. But travel destinations will indicate the importance of commercial and social opportunities even in a highly walkable environment. Thus, the high rates of active travel and physical activity in a walkable neighborhood suggest that when provided compelling destinations, seniors walk more and may achieve health benefits through daily travel.

Furthermore, Isaacson et al. (2015) emphasizes that the living environments of seniors' cities can be improved by focusing on walkability and pedestrian safety in residential areas and buildings to create high accessibility to services in urban environments. Besides, active transportation can facilitate healthy ageing through improved mobility and physical health. Living in a walkable environment is linked to increased active transportation among seniors as otherwise overall travel and rates of active transportation tend to decrease with age (Hutcheson 2015). As people's mobility and cognition decline as they age, their neighborhood environments may become more significant to their health and wellbeing.

4.4 Age-Friendly Cities, Communities and Initiatives

The concept of an 'age-friendly' or 'elder-friendly' city has its roots in urban development frameworks that gained prominence during the 1990s and 2000's including 'healthy cities', 'livable cities', combined with concepts of universal design, accessibility and sustainability (O'Hehir 2014). An age-friendly community provides accessible and inclusive built and social environments where seniors can enjoy good health, participate actively and live in security. An age-friendly city (AFC) has appropriate housing, transport, physical infrastructure and social and civic frameworks that enable people to maintain participation in the community as they grow old. Being age-friendly means adapting its physical and social infrastructure to help older people age in place (O'Hehir 2014). However, it is not just older people who benefit; it will also benefit younger people and people with disabilities (Fitzgerald & Caro 2014; Menec et al. 2011). Thus, an AFC emphasizes the notion of being friendly for all ages and not just "elder-friendly" (WHO 2007b) and fosters solidarity between generations and within communities facilitating social relationships in local services and activities, that bring together people of all ages. Thus, an AFC adapts its structures and services to be accessible to and inclusive of older people with varying needs and capacities (WHO 2007a).

Efforts to make cities and communities more age-friendly have gained significant momentum in recent years (Fitzgerald & Caro 2014). Elder-friendly community development is a recognized and growing movement represented by American Association of Retired Persons (AARP) Liveable Communities and Advant Age Initiative led by Centre for Home Care Policy and Research, Visiting Nurse Association of New York. Similar projects have been undertaken such as City of Calgary's Elder-Friendly Community in Canada (Plouffe & Kalache 2010). The members of European Healthy Cities Network have applied the 'healthy ageing' approach by WHO in their Active Ageing report (Green 2013). Such initiatives have been explored in Canada, Spain, Brazil, Australia and many other countries. In Canada, several provinces (British Columbia, Manitoba, Quebec, Nova Scotia, Labrador) have already launched age-friendly community initiatives (Menec et al. 2011). Within 2007-2011, over 560 communities in eight Canadian provinces (316 are in Quebec alone) are becoming more age-friendly. However, most communities are still at the initial stages of implementation.

Globally, there are several approaches and organizations to promote age friendly initiatives encouraging the development of age-friendly cities and communities. The WHO Global Network of Age-Friendly Cities and Communities was initiated in 2010 as a network of cities around the world contributing to an ageing community (Beard & Montawi 2015). European Commission formed the Action Group D4 on Age-Friendly Environments on Active and Healthy Ageing (Fitzgerald & Caro 2014). The Advantage Initiative, launched in 1990s, focused on creating elder-friendly communities to meet the needs and nurture the aspirations of seniors (Fitzgerald & Caro 2014; Menec et al. 2011). AARP Liveable Communities promote development of safe, accessible and vibrant environments for seniors and the National Association of Area Agencies on Ageing (n4a) Liveable Communities Initiative offers technical assistance to help organizations develop liveable communities (Fitzgerald & Caro 2014). Building Healthy Communities for Active Ageing (BHCAA) Award Program is developed to identify communities in United States that have combined smart

growth and active aging concepts (Fitzgerald & Caro 2014). Village Movements are grassroots organizations that coordinate access to affordable services that facilitate people to age in their communities and consolidate information about available services so that seniors can remain engaged in the community (Fitzgerald & Caro 2014). Besides these, other frameworks developed are WHO Active Ageing (WHO), Positive Ageing (New Zealand), Social Connectivity (Canada), Healthy Ageing (Canada), Conceptual Process (U.S.A), Manchester Valuing Older People (U.K), etc. (Steels 2015). Although different frameworks have been developed targeting the aged people, the frameworks for age-friendly built environment are still required.

