2020

Defining and assessing the characteristics of the built environment that contribute to the well-being of people with dementia living in aged care facilities in Singapore

Shuzhen Joanna Sun

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**Defining and assessing the characteristics of the
built environment that contribute to the well-being of
people with dementia living in aged care facilities in Singapore**

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Emeritus Professor Roger Fay

Professor Belinda Goodenough

Professor Patrick Crookes

This thesis is presented as part of the requirement for the conferral of the degree:

Doctor of Philosophy

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Australian Government Research Training Program Scholarship

The University of Wollongong

School of Nursing

August 2020

Abstract

Background

Dementia enabling environments are a key factor in addressing the needs of people living with dementia in residential aged care facilities. Despite the evidence supporting the development of these environments, there are no salutogenic validated or reliable tools that can guide, measure, or evaluate dementia enabling environments in Singapore. The study uncovers the characteristics of the built environment that contribute to the well-being of Singaporeans living with dementia. With the findings, the study plans to translate the knowledge into action by developing an acceptable, reliable, and culturally sensitive tool for Singapore.

Methods

The study employed a sequential qualitative-quantitative mixed method design. The study was structured into two phases. A scoping review was carried out in the first phase to understand the characteristics of nursing homes in East and Southeast Asia in relation to eight design principles (Chapter 2). An investigation was carried out into the cultural characteristics and the acceptance of eight principles of design in Singapore through focus group discussions (FGD, n=150). Qualitative data and descriptive statistics were collected and analysed (Chapter 3). The testing of the Singaporean Environmental Audit Tool (SEAT) made up the second phase and data via interviews on the barriers and facilitators and usability were obtained after participants (n=6) tested the tool in eight nursing homes in Singapore (Chapter 4). The quantitative data on the internal consistency and reliability of the tool was collected and analysed using SPSS version 25. All qualitative data were thematically analysed using NVivo 11.

Results

The scoping review found that the eight principles of design can be applied in nursing home environments in East and Southeast Asia when cultural sensitivities such as spaces for palliative care, technology, spirituality, and culturally familiar features were addressed. The successful outcome of the first phase of the study enabled research into the second phase of the study. Data echoed those of the scoping review, with the same cultural characteristics being identified as lacking in the Australian Environmental Assessment Tool High-Care

(EAT-HC). The data indicated a high level of acceptance of the eight principles of design among Singaporeans. The study also provided insights into barriers and facilitators which can potentially impact on the implementation of the Singaporean version of the EAT-HC. Results from the first phase contributed to the development of the Singapore Environmental Audit Tool (SEAT). In the second phase, the tool was found to be culturally appropriate, reliable, and acceptable for use in Singapore when undertaken by users with knowledge of dementia. Education and training in the space of dementia enabling environments are recommended for users of the SEAT (Chapter 5).

Findings

The study demonstrates the strong potential for the EAT-HC to be adapted for countries in East and Southeast Asia. The evidence indicates that the inclusion of key cultural characteristics such as the inclusion of technology, culturally familiar features and spaces for palliative care and spiritual reflection are vital for the wellbeing of people living with dementia in nursing homes in Singapore and the region. The SEAT was found to be a validated, reliable, and culturally appropriate tool for use in Singapore. Awareness, education, and training remain to be key requirements to enable the SEAT to be utilised effectively. A knowledge-to-action framework was also founded to enable the longevity of the tool.

Implications for Practice

This study maps the processes involved in the development of the SEAT and will aid researchers in the future to adapt the EAT to diverse cultures across countries (Chapter 7). The tool will enable aged care professionals in Singapore to enhance their knowledge of dementia enabling environments. The tool will be able to provide a measure of the application of the relevant principles of design for an environment for a person with dementia in a Singaporean high care facility. Without a validated environmental audit tool for people with dementia living in Singapore, facilities in Singapore and Asia-Pacific countries have no means of determining if the facilities are culturally appropriate and fit for purpose. This study has opened doors to enable Australia and Singapore to work collaboratively to improve dementia enabling environments on an international landscape.

Acknowledgements

I would like to express my utmost gratitude to my principal supervisor Professor Richard Fleming whose mentorship, kindness and knowledge continue to motivate and inspire me in my work in dementia care.

I would like to acknowledge Emeritus Professor Roger Fay for his support and encouragement and Professor Belinda Goodenough and Professor Patrick Crookes for their support.

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My sincere thanks to Professor Marijka Batterham, Director of the Statistical Consulting Centre, for her statistical advice and Dr Denis Whitfield for editorial assistance in accordance to the Australian Standards for Editing Practice.

To my very supportive husband, Simon, and my very tolerant Thomas, thank you for being there always.

Certification

I, Sun Shuzhen Joanna, declare that this thesis submitted in fulfilment of the requirements for the conferral of the degree Doctor of Philosophy, from the University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. This document has not been submitted for qualifications at any other academic institution.

Shuzhen Joanna Sun (Candidate)

1st July 2020

Publications constituting this thesis

Publications

- Sun, J., & Fleming, R. (2018). Characteristics of the built environment for people with dementia in East and Southeast Asian nursing homes: a scoping review. *International Psychogeriatrics*, (4), 469-480.
- Sun, J. (2020). The appropriateness of adapting the Australian Environmental Assessment Tool – High Care (EAT-HC) for persons with dementia in Singapore. *Health Environments Research & Design Journal*. Advanced online publication <https://doi.org/10.1177/1937586720929044>
- Sun, J., Tan, W.M., Luo, D.L., & Ng, V. (2020). *The implementation of the SEAT in Singapore: Translating research into policy and practice*. Singapore: Agency for Integrated Care.
- Sun, J., & Fleming, R. (in press). The development and reliability of the Singaporean Environmental Assessment Tool (SEAT) for facilities providing high levels of care for people living with dementia. *Health Environments Research & Design Journal*.

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- Fleming, R., & Sun, J., (in press). *Singaporean Environmental Assessment Tool*. In Agency for Integrated Care, Singapore (Ed.), *Looking to the Future: Designing and Managing Residential Facilities for People with Dementia* (pp. 41-48). Singapore, Agency for Integrated Care.

Conference Presentations and Posters

- Sun, J., Fleming, R., Fay, R., & Crookes., P. (2015). *Defining and assessing the built characteristics of the built environment that contribute to the well-being of people with dementia living in Chinese, Malay, and Indian aged care facilities in Singapore*. [Poster presentation]. Wicking Dementia Interventions Symposium 2015, Tasmania,

- Australia. <https://doi: 10.13140/RG.2.2.17915.11047>
- Sun, J., Fleming, R., Fay, R., & Crookes., P. (2016). *Environmental Design of Nursing Homes for People with Dementia in Singapore*. [Paper presentation]. Australian Association of Gerontology. Cutting Edge Ageing Research, Hobart, Tasmania, Australia. <https://doi: 10.13140/RG.2.2.18334.54080>
- Sun, J., & Fleming, R., (2018). *Knowledge Translation: a progress report on the culturally sensitive application of a dementia environment audit tool in Asia*. [Poster presentation]. 3rd Tasmanian Dementia Symposium, Tasmania. <https://doi: 10.13140/RG.2.2.17915.11047>
- Sun, J., & Fleming, R., (2018). *The built environment for people with dementia in Asia*. [Paper presentation]. 51st Australian Association of Gerontology Conference, Victoria, Australia. <https://doi: 10.13140/RG.2.2.21198.10563>
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- Sun, J., & Fleming, R. (2020). *Characteristics of the built environment for people with dementia in nursing homes in Asia*. [Poster presentation]. 34th Alzheimer's Disease International Conference, Singapore. <https://doi:10.13140/RG.2.2.36466.56000>
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- Sun, J. (2020). *The appropriateness of adapting the Australian Environmental Assessment Tool – High Care (EAT-HC) for persons with dementia in Singapore*. [Paper presentation]. 53rd Australian Association of Gerontology Conference, Tasmania, Australia.
- Sun, J. (2020). *Aged care facilities in East and Southeast Asia: A physical expression of the history and culture of dementia*. [Paper presentation]. 53rd Australian Association of Gerontology Conference, Tasmania, Australia.
- Sun, J. (2020). *A cultural adaptation of the Australian Environmental Assessment Tool High-*

Care (EAT-HC) for the Singapore population. [Paper presentation]. University of Wollongong School of Nursing: Nursing Research Conference, Wollongong, Australia. <https://youtu.be/kykCGgeDouc>

Other Publications and Presentations arising from the thesis

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Sun, J. (2018). Grandma's Dementia & Ignorance was certainly not bliss. *Project we forgot*. <https://projectweforgot.com/your-aid/country/singapore/grandmas-dementia-ignorance-certainly-not-bliss/>

Sun, J. (2020). We need environments for people with dementia that are tech ready for social connectivity. *National Institute for Health Research, Dementia Researcher*. <https://www.dementiaresearcher.nihr.ac.uk/guest-blog-we-need-environments-for-people-with-dementia-that-are-tech-ready-for-social-connectivity/>

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Sun, J. (2020, July 30). The role of a knowledge broker in an international research project [Webinar]. In *World Young Leaders in Dementia (WYLD), Working in different dementia fields series*. <https://wyldementia.org/>

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Summary

The following contains a plain English summary of the study and an overview of each chapter within the thesis. The thesis is formatted as per 7th edition American Psychological Association (APA) style guidelines. A snapshot of each chapter contains information on

1. The research question related to the chapter,
2. Investigative results and outcomes related to the research question and,
3. Publication outcomes.

The context statement can be found in the introduction (Chapter 1), with the outcome and conclusion of the project found in chapters 1 and 8.

Chapters

Prelude

The prelude provides readers with an understanding of my motivation for this study. It touches on my personal experiences of a loved one who was living with dementia and the changes in the environment that impacted our lives.

Publication:

Sun, J. (2018). Grandma's Dementia & Ignorance was certainly not bliss. *Project we forgot*.
<https://projectweforgot.com/your-aid/country/singapore/grandmas-dementia-ignorance-certainly-not-bliss/>

Chapter 1

The introduction is comprised of two parts; the first part (Chapter 1.1) is an introduction to the study comprised of the aims, methodology, structure, and overall approach.

Research Question (Chapter 1.2): Is there a culturally appropriate and salutogenic dementia environment assessment tool currently available for application in Singapore? Can the design principles that are the basis of the Australian Environmental Assessment principles be used as the foundation for an environmental assessment tool in Singapore?

The second part (Chapter 1.2) is a literature review that has been presented and published as a poster. It provides readers with the evidence on the lack of a validated dementia enabling environmental assessment tool for the Singaporean population and an argument for the need of this study.

Outcomes

Presentation and poster:

Sun, J., Fleming, R., Fay, R., & Crookes., P. (2015). *Defining and assessing the built characteristics of the built environment that contribute to the well-being of people with dementia living in Chinese, Malay, and Indian aged care facilities in Singapore*. [Poster presentation]. Wicking Dementia Interventions Symposium 2015, Tasmania, Australia. <https://doi.org/10.13140/RG.2.2.17915.11047>

Sun, J., Fleming, R., Fay, R., & Crookes., P. (2016). *Environmental Design of Nursing Homes for People with Dementia in Singapore*. [Paper presentation]. Australian Association of Gerontology. Cutting Edge Ageing Research, Hobart, Tasmania, Australia. <https://doi.org/10.13140/RG.2.2.18334.54080>

Chapter 2

Research Question: Is there a culturally appropriate dementia environment assessment tool currently available for application in East and Southeast Asia? Can the design principles that are the basis of the Australian Environmental Assessment principles be used as the foundation for an environmental assessment tool in these regions?

There was a need to further explore and confirm the lack of a culturally appropriate tool that can be applied in Singapore. This chapter comprises a published scoping review that investigated the existence of a tool in East and Southeast Asia. The scoping review found that there was no culturally appropriate dementia assessment tool available and a low level of awareness surrounding dementia enabling environments in East and Southeast Asia. The principles of design that are the basis of the Australian Environmental Assessment Tool High-Care (EAT-HC), when applied with cultural sensitivities of the population, is applicable in the design of facilities providing high levels of care for people living with dementia.

An extended discussion is included in this chapter providing information on cultural beliefs that have shaped the design of current built environments providing high levels of care for people living with dementia in these regions. The extended discussion serves to provide context and insight into values and beliefs that have influence and shaped the built environmental design throughout history.

Outcomes

Publication & Presentation:

Sun, J., & Fleming, R. (2018). Characteristics of the built environment for people with dementia in East and Southeast Asian nursing homes: a scoping review. *International Psychogeriatrics*, (4), 469-480.

Sun, J., & Fleming, R., (2018). *The built environment for people with dementia in Asia*. [Paper presentation]. 51st Australian Association of Gerontology Conference, Victoria, Australia. <https://doi.org/10.13140/RG.2.2.21198.10563>

Sun, J., & Fleming, R. (2019). *Characteristics of the built environment for people with dementia in nursing homes in Asia*. [Poster presentation]. Australian Dementia Forum 2019, Tasmania, Australia. <https://doi.org/10.13140/RG.2.2.36466.56000>

Chapter 3

Research Question: What are the characteristics of the built environment that contribute to the well-being of people with dementia in Singapore? Can the design principles which are the basis of the Australian Environmental Assessment principles be used as the foundation for an environmental assessment tool?

The published chapter argues that characteristics of the built environment were aligned with the Australian Environmental Assessment Tool High Care (EAT-HC). The principles of design which make up the basis of the tool can contribute to the well-being of Singaporeans living with dementia. The manuscript provides details on culturally specific key design characteristics that are subsumed under the principles. It also provides insights into additional characteristics not found in the Australian EAT-HC, such as the need for the inclusion of items that are inclusive of technology, palliation, and spirituality in the built environment.

An extended discussion is included in this chapter and presents the findings related to the barriers and facilitators that may impact on the development and implementation of the tool from the perspective of participants. The barriers and facilitators are;

1. The need for a definition of the nursing home for people living with dementia,
2. The need to increase the understanding of the role of the environment in dementia care,
3. The need for an environment to promote social inclusion and citizenship.

Outcomes

Publication and Webinar:

Sun, J. (2020). The appropriateness of adapting the Australian Environmental Assessment Tool – High Care (EAT-HC) for persons with dementia in Singapore. *Health Environments Research & Design Journal*. Advanced online publication
<https://doi.org/10.1177/1937586720929044>

Sun, J. (2020, May 27). *Adapting the Australian Environmental Assessment Tool – High Care (EAT-HC)* [Webinar]. Dementia Researcher: National Institute for Health Research, webinar series. <https://www.dementiaresearcher.nihr.ac.uk/event/adapting-the-australian-environmental-assessment-tool-high-care-eat-hc/>

Chapter 4

Research Question: What questions should be included in this tool? Does the tool have satisfactory psychometric and usability properties?

The chapter, which had been submitted for publication, outlines the development and testing processes of the Singapore version of the Environmental Assessment Tool for facilities providing high levels of care to people living with dementia. The Singapore version of the tool, the Singaporean Environmental Assessment Tool (SEAT), was found to have an acceptable level of usability and a moderate level of reliability among subscales. The final 83-item tool had seven more questions than the Australian version of the tool because of the inclusion of additional culturally appropriate items. The SEAT is a valid, reliable, and culturally sensitive tool when applied by users who have knowledge of dementia enabling environments.

Outcomes

Publication and Educational Resource:

Sun, J., & Fleming, R. (in press). The development and reliability of the Singaporean Environmental Assessment Tool (SEAT) for facilities providing high levels of care for people living with dementia. *Health Environments Research & Design Journal*.

Sun, J., & Fleming, R. (in press). *Singaporean Environmental Assessment Tool*. In Agency for Integrated Care, Singapore (Ed.), *Looking to the Future: Designing and Managing Residential Facilities for People with Dementia* (pp.41-48). Singapore, Agency for Integrated Care.

Chapter 5

Research Question: How can a culturally sensitive tool be implemented and sustained in Singapore and Asia?

This chapter, which has been presented as a poster, contains a clear and simple report accompanied with infographics that have been tailored for readers from countries that meet the profile of having a population that has low awareness of dementia enabling environments and/or research in the aged care. The report is targeted at individuals from these countries who are interested in the adaptation, implementation, and sustainability of an environmental assessment tool. Readers are introduced to an applicable knowledge-to-action framework that enables the longevity of the environmental assessment tool after successful implementation.

Outcomes

Poster:

Sun, J., & Fleming, R., (2018). *Knowledge Translation: a progress report on the culturally sensitive application of a dementia environment audit tool in Asia*. [Poster presentation]. 3rd Tasmanian Dementia Symposium, Tasmania. [https://doi: 10.13140/RG.2.2.17915.11047](https://doi.org/10.13140/RG.2.2.17915.11047)

Chapter 6

Research Question: What is the impact of the research on policy and practice in dementia environmental design in Singapore?

This chapter contains a description of the international collaboration in this study between the University of Wollongong and the national integrated care agency in Singapore. A description of the influence that the Singapore version of the Environmental Assessment Tool has on policy, planning, design, and evaluation of high care facilities providing care for people living with dementia in Singapore is provided. The chapter also contains information on practice; on actionable steps that may be taken by the national integrated care agency in Singapore.

The aims of the implementation process can be summarised as;

1. creating awareness of the Singapore version of the Environmental Assessment Tool by making it free for public use.
2. creating acceptance and adoption through the use of the tool in the process of evaluation
3. creating adherence to the tool involving policy makers in the review of plans for sustainability.

Outcomes

Commentary:

Sun, J., Tan, W.M., Luo, D.L., & Ng, V. (2020). *The implementation of the SEAT in Singapore: Translating research into policy and practice*. Singapore: Agency for Integrated Care.

Chapter 7

Research Question: What is the impact of a knowledge broker on an international research project?

The role of a researcher as a knowledge broker was essential in ensuring that research between both countries was inclusive, respectful, and efficient. This chapter contributes to the pool of knowledge about the effective utilisation of the researcher as a knowledge broker. It describes the role, attributes, challenges and significance of the knowledge broker to the research, development and implementation of the Singaporean Environmental Assessment

Tool (SEAT); the Singaporean version of the EAT-HC. The chapter is written as a reflection of my experience as a knowledge broker in this research project.

A commentary is included to highlight the limitations encountered in the recruitment process in this international study. Strategies used to mitigate the challenges to elicit an inclusive participatory process are also shared.

Outcomes

Accepted for a presentation:

Sun, J. (2020, July 30). The role of a knowledge broker in an international research project [Webinar]. *In World Young Leaders in Dementia (WYLD), Working in different dementia fields series*. <https://wyldementia.org/>

Chapter 8

This chapter consists of a conclusion and epilogue. An epilogue is included because it contains a personal reflection of the study and aspirations for it to bring positive change in the implementation of dementia enabling environments in Singapore, and in East and Southeast Asia.

Prelude

An article written and published as part of a series of stories in a global online community network platform for caregivers of persons living with dementia known as Project We Forgot.

Sun, J. (2018). Grandma's Dementia & Ignorance was certainly not bliss. *Project we forgot*.

<https://projectweforgot.com/your-aid/country/singapore/grandmas-dementia-ignorance-certainly-not-bliss/>

The prelude provides readers with context and history behind my motivations in engaging in research in the field of dementia-enabling environments. The article touches on the life of my great grandmother, who lived with dementia and struggled to adapt to her home after it had been renovated. Her home, after the renovations, did not contain any semblance of familiarity or of her identity. The aim of the article is to highlight the significant impact of the environment on the person living with dementia and to prompt readers to take action by increasing their understanding of dementia.

The experiences of living with my great grandmother, dementia and the built environment has over the years of my life prompted me to seek out ways to understand my experiences and to seek solutions to help people and families in similar situations. My education and experiences in psychology, aged care, nursing, media, and design has led me to this point. It is with much hope that the product of this study will improve the quality of life for people living with dementia and everyone around them, not only in Singapore but also in the countries in East and Southeast Asia.

My great grandmother lived next door, and I affectionately called her Lau Ma. She had silver grey hair and was a petite slim built lady with tortoiseshell framed spectacles and a signature hairdo parted to the left and that was never longer than just past her ears. She always dressed in a Sam Foo at home; a loose-fitting cotton top fastened with buttons and dark coloured loose, comfortable looking ankle length trousers. If she had to go out for dinner, she would put on a linen or button front shirt and a simple pair of very tiny pearl earrings. She spoke Teochew (Chinese dialect), had oatmeal for breakfast, cooked and ate simple meals which were steamed or stewed accompanied by a bowl of rice. Her beauty regime consisted of moisturising with Hazeline snow which left a tint of rose which hung around her like a subtle hidden bouquet. Sometimes I would have a giggle when she was in a hurry, and she had applied her moisturiser but had not rubbed it in, and you could see some residue of the waxy clumps of the product on her face. Her drinking glasses always had an aromatic Tieguanyin (Oolong Tea) scent. She loved her plants as much as her Channel Eight dramas (local TV Channel) and ritually drank a shot of whisky mixed with a spot of water in the evenings.

She loved gardening so much that she had plants in her home and the rest of her plants were in our little garden too. I remember at five o'clock like clockwork I would hurry out and help water all the plants with a red plastic watering can making several trips to fill it up because the watering can was a third the size of my body. I would watch her trim and talk to her plants like they were friends of fifty years. She shared with me the pomegranates and papaya that she grew, and she would boil the clovers in the garden and make a tea out of them. We had a little ritual in our family; she would be the first person that we would greet so when I was older every day after school I would pop over and bellow through her window to let her know I am home after school and she would respond with an equally loud acknowledgement. When I think back now, it sure was a quirky ritual.

I did not know anything about dementia at that age. I knew the Chinese form of it which people had commonly called 老人癡呆症 (lao ren chi dai zen) but our understanding was a ball of myths and half-truths. Like how the heart would give out and we will pass away, so will the brain, which was how it was explained to me when I was little. Computers in those days were rare, and the internet ran on 56kbps making a shrill ringing sound when it dialled up. Books in the library were always three years out of date, and you always had to wait to borrow a good book, mobile phones were the size and weight of a brick, the Primary

School Leaving Examination (PSLE) was the biggest hurdle in life. I did not think to fact check at that age, and took what adults said as the golden truth.

My great grandmother lived at home and aside from the market, and her hairdresser at Toa Payoh (housing estate in Singapore) and the occasional dinner at a restaurant outside once every few months with family members she stayed at home. Her life was a huge routine of making breakfast, house chores, gardening, caring for her pet bird and daily social engagement with family members (all during the day) who came to visit. If she did forget things, initially she would say she is old, and it is okay to be forgetful (Lau liao boh ki ti – old and forgetful in Hokkien, a Chinese dialect). What she felt, I would never know. She seemed to be aware of her failing memory but talked about it like it was just another bump in the road and laughed it off. Her high self-efficacy and her ability to remain independent as a result of a familiar environment were certainly a factor. I still believe strongly today that it kept her going as long as she did.

The first sign that I noticed that something was quite wrong at that young age was when she started to live in her clothes for days, three days in fact and she had not showered. I remember standing beside her outside her bedroom and jokingly said that she smells, and she needs to shower and went to pull clothes out of her moth ball smelling cupboard. She smiled and agreed and went to shower soon after. The adults must have noticed too because I remember people talking about how they were worried about her cooking, and they were talking about cutting off the gas at one point to make sure she would be safe. When I think back now as her brain deteriorated, physiologically her body appeared healthy as a horse for a person in their late eighties. For the last family reunion dinner, I had with my great grandmother I recall bringing her around to our place for the typical steamboat meal. She sat in the living room waiting while my mother was getting the bits and pieces together, and all she did was repeatedly asking me if I had eaten (Jiak pa buah? – in Hokkien, a Chinese dialect). After this dinner, she went to live with other relatives while her home was being renovated into a beautiful villa-style residence. Her beige metal grills, colourful tiled floors, hardwood furniture and potted plants were replaced with modern dark brown fences, rustic sand ceramic floor tiles. The layout of the rooms changed, and it was the same home on the same street, but it looked nothing like the home she had lived in. She came back to stay, and as a child, I recall walking up at night hearing her calling out on numerous occasions. Once I looked at the clock and recalled it was two in the morning, and she kept calling out sounding

painfully lost and confused. My parents would talk to her standing behind a wall of hardwood fencing to help calm her down. She had a different primary caregiver, and we did not have access to her home, so all we could do was talk to her. My last physical memories of her were the sound of her voice, scared, frantic, confused, lost and alone in the dark, in the night, in a seemingly familiar yet unfamiliar environment. Months later, her primary caregivers sold the house, and she stayed with them until she passed in 2009. I never saw her again.

As a kid, not knowing any better about dementia, I too did not do more to make her experiences, our memories, and our relationship any better. Dementia is not an isolated condition; it is a condition that transcends family relationships, social bonds and tests the strength of love, care, and unity within the family. I am wearing my heart on my sleeve here, but I certainly hope that in this day and age of knowledge, education and technology, for everyone the last memories of their loved ones are peaceful and positive memories. We just drifted apart as I drifted out of her memory. In my experience, ignorance was certainly not bliss.

Chapter 1.1: Introduction

Chapter 1 contains an overview of the study and the context statement. Chapter 1 was submitted to the University of Wollongong as part of the study's research proposal and has been updated to present an overview of the study.

Background

Singapore is a country that has experienced positive growth and progress in health and medicine since attaining independence 55 years ago. The country is experiencing an increasing life expectancy averaging 85.4 years for women and 81 years for men. The increasing life expectancy has led to an increasing ageing population; it is estimated that almost 13.7 percent of the resident population is aged 65 years and above, and approximately 82,000 older adults may be living with aged-related dementia in Singapore (Subramaniam, Chong, & Vaingankar et al., 2015; Government of Singapore, 2019). The financial and economic burden associated with dementia for Singapore was estimated to be 1.67 billion (USD) in 2015 (Woo, Thompson & Magadi, 2017). In addition to the ageing population, Singapore is facing a shrinking old age support ratio, from 5.7 working adults aged 20 to 64 for each person over the age of 65 in 2014, to 4.8 working adults in 2019 (Government of Singapore, 2019). The challenges brought about by the shrinking population of working adults, and stressors in care provision for older adults coupled with the increasing costs of care is having an impact on traditional living arrangements (Tew, Tan, & Luo, 2011; Thompson, Riley, & Eberlein, et al., 2012). These changes have contributed to a change in traditional stereotypes of older adults being cared for by family in their own homes. For older adults with dementia requiring high levels of care but without caregivers, or those whose caregivers are no longer able to provide care at home, long term residential care facilities that can provide high levels of care may be their only option.

The number of long-term care residential care facilities or nursing homes in Singapore continues to increase year by year. In 2014, 66 homes and 10,780 beds were available for older adults with and without dementia. In 2018, six more nursing homes were developed and there are now 15,205 beds available for 547,900 older adults (Government of Singapore, 2019). The Singapore government continues to work to introduce, improve and sustain care services for people living with dementia (See, 2013; Ministry of Health Singapore, 2013). Despite the number of nursing homes increasing to meet the needs of the ageing population and people living with dementia, there is only one publication from the Singapore government providing information and a checklist on the design and planning of nursing homes for people living with dementia in Singapore (Dementia Nursing Home Design and Resource Panel, 2015). A guidebook is also available to provide a blueprint for the design of nursing homes in Singapore, however little information on dementia is available in the

document (Ministry of Health Singapore, 2002). No validated dementia-specific environmental assessment tools have been developed for the Singaporean population to help guide and support the development of facilities providing high levels of care for people living with dementia (Sun & Fleming, 2018).

A validated environmental assessment tool that meets the needs of Singaporeans is critical for the design of nursing homes providing high levels of care for people living with dementia. Valid and reliable assessment tools are essential in the discipline of health and social sciences as they introduce a structured system of measures that is based on evidence, mitigating issues associated with individual cognitive biases and human error (Steiner, Norman & Cairney, 2015). In the process of designing a dementia enabling environment, an assessment tool can provide all stakeholders with a measurement tool and results that can be quantified. Unlike guidebooks that provide qualitative information on the environment, the results of an assessment tool allow users to clearly identify strengths and weaknesses of the facilities in measurable degrees. In Singapore, the design of a facility may encompass a multi-disciplinary team of architects, administrators, and aged care staff coming together to design a facility. Users from different backgrounds may have different interpretations of dementia enabling environments based on their knowledge and experience. Individual subjective judgement from team members of different backgrounds will result in miscommunication, lack of consensus and questionable reliability of recommendations. Fixed values can provide tangible benefits and a common quantitative point of reference. Results from an assessment tool when used with a guidebook can provide a single accurate value and identifier to help users reach a common consensual understanding of the description of good design and means of improvement in the process of planning.

When reviewing the cultural diversity of Singapore, with a multi-ethnic (Chinese Malay and Indians), multi-religious and highly urbanised society, it cannot be assumed that environmental assessment tools for people living with dementia overseas can be applied for Singaporeans. In addition to an ultra-urbanised society, Singapore is close to the equator and so encounters environmental impacts on the built environment that are unique to the geographical location.

The aim of this study is to understand the cultural characteristics of the built environment for Singaporeans living with dementia. The study considers the appropriateness of the adaptation of the Australian Environmental Assessment Tool High-Care and its

principles of design for Singapore and to develop a valid and reliability environmental assessment tool for Singapore. The study lays the foundation for the development of an evidence-based tool that can be used to guide and evaluate designs and plans to ensure that the design is culturally appropriate and complies with international best practice in the provision of nursing homes for people living with dementia in Singapore.

Aims

The aims of this study are to understand and describe the characteristics of the built environment that contribute to the well-being of people with dementia in the Singaporean context. In addition, the study uses this knowledge to develop a tool that will provide policymakers, designers, and managers with an opportunity to evaluate current and future nursing homes for people with dementia.

Methodology

It is evident that a critical gap in knowledge exists in the area of built environment design for residents with and without dementia living in nursing homes in Singapore (Sun & Fleming, 2018). The current design framework and clinical guidelines have a strong emphasis on quantitative outcome indicators such as the minimum number of residents in a nursing home, staffing ratios, space norms and clinical care (Ministry of Health, 2002; Koh, 2004; Ministry of Health, 2013). Clinical care in nursing homes has a strong emphasis on the management and not the prevention of BPSD and incontinence, and focuses on the prevention of falls and on infection control (Ministry of Health, 2002; Koh, 2004; Ministry of Health, 2013; Wee et al., 2015).

Residents of nursing homes, their caregivers and non-users, all share similar negative notions that nursing homes in Singapore are restrictive, with the psychosocial aspects of care neglected (Wee et al., 2015). However, nursing homes continue to be the choice of care because of the inability of the caregivers to provide informal care and because of the high care needs of the residents.

Currently, built environments of nursing homes in Singapore mirror acute care establishments. Despite the lack of frameworks or guidelines, and the inability of nursing homes to provide an environment where residents can maintain their independence with dignity and respect in an enabling environments (Koh, 2004; Wee et al., 2015) policy makers

continue to express the need to develop dementia-friendly nursing homes and continue to engage in the design and construction of facilities for people with dementia (See, 2013).

This study aims to address the gap in knowledge about the design of nursing homes for people with dementia in Singapore by unpacking the eight principles of dementia environmental design that is the basis for the EAT (Fleming & Bennett, 2015). As evidenced in the literature, dementia and the physical environment is a rare discussion topic among Singaporeans. In addition, the literature review suggests that there is no culturally appropriate, valid, and reliable environmental audit tool for a Singaporean population in the area of dementia enabling environments.

This study utilises "mixed methods multi-strand design" conceptualised by Tashakkori and Teddlie (2010, p. 319). Multi-strand mixed designs are made up of two or more methods and consist of three dimensions (Figure 1.) The first phase utilises qualitative methods which consists of thematic and nominal qualitative data analysis to substantiate the research questions in this study. The second phase is further segmented into two stages of testing, and maps out the stages in which data are collected from both qualitative and quantitative methods at a particular point in time. The last dimension describes recommendations derived from the inferences attained from the first and second phase.

Figure 1. Sequential Mixed Model Design adapted from Tashakkori and Teddlie (2010, p. 147).

Based on the sequential mix model design adapted from Teddlie and Tashakkori (2010), the first phase commences with a literature review to gather evidence of dementia enabling environmental design in Asia. This is followed by semi-structured interviews and survey questionnaires to allow the exploration of intimate and sensitive cross-cultural issues in dementia and the environment. The qualitative data collected is essential to the research design, and only with the qualitative strand can the next stage be carried out. The preliminary literature review revealed no existing appropriate environmental assessment tool. Assumption of the need to adapt the EAT for Singapore (SEAT) through the understanding of the participants' cultural perceptions and complex needs in dementia enabling environment will influence the research design. The emerging themes will enable and facilitate the design of the SEAT.

In the second phase with the adapted SEAT, a mixed methods qualitative-quantitative strand will serve to assess the usability, reliability and validity of the tool and confirm its

applicability. Qualitative data obtained during the pilot process will provide information on the usability of the tool across various users. In the quantitative aspects of phase two, a causal-comparative design will be adapted from an existing methodology to review the inter-rater reliability of the EAT and the SEAT through the utilisation of an intra-class correlation coefficient and weighted kappa (Streiner & Norman, 2008; Fleming, 2010b). SPSS is the software use for the process of analysis. The results will inform the study of the validity and reliability of the SEAT. Finally, a meta-inference obtained by the combination of inferences found in both phases will provide the recommendations about the application of the SEAT in the areas of policy, best practice, and future research initiatives in dementia environmental design.