4.5 Age-friendly City – WHO Initiatives

WHO released a Policy Framework on Active Ageing in 2002 for developing and strengthening health and social policies in an ageing world. To address the challenges in an ageing society, the WHO Age-Friendly Environments Programme was launched in mid-2000s (WHO, 2007a). From extensive research with collaboration of 33 cities from all the continents, WHO produced the "Global Age-friendly Cities: A Guide" and the "Checklist of Essential Features of Age-friendly Cities" to assist cities and communities (Plouffe & Kalache 2010) to self-assess and understand the characteristics of an Age-friendly City (AFC) (WHO, 2007a). WHO determined the features of AFCs and categorized the AFC checklists in eight domains (Plouffe & Kalache 2010): outdoor spaces and buildings; transportation; housing; social participation; respect and social inclusion; civic participation and employment; communication and information; and community support and health services (WHO, 2007a) as shown in Figure 2 below. WHO's approach is regarded as a starting point for many community developments, research activities and establishment of a larger global network of age-friendly communities (WHO 2007b). The WHO model of age-friendly cities has been applied by city, state and municipal governments and civil society organizations in several countries (Plouffe & Kalache 2011).

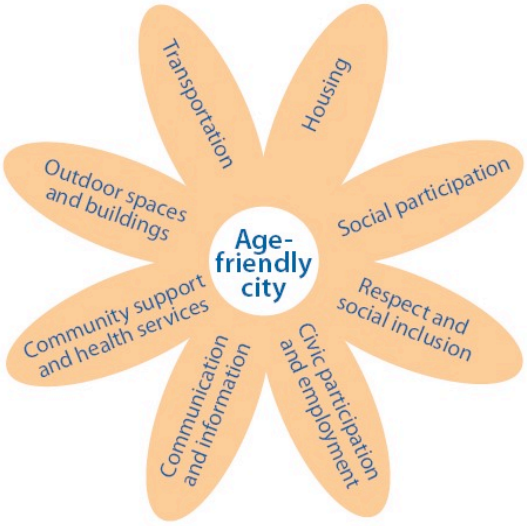

Figure 2: Eight domains of Age-friendly Cities [Source: WHO 2007b]

Further in 2010, WHO established the Global Network of Age-friendly Cities and Communities (Moulaert & Garon 2016) to support cities and communities that want to develop age-friendly initiatives (Beard & Montawi 2015; WHO 2007b). The

network has 250 members across 23 nations till 2015 with accountability for about 100 million people (Beard & Montawi 2015) worldwide. According to WHO, the concept of age-friendly cities and communities has been identified as a way of addressing the needs of ageing population (Moulaert & Garon 2016) and has become central to the notion of ageing in place (Kalache 2013). It has raised consciousness about the importance of planning and managing urban environments to address the challenge of population ageing (Buffel, Phillipson & Scharf 2012). Thus, AFCs are required to cooperate with urban planners on modifying the built environment to better adjust public spaces, infrastructures and housing to the necessities of aged people (Jackisch et al. 2015). In accordance, Jackisch et al. (2015) clustered the eight domains developed by WHO into three mutually reinforcing and overlying dimensions of interventions as shown in Figure 3:

i) Physical / built environment (outdoor and public spaces, buildings and transportation): resonates with healthy city theme of healthy urban environment and design.

ii) Social environments (opportunities of seniors for social participation, attitudinal environments such as respect, social exclusion, civic participation and communication): strongly associates with theme of caring and supportive environments (Green, Jackisch & Zamaro 2015)

iii) Municipal services (social, health services and information): replicates health services component of the caring environments' theme and action on behavioral risk elements from the healthy living theme (Jackisch et al. 2015).