Structure & approach

An overview of the research questions and pertaining chapters can be found in the table below.

Table 1. A summary of the chapters and research questions

Chapter	Research Question	Chapter/Publication Title
-	Prelude	Sun, J. (2018). Grandma's Dementia & Ignorance was certainly not bliss. https://projectweforgot.com/your-aid/country/singapore/grandmas-dementia-ignorance-certainly-not-bliss/
1.1	Introduction An overview of the study and the context statement.	Sun, J., Fleming, R., Fay, R., & Crookes., P. (2016). <i>Environmental Design of Nursing Homes for People with Dementia in Singapore</i> . [Paper presentation]. Australian Association of Gerontology. Cutting Edge Ageing Research, Hobart, Tasmania. https://doi:10.13140/RG.2.2.18334.54080
1.2	Is there a culturally appropriate and salutogenic dementia environment assessment tool available for Singapore? Can the design principles that are the basis of the Australian Environmental Assessment principles be used as the foundation for an environmental assessment tool in Singapore?	Sun, J., & Fleming, R., Fay, R., & Crookes., P. (2016). Environmental Design of Nursing Homes for People with Dementia in Singapore. [Paper presentation]. Australian Association of Gerontology. Cutting Edge Ageing Research, Tasmania, Australia. https://doi:10.13140/RG.2.2.18334.54080

Phase 1		
2	Is there a culturally appropriate dementia environment assessment tool currently available for application in East and Southeast Asia?	Sun, J., & Fleming, R. (2018). Characteristics of the built environment for people with dementia in East and Southeast Asian nursing homes: a scoping review. <i>International Psychogeriatrics</i> , (4), 469-480.
3	What are the characteristics of the built environment that contribute to the well-being of people with dementia in the Singapore? Can the design principles which are the basis of the Australian Environmental Assessment principles be used as the foundation for an environmental assessment tool?	Sun, J. (2020). The appropriateness of adapting the Australian Environmental Assessment Tool – High Care (EAT-HC) for persons with dementia in Singapore. <i>Health Environments Research & Design Journal</i> . Advanced online publication https://doi.org/10.1177/1937586720929044
Phase 2		
4	What questions should be included in this tool? Does the tool have satisfactory psychometric and usability properties?	Sun, J., & Fleming, R. (in press). The development and reliability of the Singaporean Environmental Assessment Tool (SEAT) for facilities providing high levels of care for people living with dementia. <i>Health Environments Research & Design Journal</i> .
Meta-Inference		
5	How can a culturally sensitive tool be implemented and sustained in Singapore and Asia?	Sun, J., & Fleming, R., (2018). <i>Knowledge Translation: a progress report on the culturally sensitive application of a dementia environment audit tool in Asia</i> . [Poster presentation]. 3rd Tasmanian Dementia Symposium, Hobart, Tasmania. https://doi: 10.13140/RG.2.2.17915.11047
6	What is the impact of the research on policy and practice in dementia environmental design in Singapore?	Sun, J., Tan, W.M., Luo, D.L., & Ng, V. (2020). <i>The implementation of the SEAT in Singapore: Translating research into policy and practice</i> . Singapore: Agency for Integrated Care.
7	What is the impact of a knowledge broker in an international research project?	Sun, J. (2020). The role of a knowledge broker in an international research project [Webinar]. <i>World Young Leaders in Dementia (WYLD), Working in different dementia fields series</i> . https://wyldementia.org/
8	Conclusion	-
	Epilogue	

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Chapter 1.2: Environmental Design of Nursing Homes for People living with Dementia in Singapore

The literature review was presented at the Australian Association of Gerontology, Cutting Edge Ageing Research event for Early Career Researchers in Hobart. Findings from the review also contributed to a poster presented at the Wicking Dementia Interventions Symposium 2015.

Sun, J., Fleming, R., Fay, R., & Crookes., P. (2015). *Defining and assessing the built characteristics of the built environment that contribute to the well-being of people with dementia living in Chinese, Malay, and Indian aged care facilities in Singapore*. [Poster presentation]. Wicking Dementia Interventions Symposium 2015, Tasmania, Australia. <https://doi.org/10.13140/RG.2.2.17915.11047>

Sun, J., Fleming, R., Fay, R., & Crookes., P. (2016). *Environmental Design of Nursing Homes for People with Dementia in Singapore*. [Paper presentation]. Australian Association of Gerontology. Cutting Edge Ageing Research, Hobart, Tasmania, Australia. <https://doi.org/10.13140/RG.2.2.18334.54080>

Research Question relevant to the chapter:

Is there a culturally appropriate and salutogenic dementia environment assessment tool currently available for application in Singapore? Can the design principles that are the basis of the Australian Environmental Assessment principles be used as the foundation for an environmental assessment tool in Singapore?

This chapter presents an in-depth analysis and evidence of the need and the lack of a validated dementia environment assessment tool in Singapore. This chapter, which comprises a literature review, gives readers an understanding of the current level of knowledge of the influences and the underpinning principles of design involved in the design, development and maintenance of the built environment of nursing homes in Singapore that care for people with dementia in the absence of environmental assessment tools.

Abstract

Background: Singapore is a multicultural society with an ageing population that is experiencing a growing number of Singaporeans living with age-related dementia. Evidence indicates that there are no environmental assessment tools available to guide the development of dementia enabling environments in Singapore. In light of the growing number of Singaporeans living with dementia and in the absence of culturally appropriate resources in dementia enabling environments, this literature review provides an insight into the characteristics of the nursing homes in Singapore through the lens of the Australian principles of designs for dementia enabling environments. In addition, the review examines the current knowledge and influences and uncovers underpinning principles of design.

Methods: The Arksey and O'Malley methodological framework and the The Population, Intervention, Comparison, Outcomes and Context (PICOC) were utilised in the study. Five scientific databases and grey literature obtained through an internet search of databases were included because of the small pool of peer-reviewed articles.

In the selection process, 177 articles were identified through the academic database and 101 articles were identified from the search of the grey literature. After reviewing the abstracts of the articles, 47 articles were retrieved along with 53 photos from the National Archives of Singapore that provided explicit evidence of the characteristics of the built environment for people with dementia in Singapore. Of the 53 images, approximately two percent were from an academic source, and 90 percent of the photographs were from the National Archives of Singapore. The remaining eight percent were obtained from news publications.

Results: The initial search uncovered 177 peer-reviewed articles, and 101 articles including photos were retrieved from the search of grey literature.

Conclusions: The characteristics of the nursing homes in Singapore, when reviewed through the Australian principles of designs, is hospital-like. Current knowledge of dementia and environments in Singapore is pathogenic, with a focus on the extension of life. More research and education needs to be carried out in the dementia care sector in Singapore to create more awareness and understanding of dementia and the environment.

Introduction

Singapore is a country with an ageing population with 459,800 (11 percent) of their citizens above the age of 65 and 535,600 (13.7 percent) between the ages of 55 and 64 years in 2015 (Prince, 2015; Singapore Department of Statistics, 2015). Forty five thousand people were living with dementia at a cost of USD \$1.7 billion in 2015. By 2030, 103,000 people will be living with dementia. Life expectancy has continued to increase for Singaporeans; the current life expectancy stands at an average of 82.4 years, 84.5 years for females and 80.1 years for men (Singapore Department of Statistics, 2014). As a consequence of low fertility rates, there are only 5.7 adults aged 20 to 64 for every person over 65 years of age. The age dependency ratio is 50.2 percent. The growing ageing population brings about challenges for working adults because the increasing life expectancy and decreasing old-age support ratio have contributed to the increasing number of older adults who require physical and financial support from working adults (Thomson et al., 2012). There are an increasing number of older adults living with dementia and many will have to turn to nursing homes as the numbers of dedicated caregivers continue to decline. The topic of nursing home development in Singapore appears to have been avoided at the national level prior to 2003. No study on identifying the care needs of the residents who lived in the nursing homes was conducted before 2003 (Yap et al., 2003). In recent years, the government has recognised the need for more nursing homes in Singapore (Lam, 2014). In 2014, there were only 66 nursing homes available and a total of 10,780 beds for the care of people with and without dementia. Twelve more new nursing homes were in the pipeline to be completed by 2016 (Lam, 2014; Ministry of Health, 2015). The government has promised a total of 17,150 nursing beds to be made available by 2020.

Singapore has a multicultural society with three major ethnic groups, Chinese, Malays and Indians. Nursing homes in Singapore may cater for an ethnic group or, in the majority of the homes, all three ethnic groups. According to the Singapore Department of Statistics (SDS, 2011), the Chinese population makes up the majority of the resident Singaporean population over 65 years of age (385,889 Chinese Singaporeans) followed by Malays (40,601 Malay Singaporeans), and Indians (27,005 Indian Singaporeans). Though the common language is English, each ethnic group may speak a different native language-based on their ethnicity. The Chinese population may speak Mandarin or a dialect such as Teochew, Cantonese, Hokkien, Hainanese, Hakka, or a variety of dialects. The Malay population will converse in

Bahasa Melayu and the Indian population may speak Tamil, English, Hindi, or Punjabi. Most signage in Singapore can be found written primarily in English, followed by Mandarin, Bahasa Melayu and Tamil.

In addition to the three main ethnic groups, there is a range of religious affiliations. A population census carried out in 2010 identified that 83 percent of Singaporeans have an affiliation with at least one religious denomination. The main religious groups are Buddhism, Taoism, Islam, Hinduism, Sikhism, and Christianity (Singapore Department of Statistics, SDS, 2011). The census (SDS, 2011) reported that Buddhists made up the majority of the religious population at 33 percent, followed by 18 percent Christians, 15 percent Muslims, 11 percent Taoists, 5 percent Hindus, 0.003 percent Sikhs. Seventeen percent of the population had indicated that they had no religious affiliation. As a result, nursing homes in Singapore provide care for people with dementia from a range of ethnic and religious backgrounds. On top of a multi-ethnic and multi-religion society, high urbanisation has resulted in intense population density. The population density (persons per square kilometre) increased from 3,538 in 1970 to 7,697, in 2015. With the significant population density, the family home has become a place of privacy, space, and refuge to be away from the high-density environments found in community or outdoor spaces (SDS, 2011). The data on the population density in Singapore during the 1970s provides an insight about the lifestyles of people born during and before 1970s. Singaporean baby boomers would have grown up with a different schema of personal space, especially in community areas of engagement and outdoor space, given that the population density was half of what Singaporeans are currently experiencing today.

In countries such as Australia, the United Kingdom, and the United States, people who grew up in cottages can reside in long-term care facilities that are a reflection of the living spaces in their youth. Familiarity with the style of building and a domestic and home-like environmental are elements that should be incorporated when designing living spaces for people with dementia (Marshall, 2001). In Singapore, the momentum of growth of older adults living with dementia is increasing. Thompson et al. (2012) suggest that the sustainability of traditional services such as home care will encounter challenges and accommodation to provide care for people with dementia is urgently required (2012).

With an ageing population and a rising number of baby-boomers with age-related dementia in Singapore, the government is casting its sights on developing dementia-friendly nursing homes (See, 2013). It is vital that information be made available for architects,

developers, builders, and health care professionals to gain an understanding of dementia-friendly facilities. This section reviews the challenges, complexities, and limitations in the building of nursing homes for people with dementia in Singapore as a result of the demographics, cultural sensitivities, social and economic challenges identified in the literature.

In Singapore, a guidebook on nursing homes (Ministry of Health, 2002) is available to help provide a blueprint to create an environment for a long-term care facility. A review of the document reveals that it contains no fundamental principles to offer a direction for development of an environment that can support and enable people with dementia. Principles are essential in the decision-making process and given that they are broader than specific instructions they can lend a guiding hand to a complex situation that requires unique solutions (Newman & Brown, 1996). Principles can provide a foundation and alignment of beliefs for people working in a multi-professional setting, especially in the design of a dementia specific nursing home. The essential requirements of the environment must be understood by architects, builders, nursing home operators, clinicians, administrators and staff, and principles will be able to provide them with a common understanding of key concepts. The literature review examines the development of the environmental design of nursing homes in Singapore by providing an investigative lens into the past to analyse the principles of design and themes that have influenced the development of current nursing home environments. The present principles and themes observed in the environmental design of nursing homes caring for people with dementia is also be examined to define an objective precedent for the need for further research in this field.

Methods

A scoping review is utilised to capture current knowledge, identify the breadth of evidence, and to identify key concepts and gaps within a specific timeframe of a topic (Arksey and O'Malley, 2005). Scoping reviews have been argued to be more than a supporting process in a systematic review; they can be utilised as a methodological framework to identify gaps in the literature and to provide direction for future research (Arksey & O'Malley, 2005; Levac et al., 2010). Scoping reviews, unlike systematic reviews, make no attempts at conducting quality assessments but are only to report on the extent of the evidence (Booth et al., 2012).

The scoping review conducted in this study was used to uncover the current level of knowledge about the influences and the underpinning principles of design involved in the design, development and maintenance of the built environment of nursing homes that care for people with dementia in Singapore.

Nursing homes in this review were defined as facilities that provide basic residential aged care services and medical or nursing services for their residents. This scoping review was carried out utilising the methodological framework recommended by Arksey and O'Malley (2005). In summary, the methodological framework is broken down into the following steps: determining the research question, establishing relevant studies through a systematic search, selection of studies, carrying out a thematic synthesis and presenting a summary of the findings.

Figure 2. An adaptation of the Arksey and O'Malley (2005, p. 22) methodological framework utilised in the scoping review.

The methodological framework for scoping studies includes a systematic search for articles (Arksey and O'Malley, 2005). The five scientific databases included in the search were, Scopus, PubMed, Medline, CINAHL and Google Scholar. Because there are a small number of peer-reviewed articles, the search was extended to include publications from sources containing grey literature. A Google internet search of databases included those of the Singapore government, and regulatory and educational organisations. The framework includes articles on residential aged care facilities caring for people above the age of 65 with and without dementia and international articles with an emphasis on the local Singaporean setting. Keywords utilised in the search include "dementia" and "nursing home", and

"Singapore".

The Population, Intervention, Comparison, Outcomes and Context (PICOC, Petticrew & Roberts, 2006; Booth et al., 2012) framework was used to define the scope of the review and to provide focus on the questions identified. In addition to the search terms, the words "old folks" and "aged" were used as a substitute for the chronological age of 65 years and above for articles (see Table 2). The inclusion criteria also include articles that may be peer or non-peer reviewed, published between 1950 and 2015, available in English, and provides evidence on the built environment design in Singapore that supports the thematic synthesis.

Table 2. PICOC model (Pettigre & Roberts, 2006, p. 44).

Population	Older adults 65 years and above
Intervention/Exposure	Facilities that provide basic residential aged care services and/or medical care for their residents with/without dementia.
Comparison	None
Outcomes	The knowledge of the built environment of nursing homes in Singapore that care for people with dementia; the influences and the underpinning principles involved in the design.
Context	Primary emphasis is on articles from Singapore. Secondary emphasis is on articles from international sources that include Singapore.

In the selection process, 177 articles were identified through the academic databases and 101 articles were identified from the search of the grey literature. After reviewing the abstracts of the articles, 47 articles were retrieved along with 53 photos from the National Archives of Singapore (National Archives of Singapore) that provided explicit evidence of the characteristics of the built environment for people with dementia in Singapore. Out of 53 images obtained, approximately two percent were from an academic source, and 90 percent of the photographs were from the National Archives of Singapore. The remaining eight

percent were obtained from news publications.

The thematic synthesis provides a structured and organised insight into the underpinning principles that have been contributing to the development of the characteristics of the built environment in Singaporean nursing homes. The process includes three phases: the initial stage of freehand coding of the identified literature, organising the ‘codes’ into themes, and analysing the findings in relation to the latest eight principles of design (Booth et al., 2012; Fleming & Bennett, 2014; Fleming & Bennett, 2015).

In Singapore, people with dementia are most commonly admitted into nursing homes because of the inability of caregivers to provide physical care or cope with behavioural issues exhibited by the residents. The literature points out that at least 50 percent of residents are living with cognitive impairment or dementia and more than 50 percent are living with visual impairment, urinary incontinence, or require assistance with mobility and activities of daily living (Yap et al., 2003). The principles found in the EAT-HC provide a logical framework for the thematic synthesis as the EAT-HC was designed to provide information on environments used for the care of people with dementia and with the high care needs prevalent in Singaporean nursing homes.

Table 3. 8 Key Design Principles (Fleming & Bennett 2015, p. 3).

1. Unobtrusively reduce risks

People with dementia require an internal and external environment that is safe, secure and easy to move around in if they are to make the best of their remaining abilities. However, obvious safety features and barriers will lead to frustration, agitation and anger and so potential risks need to be reduced unobtrusively.

2. Provide a human scale

The scale of a building will have an effect on the behaviour and feelings of a person with dementia. The experience of scale is determined by three factors: the number of people that the person encounters, the overall size of the building, and the size of the individual components, such as doors, rooms and corridors. A person should not be intimidated by

the size of the surroundings or confronted with a multitude of interactions and choices. Rather the scale should help the person feel in control.

3. Allow people to see and be seen

The provision of an easily understood environment will help to minimise confusion. It is particularly important for people with dementia to be able to recognise where they are, where they have come from and what they will find if they head in a certain direction. When they can see key places, such as a lounge room, dining room, their bedroom, kitchen or an outdoor area they are more able to make choices and find their way to where they want to go. Buildings that provide these opportunities are said to have good visual access. Good visual access opens up opportunities for engagement and gives the person with dementia the confidence to explore their environment. It can also enable staff to see residents from where they spend most of their time. This reduces their anxiety and the anxiety of the residents.

4. Manage levels of stimulation

• Reduce unhelpful stimulation

Because dementia reduces the ability to filter stimulation and allows attention to only those things that are important, a person with dementia can become stressed by prolonged exposure to large amounts of stimulation. The environment should be designed to minimise exposure to stimuli that are not helpful. The full range of senses must be considered. Too much visual stimulation, for example, is as stressful as too much auditory stimulation.

• Enhance helpful stimulation

Enabling the person with dementia to see, hear and smell things that give them cues about where they are and what they can do can help to minimise their confusion and uncertainty. Consideration needs to be given to providing redundant cueing i.e. providing a number of cues to the same thing, recognizing that what is meaningful to one person will not

necessarily be meaningful to another. A person may recognize their bedroom, for example, because of a view, the presence of furniture, the colour of the walls, the light fitting or the bedspread. Cues need to be carefully designed so that they do not add to clutter and become over-stimulating.

5. Support movement and engagement

Aimless wandering can be minimised by providing a well-defined pathway, free of obstacles and complex decision points, that guides people past points of interest and gives them opportunities to engage in activities or social interaction. The pathway should be both internal and external, providing an opportunity and reason to go outside when the weather permits.

6. Create a familiar place

The person with dementia is more able to use and enjoy spaces and objects that were familiar to them in their early life. The environment should afford them the opportunity to maintain their competence through the use of familiar building design (internal and external), furniture, fittings and colours. This will involve an understanding of the personal background of the people living in the environment. The involvement of the person with dementia in personalising the environment with their own familiar objects should be encouraged.

7. Provide opportunities to be alone, with other residents or with others from the community

People with dementia need to be able to choose to be on their own or spend time with others. This requires the provision of a variety of spaces, some for quiet conversation with one or two others and some for larger groups, as well as spaces where people can be by themselves. These internal and external spaces should have a variety of characters, e.g. a place for reading, looking out of the window or talking, to cue the person to what is available and to stimulate different emotional responses.

Without constant reminders of who they were, a person with dementia will lose their sense of identity. Frequent interaction with friends and relatives can help to maintain that identity. This is made easier when the person is admitted from the local community as friends and relatives are able to drop in easily.

The environment must include spaces for the resident and their visitors to use within the unit and in its immediate surrounds. These need to be attractive and comfortable to encourage visitors to come and spend time. Stigma remains a problem for people with dementia so the unit should be designed to blend with the existing buildings and not stand out as a 'special' unit. Where possible a 'bridge' should be built between the unit and the community by providing a space that is used by both the community and people with dementia. Where the unit is a part of a larger site, there should be easy access around the site so people with dementia, their families and friends can interact with other people who live there.

8. Support the values and goals of care

An environment that embodies the values and goals of care, e.g. provides opportunities for engagement with the ordinary activities of daily living to support rehabilitation goals, will assist the patient with dementia to respond appropriately and the staff to deliver the desired care. The values and goals need to be clearly stated and the building designed both to support them and to make them evident to the person with dementia and to staff. The building becomes the embodiment of the philosophy of care, constantly reminding the staff of the values and practices that are required while providing them with the tools they need to do their job.

Results

1. Unobtrusively reduce risks

A safe and secure environment that promotes engagement, movement and independence is essential for a positive wellbeing in people living with dementia (Fleming & Bennett, 2015). Environments that contain obvious safety features to reduce risk can contribute to negative or poor mental health.

The literature contains a strong emphasis on "falls" in nursing homes. This is a common theme throughout 40 percent of the literature reviewed (Ministry of Health, 2002; Yap et al., 2003; Koh, 2004; Ministry of Health, 2013). Koh (2004) proposed a need for a safe environment and the need for residents to participate in regular exercise to reduce the risk of falls. Koh also touches on the necessity of attention and care in the use of psychotropic drugs and the use of restraints on residents in nursing homes. Mamun and Lim (2005) found that 23% of residents in their study were on physical restraints and 64% were living with dementia. The extensive influence of the fear of residents falling had translated into a high number of residents being physically restrained.

Photographic evidence from the National Archives of Singapore (2015) provided a visual understanding of the development of nursing homes and current landscape in the growing number of structural elements that have appeared obtrusively to reduce the risks of falls in the nursing homes. The design of the nursing homes in the 1960s seemed to contain external environments that allowed older adults to participate in a variety of activities in some different environments such as gardens, an area for rearing poultry, outdoor discussion areas, and sewing rooms. As the design of nursing homes took on an institutionalised approach, more prominent features, such as the lack of planned wandering areas and long visually unstimulating corridors, were introduced to minimise risk, especially in the areas of movement.

Curtains replaced traditional wooden screens and, for some facilities, removal of privacy screens allowed residents to always be easily monitored. Windows facing the corridors were also built into bedrooms enabling staff to look in; however, residents who are lying in their beds are not be able to see out of these windows (National Archives of Singapore, 2015). Bathrooms and toilets may not contain grab bars or handrails in some facilities, causing residents to require assistance to utilise toileting and bath facilities (Yeo,

2014). The literature suggests that clinical nurses' station on every floor of the nursing home had become a necessity (Ministry of Health, 2002).

The elements found in the current design of the nursing homes in Singapore provide an environment that reduces risks for residents in an obtrusive manner. The fear of residents encountering any physical harm may have compromised the psychological, social, and physiological aspects of the residents' quality of life and care.

2. Provide a human scale

The physical environment of a nursing home has an impact on the mental, emotional, and physical aspects of the resident. In this principle "human scale" is determined by three factors:

- i. The population density of the nursing home
- ii. The size of the facility
- iii. The size of the fixtures and fittings (Fleming & Bennett, 2015).

Early establishments in the 1950s that cared for the aged reflected the social space norms and population density found in the era (Forman, 1955; Kaye, 1960). Through the ages, the population density of the homes increased with the size of the facilities, as seen in photographic evidence (National Archives of Singapore, 2015).

Figure 3. Digital Image of Nursing Home in Singapore between 1955-56 found in the American Geographical Society Library Digital Photo Archive (Forman, 1955) and of Lions Nursing Home in 1985 found in the National Archives (1985).

The review also found that the Ministry of Health guidelines stipulate that nursing homes in Singapore should ideally be built to accommodate 200 residents. A personal space of six square metres, which is inclusive of a single bed and a storage unit for their personal items, is stipulated. A single bed was found to occupy approximately 2.9 square metres (Roberts-Hughes, 2011). Therefore, a single bed will occupy close to half of the six square metres of personal space. Each bedroom is designed in an acute care fashion with bedrooms, known as wards, containing eight or more beds per room (Ministry of Health, 2002; National Archives of Singapore, 2015).

The guide indicates that for a 200-bed nursing home, the floor area containing essential amenities such as bedrooms, dining hall, and bathrooms, should be approximately 1,810 square metres.

Figure 4. Comparison of the Ministry of Health (2002) space norms per bed and the living space of a current one bedroom room public flat (HDB, 2014).

Ministry of Health (2002) total space norms per person: six square metres

Housing Development Board (2014)
total space norm in a “1-room flat” is 26 square metres

The bed space is the only personal space allocated for each resident in a nursing home, with half of the physical space occupied by the resident’s bed. The stipulated space norm currently stands at six square metres (Ministry of Health, 2002). Six square metres is less than half of the average space (13 square metres) that residents living in the smallest sized HDB flats are accustomed to when shared between two individuals (Singapore Department of Statistics, 2011).

3. Allow people to see and be seen

It is essential that the environment provides clear and simple visual access, especially to areas required for an individual's activities of daily living such as toilets, bathrooms, living space, and dining areas. An environment with clear and simple visual access will allow people to navigate in their environment with confidence, while enabling staff to have a line of sight of the residents in commonly used areas (Fleming & Bennett, 2015).

Koh (2004) recommends that residents should have access to bathroom and toileting facilities and argue that more needs to be done to prevent urinary and faecal incontinence among residents. The National Archives of Singapore (2015) and Yeo (2014) provide insight into the design of the nursing home facilities with clear visual access for nursing staff and bedrooms containing numerous residents in an open space containing few or no screens. The evidence depicts windows located above the eye level of residents resting in a chair or on a bed. This results in limited visual access for residents to a view of the environment beyond their bedrooms (Yeo, 2014; National Archives of Singapore, 2015). The high windows provide nursing staff standing at the windows to have a clear view of all residents in the open plan bedroom. However, entrances and exits are indistinguishable, and it is unclear where the entrances or exits may lead the residents to. Clocks were observed to be positioned close to the ceiling and high above eye level in various facilities (National Archives of Singapore, 2015; Yeo, 2015).

No recommendations were provided in the Ministry of Health (2002) guidelines with regards to visual access. Current design of the environment in the areas of visual access is observed to provide nurses with a line of sight to monitor residents (Mamun & Lim, 2005) and allows people to be seen at all times by fellow residents and staff. However, the environment prevents residents from seeing critical areas such as the toilets, garden or wandering areas.

4. Manage levels of stimulation

The environment can help to provide stimulation that may be beneficial to the person with dementia by promoting positive emotions and behaviours and by helping the person with dementia to maintain their independence (Fleming et al., 2003; Fleming, 2010; Fleming et al., 2014; Fleming & Bennett, 2015). As mentioned by the authors above, an environment containing a large amount of negative visual, auditory, tactile, and olfactory stimulus will create an environment that contains a multitude of stresses for the people living with

dementia.

The Ministry of Health (2013) acknowledged that environmental factors can contribute to aggression and agitation and suggested that environmental design features can be utilised to reduce behavioural and psychological symptoms of dementia. However, no additional details were provided by the document.

Photographic evidence from Yeo (2014) and from the National Archives of Singapore (2015) presented bedrooms designed in the layout of an open ward containing a number of beds in each room with no individual screen or blinds for each bed. Most residents appear only to have a handful of items displayed on top of a bedside table to personalise their bed space. Household goods such as large water jugs, fans or thermos flasks were observed to take up some of the residents' personal space instead of personal artefacts; thus creating a sense of anonymity. Furniture like beds, tables and chairs appear uniform and indistinguishable from one another. The walls of the facilities (Yeo, 2014; National Archives of Singapore, 2015) appeared to be painted in uniform colours, resulting in the lack of distinction between rooms. Colour contrast can be observed in some facilities but not others. No signage can be seen to aid residents with orientation or wayfinding. The photographic evidence regarding the environment in nursing homes appears to present an environment that promotes clinical anonymity, little or no positive stimulus and little or no reduction of negative stimulus.

5. Support movement and engagement

The Ministry of Health (2002) provides recommendation on physical rehabilitation, memory games, music therapy and the involvement of an occupational therapist to aid residents in movement and engagement. The guide stipulates that Enrolled Nurses (EN) should be walking the residents and carrying out motion exercises. Other examples of therapies for residents include activities involving laundry, work in the kitchen, or ward or gardens cleaning. The guide also provides information on items such as chess, Mah-jong sets, cards, Chinese checkers, and jigsaw puzzles required for activities available for residents living in nursing homes. The guide (2002) also includes musical instruments citing that they can be utilised for therapeutic group activities or auditory stimulation. Other fixtures to support movement and engagement include parallel bars, wooden staircases with rails, and overhead wire mesh that is used for rehabilitation exercises with slings and pulleys (Ministry

of Health, 2002). Most facilities appear to have long corridors equipped with handrails with indistinguishable entrance or exit points and an absence of rest areas along corridors (Yeo, 2014; National Archives of Singapore, 2015). See (2013) also reinforces that activities that aid regular physical maintenance and therapeutic services are provided in nursing homes. Koh (2004) provides a contrasting view that more needs to be done to support residents to have more freedom of movement. Activities relating to movement and engagement in photographic evidence indicate that activities appeared to be prescribed and conducted in large high-density groups (Yeo, 2014; National Archives of Singapore, 2015). There is no evidence available to show that the design of a nursing home environment has been systematically used to enable independent movement and engagement.

6. Create a familiar place

In the areas of fixtures and fittings, storage cabinets or bedside lockers are provided for each resident with some space to place small personal items; however, standard household items such as water jugs and fans appear to utilise the personal spaces of resident's bedside lockers (Ministry of Health, 2002; Yeo, 2014; National Archives of Singapore, 2015). As seen in the photographic evidence, the fixtures and fittings appear to resemble those utilised in acute care. Goh (2004) notes that nursing homes should take note of the relevance of personal items to the residents and not the number of items that belong to the resident.

Small private spaces were not mentioned in the literature but the availability of large group spaces was highly encouraged. The environment, including fixtures and fittings that were observed, resemble those found in acute or hospital-like settings, rather than a domestic or home like environment.

7. Provide opportunities to be alone, with other residents or with others from the community

The open plan ward-like bedroom and activities area found in the nursing homes allows residents to have a complete view of the people around them (Ministry of Health, 2002; Koh, 2004; Yeo, 2014; National Archives of Singapore, 2015) However, this is not a clear indication that residents will be able to communicate with people around them because there is a lack of private areas for conversations.

Current design suggestions regarding the privacy of residents in the nursing home only apply to the design of showering and toileting facilities (Ministry of Health, 2002). In the Singaporean clinical guidelines for dementia, privacy as an essential element in the

environment is only necessary for the management of responsive behaviours (Ministry of Health, 2013). Review of the photographic evidence of the environmental design shows bathroom designs consisted of a shower, with a cubicles-like layout similar to those found in public swimming pools, schools and gyms (Yeo, 2015). Shower curtains instead of doors provided privacy for each of the shower cubicles. A suitable level of privacy is required to ensure that residents can utilise toileting facilities independently. The lack of privacy can lead to faecal and urinary incontinence (Koh, 2004). Koh adds that dressing should also be carried out in private.

The issue of lack of privacy has also been associated with end-of-life care and with a large open ward for bedrooms. No requirements for private rooms for end-of-life care means residents and families may have little dignity and comfort at the end of life (Ministry of Health, 2002; Koh, 2004; Teo et al., 2014). Despite a majority (83 percent) of the Singaporean population (Singapore Department of Statistics, 2015) citing a religious affiliation, no information regarding specific environmental design approaches to meet spiritual requirements or cultural sensitivities are recommended. This can be achieved respectfully through the allocation of spaces such as prayer rooms and spaces for spiritual or cultural community engagement to the benefit of the resident. The literature supports the need for residents to live in the wider community, suggesting the development of nursing homes be integrated with public housing estates (Sitoh, 2003). Caregivers have reported that nursing homes tend to be located in areas that are away from the community (Wee et al., 2015). When caregivers had to choose between tackling long commutes to see their relatives, resulting in a reduction in the number of visits, or not utilising nursing homes at all, the latter was chosen (Wee et al., 2015).

There is a limited variety of spaces for the individual; nursing homes are only required to provide spaces such as a communal activity area, shared toileting facilities and a communal bedroom (Ministry of Health, 2002). All areas are communal with the objective of providing space for residents in group settings but ignoring the need for privacy and personalisation of individual spaces. Therefore, social activities that involve residents and the community are made possible through the years as a result of large communal spaces, and by holding mass festive celebrations and performances organised for the home (See, 2013; National Archives of Singapore, 2015) but personal activities that allow the resident to be alone are not achievable in the nursing home.

8. Support the values and goals of care

As seen in the literature (Mamun & Lim, 2005; Wee et al., 2015), nursing homes in Singapore are known to provide custodial care, and clinical care is executed efficiently by caregivers and residents. However, resident's psychosocial needs, functional independence and dignity was found to be neglected (Setia, 2011). The residents of the nursing homes in Singapore are now in need of higher levels of nursing and medical care compared to residents of the past (Wee et al., 2015). The nursing homes caring for people with dementia were observed to contain design elements closely associated with that of an acute care facility (National Archives of Singapore, 2015; Yeo, 2014). The outcome measures have to include the preferences of the residents and their quality of life, instead of the innate focus on medical care (Sitoh, 2003). Fleming and Bennett (2015) state that an environment "that embodies the values and goals of care" will be able to support residents with dementia (p. 4). They further add that clarity in the facility's values and goals coupled with an alignment in the environment design reflecting the philosophy of care of the organisation will empower and enable the staff to carry out the mission and vision of the organisation.

The literature does no mention values or goals of the organisations (Ministry of Health, 2002; Sitoh, 2003; Koh, 2004; See et al., 2013; Teo et al., 2014; Wee et al., 2015). In the areas of philosophy of care, a person-centred approach has been recommended in the clinical guidelines for dementia care for the care of people with dementia (Ministry of Health, 2013). In the absence of a clear statement of goals and values specifically developed for nursing homes, the nursing homes have adopted the design objectives of acute care facilities. This has resulted in the construction of facilities catering for the masses and with a focus on cleanliness and sanitation, operational efficiencies, and a medical model of care. Caregivers of a person with dementia living in a nursing home in Singapore can expect to see their loved ones provided with a shared bedroom, a bed space of six metres square and a distance of 1.2 metres between neighbouring beds. The person can experience a bed with side rails, one pillow, a locker, a bed screen and sharing toileting and shower facilities with up to 15 people with dementia. The person with dementia may have to share the same dining hall and activities areas with up to 99 other residents while having 2.2 square metres of personal space. Such large and overcrowded communal areas can promote unhelpful auditory, visual, olfactory, and tactile stimulation. The literature does not make recommendations for quiet areas where residents can independently and privately carry out personal activities or have

private conversations with their loved ones. It is found that on average, contact from either family, friends, or volunteers is on a monthly basis (Yap et al., 2013). With the little consideration in the built environment to include family caregivers or volunteers, there is a need to understand if the current built environment has an impact on the scarce links with the community. Activities and community engagement are not prioritised for residents. Instead, an emphasis on rehabilitation to enable functional independence is encouraged (Ministry of Health, 2002).

Conclusion

At the end of their life, residents may have to spend their last days in a hospital because the nursing homes lack the facilities and capabilities needed to provide palliative care (Teo et al. 2014). Nursing home environments are currently designed to mirror acute care and, in the same likeness, the quantitative aspect regarding the extension of life through the minimisation of any physiological harm, disease, and infection control. Non-clinical qualitative aspects of care, such as development and maintenance of residents' psychosocial health and the positive impact of personalised activities of daily living, need to be addressed. The recommendations provided by the guidelines are hardly conducive to quality dementia care; nursing homes, however, continue to take in residents with dementia despite the acute care design of the facilities.

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Chapter 2: Characteristics of the built environment for people with dementia in East and Southeast Asian nursing homes: a scoping review

Scoping review written by the candidate and published in the International Psychogeriatrics.

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Research Question relevant to the chapter:

Is there a culturally appropriate dementia environment assessment tool currently available for application in East and Southeast Asia?

The scoping review found that there was no culturally appropriate dementia assessment tool available and discovered a low level of awareness surrounding dementia enabling environments in East and Southeast Asia. The eight principles of design that are the basis of the Environmental Assessment Tool High-Care, when applied with cultural sensitivities of the population is applicable in the design of facilities providing high levels of care for people living with dementia. An extended discussion is included in this chapter providing information on cultural beliefs that have shaped the design of current environments providing high levels of care for people living with dementia in East and Southeast Asia.

Abstract

Background: This scoping review explores the characteristics of the current built environment used to accommodate people with dementia in East and Southeast Asia. It is structured around the eight principles of design found in the Environmental Audit Tool High-Care (EAT-HC). In addition, the review examines the level of knowledge and other influences contributing to the development of nursing homes in the region.

Methods: The review was carried out utilising the methodological framework recommended by Arksey and O'Malley. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) provided an overarching structural framework for the reporting process and the Population, Intervention, Comparison, Outcomes and Context (PICOC) framework defined the scope of the review and focus on the research question. Six databases were accessed for the search, and 1846 publications between 2001 to 2015 were retrieved.

Results: 48 articles from nine countries met the inclusion criteria. All articles presented discussions that fundamentally included at least one principle of design and with some including all principles. The most prevailing principles discussed, found in 59% of all the articles was the need for familiarity for residents in the environmental design of facilities.

Conclusions: The review found that the eight principles of design when applied with cultural sensitivity in countries in East and Southeast Asia can identify gaps in knowledge of the design for dementia enabling environments and suggest areas for improvement. An assessment tool based on the principles of design will be able to provide a guide for stakeholders in the design, development, or modification of nursing home environments.

Introduction

There are approximately 17 million people with dementia in East and Southeast Asia (SEA) and by 2050, there will be 50 million in the region (Alzheimer's Disease International, 2015). According to Alzheimer's Disease International (ADI) long-term residential facilities commonly known as nursing homes established in countries such as China, Japan, Korea, Malaysia, Singapore, Philippines and Sri Lanka provide accommodation and nursing care for people living with dementia (ADI, 2014). Studies show that nursing homes in Asia are characterised by social isolation, inferior quality of care, and low quality of life (Zulkifli and Khan, 2014; Huang et al., 2015; Wee et al., 2015). People with dementia in the region are admitted into nursing homes when their care needs have become too high to be met within the community (Cheng et al., 2011; de Guzman et al., 2012). The profile of nursing home residents includes people with dementia with no full-time caregivers, or who are destitute. The growth in the number of people with dementia and the disruption of traditional care provision brought about by industrialisation is obliging most countries in East and SE Asia to consider how they can improve their service provision and infrastructure for the growing number of people living with dementia (Wu et al., 2009a; Cheng et al., 2011; de Guzman et al., 2012).

The built environment is an essential component of long-term care facilities. When designed well it contributes to the quality of the care delivered to the residents and the quality of life they enjoy (Fleming and Purandare, 2010; ADI 2015). A validated and reliable measure of the quality of the built environment can help to translate knowledge derived from research into tangible supportive quality health outcomes for residents with dementia by guiding the development of dementia enabling environmental designs that are evidence based. The built environment can be described in relation to a set of underlying principles (Marshall, 1998; Fleming and Purandare, 2010; Fleming and Bennett, 2015a). An understanding of these principles can guide the developmental design process resulting in a final product that can positively shape the user experience and help maintain the rights of people with dementia, their privacy and their physical and cognitive well-being (Fleming and Bennett, 2014). Designing nursing homes without the support of evidence-based, culturally appropriate guiding principles will result in a design that will perpetuate the current, unsatisfactory, state of affairs.

The World Health Organization (WHO, 2012) advocates for person-centred care to be

provided to people living with dementia. A review of assessment tools for dementia enabling environments; such as the Multiphasic Environmental Assessment Procedure (MEAP), Therapeutic Environment Screening Survey for Nursing Homes (TESS-NH), Special Care Unit Environmental Quality Scale (SCUEQS) reveals an institutional approach which deviates from WHO recommended practices of person-centred care (Fleming 2011). However, the Environmental Audit Tool (EAT), a tool which encompasses person-centred care utilizing a principle-based approach has been used in Australia for some years to assist health, and aged care organisations understand the strengths and weaknesses of their existing buildings and plan refurbishments (Fleming and Bennett, 2015a). The Environmental Audit Tool High-Care (EAT-HC) is based on principles that "closely reflect the needs of people with dementia cared for in high care units" (Fleming and Bennett, 2015a, p193), and there is a close alignment between the aims of the EAT-HC, person centred care, and the high care needs of people with dementia that are living in nursing homes in Asia. The EAT-HC contains eight principles of design (Table 1) that guide the audit process (Fleming and Bennett, 2015b). The review of the literature reported here did not reveal any Asian equivalent of the EAT-HC.

Table 4. Key Design Principles (Fleming and Bennett 2015b, p. 3).

1. Unobtrusively reduce risks

People with dementia require an internal and external environment that is safe, secure and easy to move around if they are to make the best of their remaining abilities. However, obvious safety features and barriers will lead to frustration, agitation and anger and so potential risks need to be reduced unobtrusively.

2. Provide a human scale

The scale of a building will have an effect on the behaviour and feelings of a person with dementia. The experience of scale is determined by three factors; the number of people that the person encounters, the overall size of the building and the size of the individual components, such as doors, rooms and corridors. A person should not be intimidated by the size of the surroundings or confronted with a multitude of interactions and choices. Rather a scale should help the person feel in control.

3. Allow people to see and be seen

The provision of an easily understood environment will help to minimise confusion. It is particularly important for people with dementia to be able to recognise where they are, where they have come from and what they will find if they head in a certain direction. When they can see key places, such as a lounge room, dining room, their bedroom, kitchen and an outdoor area they are more able to make choices and find their way to where they want to go. Buildings that provide these opportunities are said to have good visual access. Good visual access opens up opportunities for engagement and gives the person with dementia the confidence to explore their environment. It can also enable staff to see residents from where they spend most of their time. This reduces their anxiety and the anxiety of the residents.

4. Manage levels of stimulation

- ***Reduce unhelpful stimulation***

Because dementia reduces the ability to filter stimulation and attend to only those things that are important, a person with dementia can become stressed by prolonged exposure to large amounts of stimulation. The environment should be designed to minimise exposure to stimuli that are not helpful. The full range of senses must be considered. Too much visual stimulation, for example, is as stressful as too much auditory stimulation.

- ***Enhance helpful stimulation***

Enabling the person with dementia to see, hear and smell things that give them cues about where they are and what they can do, can help to minimize their confusion and uncertainty. Consideration needs to be given to providing redundant cueing i.e. providing a number of cues to the same thing, recognizing that what is meaningful to one person will not necessarily be meaningful to another. A person may recognize their bedroom, for example, because of a view, the presence of furniture, the colour of the walls, the light fitting and/or the bedspread. Cues need to be carefully designed so that they do not add to clutter and become over-stimulating.

5. Support movement and engagement

Aimless wandering can be minimised by providing a well-defined pathway, free of obstacles and complex decision points, that guides people past points of interest and gives them opportunities to engage in activities or social interaction. The pathway should be

both internal and external, providing an opportunity and reason to go outside when the weather permits.

6. Create a familiar place

The person with dementia is more able to use and enjoy spaces and objects that were familiar to them in their early life. The environment should afford them the opportunity to maintain their competence through the use of familiar building design (internal and external), furniture, fittings and colours. This will involve an understanding of the personal background of the people living in the environment. The involvement of the person with dementia in personalising the environment with their own familiar objects should be encouraged.

7. Provide opportunities to be alone, with other residents or with others from the community

People with dementia need to be able to choose to be on their own or spend time with others. This requires the provision of a variety of spaces, some for quiet conversation with one or two others and some for larger groups, as well as spaces where people can be by themselves. These internal and external spaces should have a variety of characters, e.g. a place for reading, looking out of the window or talking, to cue the person to what is available and stimulate different emotional responses.

Without constant reminders of who they were, a person with dementia will lose their sense of identity. Frequent Interaction with friends and relatives can help to maintain that identity. This is made easier when the person is admitted from the local community as friends and relatives are able to drop in easily.

The environment must include spaces for the resident and their visitors to use within the unit and in its immediate surrounds. These need to be attractive and comfortable to encourage visitors to come and spend time. Stigma remains a problem for people with dementia so the unit should be designed to blend with the existing buildings and not stand out as a 'special' unit. Where possible a 'bridge' should be built between the unit and the community by providing a space that is used by both the community and people with dementia. Where the unit is a part of a larger site, there should be easy access around the

site so people with dementia, their families and friends can interact with other people who live there.

8. Support the values and goals of care

An environment that embodies the values and goals of care, e.g. provides opportunities for engagement with the ordinary activities of daily living to support rehabilitation goals, will assist the patient with dementia to respond appropriately and the staff to deliver the desired care. The values and goals need to be clearly stated and the building designed both to support them and to make them evident to the person with dementia and staff. The building becomes the embodiment of the philosophy of care, constantly reminding the staff of the values and practices that are required while providing them with the tools they need to do their job.”

This scoping review aims to examine nursing homes in East and SE Asia through the lens of these eight principles of design, providing a view of the characteristics of the built environment used to provide accommodation and support to people with dementia in nursing homes in the region. It has been carried out in the context of the development of a Singaporean version of the EAT-HC. This work is involving input from the major cultural groups of Singapore; the Malays, Chinese, and Indians and is expected to result in the provision of versions of the EAT-HC that are relevant to these cultures.

Methodology

A scoping review was carried out to give a clear picture of the application of the principles in East and SE Asia nursing homes. With previous studies (ADI, 2015) indicating that there is little evidence available on dementia care in East and SE Asia, a scoping review is the best approach to explore the existing literature and critically analyse the available evidence (Cheng et al., 2011; Chang, 2013). A scoping review is exploratory and has the ability to consolidate a diverse range of evidence; including grey literature; providing theoretical clarity to aid in the provision of a direction for future research (Arksey and O'Malley, 2005). However, a scoping review only provides clarity on the extent of the evidence and does not aim to conduct assessments on the quality of the evidence (Booth et al., 2012). The scoping review was carried out in accordance with the Arksey and O'Malley

(2005) methodological framework, which consists of five steps: defining the research question (1), uncovering the evidence through a systematic search (2 and 3), selecting the evidence (4), executing a critical analysis and thematic synthesis of the findings to present a clear summary (5).

Figure 5. The Arksey and O'Malley (2005, p. 22) methodological framework utilised in the scoping review.

The scoping review was undertaken in March 2016. The list of East and SE Asian countries was drawn up and categorized as per the World Health Organization Global Burden of Disease world regions; this includes high-income Asia Pacific countries such as Brunei, Japan, Singapore and South Korea (Global Burden of Disease Study 2013 Collaborators, 2015). Due to the complex range of dementia awareness in the long-term care industry in Asia, the study included publications that touch on long-term care environments that provide care for older adults without a specific focus on dementia on the assumption that such environments are similar to Australian facilities in accommodating a high proportion of people with dementia (AIHW, 2012). The publications are limited to English databases and grey literature from 2001 to 2015.

A systematic search strategy for identifying relevant studies from both research databases and credible sources of grey literature was designed in line with Arksey and O'Malley (2005) methodological framework for scoping studies. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA, Moher et al., 2009) statement was used to guide the design of the overarching structural framework for the reporting process of the systematic search strategy.

Six scientific databases were accessed; ScienceDirect, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Scopus, Japan Science and Technology Information Aggregator Electronic (J-STAGE), Australia/New Zealand Reference Centre, and MEDLINE. A search was also carried out on reference lists to identify key journals, such as the Journal of Asian Architecture and Building Engineering, and publications from the Health Environments Research and Design Journal in accordance to their methodological framework (Arksey and O'Malley, 2005). Additional sources of grey literature included publications from advocacy groups, government, educational and regulatory organisations. The initial search strategy included broad concepts which introduced the main concept of the 'environment', 'dementia', 'older adults'; it was then supplemented with specific keywords to narrow down and increase the sensitivity of the search.

The study eligibility process utilized the Population, Intervention, Comparison, Outcomes and Context (PICOC, Table 3) framework to define the scope of the review and provide focus on the research question identified (Petticrew and Roberts, 2006; Booth et al., 2012). Delving deeper into the process additional search terms had to be utilized due to the difference in the interpretations and terminology of older adults and long-term care facilities in Asia (Wu et al., 2008; Srithamrongsawat et al., 2009; de Guzman et al., 2012; Zulkifli and Khan, 2014). Addition terms such as "nursing home", "institution", "old folks", "aged", "elderly", "senior" AND "old age" contributed to the study selection process (Table 5). A chronological age of 65 years and above was included in the selection process to ensure a focus on long-term care environments specifically for older adults.

Table 5. PICOC model (Pettigre and Roberts, 2006).

Population	Older adults 65 years and above
Intervention/Exposure	Long-term care facilities that provide high levels of nursing care for residents with/without dementia.
Comparison	None
Outcomes	Understanding the characteristics of the built environment of long-term care facilities for people with dementia in Southeast and East Asia through the eight principles of environmental design.
Context	Primary emphasis is on literature with a focus on the characteristics of the long-term care built environment of nursing homes in Southeast and East Asia. Secondary emphasis consists of literature containing multi-national studies but with data on Southeast and East Asia.

Following the application of the PICOC framework, the articles selected were processed in compliance with the fourth stage of the scoping review framework, and the evidence was contextualized and entered a data-charting form (Arksey and O'Malley, 2005). NVivo 2011 followed by Microsoft Excel 2016 were used to manage a comprehensive summary containing data extracted in the form of a narrative review for each of the articles. Types of study, frequencies of occurrences of data in each geographic location and the reporting of the presence or absence of the application of the design principles are reported (Figure 2). Given that scoping studies are not designed to assess the quality of the studies, the literature analysed was not selected or weighted on the quality of the evidence provided (Arksey and O'Malley, 2005). The process of developing the summary of the identified available research and gaps process concluded the fifth stage of the scoping review framework by Arksey and O'Malley (2005).

Results

In the initial search process, 1846 articles comprising of 1537 peer-reviewed publications and 309 sources of grey literature were found (Figure 6). Screening for duplicates ensued, and 1806 records remained. A review of the titles and abstracts of the documents obtained resulted in the removal of 435 records due to lack of relevance. A further screening of 1371 records for the availability of full-text articles led to the exclusion of 671 publications. After extracting the records which contained full text, 700 remained in the database for the eligibility process. 652 publications contained all the search terms. However, when reviewed utilizing the PICOC, 604 of these publications fulfilled the population and intervention criteria but did not provide sufficient information on environmental characteristics so did not fulfil the standards in the areas of context and outcome. Therefore, only 48 qualitative and quantitative articles remained for the scoping review, 65% (31) of the literature consisted of qualitative studies. 90% (43) were academic peer-reviewed publications, one dissertation was included and the remaining four sourced from 'grey' literature found in regulatory bodies in Singapore, Malaysia, Thailand, and Hong Kong Special Administrative Region of the People's Republic of China. Malaysia (11 articles, 23%) and Taiwan (10 articles, 21%) were the top two countries mentioned in the publications producing 44% of the total literature that contributed to the results of the scoping review. This was followed by Japan (seven articles, 15%), China (five articles, 10.5%), Singapore (five articles, 10.5%), Philippines (three articles, six percent), South Korea (three articles, six percent), Thailand (two articles, four percent), and Sri Lanka (two articles, four percent). No research articles on nursing home environments were found for Brunei, Cambodia, Indonesia, Democratic People's Republic of Korea, Laos, Maldives, Timor-Leste and Vietnam which was consistent with the findings in a study conducted on a search for English literature on healthcare across Asia (McCuskey-Shepley & Song, 2014).

Figure 6. PRISMA flow diagram (Moher et al., 2009) illustrating an overview of the systematic search strategy executed in this scoping review.

Only 15 articles (31.5%) originated from high-income countries (Global Burden of Disease Study 2013 Collaborators, 2015) such as Japan (15%), Singapore (10.5%), and South Korea (six percent). Middle to low-income non-English speaking countries contributed to 68.5 percent of the articles in English, suggesting that research in the area of aged care and the environment is not limited to high-income countries in East and SE Asia but is an issue

that is relevant across the countries.

Figure 7. Evidence of application of the principles of design across the literature (Fleming and Bennett 2015b, p. 3)

Principles of design

1. Unobtrusively reduce risks
 2. Provide a human scale
 3. Allow people to see and be seen
 4. Manage levels of stimulation
 5. Support movement and engagement
 6. Create a familiar place
 7. Provide opportunities to be alone, with other residents or with others from the community
 8. Support the values and goals of care
-

Applied: Literature that contained discussion indicating that one or more principles of design have been considered in a specific country.

Not Applied: Literature that contained discussion that has no reference to one or more principles of design in a specific country or specifically describes the lack of application of a principle.

*Please note that all percentages have been rounded up to the nearest whole number.

All 48 articles included in the analysis contained findings that indicated an awareness of a minimum of one principle of design and a maximum of all eight principles of design. The sixth principle of design "create a familiar place" was the most extensively discussed principle and was present in 59 percent of the articles reviewed (Figure 7). The same principle was also the most likely principle to be specifically described as not being applied in the current environmental design of nursing homes across East and SE Asia (46%). The third principle, "allow people to see and be seen", was the most highly applied principle with 31 percent of the articles citing the application of the principle in nursing homes across the region.

Unobtrusively reduce risks

Findings surrounding the principle of "unobtrusively reduce risks" highlighted two issues; the lack of safety measures and the presence of obtrusive safety measures.

The items of the EAT-HC that describe the principle were evident in 43 percent of the literature with 33 percent indicating that the principle was not appropriately applied (Figure

7, Fleming and Bennett, 2015b, p. 3). Research from Korea, Malaysia and Thailand stated that facilities contain environmental elements that are not designed to reduce risk. For instance, as a result of rain, some facilities have corridors and ramps that become slippery and wet posing a high risk of falls for residents (Othman and Fadzil, 2015). Literature from Thailand indicates that safety regulations are not mandatory and in Malaysia, it was found that some facilities may contain staircases in communal areas, uneven flooring, and steep ramps which pose a risk to residents (Srithamrongsawat et al., 2009; Zulkifli and Khan, 2014; Othman and Fadzil, 2015). In Korea, the provision of standardized beds that do not cater to the individual needs of the residents' have contributed to falls (Chang, 2013).

Articles from China and Japan describe environments designed with the aim of obtrusively reducing risk. The literature touched on facilities that oppose any display of plants due to fear of infections and obstacles to mobile residents, and rooms that obtrusively bar residents within to prevent wandering (Wu et al., 2008, Otsuka et al., 2010). Despite the findings, some literature advocates for the need for environmental modifications that can help to reduce risk unobtrusively (Ministry of Health Malaysia, 2009; Li and Khan, 2012).

Provide a human scale

53 percent of the articles contained discussions on the items from the EAT-HC that describe the second principle of design "provide a human scale", and 38 percent of the literature found that the principle was not adequately applied (Figure 2, Fleming and Bennett, 2015b, p. 3). Articles highlighted the issues of bedrooms containing occupancy rates as high as eight beds in a room indicating a significantly high number of personal encounters between residents (Hsieh et al., 2012). There may be up to sixteen older adults of no relation sharing one shower and a toilet, which may prove to be a confronting experience for both people with and without dementia (Ministry of Health Singapore, 2002). Some examples of the scale of the buildings recommend that the size of the environment should ideally contain a minimum of 200 residents, sharing one multipurpose hall and residing in bedrooms providing a 1.2 meter gap between each bed (Ministry of Health Singapore, 2002). Though the facility is physically small it does not align with the principle of a providing a small-scale environment in that the number of people sharing common activity and dining space far exceeds the parameters set by the EAT-HC items. Facilities were reported to be prone to overcrowding and residents were commonly subjected to high-density living (Hsieh et al., 2012; Normala, et al., 2014). The scale of the building also impacts on the delivery of

palliative care; respect, dignity and privacy when the delivery of care is in an open ward setting, that is overcrowded and noisy (Koh, 2004). The review of the literature found that residents, caregivers, staff and researchers alike have identified the need for an enabling environment that reflects a culturally appropriate home, that is smaller in scale, to improve residents' well-being and staff satisfaction (Chuang and Abbey, 2009; Cheng et al., 2011, Chang, 2013, Lee et al., 2013).

Allow people to see and be seen

46 percent of the articles placed great emphasis on the items in the EAT-HC that describe the third principle “allow people to see and be seen” with 31 percent of the articles reporting the application of the principle (Figure 2, Fleming and Bennett, 2015b, p. 3). The correct application of this principle enables residents to be able to find their way around by being able to see where they want to go. It also provides a benefit in terms of improving the opportunity staff have to monitor the residents. However, this secondary benefit can be overemphasised, and the design of facilities described in the literature often appears to overwrite the privacy and care needs of residents (Chuang and Abbey, 2009; Wu et al., 2009a; Wee et al., 2015). While some have been applied appropriately maintaining privacy for residents, the findings also resulted in residents reported to be “living in public spaces” with many residing in shared open concept bedrooms or wards with no partitioning between beds (Chuang and Abbey 2009, p. 1642). The open space design, coupled with the proximity and lack of partitioning between beds have resulted in feelings of distress and anxiety (Tsai and Tsai, 2008; Chang, 2013). Residents may also share the same room with residents requiring the end of life care or roommates in severe stages of dementia which leads to residents engaging in ruminating thoughts of death and misfortune creating anxiety and fear (Tsai and Tsai, 2008; Chang, 2013). The need to be able to see residents at all times by staff have resulted in the creation of environments that compromise the mental health of residents, by failing to create spaces that preserve the privacy, dignity and respect of people with dementia.

Manage levels of stimulation

A total of 48 percent of the literature touched on the fourth principle of design, the use of managing levels of stimulation in the environment (Figure 3, Fleming and Bennett, 2015b). Only ten percent of the literature addressed designing to manage levels of stimulation

in the environment, while 38 percent of the literature described environments designed without regard to enhancing positive or reducing negative stimulation. As a result of the lack of designs that contribute to the management of levels of stimulation, the literature reviewed provided numerous examples of adverse effects of excessive visual, auditory, and olfactory stimulation. Excessive noise and visual activity due to a multitude of individuals engaged in either movement, conversations or verbal outburst in overcrowded spaces, audio and visual output from televisions, and the smell of waste are all highly distressing to residents (Chuang and Abbey, 2009; Hsieh et al., 2012; Chang 2013). Other articles provided a view of the effects of environments that lack stimulation, reporting that residents experience high levels of isolation, boredom, feelings of suffering and losing the will to live resulting in a low quality of life (Yap et al., 2003; Hsieh et al., 2012; Chang 2013; Chen and Li, 2014). Articles report either a high level of stimulation or contrastingly no stimulation which are both detrimental to residents with dementia. There appears to be a gap in the understanding of the role that stimulation has in improving the care for residents with dementia with only ten percent of the literature indicating that there are facilities capable of reducing negative and enhancing positive stimulation in the environment.

Support movement and engagement

46 percent of the articles highlighted the application of items from the EAT-HC that describe the fifth principle "support movement and engagement", with 29 percent of the literature citing evidence of negative application (Fleming and Bennett, 2015b). Examples consist of facilities that have pathways which contain clutter or obstacles and those that bar residents from venturing outdoors, discouraging movement and engagement (Komatsu et al., 2007; Srithamrongsawat et al., 2009; Hwang et al., 2013; Zulkifli and Khan, 2014; Ibrahim and Dahlan, 2015; Othman and Fadzil, 2015). These environments result in residents indicating an elevated level of discomfort as they remain disengaged and in bed during the day (Komatsu et al., 2007). Improving environmental factors by raising awareness of and applying, the fourth and fifth principles of design can help to reduce disruptive and distressing behaviours while supporting residents to remain independent, engaged, and cognitively stimulated (Kasai et al., 2015).

Create a familiar place

59 percent of the literature touched on the sixth principle, "create a familiar place"

(Fleming and Bennett 2015b, p. 3). The available literature describes a wide variety of environmental designs for nursing homes in East and SE Asia, from small townhouses to large institutions. The designs from each country vary, reflecting the needs of the community, available resources and the current cultural understanding of the care for people with dementia (Chuang and Abbey, 2009). The terminology utilized in the literature suggested that residential aged care facilities are commonly seen as institutions (62.5%), and there was little mention of the design of positive enabling environments for people with dementia, the operational sustainability of the facility or inclusion with the wider community. The descriptions of the environments indicate that they lack a familiar, home-like feel and do not have designs and artefacts that reflects the characteristics of the residents from specific Asian populations.

Provide opportunities to be alone, with other residents or with others from the community

The seventh principle, "provide opportunities to be alone, with other residents or with others from the community" was mentioned in 54 percent of the articles (Fleming and Bennett 2015b, p. 3). Up to 35 percent cited the lack of opportunities, for residents to be alone, with fellow residents or engagement with the wider community. Residents have cited loneliness, and feelings of exile and suffering despite living in a communal environment, disclosing the lack of meaningful social engagement and segregation from the wider community as a result of safety concerns (Chuang and Abbey, 2009; Chang, 2013; Zulkifli and Khan, 2014; Ibrahim and Dahlan, 2015). Segregation from the community can be either exclusion via geographical isolation or through the lack of opportunities for occupation and meaningful community interaction (Wee et al., 2015). Literature from Malaysia and Japan indicated that children are not permitted or encouraged to visit nursing homes (Otsuka et al., 2010; Othman and Fadzil, 2015). In 19 percent of the literature, there are examples of implementation of the principle. Facilities in China, Japan, Malaysia and Sri Lanka encourage older adults to engage in activities that can be done in private or with fellow residents, the community. These activities include gardening, house chores, community and family engagement programs, religious activities, and charitable work with the greater community (Wu et al., 2008; Traphagan and Nagasawa, 2008; Otsuka et al., 2010; Risseuw, 2012). Such activities provide occupation, meaning and social engagement for residents, increasing motivation, coping skills and acceptance of their new living environment

(Komatsu et al., 2007; Chen and Li, 2014; Otsuka et al., 2010)

Support the values and goals of care

Awareness and application of the principle "support values and goals of care" are very low (Fleming and Bennett 2015b, p. 3). Only 25 percent of all articles touched on the principle, out of which only 10 percent indicated an understanding of the application of the principle. In the thematic analysis, the institutionalized appearance of nursing homes described in the articles corresponds to a medical model of care with notions of temporary residence, provision of medical care, disease and sickness (Tsai and Tsai, 2008; Chuang and Abbey, 2009; Othman and Fadzil, 2015). The remaining 15 percent included discussions on the need for focus in and understanding of the goals and values of nursing homes in addition to the change in the environment to produce a positive outcome for residents living in the institutionalized nursing home environment (Chang, 2013; Zulkifli and Khan, 2014).

Additional Findings

The principles did not cover key factors such as religious spaces, palliative care spaces, cultural specificity, or the presence of assistive technology. 23 percent of the papers highlight the need for the acknowledgement and incorporation of culturally appropriate environmental features, 17 percent of the papers touched on the need for religious spaces to meet the religious and spiritual needs of residents (Kasai et al., 2015), four percent of the papers also brought forward the notion of introducing technology to empower residents and aid staff in the activities of daily living, to unobtrusively reduce risk, manage levels of stimulations and promote movement and engagement through a range of technological aids (Ministry of Health Malaysia, 2009; Long, 2012).

Discussion

The scoping review identified substantial weaknesses in the design of facilities for people with dementia in East and SE Asia when they are viewed through the lens of principles that have been successfully employed in countries such as the United Kingdom and Australia. It is tempting to suggest that the application of the eight principles of design would better address the needs of the people with dementia through the promotion of risk reduction, the provision of physical and cognitive engagement, familiarity, privacy and the support of dignity.

However, it is premature to come to this conclusion. It is clear that there are great differences between the cultures, as exemplified by Australia and the UK, and those found in East and SE Asia. These differences may render the principles of design described here somewhat irrelevant to the design of aged care homes in these cultures. There may even be sufficient differences between the cultures found in East and SE Asia to make it necessary to understand the application of the principles culture by culture. However, the fact that it has been found to be possible to analyse the existing literature using these principles as a framework suggests that they, at least, provide a starting point for a discussion on what is important in designing for people with dementia in East and SE Asian aged care homes. Such a discussion is taking place in the context of the project mentioned in the introduction, the development of a Singaporean version of the EAT-HC. It is anticipated that the process of developing the Singaporean version of the EAT-HC will throw considerable light on the relevance of these principles to East and SE Asia.

This study has shown that the eight principles are not sufficient to encompass all of the design features mentioned in the papers examined. Consideration needs to be given to spaces for palliation, technology, religious activities, and culturally appropriate features. The introduction of palliative care may not only contribute to an increase in the number of physical spaces for people with dementia to receive palliative care but it may have a direct impact on the level of awareness of palliation among the aged care work force and the family caregivers. The results also illustrate the need for physical spaces to be future proof. With the rampant growth of technology in aged care in the areas of communication, telehealth, surveillance, safety and assistive technology; the ability of the built environment to support the use of technology enables the provision of technological interventions. Findings of the scoping review also suggested the built environment can promote cultural and religion inclusion, further preserving the identity of the person with dementia through the introduction of culturally appropriate features and religious spaces. These topics may fit into the existing principles, or failing that, require the establishment of additional principles.

The results of this consideration will feed into future revisions of the Australian version of the EAT-HC with the intent of making it more relevant to a multi-cultural country where assistive technology is finding ever more significant roles in the care of people with dementia (Fleming and Sum 2014, Chu, Khosla et al. 2017)

Conclusion

The evidence found in the literature may be interpreted as a lack of awareness of the knowledge base on environmental design for people with dementia in the provision of dementia specific services for older adults in East and SE Asia (Chung and Abbey, 2009; Kong and Evans, 2012). The absence of the application of principles of design that have been shown to be effective in providing high quality environments in the United Kingdom and Australia suggest that there is an opportunity to aid regulatory bodies and design professionals to minimise the persistence of the building of long-term care facilities in Asia that have been described as being unable to meet the needs of people with dementia (Chung and Abbey, 2009; Wee et al., 2015). However, this will need to be done with an awareness of the need for cultural sensitivity. At this stage, it appears that the use of the eight principles of design provides a lens that helps with the identification of the strengths and weaknesses of the existing designs but they require modification, or supplementation, to accommodate the extra features that have been identified in the Asian literature.

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Extended Discussion

While the present study describes the current state of nursing homes in the region through the lens of the principles of dementia enabling design, it was not able to fully address one of the main aims of the scoping review - to examine the cultural influences that have contributed to the development of nursing homes in East and Southeast Asia. The study does not provide insight into the historical and cultural influences that have shaped the cultural perceptions and expectations of the built environments providing high levels of care for people living with dementia today. The lack of a historical context limits the understanding of the impact of culture on the beliefs and values of the public, of the aged care sector and of governments that have shaped the design of the facilities so that they reflect pathogenic built environmental design.