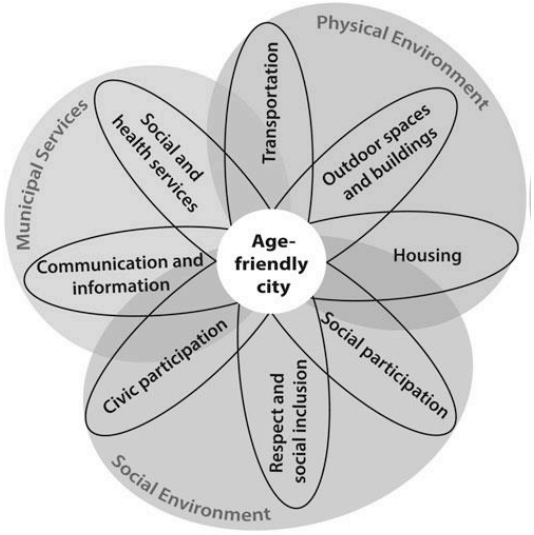

Figure 3: Three clusters for eight domains of an age-friendly city
(Source: Jackisch et al. 2015)

In this paper, only physical or built environment is considered for further discussion.

4.6 Age-friendly Built / Physical Environment

The built/ physical environment constitutes homes, workplaces, schools, libraries, hospitals, long-term care facilities, streets, transportation systems, parks, playgrounds and any outdoor spaces. The built environment's scale varies from unit, block and housing to neighborhood to cities (Karuppannan & Sivam 2013). Housing is not limited to the house only; it comprises immediate environment, community amenities and services at neighborhood level such as location and proximity to facilities and informal supports such as family and friends, availability and adequacy of open spaces, accessibility and usability of transportation and security concerns (Kaplan 1985).

Older people are living in their homes and communities but in environments that have not been designed with their needs and capacities in mind (WHO 2016). Much focus is directed towards providing retirement incomes and increasing expenses on healthcare systems than towards planning and housing issues. Generally, primary health conditions affecting aged people are associated with issues such as reduced physical activity and social isolation (Landorf, Brewer & Sheppard 2007). Many illnesses in old age are preventable as most of them relate to more inactive lifestyle and physical activity improves physical and emotional wellbeing and lowers the risk of cardiovascular disease, diabetes, obesity, cognitive decline, alzheimer's /dementia, etc.

Properly designed and maintained built environment can encourage and support regular exercise, reduce crime, create safer neighborhoods and reduce pollution and toxic emissions inside buildings and in outdoor air (CHE 2015). A built environment has a significant role in influencing physical activities and in stimulating positive social interactions (John, Lehmann & Sivam 2013). Appropriate built environments are necessary to develop behavioral and social interventions that can improve social support in community settings as they affect the older person's capacity to stay active, participate and contribute to society (Karuppannan & Sivam 2013). Active ageing is an essential feature to improve long-term health (Saelens, Sallis & Frank 2003) and neighborhood design influences the active ageing (Michael, Green & Farquhar 2006). Many research on ageing have indicated the strong association between poor health and underprivileged neighborhoods (Dunn & Hayes 2000; Pampalon et al. 2007; Wilson et al. 2004). Thus, the built environment has a dominant influence on mobility, independence and autonomy in old age and can facilitate or hinder the quest for a healthy lifestyle at all ages.

However due to absence of adequate public transport, inappropriate location of amenities and design of public spaces, neighborhoods do not satisfactorily support healthy ageing (Sivam 2011). Thus, it is essential to generate a safe pedestrian environment, convenient access to public transport, shopping centers and public services, recreational amenities and health centers which can considerably improve the neighborhoods and can positively affect the ageing (Karuppannan & Sivam 2013). De Donder et al. (2013) confirm that a neighborhood perceived to be physically adjusted to the requirements of older people also increases the feelings of safety.