This extended discussion has been accepted as an oral presentation for the 53rd Australian Association of Gerontology Conference, Australia which will be held November 2020.

Sun, J. (2020). *Aged care facilities in East and Southeast Asia: A physical expression of the history and culture of dementia*. Oral Presentation accepted for the 53rd Australian Association of Gerontology Conference, Australia.

The built environment of nursing homes: A physical expression of the cultural beliefs of dementia in East and Southeast Asia

Dementia is not a new or foreign condition in East and Southeast Asia. Traditional Chinese Medicine (TCM) documented the existence of dementia in the Yellow Emperor's Internal Classics 2000 years ago during the Han dynasty (Liu et al., 2012). Between 581 AD and 1202 AD, during the Ming and Qing dynasties, signs and symptoms such as memory loss, inappropriate behaviour and responsive behaviours were captured by physicians of TCM as a condition affecting older adults (Sun, 1955; Hong, 1981). In addition, brain atrophy was documented, and physicians had attributed this condition to poor vascular circulation, depleting life force and accumulation of phlegm (Liu et al., 2012). Korean medicine, which shares similarities with Chinese medicine, similarly held beliefs that poor vascular health resulted in signs and symptoms of dementia commonly associated with old age (Yeo & Gallagher-Thompson, 2006; Liu et al., 2012; Fukui, 2015). In Japan, dementia was described

in the literature between 11th century and the 17th century as a deterioration of cognitive functions in old age (Fukui, 2015). Today, discussion continues within the circles of TCM about potential treatments and cures for dementia in collaboration with Western evidence-based medical research (Liu et al., 2012).

The acceptance of the cultural belief that dementia is a part of the normal ageing process gives rise to a level of misconception that it is futile to address care needs for people living with dementia. Designing environments for people living with dementia is not viewed as a priority resulting in a lack of understanding and development of appropriate care models and environments (Cheng et al., 2013).

In a similar degree, facilities caring for vulnerable older adults have long been described in the history books in Asia. Records indicate that these facilities began in 552 AD and evidence of these facilities has been found in China, Japan and Korea where they provided nursing care to older adults but also to the destitute and disabled (Iwasa 1966). Alms-houses, which were the precursors to nursing homes, were described in detail in documentations found in East Asia (Iwasa, 1966; Wu, Mao & Xu, 2008; Suwanrada, et al., 2014). Reviewing the records of long-term care facilities for older adults in the past indicated that the facilities providing both medical and nursing care that catered to different needs of older adults were commonly situated in proximity to temples and hospitals (Iwasa, 1966).

Despite, hundreds of years of existence in Asian countries, long-term care facilities such as nursing homes are an unacceptable living environment for older adults with family because of cultural and traditional notions that the care for older adults should be carried out by members of the family (Tew et al., 2011; Kwon & Tae, 2012; Thompson et al., 2012). However, the Japanese have recognised the need to address the issues of long-term care and the changing reality of ageing in their country earlier than most Asian countries, leading to policy changes and structural developments that can provide quality of life and care for Japanese residents with dementia (Komatsu et al., 2007; Tamiya et al., 2009). Unfortunately, the concept of an older adult with family moving into nursing homes remains an idea riddled with the challenging stigma of abandonment, dishonour, and shame in most parts of Asia (de Guzman et al., 2012; Liu et al., 2012; Thompson et al., 2012; Teerawichitchainan et al., 2015).

The common schema of nursing home environments within Asian communities is one

that promotes social isolation, poor quality of care and low quality of life and contributes to the low acceptance, poor understanding and marginal structural development of the aged care industry over the years (Sitoh 2003; Tew, et al., 2011; Huang, et al., 2015). Literature originating from East and Southeast Asia refers to residential aged care facilities as nursing homes, old folks' homes, institutions, or long term care hospitals (Chiba et al., 2012; Hsieh & Huang, 2012; Zulkifli & Khan, 2014; Song et al., 2014; Fukui, 2015; Wee et al., 2015). When it comes to options for residential care, most people with dementia and their caregivers in Asian regions face a challenging situation flowing from conflicting traditional and cultural ideologies and the lack of facilities (Thompson et al. 2012). The stigma of nursing homes in Asia has contributed to the lack of discussion, planning and development resulting in the development of only a small number of facilities in most countries; most of which are unsuitable for people living with dementia because their design does not take into account the special care needs of these vulnerable people.

The maintenance of traditional standards in the care of a person with dementia in Asian communities within the family home is bringing about threats to the physical, social and mental health of the individual with dementia and their caregivers (Ineichen, 1998; Prince, 2004; Tew, et al., 2011; Thompson 2012). In the last decade, the situation has grown critical, and the need for policymakers to help relieve caregiver strain has been identified (Prince, 2004). An increasing ageing population in Asia, declining family sizes, migration patterns and the need for dual-income households have resulted in many Asians families coming to accept residential aged care facilities as a new continuum of care (Cheng et al., 2011; Thompson et al., 2012; Zhong & Lou, 2013). Despite the increase in their financial ability to pay for informal care to reduce the need for institutionalisation, the low awareness of dementia, lack of capacity and capability issues in health and social services in Asia has resulted in an inadequate understanding of care for clients with responsive behaviours. Family caregivers' preference for a long-term care facility heightens when the person with dementia at home exhibits responsive behaviours (Tew et al. 2011). In reality, caregiver strain in Asia is found to be as high as those experienced in developed countries such as Australia and the United Kingdom, but as a result of the stigma it is culturally unacceptable to acknowledge feelings of burden or stress experienced by the caregiver in most parts of this region (Prince, 2004; Torti et al., 2004; La Fontaine, 2007).

As the number of individuals with dementia continues to grow in Asia, greater

understanding is required to provide support and services for people with dementia and for their caregivers in aged care facilities such as nursing homes. As their condition progresses, older adults with dementia become vulnerable and marginalised. It is a prevailing belief that with the downward trajectory of dementia the person with dementia will ultimately lose their 'self', becoming "less of a person" (Millett 2011, p. 511). This mindset or belief results in depersonalised and disengaged care from both formal and informal caregivers and the objectifying of resident (Davis, 2004; Kontos & Neglie, 2007). This mindset contributes to the disablement process through environmental deprivation (Masala & Petretto 2008). The disablement process (Clarke & George 2005) includes recognition that there are factors in the built environment that can accelerate or decelerate the pathological progression influencing the degree of impairment. Structural barriers can make a difference in the capacity and capability of a person with impairment to carry out activities, and a focus on an environment that is purpose-built is required to maintain independence in activities of daily living (Clarke & George 2005). However, it has been found that the prevailing trend is to continue the marginalisation and institutionalisation of people living with cognitive impairment in various countries (Masala & Petretto, 2008; Sun, 2020).

The literature indicates a cultural emphasis on physical longevity and an acceptance that the resident will lose their sense of self. The result is a focus on the "quantity of life" of the resident. The focus on the quantity of life is overwhelming; so much so that the evidence indicates that the quality of life of the person is compromised (Sun & Fleming, 2018). Findings indicate that with the objectification of the resident and death being a taboo topic in most of the East and Southeast Asian regions, there is a lack of community discussion about the quality of life and palliative care for the resident (Koh, 2004). The public understanding and belief are that the objective of aged care is to physically prolong life. This belief needs to be extended to ensure that people can continue to have meaning and quality of life (Sun & Fleming, 2018; Goeman et al., 2019; Steele et al., 2019; Sun, 2020). It is recognised that there needs to be a balance in the measures of care for residents, but the cultural beliefs of quantity continue to be a barrier to designing environments that support functioning and quality of life.

Every country in Asia will approach the care of their people with dementia in the manner that they deem culturally appropriate and within their financial and political means; be it with active strategies and support or with the expectations that family in the community

will help in care provisions (Prince, 2015). However, in every country, there will be older adults who will not have full-time caregivers or who are destitute and will require care in a long-term care facility. With the escalating number of people with dementia living in care facilities worldwide, the built environment has only recently been recognised in some parts of the region as an essential component that contributes to the quality of life and care of the residents (Prince, 2015; Fleming & Purandare, 2010; Otsuka et al., 2010). It is critical that residents have an acceptable and sustainable built environment that can maintain, protect and support their quality of life and care in the last stages of their lives.

The evidence found in the literature currently points to the lack of best practice evidence-based information on dementia and government support in the provision of dementia-specific services for older adults in most countries in East and Southeast Asia (Poi, Forsyth & Chan 2004; Kutsumi et al., 2009; Setia et al., 2011). Failure to regulate and guide the design of facilities has resulted in numerous unsuitable long-term care facilities in Asia that are not purpose built for the needs of people with dementia or provide the quality of care and life that they require (Chuang & Abbey, 2009; Wee et al., 2015). Few studies of dementia have been conducted on dementia in the countries of Southeast Asia and Asia, resulting in a call for action for more synthesis of the evidence on dementia research (Prince, 2015). A review of the high care living environments of people with dementia is needed to identify the barriers to the provision of structural improvements in the built environment. Understanding the landscape of the built environments for people with dementia living in aged care facilities will assist with the development of effective design initiatives, interventions, and policies that will enhance the enablement process in these long-term care facilities.

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Chapter 3: The appropriateness of adapting the Australian Environmental Assessment Tool High Care (EAT-HC) for persons with dementia in Singapore

The research paper written is by the candidate and published in the Health Environments Research and Design Journal.

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Research Question relevant to the chapter:

What are the characteristics of the built environment that contribute to the well-being of people with dementia in Singapore?

Can the design principles which are the basis of the Australian Environmental Assessment tool be used as the foundation for a Singaporean environmental assessment tool?

The study found that characteristics of the built environment that were aligned with the Australian Environmental Assessment principles of design can contribute to the well-being of Singaporeans living with dementia. This study provides details about culturally specific key design characteristics that are subsumed under the principles. It also provides insights into additional characteristics not found in the Australian Environmental Assessment Tool, such as the need for the inclusion of technology, palliation, and religious spaces. An extended discussion is included in this chapter that presents the understanding of barriers and facilitators that may impact on the development and implementation of an environmental assessment tool from the perspective of participants.

The themes can be summarised as;

1. The need for a definition of the nursing home for people living with dementia

2. The need to increase the understanding of the role of the environment in dementia care
3. The need for an environment to promote social inclusion and citizenship.

Implications for practice

- The principles of design of the EAT-HC are acceptable and suitable for application in Singapore.
- A cultural adaptation of the EAT-HC may improve the quality of life for Singaporean residents living with dementia.
- Culturally sensitive characteristics that should be included to reflect the needs of Singaporeans include technology, palliative care, and spaces for spirituality.
- The findings have set the foundation for the development of a Singaporean version of the EAT-HC.

Abstract

Objectives: This study investigated the level of acceptance in Singapore of the eight principles of design underpinning the Environmental Assessment Tool – High Care (EAT-HC) which is commonly used in Australia to evaluate environments for the care of people living with dementia. A secondary goal was to identify topics particularly relevant to the Singaporean context that are not included in the Australian EAT-HC.

Background: This study was undertaken in preparation for the development of a Singaporean version of the Australian Environmental Assessment Tool - High Care (EAT-HC).

Methods: Discussions of 23 focus groups involving 150 family caregivers, aged care staff, administrators and architects were recorded and thematically analysed to identify characteristics of the principles underpinning the EAT-HC that are unlikely to be relevant in a Singaporean version and to identify additional topics required to tailor it to reflect the Singaporean culture. The thematic analysis was supplemented with quantitative data obtained through the use of simple Likert scales measuring the appropriateness of each principle in the Singaporean context.

Results: The principles of design that underpin the EAT-HC were highly accepted by participants and provided a framework for a systematic exploration of Singaporean residential care for people with dementia. Some topics of particular relevance to Singapore were identified. These can be subsumed by the principles without the need for the principles to be changed.

Conclusion: The results support the use of the design principles underpinning the EAT – HC as the foundation of a tool for the evaluation of Singaporean dementia facilities.

Introduction

Singapore is a small island (719.9 square kilometres) in Southeast Asia that houses a multi-racial population of 5.6 million people, of which 516,692 are older adults aged 65 years and above (Singapore Department of Statistics, 2018). There are approximately 53,000 people living with dementia in Singapore (Alzheimer's Disease International, 2014; Singapore Department of Statistics, 2018). As in developed countries the provision of residential care is an important component of the services available to them. Most of the 15,205 beds are provided in situations where cost and the replication of a hospital environment have dictated the design of the buildings (Government of Singapore, 2017; Sun & Fleming, 2018). These buildings do not meet the needs of people living with dementia. Hospital-like environments are not home-like or familiar, comprising of negative stimulation and pay little attention to the cultural aspects of care (Grey et al., 2019). Facilities that are not purpose-built to meet the needs of people living with dementia result in the creation of stress-inducing environments for residents, family caregivers, and staff compromising their experience of health, wellness, safety, and the ability to build positive social connections (Wee et al., 2015; Tsai & Tsai, 2008). On the other hand studies have shown that the built environment can promote positive behaviours in people living with dementia and compensate for declining cognitive abilities.(Chaudhury, Cooke, Cowie, & Razaghi, 2017; Fleming & Purandare, 2010; Marquardt, Bueter, & Motzek, 2014)

There are no validated assessments tools available in the South-East Asian region to provide an evidence-based evaluation of dementia-specific aged care facilities to inform the remodelling of existing facilities and the planning of new facilities (Sun & Fleming, 2018). The availability of a validated environmental assessment tool would provide a reliable platform of communication and evaluation for all stakeholders in Singapore working to develop best practice, evidence-based dementia enabling environments. Such a tool would help to address the challenges faced by residents living with dementia, their families, and staff by facilitating the identification of the strengths and weaknesses of the environments being used, enabling designs to be developed to systematically improve the environment. A tool appropriate in the cosmopolitan Singaporean context is also likely to be useful in other parts of Southeast Asia. A scoping review was conducted to find a tool that could be adapted to the Singaporean context (Sun & Fleming, 2018). The Environmental Assessment Tool High-Care (EAT-HC), a tool developed based on the Environmental Assessment Tool (EAT)

(Fleming and Bennett, 2015) is a tool that is inclusive of people living with dementia who may be immobile or those requiring end of life care. The EAT-HC was identified by Sun and Fleming (2018) as the best available tool to provide a standardised assessment to guide and evaluate aged care facilities for people with dementia requiring high levels of care for the Singaporean Population. This tool is in common use in Australia and is recommended by the Australian Aged Care Quality and Safety Commission for use by aged care providers wishing to ensure that their buildings meet Standard 5 of the Australian Aged Care Quality Standards (Aged Care Quality and Safety Commission, 2018). The Aged Care Quality Standards are recommended outcomes provided by the Aged Care Quality and Safety Commission and standard 5 makes reference to the physical environment in residential care and the impact that it has on residents quality of life, independence, and wellbeing (Aged Care Quality and Safety Commission, 2018). The EAT-HC is designed to guide the user through an evaluation of the built environment against eight principles of design (Table 6.). The principles have their origin in Australia where they have informed the development of specialised dementia care units and the evaluation of residential aged care environments since the 1980s (Fleming, 2011; Fleming & Bennett, 2013; Fleming & Bennett, 2015; Fleming, Goodenough, Low, Chenoweth, & Brodaty, 2016; Fleming, Kelly, & Stillfried, 2015; Smith et al., 2012). However, if the tool is to be used in Singapore, they must be subject to an examination of their relevance to the Singaporean context.

Table 6. Eight Principles of Design underpinning the EAT-HC (Fleming and Bennett, 2015b, p. 3)

1. Unobtrusively reduce risks

People with dementia require an internal and external environment that is safe, secure, and easy to move around in, if they are to make the best of their remaining abilities. However, obvious safety features and barriers will lead to frustration, agitation, and anger and so, potential risks need to be reduced unobtrusively.

2. Provide a human scale

The scale of a building will have an effect on the behaviour and feelings of a person with dementia. The experience of scale is determined by the number of people that the person

encounters and the overall size of the building. A person should not be intimidated by the size of the surroundings, rather scale should help the person feel in control.

3. Allow people to see and be seen

It is particularly important for people with dementia to be able to recognize where they are, where they have come from, and what they will find if they head in a certain direction. When they can see key places, such as a lounge room, dining room, their bedroom, kitchen, and an outdoor area, they are more able to make choices and find their way to where they want to go. This arrangement can also enable staff to see residents from where they spend most of their time, reducing their anxiety and the anxiety of the residents.

4. Manage levels of stimulation

Reduce unhelpful stimulation: Because dementia reduces the ability to filter stimulation and attend to only those things that are important, a person with dementia can become stressed by prolonged exposure to large amounts of stimulation. The environment should be designed to minimize exposure to stimuli that are not helpful.

Enhance helpful stimulation: Enabling the person with dementia to see, hear and smell things that give them cues about where they are and what they can do, can help minimize their confusion and uncertainty. Cues need to be carefully designed so that they do not add to clutter and become over-stimulating.

5. Support movement and engagement

Aimless wandering can be minimized by providing a well-defined pathway, free of obstacles and complex decision points, that guides people past points of interest and gives them opportunities to engage in activities or social interaction. The pathway should be both internal and external, providing an opportunity and reason to go outside when the weather permits.

6. Create a familiar place

The person with dementia is more able to use and enjoy spaces and objects that were familiar to them in their early life. The environment should afford them the opportunity to maintain their competence through the use of familiar building design (internal and

external), furniture, fittings, and colours. This will involve an understanding of the personal background of the people living in the environment.

7. Provide opportunities to be alone, with other residents, or with others from the community

People with dementia need to be able to choose to be on their own or spend time with others. This requires the provision of a variety of spaces, some for quiet conversation with one or two others and some for larger groups, as well as spaces where people can be by themselves. Without constant reminders of who they were, a person with dementia will lose their sense of identity. Frequent interaction with friends and relatives can help maintain that identity. The environment must include spaces for the resident and their visitors to use within the unit and in its immediate surrounds. Where possible, a “bridge” should be built between the unit and the community by providing a space that is used by both the community and people with dementia.

8. Support the values and goals of care

An environment that embodies the values and goals of care, e.g. provides opportunities for engagement with the ordinary activities of daily living to support rehabilitation goals, will assist the patient with dementia to respond appropriately and the staff to deliver the desired care. The values and goals need to be clearly stated and the building designed both to support them and to make them evident to the person with dementia and staff. The building becomes the embodiment of the philosophy of care, constantly reminding the staff of the values and practices that are required while providing them with the tools they need to do their job.

Aim

The aim of this study is to prepare the way for the adaptation of the EAT-HC for use in Singapore by investigating if the eight principles of design are an appropriate foundation for the development of a Singaporean Environmental Assessment Tool and identifying culturally specific characteristics of the building that should be taken into account in the adaptation of the EAT-HC for use in Singapore.

Significance

In Singapore, older adults aged 65 years and above make up 14.4 percent of the population, with the prevalence of dementia being 10 percent of older adults (Subramaniam et al., 2015; Sun & Fleming, 2018; Government of Singapore, 2019). With the growing ageing population, population of people living with dementia, and an old age support ratio of four and a half working adults to one older adults above 65, there is a growing number of residential aged care facilities developed to accommodate those who cannot, or choose not to, live in the community (Government of Singapore, 2019; Ministry of Health Singapore, 2019). The building of these facilities is progressing without a systematic framework for their design or evaluation. The sharing of an Australian framework has the potential to help aged care providers in Southeast Asia to assess their current facilities and develop new services in a more systematic way.

Methods

Study Design

A series of 23 focus groups conducted in 2016 provided the data for the study. The use of focus groups is a well-established method to capture and review cultural norms, beliefs and values of diverse communities in cross-cultural settings in a respectful and empowering manner (Kitchen, 2013). The thematic data available from the focus group discussions was supplemented with quantitative, descriptive data obtained through the use of Likert scales to report judgements on the level of appropriateness of each principle to the Singaporean context.

Population and Sample

As the intention is to have the Singaporean EAT-HC used by all stakeholders involved in planning, design and operations of facilities caring for Singaporeans living with dementia focus group included individuals from different ethnicity who were working in an aged care setting or involved in the planning, policy, management, or design of the built environment. The views of people living with dementia were represented by the inclusion of family members. A convenience sample of seven nursing homes, an acute care geriatric team, community care organisation, government and design agencies, and an advocacy group was established. A call for expressions of interest in participating in the study distributed within these organisations resulted in the recruitment of 150 participants (Table 7.). Ethics approval

for the study was obtained from the University of Wollongong Human Research Ethics Committee (HREC, application 2016/122)

Table 7. Demographics of Participants

Gender	Female 79%	Age	21-30	31-40	41-50	51-60	61-70	
			38%	29%	17%	12%	3%	
Occupation								
Nurse Aged Care	Allied Health	Administrator	Aged care staff	Nurse Acute Care	Nursing Aide	Family Caregiver	Architect	Other
45%	17%	11%	5%	5%	4%	3%	3%	7%

Data Collection

A total of 23 focus groups were conducted with an average of seven participants per group. Focus groups were organised according to organisations and roles, such as aged care workers, management, administrative staff, and architects. Of the 23 focus groups, three focus groups, comprised of multi-disciplinary teams, as the organisations were made up of staff from different backgrounds. Participants attended an information session before the commencement of the study to ensure they had full knowledge of their role in the study, with allowance for withdrawal without consequences should they wish to do so. A handout containing all the focus group questions, a summary of the eight principles of design and questions on participants' demographic data was distributed during the information session.

The handout allowed participants to familiarise themselves with the eight principles of design, the structure of the discussion, and questions involved before consent and commencement of the focus groups. The handout enabled participants, particularly those who did not have English as a first language, to have a clear understanding of their involvement in the study, clarify any questions about the principles of design, or the processes involved. The handouts were available to the participants during the focus groups, allowing participants to

refer to the description of the eight principles as the discussion developed. This helped to address cultural sensitivities, such as “facework” and collectivism. These are key considerations in undertaking focus groups in Asian communities (Lee & Lee, 2009), by allowing participants to refer to the eight principles of design at any time during discussion without the fear of having to be “impolite” or “irrelevant” should they need information. The participants were asked to discuss the suitability of the principles of design and to indicate their views on how appropriate each principle is in the Singaporean context. Their perception of the level of appropriateness of each principle was recorded using a 7-point Likert scale. The answers ranged from “strongly disagree” to “strongly agree”, allowing participants to respond concisely and consistently.

An open discussion followed on the characteristics, barriers, and facilitators of each principle. The discussions were focussed on questions such as the motivations behind participants’ selection of score for the specific principle, how did they feel that the principle was appropriate for the development of a Singaporean tool, what were the cultural characteristics that should or should not be included, and what are the current barriers to implementation of the principle and facilitators of these principles. To ensure that all of the participants had an opportunity to respond an additional element of “indirect communication” was included by allowing participants to write their answer down if they did not wish to provide verbal answers. Providing an option for non-verbal responses has been found to increase the level of expression and participation in focus groups conducted in collective cultures (Lee & Lee, 2009). Participants were provided with as much time as they required to make written responses for each question. At the end of the FGD, participants were given additional time to review their written responses. All participants (n=150) completed the section on demographic data, and 144 handouts contained handwritten responses from the participants.

Data Analysis

The process of analysis began as soon as discussions began with notes made during the process of discussion. Notes were made on the perceptions of group behaviour, participants’ body language, repetitive themes and concepts that arose from each focus group. All audio data collected from the focus group discussions were transcribed verbatim with reference to the memos made during the FGD into NVivo 11, a software program used in the analysis of rich text-centric qualitative data enabling (QSR International Pty Ltd. 2015.). The

process of open coding was repeated using NVivo, and a codebook was created. Upon completion of the codebook, key concepts were drawn out until the attainment of conceptual saturation.

Results

The results are reported against the eight principles of design (Table 8).

Table 8. Summary of Quantitative Results

Principle	Likert Scale Score (1= Strongly Disagree, 7 = Strongly Agree)							
	Mean	1	2	3	4	5	6	7
1. Unobtrusive safety	6.01	0%	0%	1%	4%	13%	47%	35%
2. Human scale	5.86	0%	1%	2%	5%	17%	49%	26%
3. Allow people to see and be seen	5.94	0%	1%	3%	6%	13%	40%	38%
4. Manage levels of stimulation	5.98	0%	1%	1%	6%	8%	54%	31%
5. Support movement and engagement	6.06	0%	1%	1%	3%	11%	42%	40%
6. Familiar place	6.20	0%	1%	1%	2%	5%	48%	43%
7. Opportunities to be alone or with others	6.02	0%	0%	1%	5%	16%	39%	39%
8. Support the values and goals of care	6.00	0%	1%	1%	3%	10%	43%	40%

Unobtrusive safety

A large number of participants (82 percent) indicated that they “agreed” or “strongly agreed” that the principle of unobtrusively reducing risk is appropriate and should be included in the Singaporean version of the EAT-HC. However, the participants indicated mixed feelings about the balancing of risks and safety measures. They perceived a need for obtrusive measures to prevent injuries relating to falls and the need to present an overt appearance of implementing safety measures to family caregivers for fear of accusations of negligence. In addition, inadequate staffing, regulations, medical models of care, fear of liability and litigation, fear of job losses, cultural emphasis on quantity rather than quality of life were offered as reasons for the use of obvious safety measures. Nevertheless, participants recognised that obtrusive design impinges on the dignity of the residents and highlighted that residents are displaced and disempowered in such obtrusively safe environments and agree that the principle of unobtrusive design can enhance the quality of life for the residents. Suggestions include utilising technology as it can be an unobtrusive component in reducing risk.

Human Scale

Three quarters (75 percent) of participants indicated that they “agreed” or “strongly agreed” that the principle of providing a human scale is appropriate in the implementation of aged care facilities in Singapore. However, participants were quick to highlight the cultural differences between Australia and Singapore when it came to the density of people encountered in a nursing home, the size of the building and the familiarity of fixtures and fittings. While recognising the confronting nature of residents waking up in an unfamiliar environment with 29 other people they acknowledged that land scarcity, an economy of scale, compliance with building regulations and fire safety, model of care, and cost of the development of nursing homes as reasons for the size and density of Singaporean nursing homes. Many indicated that the level of personal space may be different for Singaporeans due to the collective culture and urbanised living in flats which have become a social norm. Singaporeans tend to favour sharing a room with other individuals and supported a cluster design resembling Housing Development Board (HDB) flats. To provide a clearer understanding of a Singaporean’s perspective of a human scale, it is necessary to have an understanding of the built environment that 80 percent of Singaporeans call home, which are the HDB flats (HDB, 2019). HDB flats are modernised high rise and high-density blocks of

flats with built environmental features that are unique to Singapore (HDB, 2019; Glendinning, 2014). For more than one million flats in Singapore, there are only six different sizes of flats ranging from 35 square metres to 130 square metres, containing between one to three bedrooms. Common characteristics identified by Generalova and Generalova (2014) include; a single living and dining room space, a kitchen which flows into a laundry area, and in flats that comprised of more than one bedroom, an ensuite accompanies the master bedroom. The overall structural design of the flats seeks to ensure maximum ventilation while minimising exposure to the intense heat and sunlight, as well as protection from torrential rain during the monsoon season (Glendinning, 2014). Open spaces on the ground floors known locally as "void decks" are a familiar sight, designed to build an inclusive community, they enable residents to utilise the area for social community activities and functions such as weddings, birthdays, and funerals (Generalova and Generalov, 2014; Glendinning, 2014; Housing & Development Board, 2019). These concrete structures also contain universal elements such as common corridors with handrails on floors above ground level and walking paths on the ground level outside the flats surrounded by greenery leading to community amenities, recreational facilities and public transport. HDB flats appear to embody an agreeable, comfortable, and familiar scale for Singaporeans, reflecting an environment that is found in daily living, helping people to feel familiar and in control.

Allowing People to See and Be Seen

A large majority (78 percent) of the participants indicated that they “agreed” or “strongly agreed” with the appropriateness of the principle of allowing people to see and be seen. Participants agreed that it was vital that residents can be seen by staff and that visual cues will be helpful to both the staff and residents. The principle touches on the need for residents too, to have visual access to enable orientation and movement, allowing residents to navigate through their environment with ease, thus reducing their anxiety. Residents were observed to be in facilities that offer little visual access to enable navigation and orientation as a result of the environmental design and layout. Participants cited an emphasis on the safety of the residents, resulting in over-surveillance, leading to the loss of privacy for residents.

Manage stimulation

Most of the participants (85 percent) indicated that they “agreed” or “strongly agreed” with the principle of managing levels of stimulation. Participants observed that no attempts

have been made to the environment to regulate audio, olfactory, tactile, or visual stimuli. Living, dining and recreational activities were said to be carried out in one location. They attributed this to a lack of understanding of the impact overstimulation on residents. Some participants cited that the management of stimulation was an impossible task due to the lack of a variety of spaces in the environment, soundproofing, differences in resident's needs, and funding to improve the environment. A participant provided examples of issues encountered with the management of positive stimulation as a result of a lack of knowledge or understanding. Quiet rooms that are designed to provide positive sensory experiences for residents became multi-purpose rooms, doubling up as a storeroom or were left unused as surveillance of residents was not possible for staff. Instead of a room that promotes positive stimulation, some quiet rooms have become a holding area for residents who are noncompliant, which is contradictory to the room's objective as a space associated with positive sensory experiences. Participants acknowledged that there is a need for education and understanding to manage stimulation in the environment to reduce stressors and thereby improve the quality of life for residents with dementia. They cited the need for more innovative technological aids to help with lighting, temperature, surveillance, and sound control in the nursing home. Technology could also be utilised for personalised sensory stimulation or reminiscence therapy. Due to the multiracial population in Singapore, propositions for more culturally appropriate colours and signage were suggested. Participants request for richer, brighter colours instead of pastel colours or shades of black for background. Black was commonly associated with death. Signages should be inclusive of English, Mandarin, Malay and Tamil languages. Participants note that this may not possible on all signage but is ideal.

Support movement and engagement

Participants (82 percent) strongly indicated that they "agreed" or "strongly agreed" with the principle of supporting movement and engagement. Participants shared their observations of external activity spaces such as gardens are found to be locked to deter access for reasons of safety. The complex uniform maze-like design and layout of nursing homes was seen to be restrictive in design, preventing residents from moving around the internal spaces. Participants recognised the discouragement of free movement, of walking, as a restriction of basic human rights. Participants touched on the reasons that have resulted in environmental designs that restrict movement and engagement, citing fear due to

recommendations from family caregivers or staff as a result of the inability to be financially compensated should the resident require additional medical care as a result of injury. Due to the vertical design of facilities, participants wanted to see more internal wandering paths with wider pathways for wheelchair accessibility, fewer exit doors and clutter. Better facility design to enable residents to travel between floors was also requested by participants.

Familiar Place

Almost all participants (91 percent) indicated that they “agreed” or “strongly agreed” regarding the appropriateness of the principle of creating a familiar place. Hospitals or prisons were common descriptors used for the design of the built environment of nursing homes, though a small number of participants cited that they have observed nursing homes adopting the principle of creating a familiar place. Participants reported that the lack of familiarity in the environment brought about feelings of frustration and anger in residents living with dementia in aged care facilities. A diverse population of residents from a multiracial and multi-religious background was cited as an obstacle for providing a familiar environment by nursing staff, and it was hard to provide care that can meet the needs of each person. Participants however agreed that a familiar environment will encourage a person to be engaged, improve their wellbeing and quality of life. An environment that allows participants to include cultural or religious artefacts can contribute to a home-like and familiar environment contributing to the residents’ sense of identity.

Provide opportunities to be alone or with others

Only 78 percent of participants indicated that they “agreed” or “strongly agreed” with the need for the implementation of the principle of providing opportunities to be alone, with other residents or with others from the community. A recurring theme in the discussion was about the lack of privacy in facilities and an overwhelming exposure to fellow residents in facility. As mentioned, quiet rooms or spaces in which to be alone may not be inappropriately utilised, leaving residents with no appropriate private spaces. Spaces for religious or spiritual reflection that can be utilised alone or with other residents was a need identified by participants to be included in the design of facilities. Participants indicated that nursing homes are inaccessible as they can be geographically situated away from local communities. Families with children find it difficult to visit due to lack of family friendly spaces available. Participants shared that in some facilities, no chairs are available for families resulting in

visits taking a physical and mental toll on visitors. Participants however have observed large events involving volunteers and residents being carried out in large halls, which enable interaction with the community. In discussions concerning the rationale for the lack of a variety of spaces, participants highlighted the lack of awareness and stigma that is prevalent in the design of environments for people living with dementia. People with dementia may be seen as confused, hostile and a danger to themselves and others and therefore they are not encouraged to come in contact with the broader community or to be alone.

To improve opportunities for connection with the community, participants suggested that designs should incorporate intergenerational spaces, nursing homes that do not contain fences or clear boundaries, computer rooms, rooms for religious or spiritual contemplation, communal spaces such as outdoor exercise spaces and the inclusion of technology to enable telehealth and engagement with the community.

Support the values and goals of care

Most participants (83 percent) indicated that they “agreed” or “strongly agreed” with the principle of supporting the values and goals of care. Participants indicated that they have observed some environments that were disabling with a poor fit between the design of the environment and the positive, enabling model of care presented by the nursing homes. Participants explained that there was a need for collaboration and consultation between all stakeholders involved in the planning, design and development of the facility to avoid the design falling into a default hospital-like design. These stakeholders include the architects, builders, operators, staff, family caregivers and policy holders. Participants called for more discussion to consider the culture of care and current constraints, such as the issues surrounding the safety and autonomy of residents.

Discussion

The quantitative results indicated that with a maximum score of 7 and means of 5.86 to 6.20 (SD =1.075 to 1.379) participants found that the principles of design were appropriate for use in evaluating the design of nursing homes in Singapore. The qualitative results support the application of the 8 principles. They were found to be aligned with the characteristics of the built environment that contribute to the well-being of people with dementia living in aged care facilities in Singapore. Additional facilities such technology,

spaces for palliation and spiritual or religious spaces are required to meet the cultural needs of Singaporeans. For a facility to include the characteristics of the built environment that reflects the Singaporean culture, participants encouraged designs that resemble the built environment of HDB flats and their surroundings. Participants found several key characteristics not mentioned in the description of the principles that, in their opinion, will significantly contribute to the usability and relevance of the Singapore Environmental Assessment Tool. They called for the recognition of the need to future-proof facilities by ensuring that technology can be integrated into the environment as it is found to be highly beneficial for active ageing interventions, telehealth and the introduction of unobtrusive safety features (Merkel, et al., 2019). They pointed out that the inclusion of spaces for palliative care is a significant issue. Ng et al., (2016) reported that nursing homes in Singapore did not provide palliative care. Participants wish to see spaces that can provide for palliative care that preserved the dignity and privacy of the resident and their family. Space for religion or spirituality was also a key element identified in the study which was aligned with the evidence that 90 percent of nursing home residents in Singapore identified as having a religion (Tiong et al., 2013). Spaces where residents are able to display their personal religious artefacts and retire to engage in personal spiritual reflection can enhance residents experience of a home-like and familiar environment.

Participants were of the view that the application of the principles of design in facilities providing high levels of care for people living with dementia would enable residents to have a better quality of life and care. The implementation of the principles would provide significant benefits, promoting inclusion for residents, staff, families and people in the community and a sense of positive wellbeing.

Conclusion

The study demonstrates that the eight principles of design that form the foundation of the EAT-HC are accepted as being suitable for the planning, development and evaluation of aged care facilities in Singapore. Participants were of the view that a cultural adaptation of the EAT-HC has the potential to improve the quality of life for residents living with dementia. Participants shared their observation, experience and understanding of barriers and facilitators in environments in Singapore for residents living with dementia. In addition, they identified culturally sensitive characteristics associated with environmental design such as

technology, palliative care, spaces for spirituality should be included to reflect the needs of Singaporeans living with dementia. The study also suggested that there is a need for the design to evolve and to embrace the characteristics of the local HDB flats for a familiar home-like environment that is true reflection of the identity of a Singaporean home. The evidence in this study sets the foundation for the development of a Singapore version of the EAT-HC, as it provides an understanding of the cultural needs of Singaporeans in the context of the aged care facilities. The acceptance of the eight principles of design, and the identified characteristics, facilitators and barriers of the built environment specific to the population supports the adaptation of the EAT-HC for Singapore.

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Extended Discussion

The study provides supporting evidence for the acceptance of the eight principles of design for the foundation of an environmental assessment tool for Singapore. It contains information on culturally specific characteristics that should be included in the tool to ensure that cultural sensitivities are addressed. The goal of the paper was to present readers with an understanding of the level of acceptance of the eight principles of design underpinning the EAT-HC in Singapore. In addition to the level of acceptance, participants provided insight into culturally specific themes associated with the barriers and facilitators found in Singapore. The understanding of these barriers and facilitators are crucial as the level of understanding of these themes will have tangible implications for the development and implementation of the assessment tool into the future. The extended discussion serves to fill the gaps and provide a comprehensive insight accompanied by quotations from participants to enable the voices of participant to be fully utilised as evidence. Verbatim quotations can enable readers to gain a realistic insight into the severity, level of urgency or indifference about key issues and feel the emotional nuances that could not be presented in the narrative. Detailed findings leading to the understanding of the barriers and facilitators will be able to contribute to implementing strategies to ensure the successful application of a Singaporean version of the EAT-HC within Singapore.

Participants identified present barriers that, if unchanged, may have implications for the implementation of a Singaporean version of the EAT-HC. Three key themes have arisen from the qualitative data analysed and the following sections deliver the voices of the participants to the readers, and provide an insight into the needs that have to be addressed to ensure the successful implementation and use of dementia enabling environments. The key themes are;

- 1. The need for a definition of the nursing home for people living with dementia**
- 2. The need to increase the understanding of the role of the environment in dementia care**
- 3. The need for an environment to promote social inclusion and citizenship**

1. The need for a definition of the nursing home for people living with dementia

Nursing homes are residential aged care facilities providing long term care for people living with dementia. In Singapore, the built environment for a nursing home is designed in the likeness of an acute care facility. It begs the question, what is a nursing home in Singapore? Is it a facility designed to deliver acute care for people living with dementia requiring long term care? Participants provided their insight into the matter through their discussions about the current environments and the impacts the current situation has on care delivery and the quality of life of the residents they engage with and who are living with dementia.

“Nursing home was the reason why they want to solve the whole overcrowding in hospital. The idea really is because we are talking about post-war and all that, and people start to become more affluent and medication management becomes more mainstream... Your nursing home is just a by-product of the hospital. But if they are a by-product of the hospital, their KPI, their structure is very medical base, that means their space to support movement and engagement. This is not their main consideration because if a client falls down, they will blame your safety, but if you got movement, no one is going to come in and say that it’s a good thing. If you know someone falls down, you will be blamed and everyone. The system doesn’t support, and this is a very important thing. Honestly, but to get this, you need a lot of support, you need, basically need a calculated risk as far as we are concerned we are able to provide this but at the same time something that’s a conflict, the whole entire management must be able to support you if you take the view of quality of life.”

(Participant, Allied Health Professional)

In 23 focus groups, the current nursing home environment was described as a “hospital” or “institution” 44 times. Descriptions of the current nursing homes from participants were associated with built design elements found in hospitals. Participants indicated that ward like rooms, geriatric chairs with seat belts, hospital beds, and communal toileting amenities were a common sight. Large multi-purpose halls accommodating most of the residents and doubling as dining, activity and living spaces were found in nursing homes. The data indicates that residents are agitated, confused, and overstimulated in these large

group spaces.

“I think a lot of them nursing home, is totally a hospital setting so it’s just like going to a hospital so a lot of the times the staff will also (working in a hospital).”

(Participant, Nurse)

A pathogenic acute care design can influence the behaviours of staff and how they deliver care. When working in an acute like environment, staff who find themselves in a hospital-like environment take cues from their surroundings and carry out their roles much like nurses in acute care working to prioritise and deliver clinical care. In addition, participants indicate that the hospital-like surroundings encourage staff to develop expectations and engage and communicate with residents in line with a hospital setting and label residents as “patients”. Participants indicate that expectations of the residents are similar to that of patients in a hospital setting. They state that residents are required to be “managed”, and any behaviours or interventions that do not conform to clinical care “restricted” or “stopped”. One example provided by a participant indicated that pet therapy is not aligned with clinical roles and is not accepted in the nursing home.

“I’ll say this set up when they did it, they plan it for hospital-like. People (residents) come in and expect to discharge and go home... And they don’t expect too much activities.”

(Participant, Nurse)

In a nursing home with hospital-like environments, residents have been observed to identify themselves as patients. Residents were reported as believing that they were in an acute care facility and therefore would not be residing in the facility for a long period of time. Residents expected to be discharged and return to their homes. Much like a hospital environment, residents do not come to expect the delivery of psychosocial care or interventions.

“To support them in terms of social wellbeing then who is actually going to cover the bill.”

(Participant, Aged Care Worker)

Costs have also been identified as a barrier to implementation with participants concerned that dementia enabling environments that enable the support of social care will be expensive and not attainable.

Participants acknowledge that there is a clear discrepancy between what a nursing home is at present and what a nursing home should be. It is understood that a nursing home is a long-term care facility that should be providing both clinical and social care for people living with dementia. However, nursing homes as they presently are are acute-like facilities that adopt a medical model of care and with a fear that environmental improvements will contribute to additional costs that service providers will have to bear. Despite the awareness that the current environments are not suitable for residents living with dementia, the financial burden associated with a change of design remains a barrier to improvement.

In summary, participants shared that more awareness is required to facilitate dementia enabling environments. Current barriers to understanding that environments that promote disengagement or restraint are not ideal for people living with dementia should be addressed publicly. There is a deep-seated agreement that there should be a change in the cultural and community belief that the built environment should be designed with the preservation of physiological needs and the quantity of life, mitigating social, psychological, emotional and spiritual needs of a person with dementia.

2. The need to increase the understanding of the role of the environment in dementia care

There appears to be a gap in knowledge regarding the role of the built environment in the care for people living with dementia. In addition to the adoption of a pathogenic design in nursing homes for people living with dementia, participants highlighted that an environment that promotes longevity is an environment that is presently reflective of a culturally meaningful measure of life. Participants share that presently there is a focus on a protective environment aimed at preserving life, promoting disengagement and minimising physical injuries.

“I would always be worried about, oh is this the best thing for my parents, for my mother? What if she has a fall? So in terms of managing risks, the concept is I’m supposed to give them the best care. So putting her in the nursing home is the best care I can give her, so if she

falls down in the nursing home, you're telling me that is actually good care?"

(Participant, Caregiver)

Results reflect common barriers found across East and Southeast Asia such as, intrusive or lack of measures to reduce risks, and the scale of current environments do not meet the needs of residents, staff, families or the public (Sun & Fleming, 2017). The reduction of risk to the physical body is a constant theme that is also aligned with facilities in East and Southeast Asia (Sun & Fleming, 2017). Notably, participants reported “falls” as a key outcome indicator of the performance of a nursing home; to reflect a positive performance, reducing falls risk has become a priority. The environmental design focuses heavily on the reduction of physical risks, taking precedence over resident’s rights, privacy, social inclusion, mobility, and autonomy. The results are pathogenic spaces that are disabling and detrimental to the resident’s mental health as it invokes frustration, anger or distress. (Chuang and Abbey, 2009; Wu et al., 2009; Wee et al., 2015; Sun & Fleming, 2017).

Key built environment design elements that are associated with dementia for nursing home environments at present include the need for soundproofing, spaces, and elements to enhance seclusion and disengagement. Soundproofing is required to ensure that residents who express responsive behaviours such as verbal agitation cannot be heard. Locked rooms for seclusion are utilised for residents when they exhibit responsive behaviours or engage in any behaviours deemed risk averse by staff. Doors and entrances are locked, and bedrooms are used to discourage movement or reduce risks. Quiet rooms that provided a calming and comfortable space for residents living with dementia were turned into storage rooms by staff who did not understand the significance of the space.

“They (aged care staff) are really concerned about falls, and they are going to such extent that they want the person with dementia to be seated most of the time in the day because they worry about the person having injuries and falls.”

(Participant, Caregiver)

Participants working with resident report that a culture of dependency among older adults may also contribute to residents accepting a pathogenic environment that promotes care dependency. Two different perspectives were provided by participants as the cause for

residents' dependency. Firstly, residents look upon themselves as a burden on society and therefore accept care without question. They only engage in activities with assistance to ensure they come to no harm and so not to contribute to additional burden on family or staff. The second is a cultural perspective observed by participants. They found that some older adults receiving care expect all means of support and protection from staff. These older adults wish to be fully assisted and do not wish to engage in activities independently. Research is required to understand residents' motivations behind their need for disengagement.

For Singaporeans living with dementia, the quantity of life is associated intrinsically with care, and it is given precedence over the quality of life and instead of having a life that seeks to attain both longevity and meaning. Therefore, the environments contain designs that are posed to reduce any physical risks for people living with dementia. However, with the aged care workforce, residents, family, and public acceptance of the belief that residents should be protected from any physiological harm, environmental design continues to take on a pathogenic design, focusing on risk reduction and disablement. Participants advocating for dementia enabling environments express frustration at the lack of awareness that continues to be a barrier preventing the implementation of improved environments that can aid dementia care.

“There’s an incident then the home the high care facility tends to get the blame and is the tendency to have to go through this whole investigation. Why this, why that and ya, then it becomes this over-protective environment again.”

(Participant, Nurse)

Participants shared that residents living with dementia are a liability and require a high level of protection which is reflected in the design of the built environment. Because there is a lack of awareness and support from the public and the health system, creating salutogenic environments is not sustainable in the current landscaper when awareness and acceptance are low. Should dementia enabling environments be adopted, the designs may not be adhered to for long and may change should any residents encounter any physiological harm due followed by public, bureaucratic or legal backlash.

3. The need for an environment to promote social inclusion and citizenship

Findings indicate a need for environments to promote social inclusion and citizenship and that reflect the rights and freedom of the individual. Participants shared their thoughts on an ideal environment for Singaporeans, providing examples of environments that are inclusive, respectful, familiar, and dignified for older adults.

“In a nursing home, it’s sort of like a prison, no freedom, there’s a lot of regulation.”

(Participant, Nurse)

Environments that are ageist and promote a disease-specific culture of disablement were undesirable environments.

"legal issue, protection, they try and restrict them, and the understanding of home should be run is very limited. That’s why most of the home, in Singapore nursing home it’s always locked, people are locked in. So that is very sad because sometimes they want to be out but you can’t move them."

(Participant, Nurse)

However, the environments found in the present landscape appear to be vastly different. Participants (n=10) described environments that they have experienced as a “prison” or a “jail” with little autonomy. Residents living with dementia were referred to as “patients” and associated with “behaviours” by some participants. The term "patient" with reference to a resident was mentioned 25 times throughout the focus group discussions. Residents living with dementia appear to be associated with responsive behaviours. Participants shared the challenges of providing person-centred care but finding it impossible to implement because of the problems associated with deteriorating cognitive impairments and complexities associated with personalities. Given the association of problems and complexities of caring for residents living with dementia, the only support that some residents may receive is with basic activities such as having their meals or with personal hygiene.

"Residents need to be quiet - We have difficulty because many times when clients with dementia they are very agitated they tend to be very hostile and the noise is a concern."

"The problems and challenges varies because of the complexities of the human mind... They have developed different types of so called problems. It's not easy to actually find stimulation to interest all these locals, you have endless and never-ending ... the only stimulation we can actually achieve is try to achieve so that they can still have the ability to do their basic day to day needs. For example, eating all this and going toilet."

(Participant, Nurse)

Aged care staff is aware of a person-centred model of care; however, they share that a medical model of care experienced in acute care facilities that is regulated and structured is a familiar model of care even in the aged care sector.

"Each of us are fearful of putting certain things at risk, it's always good and safe to fall back to something familiar."

(Participant, Allied Health Professional)

Some environmental designs were suggested to be highly disabling. Spaces, furniture, and furnishings were utilised to obtrusively reduce risk resulting in the feeling of disempowerment and the loss of autonomy. The use of locked rooms, bedrails, and gates to reduce negative emotions and behaviours appear to contribute to a cycle of responsive behaviours exhibited by residents living with dementia. The evidence indicates that obtrusive environments do not contribute to the reduction of behaviours but adds to a chronic sense of frustration for both the resident and the staff (Figure 8). Disabling designs only add to reduce the quality of life for the resident and do not aid to support staff in the provision of care.

"Like a proper rail for the bed which is actually an assistive device which you can order from online then they just add it to the bed then the person cannot get out of bed because there are lock and things like that. So that's the proper way, so I think there are not very well informed of what is available to help them to serve the needs."

“We take away the person’s autonomy or independence. I guess in the current context in the nursing home they are very afraid of the resident to fall therefore, they are only restricted in this small area.”

(Participant, Allied Health Professional)

“This patient has passed away already. When he is seated up, he says “makan, makan”, “eat, eat” all the time you know. There are residents who want to see doctor all the time, how can you prevent that? You can’t. So, manage levels of stimulation how do you actually manage the patient? Ya (sic)? By restricting their behaviour, that may be a way to deter them but is that the best solution or not? Cases like that we use to restrict them from coming out from the room and somehow they stop their behaviour but they come up with other behaviours. Like “I want food, I want food” all the time, ya.”

(Participant, Nurse)

Figure 8. The use of obtrusive environments to address unmet needs and a cycle of negative wellbeing

"Having dementia, it's already very disabling, then you take away so many things away from me... I become something that I don't know what I'm becoming because my environment doesn't support these things."

(Participant, Nurse)

"I would agree from what I know currently, nursing homes have a very structured timetable and are structure, very structured venues for where each activity should take place. Like today I just visited a nursing home and the residents were having lunch, and then halfway through lunch, the nurse pulled down the shutter and they were all seated down, and they were having lunch. If somebody finishes lunch earlier can they and if they are able to, they leave and go to another area to watch TV. But because the nurse pulled down the shutter, so everybody is trapped in the dining room and so if I were in a nursing home and I am able to walk, I can't leave the table to go and watch TV or go and use the toilet without asking for permission."

(Participant, Allied Health Professional)

The current built environment does not provide for familiarity or autonomy and requires a design that can promote a meaningful sense of self. Descriptions from participants indicate that residents reside in bedrooms that are similar to open wards, with indistinguishable hospital beds, communal spaces and lockers. Participants indicate that residents may not be able to bring their personal belongings because there is insufficient space or regulations that prevent collection of personal belongings. Participants also shared that the inability to bring personal belongings has a negative effect on sense of identity and mental health. In large open wards-like bedrooms with multiple residents in the same space, for residents living with dementia, waking up in an unfamiliar bed and surrounded by an unfamiliar environment is daunting. Because of space constraints, residents may not be able to store their mobility aids by their bedside or within reach; instead, mobility aids are stored in a communal area. The inability of residents to access their personal mobility aids restricts residents and discourages them from maintaining their mobility. Some designs may have long corridors between rooms without space to rest, eliciting fear of falls and discouraging residents from independently walking from one room to another. Participants said that the

lack of freedom, autonomy and quality of life were associated with residents being homeless, prisoners or social outcast. The view was that nursing homes are perceived by the public to be an unsafe environment that serves as "a dumping ground" for residents "until the last day of their life".

"You feel like you are going to the death, the end of the road like that."

(Participant, Nurse)

"A typical bed is like a hospital bed, only half a cubicle not a full cubicle for your own personal belonging so that in itself is never sufficient. Your whole life is reduced to half a cupboard I don't know how that is vaguely possible. Some don't even have a cupboard per say."

(Participant, Nurse)

"Even watching your favourite program, you don't get to choose what you like to watch ... there are forty over people in this ward."

(Participant, Nurse)

Family caregivers have also expressed unhappiness regarding the design of nursing homes citing the lack of inclusive spaces to allow families to engage with the residents. Family members shared their feelings about having their conversations heard by staff and other residents in the facility because of the open nature of the nursing homes and lack of private spaces. Families would have to stand during visits and sometimes only allowed to stand around the bed as the bed was the only personal space available to the family and the resident. The design of the nursing homes also allowed for people to be segregated into open wards and by gender; married couples did not have the option to share a room.

"The only place you can gather is either at the bedside or at the bigger dining area where there are also probably other family members and it just seems very institutionalised a bit like a prison in that sense. Ya, and you can hear each other's conversation and if you want to interact or talk a bit more, it's kind of limited, cause (sic) everybody can hear you"

(Participant, Caregiver)

The built environment is subjected to seclusion from society and the wider community. Prices of surrounding residential properties were suggested to have a negative impact if a nursing home is close to the properties. During the study, participants shared that there was a strong stigma associated with dementia and it was a taboo topic among family members. Notions of shame, embarrassment, burden, or liability were mentioned. Dementia was associated with individuals who have lost their minds. Residents living with dementia were perceived by some participants to be dangerous to themselves, the people around them and the community, and should be secluded or restrained for the safety of the community.

Culturally Specific Design Recommendations

It can be observed from the findings that a familiar and home-like environment is needed in nursing homes. However, design recommendations that were culturally specific were not found in the description of current nursing homes provided by participants. Participants' design recommendations contribute to a narrative of the definition of a nursing home, and elements of a home-like and familiar built environment that supports the culturally sensitive and appropriate care of people living with dementia in Singapore. Participants' recommendations also provide insights into familiar and home-like designs that can promote social inclusion and citizenship.

"That's why I am saying using HDB blocks and make it into a home."

(Participant, Allied Health Professional)

"You know HDB that's a five room, three bedrooms, four, this can be converted into just a small home then a carer inside just two or what go around and care then see their needs then let them do and go round."

(Participant, Administrator)

Participants requested nursing homes to mirror the built environment of the Housing Development Board (HDB) flats. Some participants recommended that old flats, or parts of an HDB flat, could be converted to facilities for nursing homes or nursing homes be designed

to have features similar to those in HDB flats. Each unit in the flat can provide accommodation for three to five individuals with two care staff providing aid. Participants requested communal areas that are inclusive of families and visitors and that could promote movement and engagement. One family caregiver recommended the implementation of familiar age-friendly outdoor spaces containing exercise equipment, known as "fitness zones", that are found in existing public housing estates across the country. These age-friendly fitness spaces in Singapore consist of an outdoor open space; some of which may have rubberised flooring. There may be three to ten different pieces of fitness equipment such as elliptical cross-trainers, sit up benches, balance beams and other fitness equipment aimed at maintaining physical strength or stamina. Play areas for young children or children's' playgrounds were also suggested as the current facility designs are not inclusive of young children. Grandchildren are excluded from visits because there are no spaces for children to sit or gather.

"Kopi Thiams", which translates to coffee shops, are Singaporean style coffee shops and was one such feature requested by participants to be included within a nursing home. Kopi Thiam(s) is a unique feature in Singapore that has strong cultural and historical significance in the lives of generations of Singaporeans. These Kopi Thiams are found in HDB estates throughout Singapore and they are an inclusive community environment where Singaporeans of different ages gather for meals or for a chat. These spaces provide a place for families to have an affordable meal close to home, for friends to gather, and even for politicians to meet the public. Much as in some countries where a local watering hole can be found to enable locals to gather and foster relationships, the Kopi Thiam is a local establishment that allows locals to gather. Kopi Thiams can be found in the ground floor of HDB flats or shophouses. The distinct characteristic of a Kopi Thiam is the inclusion of a prominent drink stall that serves local coffee and tea, an assortment of local style eggs and toast, snacks and alcoholic and non-alcoholic beverages. Some Kopi Thiams may have additional food stalls that serve local dishes. Some establishments may open from early morning until late into the night. The design generally consists of a shop space with an open layout and with an entrance where customers can enter without opening any doors. Traditionally the drink stall was a large steel counter where beverages and food were made, with round marble-top tables, stools and wooden chairs arranged tightly. Fans are a common sight to reduce the temperature of the environment. The design of Kopi Thiams in recent

years has evolved slightly to meet the needs of the changing population. The built environment has increased in size to accommodate a larger number of customers. Larger Kopi Thiams found in HDB estates may have plastic tables and stools, brighter lighting, a television available for public viewing, and large plastic signage. To meet the needs of the younger population, some Kopi Thiams may now be found within shopping malls and with expensive and more comfortable furnishings while maintaining the essential design characteristics that contribute to the familiarity of a Kopi Thiam.

These spaces allow family members to continue to engage positively with their loved ones who are mobile. As one participant suggested, outdoor spaces can allow families to continue to engage with their loved ones, especially for people who may not be able to, or wish to, communicate verbally because of memory loss, apraxia, or depression.

Conclusion

Participants suggested that greater awareness and education about the built environment and its impact on people living with dementia among the public, staff, family, management, and government may lead to better design, inclusion and citizenship for residents living with dementia. Participants shared that an increased awareness of the principles of design will encourage more facilities providing high levels of care for people living with dementia to understand the need for an integrated and collaborative approach. A consultative process that is inclusive of residents, family, aged care staff, architects and the community will allow for the creation of Singapore centric dementia enabling environments that are salutogenic and beneficial to the community within and outside of the facility. As expressed by participants, the environment can influence the behaviours, expectations, and perceptions of the person with dementia, staff, family, and the community. Inclusive designs that can be beneficial to the public, such as facilities providing a home-like and familiar design with intergenerational spaces, can help to reduce the stigma of nursing homes in the community. The implementation of the principles would provide significant benefits, creating a salutogenic environment that promotes inclusion for residents, staff, families, and people in the community and promoting a sense of positive wellbeing.

The extended discussion allows participant voices and key recommendations to be presented. The qualitative data presented in the discussion can allow readers to envision the present and ideal states of a Singaporean nursing home for people living with dementia.

Readers are also provided with detailed observations, perspectives, understanding of the current challenges and needs that are required to be met to enable dementia environmental designs to flourish in Singapore. The extended discussion contributes to dementia enabling design recommendations that are culturally specific to nursing home in Singapore and identifies barriers to implementation. Gaps in knowledge in the understanding of dementia, dementia care and enabling environments in Singapore are clearly identified and point to a need for more research to understand the barriers and facilitators that can enable the implementation of a Singapore version of the EAT-HC.

Results from the study prove to be vital in the development of an Environmental Assessment Tool for facilities providing high levels of care for people living with dementia in Singapore. The inclusion of the potential users from Singapore in the investigation provided evidence from participants of barriers and facilitators which can have potential impacts upon the implementation of a Singaporean version of the tool. Overall, there is evidence that the principles of design that contribute to the foundations of the Australian EAT-HC is well-accepted by the participants who work with or care for people living with dementia in Singapore. This evidence indicates that there is potential for the EAT-HC to be adapted for the Singaporean population. The discovery of Singapore specific characteristics of the environment that emerged from the study enables researchers to adjust for the inclusion of culturally specific items within the Singaporean version of the EAT-HC. Lastly, understanding the local barrier and facilitators that may have an impact on the development of the tool will enable researchers to review strategies and interventions that can be introduced during the developmental stages of the study to plan for and overcome potential challenges in the next stage of the study. Understanding local barrier and facilitators that may impact the implementation process will allow researchers to review means by which the gap in knowledge can be addressed to ensure that the Singaporean version of the tool, once developed, can continue to be utilised for years to come.

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Chapter 4: The development and reliability of the Singaporean Environmental Assessment Tool (SEAT) for facilities providing high levels of care for people living with dementia

The article written is by the candidate and submitted for publication.

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Research Question relevant to the chapter:

Research Question: What questions should be included in this tool? Does the tool have satisfactory psychometric and usability properties?

The chapter outlines the development and testing of the Singapore version of the Environmental Assessment Tool for facilities providing high levels of care to people living with dementia. Results indicate that the Singapore version of the tool has an acceptable level of usability and a moderate level of reliability among subscales. The final 83-item tool had seven more questions than the Australian version of the tool because it included additional culturally appropriate items. For the tool to be adequately utilised, it is recommended that the tool be carried out by users who have knowledge of dementia enabling environments.

A commentary has been included to highlight the limitations encountered in the recruitment process in this international study arising from the limited amount of research carried out in aged care in Singapore and the low awareness of dementia enabling environments.

Implications for practice:

- The study introduces an environmental assessment tool developed for the Singaporean living with dementia in facilities providing high levels of care.
- The study provides insights into the rigorous development and testing processes and review of the level of usability, reliability, validity, and cultural appropriateness.
- The study indicates that the Singaporean Environmental Assessment Tool (SEAT) is reliable, valid, and appropriate for the Singaporean population.
- The findings indicate that knowledge and education in dementia enabling environments can empower users to use the SEAT with confidence.
- The availability of the SEAT can help guide stakeholders who are planning, designing or evaluating facilities providing high levels of care for people living with dementia in Singapore.
- The development of the SEAT can have direct implications on the design of the built environment and lead to the promotion of salutogenic environments that can have a positive impact on the well-being of people living with dementia in Singapore.

Abstract

Background: This paper describes the development of a culturally appropriate, usable, reliable, and valid assessment tool designed to evaluate the extent to which the built environment in Singaporean aged care facilities is able to support the provision of high levels of care to people living with dementia.

Methods: A multi-stage sequential mixed methods approach was carried out involving sixteen raters in stage one and six raters in stage two using an adapted version of the Environmental Audit Tool High-Care (EAT-HC) in eight nursing homes. The first stage captured qualitative data on cultural sensitivities and usability of the tool. The tool was improved based on the findings and in the second stage the usability and psychometric properties of the modified tool were again assessed. Usability was determined by data collected via the System Usability Scale (SUS) and the Questions to Assess Barriers and Facilitators survey. Psychometric properties were examined by the calculation of percentage agreement. Item level interrater agreement was measured using Fleiss' kappa, and Cronbach Alpha was used to measure the internal consistency of the sub-scale scores.

Results: The adapted tool was found have an acceptable level of usability, and moderate level of reliability among subscales.

Conclusion: The study indicates that the tool is reliable and valid when completed by users with knowledge of dementia enabling environments. For the tool to be used with confidence, education in the application of principles of design to the design of environments for people living with dementia is recommended prior to its use.

Introduction

Since the late 1980s, research into dementia enabling environments has identified the significant positive health outcomes that the built environment has on a person living with dementia (Cohen, Ray, & Weisman, 1988; Judd, Marshall, Phippen, & Dowle, 1998; Fleming, Bowles, & Mellor, 1989). The evidence indicates that there is a substantial correlation between the built environment and health outcomes such as wellbeing, behaviour, quality of care, and the ability to carry out activities of daily living (Marquardt, Bueter, & Motzek, 2014; Chaudhury, Cooke, Cowie, & Razaghi, 2017; Fleming & Purandare, 2010). The need for purpose-built nursing homes for people living with dementia has become a national priority in Singapore to meet the needs of an ageing population. In the Well-being of the Singaporean Elderly (WiSE) study, the prevalence of dementia among Singaporeans was found to be 10 percent in older adults aged 60 and older with age being a key factor (Subramaniam et al., 2015). In 2015, it was estimated that 45,000 people were living with dementia in Singapore, and by 2030 the number will have risen to 103,000 (Prince, 2015). There are no assessment tools able to provide information on the presence or absence of characteristics that support people living with dementia in Singapore and other parts of Asia. There is a lack of evidence-based guidance and support for the planning, development and construction of residential aged care facilities in this area (Sun & Fleming, 2018). The increasing number of people living with dementia in Singapore and the demand for purpose-built residential aged care facilities has resulted in the need for a culturally appropriate, usable, reliable and validated environmental assessment tool for the Singaporean population.

The Environmental Audit Tool High-Care (EAT-HC)

The EAT-HC has been identified as a useful and reliable dementia specific environmental assessment tool (Fleming & Bennett, 2015) that could be adapted for the

Singaporean population and used to create environments that enable and empower people living with dementia with varied levels of mobility (Sun & Fleming, 2018; Sun, 2020). The EAT-HC is widely used by a range of stakeholders to evaluate the built environment for people living with dementia in Australia and is one of the resources recommended by the Australian Aged Care Quality Standards Commission to assist aged care providers meet the 2019 standards <https://www.dta.com.au/aged-care-quality-standards/> (Dementia Training Australia, 2020). In addition, the tool is based on a set of design principles (Table 9) that have informed the development of aged care facilities for the last three decades in Australia (Fleming, 2011; Fleming & Bennett, 2014; Fleming & Bennett, 2015; Fleming, Goodenough, Low, Chenoweth, & Brodaty, 2016; Fleming, Kelly, & Stillfried, 2015; Smith et al., 2012).

Table 9. Key Design Principles (Fleming & Bennett, 2015b, p. 3).

1. Unobtrusively reduce risks

People with dementia require an internal and external environment that is safe, secure, and easy to move around in if they are to make the best of their remaining abilities. However, obvious safety features and barriers will lead to frustration, agitation, and anger and so potential risks need to be reduced unobtrusively.

2. Provide a human scale

The scale of a building will have an effect on the behaviour and feelings of a person with dementia. The experience of scale is determined by the number of people that the person encounters and the overall size of the building. A person should not be intimidated by the size of the surroundings; rather, scale should help the person feel in control.

3. Allow people to see and be seen

It is particularly important for people with dementia to be able to recognize where they are, where they have come from, and what they will find if they head in a certain direction. When they can see key places, such as a lounge room, dining room, their bedroom, kitchen or an outdoor area, they are more

able to make choices and find their way to where they want to go. This arrangement can also enable staff to see residents from where they spend most of their time; thus reducing their anxiety and the anxiety of the residents.

4. Manage levels of stimulation

Reduce unhelpful stimulation: Because dementia reduces the ability to filter stimulation and attend to only those things that are important, a person with dementia can become stressed by prolonged exposure to large amounts of stimulation. The environment should be designed to minimize exposure to stimuli that are not helpful.

Enhance helpful stimulation: Enabling the person with dementia to see, hear and smell things that give them cues about where they are and what they can do, can help minimize their confusion and uncertainty. Cues need to be carefully designed so that they do not add to clutter and become over-stimulating.

5. Support movement and engagement

Aimless wandering can be minimized by providing a well-defined pathway, free of obstacles and complex decision points, that guides people past points of interest and gives them opportunities to engage in activities or social interaction. The pathway should be both internal and external, and provide an opportunity and reason to go outside when the weather permits.

6. Create a familiar place

The person with dementia is more able to use and enjoy spaces and objects that were familiar to them in their early life. The environment should afford them the opportunity to maintain their competence through the use of familiar building design (internal and external), furniture, fittings, and colours. This will involve an understanding of the personal background of the people living in the environment.