The neighborhood based social networks are also critical to the wellbeing of seniors to maintain their independence in a neighborhood increasingly inhospitable to them

because of their relationship with it due to increased time they spend within it (Freedman et al. 2008). If housings are not suitable, neighborhoods are not safe and secure, footpaths are not age-friendly, street lighting is poor and there is lack of proximate public streets, pathways, right of ways, parks, open spaces and public buildings and facilities; they will not be willing to go out of their house (Karuppannan & Sivam 2008) and will be increasingly prone towards isolation, depression, reduced fitness and mobility problems. The outdoor activities and the residential preference of seniors are influenced by local shops and facilities, traffic and pedestrian infrastructure, public transportation, neighborhood attractiveness and security including the sentimental attachment to their house and place (Karuppannan & Sivam 2008). Several characteristics of urban settings when planned properly can contribute to the participation, independence, health, safety and security of seniors. Barrier-free structures and streets will enhance mobility and independence of individuals with disabilities. A well serviced neighborhood should be accessible to public or community transport since when people will age, they will be unable to drive. Apart from not wanting to be secluded from the community, seniors want to be well connected with the facilities they require as they feel that they should be capable to walk to diverse places and services by themselves (Karuppannan & Sivam 2008).

One of the key determinants of the capabilities of older people and whether they can achieve the things that are meaningful to them is the environment in which they live (Beard & Montawi 2015). New urbanism principles could be employed to address such necessities as walkability, mixed land use, good public realm, etc. could significantly improve the built environment leading to healthy ageing (Sivam 2011). Thus, due to probable influence of neighborhood on the health of old people, improving the services of neighborhoods is an imperative development and policy measure for aged people considering the degree to which elements to sort out with housing can contribute to an improved lifestyle.

7. Discussion

Though there is no standard measurement of well-being and quality of life, a fundamental concern of the aged people is satisfaction with housing (Karuppannan & Sivam 2008) which is essential not only because they require secure and comfortable home and neighborhood but also for social environments that allow them to have interaction within the community. Housing satisfaction leads to successful ageing by fostering healthy ageing in terms of physical, psychological and emotional well-being (Karuppannan & Sivam 2008). The perspective of active ageing maintains that older people can continue to live healthy, productive and fulfilling lives well into old age. Ageing in place is therefore fundamental to active ageing as it enables aged people to remain physically and socially associated to their communities (O'Hehir 2014). However, older population is living predominantly in environments that are not originally planned for them (Antoninetti and Garrett 2012) which has created multiple barriers for them as their homes and communities have no longer been suited to their changing needs (O'Hehir 2014). This disparity is worsening by inevitable deterioration of physical adaptability that may be encountered in old age. Eventually, within residential settings that have remained generally unchanged for decades, reduced physical and cognitive capability can compel aged people to encounter undesired and unintended alterations of their established routines in day to day life (Antoninetti and Garrett 2012).

If spatial form does not encourage pedestrian activities and does not deliver functional public or social places, then opportunity for social encounters is strongly restricted. It also affects people who prefer to decrease their car dependency and do not live near to restaurants, shops or religious centers within a walking distance from home (Antoninetti and Garrett 2012). These may impact on people's mobility or limit their social activities. Their place of residence may become unsuitable or access to services and support may be restricted. Therefore, the design of communities and environments that support ageing in place can help to alleviate these barriers (O'Hehir 2014).

Since ageing in place is the favored alternative for majority of older population, the preference is not only the demand for housing but also age friendly neighborhood. There is very little empirical study on neighborhood design grounded on the perspectives of older persons (Freedman et al. 2008) though there is a strong connection among social conditions of everyday living, health condition and neighborhood (Saelens, Sallis & Frank 2003). Most of the building types, housing, built structures and the urban environments need to be reconsidered to accommodate the growing ageing population (Farrelly 2014a). The opportunities for architectural design for the old people have been restricted to retirement or nursing homes (Farrelly 2014a). The studies conducted in this field are mostly constrained to the assessment of housing contentment rather than evaluating neighborhood contentment though they are closely interrelated. Further research is desirable to expand the understanding on relationship between ageing and built environment (Coleman 2015).