7. Provide opportunities to be alone, with other residents, or with others from the community

People with dementia need to be able to choose to be on their own or spend time with others. This requires the provision of a variety of spaces; some for quiet conversation with one or two others and some for larger groups, as well as spaces where people can be by themselves. Without constant

reminders of who they were, a person with dementia will lose their sense of identity. Frequent interaction with friends and relatives can help maintain that identity. The environment must include spaces for the resident and their visitors to use within the unit and in its immediate surrounds. Where possible, a “bridge” should be built between the unit and the community by providing a space that is used by both the community and people with dementia.

8. Support the values and goals of care

An environment that embodies the values and goals of care, e.g. provides opportunities for engagement with the ordinary activities of daily living to support rehabilitation goals, will assist the patient with dementia to respond appropriately and the staff to deliver the desired care. The values and goals need to be clearly stated and the building designed both to support them and to make them evident to the person with dementia and to the staff. The building becomes the embodiment of the philosophy of care, constantly reminding the staff of the values and practices that are required while providing them with the tools they need to do their job.

The objectives of this study were to assess the usability, inter-rater reliability, and validity of the EAT-HC when adapted for a Singaporean population. The intention was for the final version of the Singaporean version of the EAT-HC, the Singapore Environmental Assessment Tool (SEAT), to be culturally appropriate and enable a diverse range of Singaporean stakeholders to collaborate with confidence using the SEAT as a common platform when evaluating, planning, and designing built environments for people living with dementia and with high care needs.

Method

The study consisted of two stages. The first stage was carried out with the objective of refining the cultural relevance of the adapted tool. The second stage consisted of a “parallel mixed design” approach. It was a simultaneous application of both qualitative and quantitative methods (Tashakkori & Teddlie, 2010) to assess the usability, reliability, and

validity of the tool.

Participants

The first stage included sixteen participants who were working in or designing facilities for people living with dementia who had no experience in the use of the SEAT. This sample was deemed to be representative of potential users of the SEAT. In the second stage of the SEAT, six participants with no experience in the use of the SEAT provided the data for the evaluation of its psychometric properties. Three of them, from clinical, administrative, and architectural backgrounds, had no formal training in dementia care. The other three were from the aged care sector and involved in the direct care of people living with dementia. They had received basic awareness to tertiary level education in dementia care.

Setting

The participants used the SEAT to evaluate discrete units used to accommodate people with dementia in a convenience sample of eight nursing homes comprising 10.9 percent of the total number of nursing homes in Singapore (Government of Singapore, 2017). The eight facilities were built between the 1980s and 2016 and offer different layouts, architecture, and interior designs. They ranged from tall compact vertical facilities that blended in with the modern community to older, low-rise, more spacious facilities.

Assessment Tools

The SEAT is an adaptation of the EAT-HC. The adaptation was based on the views of 150 participants who took part in 23 focus groups discussions about the relevance of the principles of design and the content of the individual items. Results from the thematic analysis revealed a high level of acceptance of the applicability of the design principles and the content of the individual items and resulted in the development of six additional items for

the SEAT. This took the total items from 77 items in the original EAT-HC to 83 items used in the first stage of testing.

Results from stage one enabled additional user and culturally specific modifications to be included in the SEAT. Changes were made to improve the readability and usability of the tool and definitions were introduced to improve participants' understanding of the items. After modification, the SEAT was administered in stage two and the SEAT itself was evaluated through the use of the Questions to Assess Barriers and Facilitator (QABF) (Castiglione & Ritchie, 2012) survey and the System Usability Scale (SUS) (Brooke, 1996). The QABF is a survey recommended by the Canadian Institute of Health Research and is designed to assess barriers and facilitators that may have an impact on the implementation of innovations, such as the SEAT (Castiglione & Ritchie, 2012). The QABF addresses the level of awareness, attitudes, acceptance, and commitment of the participants, which in turn provide comprehensive insights on the usability of the SEAT to facilitate a positive implementation process. The System Usability Scale (SUS) is a valid and reliable measure of usability that has been applied in a diverse range of studies and industries (Bangor, Kortum, & Miller, 2009; Lewis, 2018). The 10-item scale has been strongly recommended for use when measuring perceived usability in research (Lewis, 2018). The scale provides insights about the design and applicability to ensure that the tool is user-friendly across a diverse range of users. The QABF and SUS complement each other as together they offer a wide range of insights into the overarching barriers and facilitators that impact on the use of the tool and an evaluation of usability based on task-orientated tools or tests (Lewis, 2018).

Procedure

Preceding their use of the SEAT, all participants took part in an information session where they were given an overview of the objectives of the study and the procedure to be

followed. A copy of the SEAT and the handbook were provided to each participant electronically after the information session was completed and consent was obtained. The handbook provided users with an overview of the key design principles, basic instructions on the use and scoring of the SEAT and brief descriptions of the sort of design recommendations associated with each of the topics covered by the questions. The process was designed to replicate the likelihood that people with little or no experience of using the SEAT will be downloading the handbook and assessment tool electronically for use. The participants administered the SEAT in the eight nursing homes.

All participants in stage one ($n=16$) provided qualitative data on the use of the tool and cultural sensitivities that required review through one-to-one open-ended interviews. All participants ($n=6$) in stage two administered the SEAT in the eight sites and submitted a total of 48 completed assessment tools for analysis. When they had completed the SEAT in all eight sites, the QABF and the SUS were used to obtain qualitative data relating to participants' experiences during the use of the SEAT. Participants were also invited to comment on their experiences of utilising the handbook and SEAT in the sites during the interview.

University of Wollongong Human Research Ethics Committee consented to the ethics approval for the study (application 2016/122).

Data Analysis

Interviews in both stages were transcribed and thematically analysed using NVivo (QSR International Pty. Ltd. 2015). Qualitative nominal data was obtained for both QABF and SUS. Percentage agreement was calculated for the 83 items in the SEAT. The inclusion of multiple raters in the study resulted in the need for interrater reliability to be calculated using Fleiss Kappa. Cronbach Alpha was used to calculate the internal consistency of the

SEAT subscales. Fleiss Kappa and Cronbach Alpha were calculated using SPSS 25 (IBM Corp., 2017). Internal consistency and interrater reliability were not calculated for sub-scale 8 (Table 12.) as the items were designed to capture qualitative data (Fleming & Bennett, 2015). Item reduction analysis for Cronbach Alpha was carried and items with low correlation coefficients (<0.59) were removed. This was repeated until the alphas were equivalent to those published for the EAT-HC. This procedure resulted in the identification of items that had a negative effect on the psychometric properties of the scale and needed to be examined in the light of the qualitative findings to determine whether or not they should continue to be included.

Results

Qualitative results

Qualitative analysis from participants reviewing the cultural sensitivities of the tool in stage one of the studies indicated three fundamental areas of cross-cultural differences in readability, environmental design, and the lack of familiarity with the principles of design. These three key themes influenced the way participants understood items and utilised the tool. Readability issues included unfamiliar words or complex sentence structure leading to more time being required for reading and understanding items. The changes made to the tool included the introduction of culturally familiar words and clearer sentences to improve the readability of the tool. An added issue was the current state of dementia enabling environmental design in Singapore. One of the purposes of the development of the SEAT is to raise awareness of enabling design features but the participants lacked familiarity with these and the infrequency of their presence at the sites made it difficult for some participants to conceptualise them. Questions related to types of visual access, inside and outside environments and variety of spaces caused confusion and uncertainty for some participants.

Participants highlighted cultural differences in vocabulary that reflect the contrasting Singaporean and Australian cultures. Words such as “lounge room”, “kitchen bench”, “unit”, and “unobtrusive” were highlighted as unfamiliar terms and ‘model of care’ required more explanation. Spaces for technology, spirituality, and palliative care, recommended during the development stage of the SEAT as being necessary in new nursing homes and therefore included in the SEAT (Sun & Fleming, 2018), were not found in this sample of nursing homes and their absence added to the uncertainty of some participants.

Conversely, participants expressed a positive acceptance of the SEAT as an aid to the development of dementia enabling environments in Singapore. However, it was clear in the qualitative analysis that there was a lack of an in-depth understanding of the principles of design. Items in the tool are grouped according to principles but participants found it challenging to associate items in the tool with the built environment.

In stage two, the findings from the QABF (Table 10) indicate that all participants had a clear understanding of the SEAT (100%). All participants agreed that the tool met the needs of their roles at work, is valuable to the aged care sector in Singapore and will result in improved residents’ outcomes (100%). Barriers to implementation for users of the tool included the lack of relevant training in built environments for people living with dementia and availability of resources (50%). The participants expressed the view that formal training would have enhanced their use of the tool. Additional time to complete the assessment in facilities, and more aid from staff in the nursing homes by answering questions would also help with the use of the SEAT.

Table 10. Questions to Assess Barriers and Facilitators (Castiglione & Ritchie, 2012).

Questions	Answer	% (n=6)
1. Have you heard or read about the environmental assessment tool before the pilot?	Yes	66.67%
2. Have you observed this tool in use?	No	66.67%
3. What do you know about the tool? (Description provided was an accurate description of the SEAT)	Yes	100.00%
4. Do you already use this innovation?	No	83.33%
5. Do you believe this innovation to be appropriate for aged care in Singapore? Why or why not?	Yes	100.00%
6. Do you think this innovation fits with your role (as a nurse, physician, physical therapist etc....)?	Yes	100.00%
7. Do you think the innovation will lead to improved resident or patient outcomes?	Yes	100.00%
8. Do you feel you have the skills/training needed to carry out the innovation?	Yes	50.00%
9. Do you think that there are enough resources (time, financial, space, personnel) to carry out the assessment tool?	Yes	50.00%
10. Is this innovation important to you? To your colleagues? To the leadership group? To your organisation? To the residents' patients and families?	Yes	100.00%

The overall SUS score of 60 falls into a marginal acceptable range (Brook, 1996). Findings (Table 11) show that participants found the tool well-integrated (66.67%), consistent (66.67%), convenient (66.67%) and simple (83.33%). The SUS results support those found in the QABF with participants confirming that they could be additionally supported by training or education to enhance the use of the tool (66.67%). One third of participants reported requiring assistance to use the SEAT (33.33%). However, half of the participants found that the tool can be understood quickly and that they felt increasingly

confident in the use of the tool as they worked through the eight sites.

Table 11. System Usability Scale (Brooke, 1996).

Questions	Answer	% (n=6)
1. I think that I would like to use this tool frequently.	Disagree	66.67%
2. I found this tool unnecessarily complex.	Agree	16.67%
3. I thought this tool was easy to use.	Agree	50.00%
4. I think that I would need assistance to be able to use this tool.	Agree	33.33%
5. I found the various functions in this tool were well integrated.	Agree	66.67%
6. I thought there was too much inconsistency in this tool.	Disagree	66.67%
7. I would imagine that most people would learn to use this tool very quickly.	Agree	50.00%
8. I found this tool very cumbersome/awkward to use.	Disagree	66.67%
9. I felt very confident using this tool.	Agree	50.00%
10. I needed to learn a lot of things before I could get going with this tool.	Disagree	66.67%

Quantitative Results: Item level

Following the assessment of the original EAT-HC, the final subscale consisting of two questions (items 82 and 83) that capture the subjective feedback of the facility managers regarding how the goals of care are supported by the environmental design of the facility were not included in the quantitative analysis (Fleming & Bennett, 2015).

Percentage agreement was assessed across the eight sites, with 75 percent set as the minimum acceptable level, i.e. more than 75% of the 48 ratings on the item (6 raters by 8 sites) were the same (Gwet, 2012). The findings indicate that 62 of 81 quantitative items (76.5%) attained a percentage agreement of 75% or more. For the 19 items scoring less than

75 percent, a review of the interrater reliability was conducted using Fleiss Kappa and agreement on 11 items was found to be not statistically significant ($p>0.5$, Table 12) and agreement on the other 8 items ranged from poor ($\kappa=0.123$) to moderate ($\kappa=0.457$) agreement (Table 12).

Table 12. Items and inter-rater reliability results for items with percentage agreement < 75%

Principle/ Subscale	Item No.	Question/item	Items < 75%	K	P Value
1	8	Outside, are the paths wide enough to allow two wheelchairs to pass? (Minimum width is 1.8 metres) to check against latest tool	71%	0.097	0.25
1	14	Inside, is contrast between floor surfaces avoided (e.g. sharp distinction between bedroom floor and corridor)?	73%	0.149	0.10
3	20	What proportion of residents can see the inside of a living room as soon as they leave their bedroom?	54%	-0.012	0.82
3	21	What proportion of residents can see their bedroom entry as soon as they leave a living room? (Bedroom entry includes bedroom door, architrave or other feature specific to a particular bedroom)	54%	0.020	0.72
3	22	[What proportion of residents can see the inside of a dining room as soon as they leave their bedroom?]	54%	0.000	1.00
3	24	Can the dining room(s) be seen into from the living room(s)? (Answer with reference to living and dining room used by most residents) (NA=no living or dining room)	69%	0.048	0.55
3	29	Can a garden or outside area for the residents be seen from where staff spend most of their time? (NA=no outside area)	69%	0.223	0.00
5	36	What percentage of residents have a clearly defined path from their room to the dining room, for example by using colour objects and signage, or can see the dining room from their room?	56%	0.066	0.24
5	37	What percentage of residents have a window that provides an attractive view to the outside from their bed?	60%	0.123	0.03
5	47	Is the dining room(s) clearly recognizable from outside the room? (NA= no dining room)	73%	0.457	0.00
6	61	Inside, is there a path that guides residents past areas that might invite participation in an appropriate activity (such as folding clothes, listening to music)?	73%	0.182	0.05

6	62	Inside, does the path take residents past chairs that provide opportunities for rest and/or conversation?	69%	0.166	0.07
7	65	Have most of the residents decorated their bedrooms (e.g. with photos, pictures, objects)?	69%	0.257	0.00
7	68	Is the design of the space for spiritual or religious activity familiar or culturally appropriate to the majority of residents? (Answer with reference to spiritual or religious space used by most residents) (N/A = spiritual or religious space)	69%	0.352	0.00
8	70	From the unit, within the unit, are there places where a small group of people can gather?	73%	0.005	0.95
8	71	Within the unit, are there places where a person can be on their own and/or in private conversation (e.g. nooks, sitting areas)?	71%	0.206	0.00
8	72	How many different characters are there within the unit (e.g. cosy living, TV room and sunroom)?	73%	0.164	0.02
8	73	Does the dining room allow for a choice to eat alone?	65%	-0.033	0.72
8	74	[Does the living room provide opportunities for people to be in private conversation?]	71%	0.060	0.51

Quantitative Results: Subscales

Cronbach alphas were calculated to assess the internal consistency of subscales 1,3,4,5,6 and 7. Alpha was not calculated for subscale 2 because it only has two items and this is known to reduce the alpha values (Pallant, 2011). Alpha was not calculated for subscale 8 because of the qualitative nature of the response. The alpha values were satisfactory according to the criteria of Taber (2018) after the removal of five items identified in Table 13 as being in a range from 0.60 to 0.744 (Nunnally & Bernstein, 1994).

Table 13. Subscales & internal consistency results

	Principles of Design (n=6)	Original Items	Items Removed	Total Items	Internal Consistency Cronbach Alpha (95% CI)

1	Unobtrusively reduce risks	17	5, 8, 14	14	0.608
2	Provide a human scale	2	-	2	-
3	Allow people to see and be seen	10	-	10	0.744
4	Manage levels of stimulation	24	-	24	0.60
5	Support movement and engagement	9	61	8	0.677
6	Create a familiar place	7	64	6	0.625
7	Provide a variety of places to be alone or with others	12	-	12	0.697
8	Respond to a vision for a way of life	2	-	2	-
	Total Items	83	5	78	

Discussion

Users found the SEAT to be relevant to the Singaporean aged care context but were concerned that the lack of awareness of the impact of the built environment on people with dementia. They suggested a lack of resources required to address environmental changes would be barriers to its use.

The strategy of engaging participants in the use of the SEAT with only minimal training, intended to simulate the use of the SEAT in normal conditions, resulted in some participants experiencing uncertainty about their ability to use the SEAT. However, as seen in stage two, they became familiar with it by working through the eight sites and their confidence increased. The results of the SUS indicated that, after completion of the assessments on eight sites, the participants found the SEAT to be well-integrated, consistent, convenient, and simple to use.

The quantitative results indicate a low level of agreement for 19 items, which could be grounds for excluding these items from the tool. However, examination of these items against the qualitative results suggests that cross-cultural differences and the lack of familiarity contribute to uncertainty and confusion for participants. An examination of the focus of these items revealed that they fall under three themes: visual access (9 items), inside and outside environments (3 items) and variety of spaces (6 items). Participants acknowledged the need for these items as indicators of a good environment for people with dementia and they acknowledged that they are not yet understood or present in the current Singaporean context. They recommend that uncertainty and confusion concerning these items should be alleviated through education and training and therefore these items have remained in the SEAT.

The internal consistency of the subscales was found to be similar to that of the original EAT-HC and above the minimum acceptable level after the exclusion of five items. Three items, items 8, 14 and 61 (as seen in Table 4 and Table 5) were found to have a low level of inter-rater reliability; however, the participants recommended the items be included as they were indicative of desirable design characteristics. The other two items, 5 and 64, dealing with the flooring of external environments and the need for familiar furniture, refer to uncommon but desirable features in nursing homes in Singapore. While the psychometrics could be improved by the exclusion of these items their educational function is considered to be very important (Sun & Fleming, 2018; Sun, 2020). Participants indicated that the tool was an important innovation, especially in aged care, and despite coming from a range of occupational backgrounds they indicated that the SEAT is aligned with their goals of improving aged care, can be learned quickly and is potentially useful to them. Participants recognized the need for the SEAT in environments providing high levels of care for residents

with dementia and the positive impacts that the tool can have on the improvement of the quality of life and care of the residents, families, staff, and operators in nursing homes. Both the qualitative and quantitative results indicate that there is the lack of familiarity and understanding of the characteristics of dementia enabling environments and the need for more information, education and training was a strong theme among all participants.

The final version of the SEAT consists of an 83-item tool and a user guide containing clear, culturally appropriate, and simple instructions, accompanied with diagrams. It has been designed to meet the needs of the users.

Items with poor psychometric properties are highlighted in the SEAT to enable users to distinguish between those that comprise a reliable and internally consistent scale and those that are included for educational purposes. The original idea to develop a version of the EAT that could be used by raters without prior training proved to be challenging in the Singaporean context. If the scale is to be used to measure the quality of the environment, it is recommended that raters should be provided with training that can improve their understanding of dementia enabling environments for people living with dementia and requiring high levels of care. A course specific to increasing the theoretical understanding as well as site visits to nursing homes that have dementia enabling environments should be available. Site visits are crucial as they enable the user to gain knowledge and familiarity through experiential learning. The recommendations are reflective of the qualitative results and current evidence that additional training is required to enable users to address the items adequately as the characteristics of dementia enabling environments are currently unfamiliar in the nursing homes in Singapore (Sun & Fleming, 2018; Sun, 2020). The SEAT will be available for public download on a Singaporean government agency website in 2020.

Conclusion

The SEAT has a high level of usability and combines a scale with an acceptable level of reliability and validity with items that have been included to foster systematic discussion, evaluation, and education for people engaged in the development of facilities for people with dementia. Participants were clearly of the opinion that the SEAT can facilitate positive outcomes for residents, staff, and family caregivers. However, it is also clear that the introduction of education and training will have an impact on the psychometric properties of the tool. Future research is required to evaluate the psychometric properties of the tool after education or training in dementia enabling environments and the use of the tool has been introduced in Singapore.

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Chapter 5: Knowledge Translation: a progress report on the culturally sensitive application of a dementia environment audit tool in Asia.

The article is written by the candidate and presented as a scientific poster at the 3rd Tasmanian Dementia Symposium.

Sun, J., & Fleming, R., (2018). *Knowledge Translation: a progress report on the culturally sensitive application of a dementia environment audit tool in Asia*. [Poster presentation]. 3rd Tasmanian Dementia Symposium, Tasmania. [https://doi: 10.13140/RG.2.2.17915.11047](https://doi.org/10.13140/RG.2.2.17915.11047)

Research Question relevant to the chapter:

Research Question: How can a culturally sensitive tool be implemented and sustained in Singapore and Asia?

This chapter outlines the processes required to facilitate the sustainable adoption of the SEAT. The information in it was presented to a wide Australian audience via a poster at the Tasmanian Dementia Symposium in Hobart in 2018. It was also scheduled for presentation at the Alzheimer's Disease International Conference that was intended to be held in Singapore in March 2020 but the conference was postponed because of the outbreak of the Novel Corona Virus. The poster is targeted at individuals from countries that have a population which has a low awareness of dementia enabling environments and/or research in aged care and who are interested in the adaptation, implementation and sustainability of an environmental assessment tool. Readers are introduced to an applicable knowledge-to-action framework that enables the longevity of the environmental assessment tool after successful implementation.

Abstract

The provision of dementia-enabling environments for residents with high care needs in nursing homes in Asia has been hindered by the lack of a sustainable knowledge translation framework. Failure to translate knowledge into action is prevalent across the regions resulting in the design of homes that do not support the quality of life and care for residents. By utilising the introduction of an environmental assessment tool into Singapore, this report examines the current issues in the design, construction, and management of dementia-enabling environments and how the knowledge-to-action framework can provide a solution to the gap between evidence and practice in Asia. This report suggests the adoption of a knowledge-to-action framework, consisting of knowledge creation and action cycles. The framework can enable countries to implement an environmental assessment tool and promote dementia enabling environments whilst including the ability to interpret and apply the existing evidence in a culturally sensitive manner.

Introduction

Seventeen million, a third of the global population of people with dementia, reside in East and Southeast Asia (Prince, Wimo, & Guerchet, 2015). Despite this substantial number of people living with dementia, the progress in the development of enabling environments for them has been slow and has limited the quality of care provided (Prince et al., 2015; Sun & Fleming, 2018). An acute care medical model of environmental design is dominant in long-term care facilities and reflects a focus on clinical outcomes and immediate solutions (Sun & Fleming, 2018). The institutional layouts of most long-term facilities provide little support for people experiencing cognitive impairment and provide little privacy or familiarity for residents (Tsai & Tsai, 2009; Chuang & Abbey, 2009; Sun & Fleming, 2018). The utilisation of designs based on acute care appears to be accepted by governments, service providers and their staff and is widely accepted by the community despite a large body of evidence showing that they are linked to poor outcomes for people with dementia (Sun & Fleming, 2018; Marks, Emmett & Neitch, 2014).

While there has been considerable research in the United Kingdom, the United States of America and Australia into aspects of environmental design for people with dementia, very little research has been undertaken in Asia (Chuang & Abbey, 2009; Sun & Fleming, 2018). The lack of local research has resulted in the absence of a guiding model for the development and production of sustainable, salutogenic, evidence-based practice that supports people living with dementia across Asia. The gap in Asia may be construed as a result of the lack of knowledge translation that is affecting the infrastructure, care and services provided for people with dementia in long-term care facilities. This situation has been recognised by the executive of the Agency for Integrated Care in Singapore and they are supporting the introduction of a tool to support the systematic evaluation of existing long-term facilities and the planning of future facilities.

Discussion

A recommended framework

In this discussion, knowledge translation is referred to as “the synthesis, exchange, and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people’s health” (World

Health Organisation, 2017, p. 1). It is a dynamic and inclusive bilateral process that draws together creators and stakeholders to develop a sustainable outcome that promotes up-to-date best practice and bridges the gap between knowledge and action (Graham et al., 2006). Graham's knowledge-to-action framework presents a clear and comprehensible process consisting of two core elements - a process of knowledge creation and an action cycle (Graham et al., 2006).

Figure 9. Knowledge-to-action framework adapted from the Pathman-PRECEED model for knowledge translation (Davis et al., 2003, p. 35) & the Knowledge-to-action cycle (Graham et al., 2006).

The knowledge creation component consists of three levels of knowledge generation driven by research. Progression through the levels results in the knowledge produced being more concise and tailored, resulting in fundamentally higher quality evidence-based tools or products for the end users (Graham et al., 2006).

The action cycle, the second component of the knowledge to action framework, is a dynamic process guiding the implementation and sustainability of knowledge application. The action cycle stems from the analysis of planned action theories or models and provides a

systematic means to empower and enable change.

The development of the Environmental Audit Tool High Care (EAT-HC) (Fleming & Bennett, 2015) followed the initial stages of knowledge creation. The first stage in developing the EAT-HC from the original Environmental Audit Tool (Fleming & Bennett, 2003) involved reviewing the literature (Fleming, Crookes & Sum, 2008; Fleming & Purandare, 2010). The second level of knowledge generation, the stage of knowledge synthesis, involved the identification of the robust and applicable features that can be used in the design of long-term care facilities that reduce the impact of cognitive problems related to dementia and support residents in making full use of their abilities. Further development led to the creation of the knowledge tool known as the EAT-HC (Fleming & Bennett, 2015). The audit tool, which is the result of the final phase of knowledge creation, utilises a set of eight principles (Table 1) to organise the features of good design and to guide users to discuss, modify and improve dementia-enabling environments.

The Action Cycle, aimed at introducing the EAT-HC into a country in Asia, requires an understanding of the knowledge-to-action gaps in the country and must take account of cultural specificities. It began with a scoping review that examined the built characteristics of nursing home design in East and Southeast Asia (Sun & Fleming, 2018). The review revealed evidence for the existence of a knowledge gap throughout the health and aged care systems in East and Southeast Asia between the available understanding of dementia-enabling environments, as summarised by the eight principles, and the application of that knowledge to provide best practice design interventions (Sun & Fleming, 2018). As a result of this gap, institutional environments that resemble short-term acute care facilities and that promote pathogenic medical models of care continue to be built despite global best practice recommendations of person-centred care (Sun & Fleming, 2018).

The next steps in the Action Cycle, adaptation, assessment of barriers to knowledge and the phase of implementation in the action cycle, require a "mixed methods multi-strand design" as conceptualised by (Tashakkori & Teddlie, 2010, p. 319). To adapt the tool to the local context of a given country, in this case Singapore, it is necessary that stakeholders, implementers and potential users of the tool be engaged in discussions about the design, construction and use of the tool. A qualitative approach utilising focus group discussions has been used to collect vital data from local stakeholders, users and implementers. Allowing indigenous voices to establish the usability, application and suitability of the tool is a critical

process in the action cycle (Graham et al., 2006). A written survey has complemented the focus group to provide participants with the opportunity to contribute qualitative information about cultural differences and with the knowledge to recognise practice gaps they have encountered. All qualitative data obtained from local participants is being synthesised to identify the cultural differences in the understanding, prioritisation and application of the principles and how they may be used to facilitate awareness, acceptance, adoption and adherence in the translation of the existing knowledge.

Once the tool has been adapted to the local context, barriers to change have to be assessed. Graham et al. (2006) advise that assessment undertaken by potential implementers who are involved in advocating for change will help to identify the barriers that may prevent the successful implementation of the tool. In the case of the environmental audit tool, potential implementers may also be able to identify strategies, interventions or facilitators that can support the tool and bolster an active systemic process of application among the major stakeholders and users. To facilitate this process by ensuring that the tool is valid, reliable and easy to use, a mixed method, qualitative-quantitative strand guided by the Clinical Practice Guidelines Framework for Improvement (Graham et al., 2006) is being used to confirm the applicability of the tool in Singapore. This is involving potential users collaborating with the researchers in the assessment of the inter-rater reliability, validity and ease of use of the tool via the collection of qualitative data through interviews and written surveys, and the completion of the tool by multiple raters on a sample of long-term care environments. The evaluation of the reliability and validity of the tool conforms to standard approaches and is in the process of being prepared for publication

Table 14. Practice Impact

	<p>Implementation of environmental design in Asian nursing homes could be assisted by the application of a knowledge-to-action framework</p>
	<p>The knowledge translation would, however, need to include the consideration of cultural differences.</p>
	<p>This brief report suggests that the adoption of the Knowledge Translation, knowledge-to-action framework (Figure 1) with the introduction of the Environmental Assessment Tool for High Care (EAT-HC) facilities caring for people with dementia in Singapore will contribute to residents receiving quality care.</p>
	<p>As the tool is being translated into Asian languages during this project it is anticipated that it will be used in other Asian settings to support the development and implementation of other national strategies.</p>

This brief report suggests that the adoption of the Knowledge Translation, knowledge-to-action framework (Figure 1) with the introduction of the Environmental Audit Tool for High Care (EAT-HC) facilities caring for people with dementia in Singapore will contribute to residents receiving quality care as a result of effective knowledge translation. As the tool is being translated into Asian languages during this project it is anticipated that it will be used in other Asian settings to support the development and implementation of other national strategies.

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Chapter 6: The implementation of the SEAT in Singapore: Translating research into policy and practice

This commentary is written by the candidate and as a report to the Agency for Integrated Care Singapore.

Sun, J., Tan, W.M., Luo, D.L., & Ng, V. (2020). *The implementation of the SEAT in Singapore: Translating research into policy and practice*. Agency for Integrated Care.

Research Question relevant to the chapter:

How can a culturally sensitive tool be implemented and sustained in Singapore and Asia?

This chapter provides a commentary giving insight into the international collaboration between the University of Wollongong and the Agency for Integrated care in the development of the Singaporean Environmental Assessment Tool (SEAT). The commentary will provide readers with the implications of the study in Singapore and the role of the SEAT in the dissemination of knowledge about dementia enabling environments, and the impact of the study on policy, practice and Singaporeans living with dementia.

Abstract

Singapore is a country experiencing a rise in the population of older adults with high life expectancies. The combination of these factors has given rise to an increase in the number of Singaporeans living with age-related dementia. Singaporeans living with dementia can be found ageing in place in the community, however, those requiring high levels of care are without caregiver assistance. The Singaporean health system ensures that care is provided in long term care facilities. Key variables that can improve the quality of life and care by meeting the needs and challenges of an increasing population of people living with dementia in long term care facilities have been identified; one of which is a salutogenic dementia enabling environment. However, no culturally appropriate and validated environmental assessment tool was previously available to provide a collaborative platform for stakeholders in the development of environments providing high levels of care. This report documents the steps that the Agency for Integrated Care has taken to embark on a collaborative journey to realise a vision of dementia enabling environments in long term care facilities in Singapore. The report outlines the facilitation of a collaborative international approach with the University of Wollongong to uncover the characteristics required of a long term care facility for Singaporeans living with dementia and to assess the appropriateness of the Australian Environmental Assessment Tool for the Singaporean population. A culturally sensitive tool that is uniquely Singaporean was developed.

Introduction

Dementia is perhaps one of the most critical public health and social issues in Asia as the Region tackles the problem of ageing baby boomers. Dementia is a syndrome resulting in the decline of cognition but is not a definitive disease (WHO, 2012). Because of the progressive cognitive deterioration, a person with dementia may encounter difficulties with memory, functional abilities, and behaviours and with their ability to carry out daily activities (Chapman et al., 2006). Dementia directly impacts a person's quality of life as a result of the loss of physical, emotional and social functions (Chapman et al., 2006).

Challenges

The prevalence of dementia in Singapore for older adults 60 and above is approximately 10 percent (Subramaniam et al., 2015). In 2017, 516,700 Singaporeans were 65 years and above, the average life expectancy was 85 years of age, and the old-aged support ratio was 20 percent (Singapore Department of Statistics, 2018). Singapore is also experiencing low fertility rates (Thompson et al., 2012; Hasmi & Mok, 2013). In 2015, the cost to the region amounted to approximately \$1.7 billion (USD) (Prince, 2015). There is a need to examine feasible residential options for people living with dementia because there is a sizeable old age demographic and systemic cost, shrinking family sizes and potential changes in the ability of family caregivers to provide direct care (Thompson, 2012).

Among the many essential needs that people with dementia may require, a home is a crucial primary requirement. According to Maslow hierarchy of needs, to feel safe people require a place that they can call home and that provides the necessary comforts of living. The availability of a nursing home that can cater for a person living with dementia is vital for people who live alone in the community and can no longer reside safely or independently in their own home. As family caregiver numbers continue to shrink and caregivers age, some persons with dementia may have caregivers who may no longer be able to provide care for them in their family home and need to seek other residential alternatives such as a nursing home. These situations may be the result of caregiver burnout, stress, physiological deterioration, medical ailments or death. There are many necessary elements in dementia care; one vital component that can impact the quality of life for people with dementia is the quality and suitability of the environment in which they reside in (Fleming, Goodenough, Low et al., 2014). Dementia-friendly environments in long-term care facilities in Singapore

have been receiving mounting public interest and discussion in the recent years as health literacy in the space of dementia heightens (Lam, 2014).

The development of dementia enabling environments for Singaporeans is a complex task. Unlike countries with a homogenous population, Singapore is a multicultural society made up of primary ethnic groups such as the Chinese, Malays and Indians with English as the common unifying language (Mathi & Mohamed, 2011). Living conditions familiar to Singaporeans is uniquely distinct with 80 percent of the population residing in vertical developments known as HDB apartments (Singapore Department of Statistics, 2015). These developments encompass a unique architecture with culturally specific nuances found only in Singapore (Housing Development Board, 2014). With the explicit population distribution and cultural diversity in the Singaporean society, ensuring that nursing homes are environments that are familiar and culturally appropriate can be a challenging task. Despite these challenges, the government remains undeterred and has been working progressively to ensure that people with dementia can continue to attain the quality of life and care that they deserve through infrastructure and workforce initiatives (See, 2013; Ministry of Health, 2013). Working to ensure facilities are future-focussed, in 2012 the Agency for Integrated Care, an organisation that subsumes under the Singapore Ministry of Health, helped establish a dementia nursing home design workgroup. The collaboration with health professionals and critical clinicians led to the publication of a guidebook on dementia-friendly nursing home environments in 2016. However, there is an absence of a validated assessment tool that may be able to aid stakeholders to discuss, assess and evaluate potential and current dementia enabling designs for nursing homes.

Policy

With a growing population of Singaporeans living with age-related dementia, it has been identified that there is a prerogative to ensure that the needs of individuals requiring residential care can be met through the introduction of dementia enabling environments. Looking to implement an evidence based best practice tool that is culturally appropriate for Singaporeans, an international collaboration between the Singapore Agency for Integrated Care (AIC) and the University of Wollongong in Australia was formed to develop an environmental assessment tool for aged care facilities for people living with dementia and requiring high levels of care. A validated tool will allow Singaporeans to have a standard of

measure and a means by which they will be able to determine if an aged care facility is culturally appropriate for Singaporeans and fit for purpose for people living with dementia. The Environmental Assessment Tool High-Care (EAT-HC) was found to be a tool that will be able to provide a standard of measure to determine if the principles of dementia-specific facilities are considered in the design of the physical environment (Fleming, 2010; Sun & Fleming, 2018). To maintain the longevity of the Singapore, EAT-HC, a knowledge translation framework is required to be implemented to help facilitate the continuous use of the tool in the design and development of dementia enabling environments in Singapore. The next step to address the gap in the implementation of the Singapore EAT-HC is the creation of a knowledge translation framework that involves policymakers and key stakeholders in the aged care sector in the country.

Practice

The University of Wollongong facilitated the development of the research and protocols, the process of data collection and the analysis of results with the operational aid of AIC. The AIC, having expertise in the operational and administrative aspects of aged care in Singapore, provided administrative support and monitored the progress of the research. The final product was the development of the Singapore Environmental Assessment Tool (SEAT); an 83-item tool that has been found to be culturally sensitive and reliable for Singapore. The SEAT is accompanied by a user guide that has been culturally adapted from the EAT-HC handbook to meet the needs of Singaporean users. The tool has been translated from English into Mandarin and Malay. However, the Mandarin and Malay translations require further testing for content validity.

The tool and user guide will be hosted on a website by AIC, allowing it to be freely and publicly available for Singaporeans to download and use. The implementation of a knowledge translation framework is being discussed to ensure that the tool can be sustainable in Singapore. A review of training and education needs about dementia enabling environments has been requested by research participants to enhance their knowledge and the review is underway. Training and education will enable the acceptance and adoption of dementia enabling environments, the principles of design underlying the SEAT and the SEAT itself. Policy makers are also working closely to implement strategies to ensure the sustainability and adherence of dementia enabling environments in nursing homes.

Conclusion

The SEAT aims to provide a collaborative transnational multi-disciplinary platform for discussion in about developing aged care facilities in Singapore for people with dementia. The tool will be able to provide culturally specific, validated guiding principles and assessment questions to help aged care staff, architects, developers, operators, administrators, and policymakers in the development and retrofitting of aged care facilities. The assessment tool will be able to improve the quality of life and care for residents with dementia through the process of integrated care in Singapore and by creating future-proof built environments for people with dementia.

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Chapter 7: Bringing it together – the vital role of a knowledge broker in international research

Breaking barriers and facilitating international collaboration in the adaptation of the Environmental Assessment Tool High-Care (EAT-HC) for nursing homes in Singapore as a knowledge broker.

This chapter has been written as a personal reflection of the authors' experience working in the role of a knowledge broker to facilitate international collaboration in this study. The contents of the chapter were condensed and presented in a webinar for the World Young Leaders in Dementia (WLYD) network website. A portion of the introduction section from this chapter was published in a blog post for the website.

Sun, J. (2020, July 30). The role of a knowledge broker in an international research project [Webinar]. *World Young Leaders in Dementia (WYLD), Working in different dementia fields series*. <https://wyldementia.org/>

Sun, J. (2020). The role of a knowledge broker. *World Young Leaders in Dementia (WYLD) network*. <https://wyldementia.org/>

Abstract

Research in Dementia Enabling Environments is a growing field with literature across the globe spanning more than three decades. However, there is a lack of research about dementia enabling environments in East and Southeast Asia. Without culturally appropriate evidence, the ability to implement necessary changes and improvements in the field can be challenging. Stakeholders involved in the implementation of dementia enabling environmental design recognised that there are fundamental principles that make a home. However, there are also apparent differences in key characteristics that contribute to the environment for different cultures. In addition to the differences in the characteristics of dwellings in different countries, there are varying research capabilities, levels of health literacy, local attitudes, and acceptance of non-culturally specific research in the field of dementia care. This commentary highlights the significance of the use of a knowledge broker in a project that requires the collaboration of international stakeholders from Singapore and Australia to pave the way for tangible research outcomes. The project adapted the Australian Environmental Assessment Tool High-Care (EAT-HC) for a Singaporean population, resulting in the development of the Singaporean Environmental Assessment Tool (SEAT) - an assessment tool that guides and evaluate facilities providing high levels of care for Singaporeans living with dementia. This commentary offers insight into the workings of a knowledge broker (KB) whose role in this project enabled the adoption of knowledge by facilitating its transfer across cultures and language. The commentary provides a personal and in-depth narrative of the functions, activities, tasks, barriers, and facilitators encountered by a KB in research embedded in a global health setting.

Introduction

In the last decade, dementia has become a growing health priority in Singapore and throughout the world. Singapore has a rapidly ageing population, a high age dependency ratio and a dementia prevalence rate of 10 percent for Singaporeans 60 year of age and above (Subramaniam et al., 2015; Singapore Department of Statistics, 2018). With the rising population of people living with dementia and the low number of working adults to support the ageing population, there is increasing need for knowledge of dementia enabling environments to create safe and supportive environments in nursing homes (See, 2013). There is literature on dementia enabling environments for nursing homes; however, these resources have not been scientifically tested for validity and reliability for culturally sensitivities. Without culturally translated evidence for practice, resources cannot be optimised for use for the population for the development, implementation and sustainability of dementia enabling environments. The knowledge gap results in a continuous cycle of challenges as the current built environments for people living with dementia in Singapore retain a pathogenic, hospital-like design for people living with dementia. The designs of pathogenic built environments do not meet the needs of Singaporeans living with dementia, their families, or for care providers and compromise the quality of life and care in nursing homes (Fleming, Kelly, & Stillfried, 2015; Sun & Fleming, 2018). A salutogenic environment, one that can support the wellbeing of a person living with dementia in a nursing home, can help to fill the gap in care delivery and enable an improved quality of life (Golembiewski, 2016). With an environment that supports the delivery of dementia care, the needs of the residents, families, staff, and administrators can be satisfied. An enabling environment can also reduce responsive behaviours and community stigma and, with appropriate design, community or intergenerational activities can be carried out with residents to connect residents with the community around them (Fleming, Crookes, & Sum, 2008). To aid in the design, implementation, and evaluation of nursing homes in Singapore for people living with dementia, there was a need for an environmental assessment tool that could address the cultural sensitivities of the Singaporean population. However, there are differences in policies, ideological underpinnings of aged care, and economic conditions impacting the facilitation of the research (Rozario & Rosetti, 2012).

In Singapore, filial piety is a national value leading to ageing in place being a key focus that is strongly promoted by policymakers with a focus on the principles of “Many

Helping Hands” in the national approach to long-term care (Ministry of Health, 1984; Rozario & Rosetti, 2012). The national approach places responsibility for the provision of long-term care of a citizen on families and with home care being preferred. The policy, principles and practice have enabled the costs of long-term care in Singapore to be kept low and to remain sustainable for the government (Rozario & Rosetti, 2012). Much like the differences in the characteristics of homes between Australia and Singapore, there are clearly different attitudes, policies and strategies in aged and dementia care.

As international and cross-cultural projects in the dementia care continue to increase, there is a growing need to ensure that evidence-based best practices can be translated, shared and culturally implemented to improve key outcomes for people living with dementia. However, a phenomenon dubbed the 'know-do' gap is evident in the health care sector (Ward et al., 2010; Gladman, Conroy, & Ramhoff et al., 2016; Hunter, 2019). The 'Know-do' gap is the inability to translate available or existing evidence into practice, resulting in a gap between the evidence and practice (Gladman, Conroy, & Ramhoff et al., 2016). Barriers associated with the 'Know do' gap include information that is incompatible with stakeholders, antithetical culture, and a poor understanding of barriers and facilitators (Hunter, 2019). Researchers and innovators may have strong evidence but have little knowledge of these existing barriers. Researchers and innovators seeking to adapt or introduce evidence into a new community may grapple or fail in the introduction, implementation, and sustainability of the evidence-based practice.

Figure 100. The role of the knowledge broker in knowledge in addressing the gap between evidence and practice.

To address the 'know-do' gap; researchers seeking to introduce knowledge to new stakeholders must have a clear understanding of knowledge translation. Knowledge translation according to the World Health Organisation is the "the synthesis, exchange, and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people's health" (p.1). Within knowledge translation, a human element serves as a bridge between researchers and stakeholders, that enables effective knowledge translation. This bridge ensures that is evidence is translated appropriately for alignment and understanding. At the same time; enabling cultural acceptance and collaborative relationship building that is necessary to help researchers and stakeholders achieve positive outcomes. A knowledge broker is a human element and bridge between researchers and stakeholders; an individual or a team who enables the translation, management and alignment of knowledge (Robeson, Dobbins & DeCorby, 2008; Bornbaum, 2015). Through the successful management and alignment of information, the knowledge broker can enable capacity building among stakeholders as their literacy of the evidence increases (Robeson, Dobbins & DeCorby, 2008). Researchers should not discount the benefits of a knowledge broker. With such an individual in their team, the 'Know-do' gap can be adequately addressed through a smooth process of knowledge translation with the knowledge broker as the intermediary.

This commentary highlights a key role required in this international collaboration that investigated and adapted an environmental assessment tool for facilities providing high levels of care for people living with dementia in Singapore. The role which, when introduced in the study, allowed the collaborative process to be carried out efficiently and respectfully despite differences cultures between Singapore and Australia was the role of knowledge broker. This commentary contributes to the literature about knowledge brokers, and the literature in the field of dementia enabling environments. It also provides strategies for researchers who may wish to undertake international research collaboration between Singapore and Australia in culturally adapting assessment tools.

Knowledge brokers have been recognised as an integral part of knowledge translation who help to mitigate problems in the dissemination of knowledge (Bornbaum et al., 2015). This commentary utilises Bornbaum et al. (2015) "classification of knowledge brokering tasks according to activity domains" (p. 5, Table 11) to provide an outline of key tasks and activities. The classification of activities and tasks developed by Bornbaum et al. are not

proposed to be a measure of the role of knowledge brokers, but it is a list of functions executed by the knowledge broker which inform knowledge translation practices and strategies. The processes, activities and tasks of knowledge dissemination are highly complex and collaborative. There are numerous overlaps that cannot be mistaken for a series of direct and simple steps. For clarity, the activities and tasks are categorised under the key phases of the study (Figure 10.), which have been described in Chapter 2. The phases of the study were adapted from Tashakkori and Teddlie's (2010) sequential mixed model design with the goal of providing a simple workflow of the structurally complex research process.

Table 15. Classification of Knowledge Brokering Tasks According to Activity Domains (Bornbaum et al., 2015, p. 5).

Activities and Tasks		Activity Domain		
		Knowledge Management	Linkage and Exchange	Capacity Building
1	Identify, engage and connect with stakeholders		x	
2	Facilitate collaboration		x	
3	Identify and obtain relevant information	x	x	x
4	Facilitate development of analytical and interpretive skills	x	x	x
5	Create tailored knowledge products	x	x	
6	Project coordination	x	x	
7	Support communication and information sharing	x	x	x
8	Network development, maintenance and facilitation		x	
9	Facilitate and evaluate change	x	x	x
10	Support sustainability			x

The commentary will include details on the role and activities that I have undertaken as a knowledge broker in this international study to develop and implement the Australian

Environmental Assessment Tool High-Care (EAT-HC) for Singapore to provide an overview of a knowledge broker in practice (Table 16).

Figure 11. Phases in the development of the Singapore Environmental Assessment Tool presented in a Sequential Mixed Model Design. Adapted from Tashakkori and Teddlie (2010, p. 147).

Table 16. Matrix Containing the Activities required of the Knowledge Broker against the Phases and Stages of the Study. Adapted from Bornbaum et al. (2015, p. 5) Classification of Knowledge Brokering Tasks According to Activity Domains.

Phases & Stages of the study Activities and Tasks	1	2	3	4	5	6	7	8	9	10
Preliminary Research Phase	x		x							
Phase 1	x	x	x	x		x	x	x		
Phase 2				x	x	x	x	x		
Meta-Inference								x	x	x
Classification of Knowledge Brokering Tasks According to Activity Domains.										
<ol style="list-style-type: none"> 1. Identify, engage and connect with stakeholders 2. Facilitate collaboration 3. Identify and obtain relevant information 4. Facilitate development of analytical and interpretive skills 5. Create tailored knowledge products 6. Project coordination 7. Support communication and information sharing 8. Network development, maintenance and facilitation 9. Facilitate and evaluate change 10. Support sustainability 										

The Knowledge Broker: Background

Before the preliminary research phase is introduced, it is important to have an understanding of my journey to this point. I brought into this international project an eclectic suite of expertise and knowledge through my lived experiences, work, and academic qualifications. My experiences of dementia in Singapore and Australia have had a profound impact on my understanding of dementia and aged care. My international experiences made it clear to me that culture was crucial in dementia care and an essential component in one's self-identity.

My first lived experience with dementia and the environment occurred in my childhood in Singapore. A family member who lived next door had her home of at least four decades renovated. Her home, comprised of mosaic tiles, antique hardwood furniture and potted plants was transformed. The redesign of the built environment resulted in a safe and modern environment that mirrored a fenced-in tropical resort with new furniture and

furnishings. She was living with dementia and the changes in the environment brought about distress, confusion, and fear. She was in her home, but it was not her home. She would wake up at night agitated, unable to recognise her surroundings despite having resided in the house for decades. That experience provided me with an initial insight into the detriments of unfamiliar and non-inclusive environments for people living with dementia at an early age.

When I first started working, I secured a job as a graphic designer and trained under an art director whose instructions were firmly entrenched in visual communications. I was schooled in design principles with a strong emphasis on the understanding of the roles that balance, symmetry, scale, contrast, patterns, and figure-ground played in conveying messages. It was not an exercise in pure aesthetics but cultivation in the necessary mindfulness of form and function. While working in design, I completed a Bachelor of Science in psychology which provided me with the foundations of research methods and a theoretical understanding of cognition and human behaviour. I was fortuitous to have been able to live in Australia to work and study after the completion of my degree. It was in Australia that I took up work as a personal care assistant (PCA) and later as an enrolled nurse (EN) in a residential aged care facility (RACF). Working in a RACF gave me the invaluable insight into ageing, dementia, aged care, and the impact of the built environment on the person, their family, staff, clinicians and volunteers. Walking side by side with my residents, I observed how the environment played a role in enabling or disabling a person as they engaged in daily activities. Even as an aged care worker, the identical doors and hallways on multiple levels left me disorientated and confused even in the best of times. I was keenly aware of the cultural differences in the built environment. I found that some of the residents, who were immigrants and living with dementia, appeared to find the facility much more unfamiliar. They did not speak English; they were apprehensive about having their meals in the dining area and struggled to make meaning of where they were. In the dining area, the sound from the television, the rattling of the food trolleys, the clanging of dishes and the myriad of conversations did not provide any relief. However, there were positive aspects of the built environment in Australia. Many residents could create familiar environments within their rooms. Some RACFs were very home-like for Australians and there were a variety of spaces for engagement, communication, and privacy. After my experience in aged care in Australia, and upon a completion of a postgraduate qualification in counselling, I returned to Singapore and worked as a programme manager helping to pioneer a suite of dementia care

services for the community.

Preliminary Research Phase

In this section of the commentary, I touch on key activities and events that were carried out before the research project was executed to provide information on the planning stages of the study.

Table 17. Matrix Containing the Activities required of the Knowledge Broker in the Preliminary Research Phase of the Study. Adapted from Bornbaum et al. (2015, p. 5) Classification of Knowledge Brokering Tasks According to Activity Domains.

Phases & Stages of the study Activities and Tasks	1	2	3	4	5	6	7	8	9	10
Preliminary Research Phase	x		x							
Classification of Knowledge Brokering Tasks According to Activity Domains.										
<ol style="list-style-type: none"> 1. Identify, engage and connect with stakeholders 2. Facilitate collaboration 3. Identify and obtain relevant information 4. Facilitate development of analytical and interpretive skills 5. Create tailored knowledge products 6. Project coordination 7. Support communication and information sharing 8. Network development, maintenance and facilitation 9. Facilitate and evaluate change 10. Support sustainability 										

In 2012, I was the lead secretariat for the Dementia Nursing Home Design & Resource Panel in Singapore. From my work experience as a healthcare administrator and interactions with dementia practitioners in Singapore between 2012 and 2014, I had observed that fundamental evidence-based principles of designs and international resources that were available could be applied within the Singapore context with modifications for cultural sensitivities. This stage required me to be familiar and interact with existing users of knowledge involving dementia enabling environments and to identify the resources utilised in Singapore. Dementia practitioners were utilising existing dementia assessment tools; with one such tool being the environmental assessment tool (EAT) (Fleming, 2011). In 2015, no culturally appropriate tool for the Singaporean population was available to aid in the design, development or evaluation of dementia enabling environments. After consultation with

stakeholders who were individuals working with, caring for or working on environmental design projects for people living with dementia in residential aged care facilities in Singapore, a scan of existing literature highlighted a gap in the lack of knowledge about dementia enabling environments. A common goal derived from stakeholders' feedback included the need for the conceptualisation of a new assessment tool for the Singaporean population. However, the relevant literature on health measurement scales recommended the utilisation of an existing tool that has been rigorously tested and to have it further tested for appropriateness for the Singaporean population instead of developing a new instrument (Streiner, Norman, & Cairney, 2015). This approach also maximises the opportunities for cross cultural comparisons.

I felt strongly about the lack of knowledge about dementia enabling environments in Singapore and lack of a validated environmental assessment tool that is culturally appropriate for the Singaporean population. In my personal experience, the lack of a culturally appropriate tool was a key barrier to tackling the gap in knowledge about dementia enabling environments. When talking to stakeholders, it was not uncommon to hear that there were no validated tools for the local population. Therefore, it would not be an efficient or appropriate exercise to evaluate the environments for people living with dementia, much less to gain more knowledge in dementia enabling environments. From one conversation some time ago, I was informed that none of the tools were a "right fit" for the local population.

In seeking to develop an assessment tool for Singapore, it was found that the creation of an assessment tool from ground up may not be practical. Whilst the tool may be culturally appropriate, it will not be aligned with international best-practice and cannot be comparable with other countries and cultures. The research required for the development of a tool of such a scale would require a significant time, funding, manpower and participants. Creating a completely new tool also negates the needs of people living with dementia in facilities providing high levels of care who do not have the luxury of time. The creation of a new tool will invalidate decades of research in dementia enabling environments, and contemptuously ignore the possibility of cultural collaboration for a universal measure of design. Adaptation of an existing validated tool that is based on substantial foundations was explored. It had to be a tool that has been rigorously tested and utilised in practice and allow for efficient development of a tool suitable for comparison on both a local and global scale.

To bring the project to fruition, a project plan had to be put in place and key

collaborating stakeholders identified. I knew that I had an understanding of the aged and dementia care industry and leaders in Singapore, and I knew international researchers in dementia enabling environments. This knowledge was critical in identifying stakeholders who may be willing to participate, lead and support the project. It was also vital that international researchers who may be involved in the project have experience in translational research to ensure that the research can be integrated and put into practice. Aside from having sufficient knowledge to identify stakeholders, it is important to recognise that stakeholders come from a myriad of backgrounds and cultures. They may have different viewpoints and it was my role as a knowledge broker to be aware of the differences and to mitigate the differences to enable collaboration. I had to harness the skills and talents of stakeholders and empower them to advance the study. I had to use the knowledge that I gained through my experiences and work to enable stakeholders in Singapore and Australia to recognise the gap in dementia enabling environments in Singapore. That positive change requires a collaborative and an inclusive process of co-creation. With the knowledge of existing international assessment tools utilised by Singaporeans and an analysis of the literature, it was found that the Australian Environmental Assessment Tool High-Care (EAT-HC) may be suited for adaptation. The tool was developed at the University of Wollongong by Professor Richard Fleming and Kirsty Bennett (Fleming & Bennett, 2015). Professor Richard Fleming was identified to be an international expert in the field of dementia enabling environments who had developed a set of principles of design in addition to the assessment tools. The university was also equipped with researchers who had experience in translational research in dementia. Therefore, it appeared to be the most logical step to approach Professor Richard Fleming from the University of Wollongong to start a conversation about the possibility of a research project. A meeting was set up to discuss a potential partnership. This was followed by further engagement which was conducted to plan and develop a strategy required for the implementation of the project.

In the preliminary research phase, a collaborative relationship between the University of Wollongong in Australia and a local organisation was formed (refer to Chapter 6). The organisation was identified by the knowledge broker as a key leader in the area of dementia care in Singapore. The organisation was involved in the development of the dementia nursing home design resource panel in 2012 and was involved in community and residential dementia care projects. The organisation also had a vital role in building the capacity and capability of

health and social services that provide care to people living with dementia in acute, community and residential aged care settings. With its robust network of aged and dementia care service providers, the Singaporean organisation appeared to be a suitable support for the study as its role as a national integrator set brings together stakeholders.

Upon identification of the two international organisations, face to face meetings were held of leaders in each organisation regarding the feasibility of an international study. The meetings consisted of discussions on the development of an understanding of the project between both the agency and the university and key outcomes for the project. Negotiations commenced in early 2015 and stretched for approximately six months. There was also a face-to-face meeting between key stakeholders in Australia and Singapore. The process was inclusive of the knowledge broker enrolment in postgraduate studies with the University of Wollongong. The outcome of the preliminary research phase resulted in the connection and engagement of key international organisations with these organisations agreeing to the common goal of assisting in the developing an environmental assessment tool for the population.

Phase 1

The activities and tasks in phase one are structurally complex and comprised of items one to four, six, seven and eight as seen in Table 16. These activities and tasks were not carried out in sequence; with many having to run in parallel during phase one.

Table 18. Matrix Containing the Activities required of the Knowledge Broker in Phase 1 of the Study. Adapted from Bornbaum et al. (2015, p. 5) Classification of Knowledge Brokering Tasks According to Activity Domains.

Activities and Tasks	1	2	3	4	5	6	7	8	9	10
Phase 1	x	x	x	x		x	x	x		
Classification of Knowledge Brokering Tasks According to Activity Domains.										
<ol style="list-style-type: none"> 1. Identify, engage and connect with stakeholders 2. Facilitate collaboration 3. Identify and obtain relevant information 4. Facilitate development of analytical and interpretive skills 5. Create tailored knowledge products 6. Project coordination 7. Support communication and information sharing 										

8. Network development, maintenance and facilitation9. Facilitate and evaluate change10. Support sustainability

Conceptualisation

Phase one commenced upon enrolment into the postgraduate programme. As part of the confirmation process in the candidature, relevant information was identified, obtained, and subsequently compiled into a research proposal. The research proposal developed with the guidance of research supervisors and contained a preliminary scoping review of the characteristics of the built environment in Singapore and the influences that contributed to these characteristics. Based on the scoping review, key research questions were identified for the study. The analysis of the results from the scoping review provided evidence into the model of care, characteristics, culture, and the political landscape of facilities providing high levels of care for people living with dementia in Singapore. A collaborative process was adopted in consultation with the stakeholders in Singapore and research supervisors to determine the timeline, milestones, and critical points. Critical points are events in the project that, if not adequately handled, are deemed to have an impact on the timelines and milestones of the project. The outcome of this process required the sharing of information, and multiple lines of communication between all stakeholders. To ensure the information was streamlined, a Gantt chart was developed to present an overarching visual plan of the research project. Upon confirmation of candidature and ethics approval, I continued to connect and engage with stakeholders while undertaking a wider scoping study and learning about the various administrative aspects of carrying out a study through the University of Wollongong in Australia and with organisations providing long term care in Singapore.

It was determined through the initial scoping review on Singapore that no environmental assessment tool for dementia enabling environments that was culturally appropriate for the Singaporean population was available in 2016. The process informed me that existing validated environmental assessment tools were available, but not in Singapore. A larger scoping review was carried out to determine the existence of an environmental assessment tool for people living with dementia in East and Southeast Asia that may be appropriate for Singapore. The scoping review required the guidance of the primary research supervisor who worked closely with me, allowing me to further strengthen the development

of my analytical skills in sourcing and evaluating the relevant literature. To facilitate and develop further knowledge and interpretive skills to support the work on the scoping review, I attended a course on designing for people living with dementia organised by the Dementia Training Study Centre. The formal training conducted by Kirsty Bennett, a co-author of the tool, allowed me to engage with the principles of design in a structured manner, confirm any questions that I may have and allowed me to better understand the use of the tool in practice. The training contributed to my improved ability in the thematic analysis of the scoping review that I had been working on. The findings of the scoping review found that there were no validated environmental assessment tools for people living with dementia in East and Southeast Asia. The results supported the investigation into the adaptation of an environmental assessment tool for Singapore based on the Australian Environmental Assessment Tool High-Care (EAT-HC).

With evidence that highlighted the need to close the gap between evidence and practice, the adaptation process required an examination of the level of acceptance among Singaporeans of the principles of design that sets the foundation of the EAT-HC. It was critical that Singaporean users of the tool and those whose lives will be impacted by the changes brought about by the recommendations of the tool, be part of the co-design process. This ensures that the research can be translated into action upon completion of the study. This process is critical as it enables the adaptation process to be inclusive of multi-racial participants from a multitude of backgrounds within the aged care sector in Singapore. Backgrounds include nursing, architecture or design, family caregivers, administrators, health care assistants and allied health professionals. While the principles of design were found to be accepted by the participants in the focus groups, there were clear differences in the characteristics of the built environment for the people living with dementia in Singapore that were a result of cultural influences. These differences did not only exist within characteristics of the built environment but also within the process of project coordination and collaboration.

Before the focus groups could be used, a recruitment process had to be established to engage stakeholders and participants in Singapore. The knowledge of cultural differences between Australia and Singapore in the implementation and execution of project protocols and documentations was vital in this stage of the study. The ability to understand the types and preferences of technology for communication in each country was essential because of the geographical distance between Australia and Singapore. Lack of finances meant face to

face conferences were not possible in the process of recruitment. However, I was able to ensure that a solid foundation was built around clear communication, respectful relationships, and cultural inclusiveness and administrative processes were executed succinctly.

There is a clear difference in health literacy, policies and culture in services for people living with dementia in facilities providing high levels of care. A case in point was the differences in semantics; the term “residential aged care facilities” (RACF) appeared to be exclusive to Australia and relatively unknown in Singapore. Facilities that provided similar services as RACFs in Singapore were known as nursing homes, old folk’s homes, and homes for the aged. In Singapore, Aged Care is also commonly referred to as long-term care, and older adults are known as seniors. In Australia, the term dementia care is clearly understood on a national level and among the aged care workforce (Fleming & FitzGerald, 2009). However, when phase one commenced in 2016, the term “dementia care” was not a familiar term in Singapore, and there was no standard terminology that defined care for people living with dementia. In Singapore, dementia care may be subsumed under services providing long-term care, senior care, geriatric care or elderly care (Government of Singapore, 2019). Despite English being a common language, I had to be able to ensure that documents were clearly translated with language that can be understood by stakeholders in each country.

On top of the differences in semantics, the work culture had to be well understood. In Singapore, correspondence was exchanged rapidly and efficiently. It was important to observe the structured hierarchy and to ensure that protocols were respected within the organisations for efficient communication. Communication, whether written correspondence or face to face meetings, requires a level of formality, respect and courtesy unless otherwise stipulated. Formality also extends to verbal conversations and meeting attire. As observed in the nursing homes that participated in the study, staff are issued with uniforms and upper management were observed to be dressed in business attire or in a uniform. Singaporean stakeholders expressed different areas of interest in the project, with an emphasis on the operational aspects of the study such as the steps to achieve key outcomes and plans for sustainability of the project. Details surrounding the project, such as timelines, activities, and resources required to achieve key milestones were vital in the communication with stakeholders in Singapore who expressed an interest in engaging in the study. Within Australia, stakeholders focused on a different aspect of the project, placing emphasis on the research questions, objectives, ethics, and a general overview of the research plans. In this

phase of the study, I had to be flexible to align communications across stakeholders from both countries and across all levels to enable a smooth flow of events and an efficient process of project management.

Data Collection

Network development and maintenance was carried out to continuously engage with stakeholders in Singapore via email and video conferencing. The stakeholders were organisations involved in the care, design or advocacy for people living with dementia. The organisations included nursing homes, advocacy groups, and those involved in acute care, community care, nursing home design, management of dementia care services and policymaking. This enabled the study to attain participants that meet the profile of potential users who require knowledge and understanding of dementia enabling environments for people living with dementia; especially in facilities where high levels of care are provided and with a higher need for a use of a Singaporean version of the EAT-HC. There was an overwhelming interest in the first phase of the study with five times the number of participants recruited. A total of 150 participants were recruited in Singapore for the study and 23 Focus Group Discussions (FGD) were conducted throughout the country.

I had prior experience conducting FGDs in Singapore within the health sector and a theoretical understanding of barriers to participation. I quickly recognised that there may be measures that had to be taken to ensure that all participants were able to include their thoughts in the discussions. The collective work culture and varying levels of literacy among participants resulted in the potential to reduce verbal contributions from research participants. Therefore, during the FGDs, in addition to verbal contributions, participants were provided with the option of penning their thoughts during the discussions. Handouts were provided for participants. On top of providing verbal responses to their level of acceptance for each principle of design and to provide clarity in the process of data collection, participants were provided with a choice to pen their level of acceptance. This was especially helpful when participants were unable to articulate their answers verbally or did not wish to be heard vocalising specific thoughts. The strategy was met with success as it could be observed that in some FGDs, some participants would not verbally participate but provided comprehensive written responses instead. Having an understanding of the means by which data can be collected within the population to ensure inclusiveness and equality was crucial. When confronted with a range of cultural factors, a well-planned methodology can make a

difference in the quantity and robustness of the qualitative data obtained. The process enabled participants to have choices in the provision of feedback most comfortable for them. It enabled and empowered the participants to be heard and allowed participants to be a part of the process of co-design.

Inference: Results and Interpretation

During this stage of the study, and despite the focus on the analytical aspects of the qualitative data collected from the FGD, engagement and connections had to be maintained with stakeholders in Singapore to ensure there could be additional recruitment for the testing stages of the tool. Close collaboration with the primary research supervisor was required to ensure that findings are thoroughly evaluated.

Phase 2

Conceptualisation

In phase one, the challenge was engaging stakeholders from various organisations in the process of recruitment for a FGD. The second phase required the development of a new assessment tool and two rounds of testing for validation, reliability, and usability. The testing process had to be undertaken in sites that were currently delivering high levels of care for people living with dementia. Phase two required me to utilise tasks four to eight of the activity domains (Table 19). Working with primary and secondary supervisors, the findings from the scoping review and FGDs in phase one were condensed, evaluated, and translated into outcomes that guided the development of the Singaporean Environmental Assessment Tool (SEAT). During the developmental process of the first draft of the SEAT, I had to commence discussions with stakeholders in Singapore to find suitable test sites for the SEAT. Stakeholders in Australia had to be updated of any advancement in the study. The update was also in a form of an annual report.

Table 19. Matrix Containing the Activities required of the Knowledge Broker in Phase 2 of the Study. Adapted from Bornbaum et al. (2015, p. 5) Classification of Knowledge Brokering Tasks According to Activity Domains.

Activities and Tasks	1	2	3	4	5	6	7	8	9	10
Phase 2				x	x	x	x	x		
Classification of Knowledge Brokering Tasks According to Activity Domains.										
<ol style="list-style-type: none"> 1. Identify, engage and connect with stakeholders 2. Facilitate collaboration 3. Identify and obtain relevant information 4. Facilitate development of analytical and interpretive skills 5. Create tailored knowledge products 6. Project coordination 7. Support communication and information sharing 8. Network development, maintenance and facilitation 9. Facilitate and evaluate change 10. Support sustainability 										

The conceptualisation stage in phase two proved to be very challenging as there were various activities and tasks happening in parallel. The development of the SEAT had to be carried out in an analytical and collaborative manner with guidance from supervisors from the university, whilst a smooth and continuous flow of communication with the Singaporean organisation had to be maintained. The maintenance of communication was due to the ongoing identification process of nursing home sites in Singapore for testing. In 2016, the understanding of dementia, dementia enabling environments and research in aged care was not common in nursing homes in Singapore (Sun & Fleming, 2018). The understanding of the current landscape and culture of nursing homes in Singapore was an important component in the project coordination. Working with the Singaporean organisation, the team provided direction and guidance in the recruitment process, ensuring that the process was carried out professionally. However, I endeavoured to reach out to nursing home providers outside of the recommended pool. Two nursing homes shared with the knowledge broker that they do not have residents living with dementia in their homes and therefore were not suitable sites for testing. No other nursing home responded to the request for research participation. These actions supported the decision to maintain a collaborative local organisation.