6. Recommendations

As aged people prefer 'Ageing in Place' and have sentimental attachments to their neighborhoods and their social networks, better understanding of the complexities of the environment is essential for planning age-friendly environments letting aged people to age in place (Clarke 2014). The neighborhood environment not only can assist the adoption and maintenance of an active lifestyle, it can also affect overall well-being of old people (Cerin et al. 2016) influencing individual's activities for managing the needs of seniors (WHO 2007b). When an aged person has access to age-friendly environments (Modlich 2010), health and life expectancy are expected to improve, pressure on social and health care services (Fitzgerald & Caro 2014) will be reduced and the anticipated demands will be balanced (Modlich 2010). Proper housing design can address many public health concerns such as obesity, cardiovascular diseases, diabetes, asthma, injury, depression, violence and social inequities progressing to improved well-being leading to successful ageing (Karuppannan & Sivam 2008). As people age, loneliness develops into an emergent problem and accessibility and mobility turn out to be progressively critical. Therefore, it is required to improve elder's houses and neighborhoods to avoid obstacles or potential dangers to aged people's regular activities (Karuppannan & Sivam 2008).

According to OECD 2015, infrastructure and urban form are required to be redesigned to escalate the well-being of aged people. More evidences beneficial for shaping age-friendly built environments are required (Burton 2012). Communities should be planned to be interdependent providing environments that encourage people to support one another as life circumstances will change with time and housing needs

to be adaptive over lifetimes. Housing and public spaces should be planned so that they can accommodate a society with varying requirements with changing generational needs and lifestyles possibly living on their own or needing support (Farrelly 2014b). The notion of age-friendliness is grounded on the premise that making environments age-friendly will benefit not only seniors but people of all ages ranging from a child to a mother with pram or a person with any different ability creating opportunities for social connectivity, health, well-being and ultimately quality of life (Menec et al. 2011). Thus, future researches should direct towards developing methodologies that assess the age-friendliness of an environment and developing design approaches for building age-friendly built environment.

7. Limitations

A rethink of what defines an aging society is required. Most research use data on number of persons older than a fixed year (e.g. 60, 65 or 70) to represent an aged population with the observation that this number is being maintained at older ages than in the past worldwide. However, the physical and mental abilities of older people are also increasing because of better health care and a societal focus on better health. This is partially reflected in the age at which people can obtain the aged pension, a number which has moved from 65 to 67 and to 69 in coming years. Thus, the re-design of urban environments should not be based on number of people greater than a certain age, but rather on the ability of groups of people.

The review could be improved by extending to analytical techniques and including spatial analysis. More studies are required on the approaches and methods that urban design utilizes to assist ageing in place. It would be good to have more contemporary examples of how the urban design techniques assist for developing age-friendly communities.

8. Conclusion

Ageing is being recognized as a significant issue facing individual, families, communities and nations placing pressure on services to support the ageing population. Previously, old age was only viewed as being associated with images of decline and frailty which nowadays is being transformed as the cumulative effects of improvements in health, greater life expectancy, enhanced housing and living conditions, improved healthcare and human development creating opportunities. Not only people are living longer, they are becoming healthier than previous generations and are reinventing what it means to be ‘old’. Besides redefining what it means to experience old age, they are redefining what it means to be retired and likely to continue to have active roles in their families and communities (Kalache, 2013). Therefore, creating communities that cater to the needs of an ageing population is important where they can be actively involved.

Age-friendly cities and initiatives is a growing movement that is making progress in enhancing the age-friendliness of the communities and cities. Researchers, planners, policymakers and residents have been significantly inclined towards shaping urban environments as places that nurture active ageing and independence among aged people (Cannon 2015, p.i). Architects and urban designers are required to consider

planning and designing cities, neighborhoods and public spaces that can adjust to the varying necessities of aged people.

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Contact email: reshma.shrestha@mymail.unisa.edu.au, reshstha@gmail.com, alpana.sivam@unisa.edu.au, sadasivam.karuppannan@unisa.edu.au