Data Collection

The recruitment process concluded with 10.9 percent of nursing homes in Singapore being recruited for the study in 2017 (Government of Singapore, 2020). The nursing homes

varied in age, built environmental design and research participation. One facility had been functioning for a year, while others have been providing aged care services in their facility for more than 30 years. The built environment of these nursing homes provided a range of different designs for participants to work with during the testing process. There was a large variation in the characteristics of the nursing homes. Analysis of the sites provided me with insight into the significant differences in the built environment that the participants engaged in. Some nursing homes were built on large parcels of land and were typically found to be low rise facilities consisting of one to two-storeys in height. Others were modern high-rise facilities more than five storeys in height. There were homes that had a range of activity spaces for residents and visitors, and some with minimal variety. These include homes that do not have a traditional reception on the ground floor of the facility. There were nursing homes that were well integrated into the local community with a fenceless design and that had spaces that were open to the community. These homes were also easily accessible by public transport. There were others that were located away from the public and in locations that were not easily accessible via public transport. These points all had to be analysed and reviewed they had implications on participants' involvement in the study. The participants had to be able to travel to and access the nursing homes to adequately participate in the testing process. All testing required the participants to access the sites and to assess the built environment in a physical walk-through. Location, size and complexity of the buildings had implications for the time taken for each participant to complete the SEAT in each facility. It could not be assumed that all participants were familiar with the location and setting of all the nursing homes.

When verbal agreement was obtained from the nursing homes, further steps were implemented to ensure that information regarding the study was clearly communicated and shared with the nursing homes involved. In addition to the information sheets, a presentation was provided to help the nursing homes gain an understanding of the study and the steps required. I had to forecast potential issues that may arise in the testing process that might have had implications for the residents and staff of the nursing home and research participants who would be visiting the nursing home for the testing process. Because of the scarcity of research in the aged care industry in Singapore, it was crucial that the nursing homes engaged were aware that they would be contributing to the study by allowing identified participants to visit and carry out a mock evaluation process to test the SEAT.

Continuous and open dialogue ensured that nursing homes could seek our clarification should they have any questions. My contact information was provided on the information sheet to enable nursing homes to have direct access should they have any questions about the testing process and the involvement of the home. On top of a transparent process and keeping in mind the minimal exposure to research that aged care staff have, the management was informed to keep their staff aware that it was a process for research and it was not an official audit or assessment of their current environments. In a field that is lacking in research, transparency is an important component to prevent any misunderstanding or concerns that staff may have when they witness participants visiting the facility and utilising the SEAT during the testing process. A letter of consent was received from the nursing homes once they were ready to be involved in the study. With the eight nursing homes recruited and confirmed to be sites for testing, recruitment of participants who would be involved in the first round of testing came into focus.

A profile of the participants for phase two who would be involved in the testing process was drawn up to help develop an understanding of the needs of the recruitment process in Singapore. It was anticipated that participants may not be those from phase one of the study. Participants would possibly be working adults, in middle management or leadership positions in either clinical, design or administrative positions. They would be working with or for residents living with dementia that require a high level of care. They may be involved in planning, design, implementation, or evaluation of these facilities. This profile provided researchers with an overview of the potential challenges in the recruitment process, the needs of the participants, and the strategies required to develop a successful recruitment process. Participants with roles in clinical care, such as nurses or allied health professionals, were found to have jobs in Singapore that were time-intensive (Wynman, 2016). The work culture in Singapore for white-collar workers who do not have a clinical background is similar to those in clinical care (Jones & Miller, 2018). To engage in the study, participants may be required to take personal time off work or seek approval from their employers to participate. The general work culture in Singapore was described to be one of the most challenging with workers averaging more than 45 hours a week and with 77% of workers reporting rigid working hours.

I recognised that participants may come from highly demanding jobs and time-pressed work schedules. For them to engage in the study may require taking time off from

work only to arrive at a test site that is unfamiliar, complex, busy, and difficult to reach. To help ease the transition for participants, facilitators were organised with the Singaporean organisation to provide aid to ensure that participants were supported with necessities and transport throughout the testing process. Within the nursing home, facilitators ensured participants were equipped with all the necessary printed materials such as copies of the SEAT, user guide, and stationery. Facilitators also helped to arrange for transport to help participants reach the nursing home sites during the visiting hours stipulated by the home. When participants preferred to travel to the sites in their own transport, but needed help in navigation to the test site, facilitators were also available to provide direction.

Before the recruitment process could take place, it was important to have some knowledge regarding dissemination of recruitment materials to nursing homes in Singapore. It was important that the recruitment materials were not in breach of spam laws. By working with a Singaporean organisation, recruitment materials could be disseminated through the proper aged care sector without breaching the national regulations.

The lack of understanding in the field of dementia and research in aged care in Singapore proved to be a hurdle in the recruitment process (Sun & Fleming, 2018). For potential participants who wished to be part of the testing process, the amount of time taken to be part of the study was a major barrier to participation for most working adults. I found that there were a handful of interested participants who wanted to engage in the study but expected it to be a simple and short process, much like the FGD in phase 1. Briefing sessions and a clear channel of communication were set up with participants to address expectations of the study. Potential participants whom I spoke to also discussed the need for anonymity and their want for privacy citing the small scale of the aged care sector. Therefore, all documents completed by the participants were anonymous. A total of 22 raters were recruited, 16 in the first round, and six were recruited for the last round of testing.

Inference: Results and Interpretation

The inference stage required me to work closely with supervisors to collect, analyse and interpret the findings into tangible results (see Chapter 4). The testing process resulted in the adaptation of the EAT-HC for the population of Singapore known as the Singaporean Environmental Assessment Tool (SEAT).

Meta Inference Phase

The development of the SEAT, which is a reliable, validated and culturally acceptable Environmental Assessment Tool for facilities providing high levels of care for people living with dementia, was the aim of the study. However, as seen in the scoping review and qualitative data, there is a need for an implementation plan and a means of sustainability to ensure that the SEAT can be utilised in Singapore. Continued networking and maintenance of stakeholder relationships are required to collaboratively elicit a plan of action to implement the SEAT, to facilitate change and to support the sustainability of dementia enabling environments within the country.

Table 20. Matrix Containing the Activities required of the Knowledge Broker in the Meta-Inference Phase of the Study. Adapted from Bornbaum et al. (2015, p. 5) Classification of Knowledge Brokering Tasks According to Activity Domains.

Phases & Stages of the study Activities and Tasks	1	2	3	4	5	6	7	8	9	10
Meta-Inference								x	x	x
Classification of Knowledge Brokering Tasks According to Activity Domains.										
<ol style="list-style-type: none"> 1. Identify, engage and connect with stakeholders 2. Facilitate collaboration 3. Identify and obtain relevant information 4. Facilitate development of analytical and interpretive skills 5. Create tailored knowledge products 6. Project coordination 7. Support communication and information sharing 8. Network development, maintenance and facilitation 9. Facilitate and evaluate change 10. Support sustainability 										

To enable the implementation and sustainability of the SEAT in Singapore, there needs to be a sustainable framework that can elicit culture change and can be supported by policymakers and organisations in the aged care sector. A knowledge-to-action framework and an accompanying report for the implementation and sustainability of the SEAT in Singapore were developed. It was guided by the results of the study, best-practice recommendations, and consultation with supervisors. With the knowledge of the level of literacy about dementia and dementia enabling environments in Singapore, the framework had to be self-explanatory and with steps that can be achieved by the organisations in Singapore.

By working with a local Singaporean organisation to facilitate a positive change and to address the gap in knowledge about dementia enabling environments, a report was drawn up and delivered (Chapter 6), with recommendations in the adoption of a knowledge translation framework (Chapter 5) to support the sustainability of the SEAT.

Conclusion

The role of the knowledge broker in an international study is crucial for its success. Having a researcher with experiential knowledge and theoretical understanding of the culture and beliefs in the aged care sector within the country of study can help to facilitate community-based action research and to engage participants and organisations working within the sector. In a country and sector that do not rigorously conduct research in dementia care, the knowledge broker can help to reduce misinformation, mistakes and missteps by anticipating critical issues that may occur at key points of the engagement process and facilitate a positive experience for all stakeholders. The involvement of a local national organisation in the study allows policymakers in Singapore to build connections with an international academic school of excellence in dementia, and gain insight into the community gaps and needs. For organisations involved that may not have experience in research participation, a positive experience may enable them to continue to open their nursing homes to future research activities. For participants, having a positive experience may help them develop confidence in research and acceptance of evidence and best-practice recommendations. This study provides evidence of the adoption of a knowledge broker in an international study. The activities and tasks carried out by the organisations and participants would not be possible without a knowledge broker who is able to provide a human element to connect all stakeholders in this global research setting. Future international research should consider the role of a knowledge broker to enable their study to be efficient, culturally inclusive and respectful of all stakeholders to attain collaboration that leads to a successful research outcome.

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Commentary

Lessons from the aged care sector in Singapore: The research recruitment process

This study gives readers an overview of the role of a knowledge broker leveraging on the research project as a case study. However, it does not provide sufficient insights into the limitations encountered in the recruitment process within the development of this international study. Information on the process of recruitment is vital as studies on dementia enabling environments providing high levels of care for people living with dementia remain scarce (Sun & Fleming, 2018). Understanding limitations in the recruitment process can contribute to future replication of the study in similar conditions. Significantly under-enrolled studies can have severe negative impacts on the development of the Singapore Environmental Assessment Tool and test outcomes (Preston et al., 2016). This was apparent when planning for a project involving the development of the Environmental Assessment Tool High-Care (EAT-HC) in a country and culture where dementia enabling environments are not well understood (Sun & Fleming, 2018). The following commentary will shed light on key limitations encountered in the study and steps undertaken to meet limitations in the areas of participant recruitment and the recruitment of nursing home sites for testing in Singapore.

With the study involved the development of the EAT-HC for a different population and culture, the study recognised the important role that individuals in the aged care workforce may bring in the area of usability. The inclusion criteria for enrolment into the study involved the participants in the aged care workforce who may be potential users of the tool. These individuals may be architects, administrators, project managers and aged care staff. Usability data from participants ensured that the SEAT was developed to meet the needs of users and can be utilised outside of the research setting.

Of architects, administrators, and aged care staff, only participants from the aged care workforce shared their challenges in engaging in research. Within aged care facilities in Singapore, staff face a challenging working environment. Evidence provided supports the findings that the role of an aged care worker is associated with tough working conditions, limited financial or educational advancements, and a hierarchical organisational structure (Huang et al., 2012). Such notions have markedly contributed to the lack of Singaporeans working in aged care facilities (Huang et al., 2012). The lack of a Singaporean workforce in aged care has resulted in homes being predominantly staffed by female migrants on

temporary working visa from developing countries and these people contribute between 80 to 90 per cent of the workforce (Huang et al., 2012). Staff may also be living in the aged care facilities in staff dormitories. Staff dormitories allocate approximately 2.7 square metres of space per person for accommodation (Ministry of Health, 2002). In order to reduce increased costs associated with improved qualifications, organisations may not encourage educational pathways for migrant workers and it is believed that a lack of higher qualifications will prevent migrant workers from leaving aged care for a position in acute care (Huang et al., 2012). Health literacy in the field of dementia remains poor as participants highlight the lack of training and educational opportunities and resources available to support an improvement in dementia care knowledge. Knowledge about the care and the environment of people living with dementia among the public was found to be significantly limited in the aged care workforce (Sun & Fleming, 2018; Cations et al., 2018).

Nursing homes in Singapore predominantly adopt a hospital like design (Sun & Fleming, 2018). Hospital-like design is prevalent among nursing homes in Singapore and has been long been associated with the schemas of nursing homes in the country. However, hospital-like environments are unsuitable for care as they contain features that are not familiar, enabling, or supportive for a person living with dementia (Fleming & Kelly, 2014; Petty et al., 2018; Grey et al., 2019).

Singaporeans in the aged care workforce face a range of personal and work-related challenges. These adversities, coupled with the lack of knowledge, experience and understanding of the positive role of research in aged care results in a lack of motivation to engage in studies. Instead, individuals prioritise immediate work or personal challenges over research participation. Barriers to participation from nursing homes included the association of research with disruptions to daily operations. Others had no residents living with dementia and so there was a lack of interest in the research topic. There were two recurring themes from individual participants and nursing homes; the impact from the lack of research within the field of aged care, and the lack of understanding of dementia enabling environments in the aged care industry. The lack of research and understanding in the field of dementia and the environment is not unique to Singapore; it is prevalent in East and Southeast Asia (Sun & Fleming, 2018). The study found that rigorous testing processes involving assessment tools, interviews and surveys were an uncommon and unfamiliar process resulting in challenges in the recruitment of participants. Interested parties may find the process complex and time

consuming. Lack of understanding or familiarity of dementia enabling environments may contribute to participants and nursing homes perceiving no personal advantage or benefit in engaging in the study. The combination of factors may result in low participant numbers which may yield statistically insignificant results, poor representation and a study that is not able to contribute to scientific knowledge (Nasser et al., 2011). With the objective being the development of the EAT in Singapore, it was important to attain culturally specific knowledge and feedback regarding the experiences of participants who met the profile of potential users of the tool within the aged care workforce. The researchers recognised the range of variables that may have an impact on the recruitment process and efforts were made to reach out to participants and administrators of nursing homes.

The scoping review seen in Chapter 1 (Sun & Fleming, 2018) provides insight into the research carried out throughout East and Southeast Asia on the subject of dementia enabling environments. The findings of the scoping review provided evidence to support a strategic plan of action to facilitate a successful recruitment process in view of the limitations observed. For the study, researchers recognised the need to have a clear understanding of the health system, infrastructure in aged care and local protocols associated with dementia and research participation within Singapore. The study was carried out in collaboration with the national care integration organisation for aged care. The organisation enabled researchers to carry out a well-organised recruitment campaign, identify key organisations in Singapore with a keen interest in research and dementia enabling environments, and provide administrative aid by means of time and materials. Working closely with the organisation, researchers were able to learn about key protocols that needed to be addressed and estimate time and types of resources required to engage with potential participants and nursing home administrators. Key recommendations included leveraging technology to enable an accessible channel of communication between potential participants and the researcher overseeing the recruitment process. The study utilised messaging platforms with audio or video capabilities and include an end-to-end encryption to engage with potential participants. These encrypted messaging platforms were effective, private, and affordable for interested participants from Singapore to contact the researcher in Australia. With internet connection widely available in Singapore at low cost, interested parties could get in touch with the researchers quickly and easily through an audio call. This allowed interested participants who otherwise would not have been able to afford to contact the researcher to communicate with ease and have all their

questions answered. Without the expertise of the local organisation, it would have been challenging to reach out to key stakeholders within organisations and nursing homes to elicit participation in the testing process. The agency provided direction in the understanding of protocols involved in the recruitment of nursing homes sites within the country.

The scoping review provided an insight into the aged care workforce and allowed the study to plan for attrition of participants who could not take on the additional workload. Partnering with a local national organisation in the field of aged care can allow researchers to gain insight into outreach strategies, local protocols, resources, and financial considerations that may have major implications in recruitment of participants and nursing home sites. This commentary has implications for future studies seeking to adapt the EAT-HC in countries lacking in research and with poor literacy in the space of dementia enabling environments. Researchers should be mindful of the recruitment process, undertake initial literature reviews, build partnerships with local organisations, and have a clear understanding of the systems and protocols of the country in which they are undertaking their study.

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Chapter 8: Conclusion

The evidence is clear, nursing homes providing high levels of care for resident living with dementia in Singapore and surrounding east and Southeast Asian regions, may not fully integrate all aspects of a dementia enabling environmental design. Evidence is that the construction of facilities catered for the masses with a focus on cleanliness and sanitation, operational efficiencies, and costs of care. Nursing homes in these regions are expected to serve as a home for an increasing population of vulnerable older adults that require high levels of care from admission until the end of life. Despite providing long term care, these environments that adopt a pathogenic design that mirrors the designs of acute care facilities have a negative impact on persons living with dementia. Current designs were found to place an overwhelming emphasis on physiological and cognitive deficits instead of enabling the wellbeing, social connections, and identity of residents. The current environments do not support residents living with dementia. Likewise, they do not provide sufficient support for families and care staff. Environments were found to contribute to levels of staff stress and exhaustion. However, with the growing awareness of dementia care on a global scale, there is recognition for the need to redesign and implement enabling environments to mitigate these risks for residents and staff, and to promote quality of care and life for the residents, families and staff.

Nursing homes are complex entities with designs involving collaboration between multiple stakeholders from different backgrounds. Stakeholders may include residents living with dementia, their families, staff, service providers, designers, architects and policy-makers. Key characteristics specific to the Singaporean population needs to be uncovered to drive processes that can support the evidence-based development of a collaborative and systematic platform. The Singaporean Environmental Assessment Tool offers a platform that can aid the redesign and implementation of dementia enabling environments from the stages of preplanning to the evaluation of current nursing homes. The study chose to adopt an existing, published tool instead of developing a new tool that will be different from international best-practice recommendations. The study looked to adapting an assessment tool that has been determined to be reliable. The tool also had to be used by a range of stakeholders involved in the design and care of residents living with dementia and requiring high levels of care. Reviewing the existing reliable and validated scales available in the field, the Australian Environmental Assessment Tool High-Care (EAT-HC) was identified to be

best suited for the study. The underpinning principles of design of the EAT-HC were found to be widely accepted by the Singaporean participants; however, the study shed light on the impact of culture on the built environment. The culture of the population affirms and supports the residents' sense of identity and purpose and is an essential element in the design of dementia enabling environments. The inclusion of population specific cultural sensitivities is recommended in the adaptation of the EAT-HC.

Table 21. Overview of the thesis viewed by chapter with a summary of the research questions and publication outcomes

Chapter	Research Question	Chapter/Publication Title
-	Prelude	Sun, J. (2018). Grandma's Dementia & Ignorance was certainly not bliss. Project we forgot. https://projectweforgot.com/your-aid/country/singapore/grandmas-dementia-ignorance-certainly-not-bliss/
1.1	Introduction An overview of the study and the context statement.	
1.2	Is there a culturally appropriate and salutogenic dementia environment assessment tool available for Singapore? Can the design principles that are the basis of the Australian Environmental Assessment principles be used as the foundation for an environmental assessment tool in Singapore?	Sun, J., & Fleming, R., Fay, R., & Crookes., P. (2016). Environmental Design of Nursing Homes for People with Dementia in Singapore. [Paper presentation]. Australian Association of Gerontology. Cutting Edge Ageing Research, Tasmania, Australia. https://doi:10.13140/RG.2.2.18334.54080
Phase 1		
2	Is there a culturally appropriate dementia environment assessment tool currently available for application in East and Southeast Asia? Can the design principles that are the basis of the Australian Environmental Assessment principles be used as the foundation for an environmental assessment tool in these regions?	Sun, J., & Fleming, R. (2018). Characteristics of the built environment for people with dementia in East and Southeast Asian nursing homes: a scoping review. <i>International Psychogeriatrics</i> , (4), 469-480.
3	What are the characteristics of the built environment that contribute to the well-being of people with dementia in the Singapore? Can the	Sun, J. (2020). The appropriateness of adapting the Australian Environmental Assessment Tool – High Care (EAT-HC) for persons with dementia in Singapore.

	design principles that are the basis of the Australian Environmental Assessment principles be used as the foundation for an environmental assessment tool in Singapore?	Health Environments Research & Design Journal. Advanced online publication https://doi.org/10.1177/1937586720929044
Phase 2		
4	What questions should comprise this tool? Does the tool have satisfactory psychometric and usability properties?	Sun, J., & Fleming, R. (in press). The development and reliability of the Singaporean Environmental Assessment Tool (SEAT) for facilities providing high levels of care for people living with dementia. <i>Health Environments Research & Design Journal</i> .
Meta-Inference		
5	How can a culturally sensitive tool be implemented and sustained in Singapore and Asia?	Sun, J., & Fleming, R., (2018). Knowledge Translation: a progress report on the culturally sensitive application of a dementia environment audit tool in Asia. [Poster presentation]. 3rd Tasmanian Dementia Symposium, Tasmania. https://doi: 10.13140/RG.2.2.17915.11047
6	What is the impact of the research on policy and practice in dementia environmental design in Singapore?	Sun, J., Tan, W.M., Luo, D.L., & Ng, V. (2020). The implementation of the SEAT in Singapore: Translating research into policy and practice. Agency for Integrated Care.
7	What is the impact of a knowledge broker in an international research project?	Sun, J. (2020). The role of a knowledge broker in an international research project [Webinar]. <i>World Young Leaders in Dementia (WYLD), Working in different dementia fields series</i> . https://wyldementia.org/
8	Conclusion	-
	Epilogue	

The study met all objectives (Table 21). The first phase investigated the cultural characteristics and the applicability of the foundations of the EAT-HC, which is comprised of eight principles of design. The second part of phase one is to identify the characteristics of the built environment that can contribute to the wellbeing of residents living with dementia in nursing homes providing high levels of care in Singapore. The process was carried out successfully in an inclusive manner involving a range of stakeholders. However, a limitation in the first phase of the study was the lack of mental health support available at the time of the study for people living with dementia. Because of an inability to maintain a duty of care,

proxies were involved in their stead. The second phase also investigated the level of acceptance of the Singaporean version of the Environmental Audit Tool-High Care (EAT-HC). The strength of this phase in the study was the opportunity to conduct both rounds of testing in the same nursing homes providing care for people living with dementia in Singapore and with individuals involved in their care or the design of nursing homes. Lastly, the study achieved its aim in the development and testing of a Singaporean version of the EAT-HC. A user guide for Singaporeans accompanies the tool, and both items will be released and made free for public use in March 2020. Both items will be hosted on a website by a local Singaporean organisation (refer to Chapter 6) for users to download. The analysis also contributed to the recommendation of a knowledge-to-action framework for the sustainability of the tool.

With the development of the assessment tool for Singapore and the availability of the tool for public use with support from the government, it is in hope that the Singaporean Environmental Assessment Tool (SEAT) will;

1. enhance the understanding of dementia enabling environments,
2. enable other change-makers who seek a collaborative platform to communicate with fellow stakeholders in the design of nursing homes
3. empower the change-makers with a tangible and tested resource to guide them in the development and evaluation of dementia enabling environments
4. provide evidence of the adaptability of the SEAT for countries in East and Southeast Asia for further developmental projects

In conclusion, the study highlights that the principles of design that set the foundation for the EAT-HC are acceptable and applicable to a Singaporean population. The Singaporean version of the EAT-HC, SEAT, is found to be reliable, culturally sensitive and can be used in the support, guidance or evaluation of dementia enabling environments in Singapore. The phrases used in the study in the development of the SEAT can also contribute to a blueprint for the cultural adaptation of the EAT-HC for different cultural populations.

Epilogue

Reflecting upon the research, it is without a doubt that more studies need to be undertaken in the space of dementia enabling environments in Singapore and the neighbouring regions as the population ages. Regionally, the topic of an enabling environment and cultural needs appear to exist outside the sphere of dementia care, and it is truly a missing discourse. The gap observed in the lack of evidence in dementia research about culture and environments in Singapore and the regions in 2015 had prompted my undertaking of this study.

The evidence from this study indicates a clear need for the inclusion of cultural needs when designing dementia enabling environments for a specific population. Facilities designed for residents living with dementia that are distinct from the understanding of enabling environments and cultures fail to address the needs of personhood when attempting to meet the needs of residents, staff, families, and the wider population. The evidence shows that facilities where designs do not meet the needs of the population can contribute to the stigma of residents living with dementia; residents living with dementia are to be feared and care provision is challenging. Working in poorly designed facilities has been shown to impact on the delivery of care and understanding of dementia among the aged care workforce as staff struggle to balance risk management strategies while trying to implement person-centred care in hospital-like spaces. The study brings to light questions that facilities need to consider including about a resident's history, culture and environment. There needs to be a greater awareness and connection between the culture, the built environment and the care for people living with dementia.

The study opened with my personal experience of dementia. I believe it to be an experience that is not uncommon and one that is witnessed by many family members and formal and informal caregivers across the globe. My sharing endeavoured to present a personal account of the impacts of an unfamiliar and disabling environment. Dementia is not unique to a specific population; it affects everyone globally. Despite dementia being an umbrella term, the environment in which people living with dementia reside should embrace the cultural characteristics of the country. The designs should recognise the impacts of culture on identity, familiarity, inclusion, and citizenship within the population. As such, there should be not a one size fits all, cookie-cutter template design for all environments for

residents living with dementia in high care facilities across the globe or designs that remain culturally unfamiliar to residents. However, it is divisive and inefficient to have each country or culture have vastly different standards of measures reducing the ability for comparability and reducing global transparency.

There needs to be a global standard of measure that can be adapted to ensure that facilities can be assessed, and standards met across the world. The principles of design were found to be applicable and can enable a global application for facilities providing care for people living with dementia in Singapore and the greater region. The principles alone may not be adequate to establish the specifics of culturally appropriate characteristics; an environmental assessment tool is required. The environmental assessment tool allows the implementation of culturally appropriate characteristics of the population to be embodied in the items. This new research has significant implications for practice in dementia care, and for the design of dementia enabling environments in facilities providing high levels of care and education. The principles of design can set a global standard in dementia enabling environments and the tools can be adapted to meet the cultural needs of different populations in Asia.

On a personal note, I wrote this at a time when COVID19 was being experienced right through the world and I spent three months working from home. I live in a home away from home. I grew up in Singapore but the house I now live in, as I write, is in Hobart and contains all the familiar key characteristics of a home with an environment that allows me to continue to contribute as a citizen. A space to engage in meaningful work and study, and technology to allow me to engage in continuous social engagement and inclusion with loved ones and friends in Singapore and around Australia. If I require privacy and have the need to leave spaces with overwhelming negative stimulation, I have the ability to do so. My home is a small cottage littered with books from Singapore, family photos, and a number of sentimental cultural artefacts from Singapore. My kitchen, like a scene out of my mother's, is lined with an assortment of Southeast Asian condiments, pots and utensils. During the time I worked on my thesis, I reflected on the evidence attained in the scoping review and anecdotal evidence from the participants.

Living with dementia in a ward-like, pathogenic environment that resembled a dormitory, with a curtain or a small partition between fellow strangers. Moving away from a home that is swimming with memories to a life reduced to a bed and a locker. With

everything that I have owned in my life compacted into a locker beside my bed that is less than two feet high. With no wardrobes and no laundry facilities, I could only wear a standard-issue uniform from the nursing home both night and day. Sleeping in a room with no less than seven or more strangers sleeping 1.2 metres away from me until the end of life is a daunting experience. Should my cognitive abilities deteriorate, waking up daily in a hospital would be like a scene from the movie *Groundhog Day*; it would be unbearable. Reading the news in current times brings up a foreboding set of reality. Visitors were restricted from nursing homes in many parts of Asia. There were no visits from families, volunteers or external service providers that engage residents in meaningful activities and interventions. Many of these hospital-like facilities are not culturally appropriate, nor do they support technologically-enabled social connectivity. There are no spaces for privacy and multi-faith spaces are few. As much as we recognise the role of cognitive resilience in the face of change, when coming up against an environment that leaves little self-identity while living with a progressive syndrome with no cure until the end of life begs to question the implications for the well-being of the person with dementia.

I hope that this study can change the way people understand, design and develop built environments for people living with dementia. To embrace the designs of buildings that are enabling, dignified, respectful and culturally appropriate for people living with dementia. To consider what is meaningful in the design of environments for their local population and to embrace diversity and the rich culture that each individual country can bring to enrich the lives of people living with dementia in facilities providing high levels of care. More research of this nature can only help to bring fresh perspectives and innovations that can be shared globally in the aged care sector to improve the quality of life for residents living with dementia globally. For people living with dementia and may require residential care in Asia, it is in hope that this study can elicit change and open a way forward to environments that are truly enabling. Environments that we one day can embrace and be proud of.

Appendices

Appendix 1: Scientific Poster Chapter 1.2

Scientific Poster:

Sun, J., & Fleming, R., Fay, R., & Crookes., P. (2015). *Defining and assessing the built characteristics of the built environment that contribute to the well-being of people with dementia living in Chinese, Malay, and Indian aged care facilities in Singapore*. Poster presented at the Wicking Dementia Interventions Symposium 2015, Hobart, Tasmania. doi: 10.13140/RG.2.2.17915.11047

Appendix 2: Scientific Poster Chapter 2

Scientific Poster:

Sun, J., & Fleming, R. (2019). *Characteristics of the built environment for people with dementia in nursing homes in Asia*. Poster presented at the Australian Dementia Forum 2019, Hobart, Tasmania. doi: 10.13140/RG.2.2.36466.56000

Appendix 3: Scientific Poster Chapter 5

Scientific Poster:

Sun, J., & Fleming, R., (2018). *Knowledge Translation: a progress report on the culturally sensitive application of a dementia environment audit tool in Asia*. Poster presented at the 3rd Tasmanian Dementia Symposium, Hobart, Tasmania. doi: 10.13140/RG.2.2.17915.11047

Appendix 4: Singaporean Environmental Assessment Tool: User Guide

Educational Resource:

Fleming, R. & Sun, S. J. (2020). *Singapore Environmental Assessment Tool (SEAT): User Guide*. <https://ro.uow.edu.au/smhpapers1/1501/>

Fleming, R., & Sun, J., (in press). Singaporean Environmental Assessment Tool: User Guide. In Agency for Integrated Care, Singapore (Ed.), *Looking to the Future: Designing and Managing Residential Facilities for People with Dementia* (pp.41-48). Singapore, Agency for Integrated Care.

Please note that the user guide in this appendix has been reformatted to meet the formatting requirements of the dissertation.

Singaporean Environmental Assessment Tool (SEAT)

User guide 2020

Prof Richard Fleming & Joanna Sun

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Part 1:
An Introduction to the
Singapore Environmental Assessment Tool (SEAT)
and Design Principles

Introduction to the SEAT

The purpose of this guide is to enable users of the Singapore Environmental Assessment Tool (SEAT) to confidently and successfully complete an assessment of an environment used to accommodate people with dementia. The SEAT provides a systematic framework for reviewing environments for people with dementia and identifying areas for improvement. It contains questions that have been designed to gather information on how well the ten principles described below have been put into practice.

The SEAT is designed to be used by a non-design professional and can be completed by a member of staff or a person visiting the facility with a minimal knowledge of dementia care. However, it is important that the person completing the SEAT is familiar with the design principles underpinning it prior to starting the assessment, users should familiarise themselves with the principles by thoroughly reading the description of the principles below.

The Objective of the Assessment

There is no perfect design. Even the best facilities can do things better. The purpose of the tool is to provide a systematic framework for reviewing the environment and identifying areas for improvement. There is no perfect design. Even the best facilities can do things better.

Design Principles

1. Inconspicuously reduce risks

People with dementia in a nursing home require an environment that is safe and easy to move around if they are to continue to pursue their way of life and make the most of their abilities. Potential risks such as steps should be removed. Safety features must not attract the attention of the residents as obvious safety features, such as fences or locked doors, can lead to frustration, agitation and anger or apathy and depression.

2. Provide a human scale

The scale of a building can affect the behaviour and feelings of a person with dementia. The experience of scale is influenced by three key factors; the number of people that the person encounters, the overall size of the building and the size of the individual components (such as doors, rooms and corridors). A person should not be intimidated by the size of the surroundings rather the scale should encourage a sense of wellbeing and enhance the competence of a person.

3. Allow people to see and be seen

When a person with dementia can see the key places in the nursing home, such as a living room, dining room, their bedroom, kitchenette/dry pantry and an outdoor area they are more able to make choices and get to where they want to go. Buildings that provide these opportunities are said to have good visual access. Good visual access opens up opportunities for engagement and gives the person with dementia the confidence to explore their environment. It also enables staff to see residents. This reduces staff anxiety about the residents' welfare and the visibility of the staff to the residents reassures them.

4. Manage levels of stimulation – Reduce unhelpful stimulation

Because dementia reduces the ability to filter stimulation and attend to only those things that are important, a person with dementia becomes stressed by prolonged exposure to large amounts of stimulation. The environment should be designed to minimise exposure to stimuli that are not specifically helpful to the resident, such as unnecessary or competing noises and the sight of signs, posters, places and clutter that are of no use to the resident. The full range of senses must be considered. Too much visual stimulation is as stressful as too much auditory stimulation.

5. Manage levels of stimulation – Optimise helpful stimulation

Taking unhelpful stimulation away leaves room for highlighting things that will help people

with dementia. Enabling the person with dementia to see, hear and smell things that give them cues about where they are and what they can do, can help to minimise their confusion and anxieties. Consideration needs to be given to providing a number of cues to the same thing, recognising that what is meaningful to one person will not necessarily be meaningful to another. Contrasting things that the resident needs to see with the background is a powerful way of helping them find what they need, e.g. the toilet, crockery on the table, the chair they need to sit on. Cues need to be carefully designed so that they do not add to clutter and become over stimulating.

6. Support movement and engagement

Purposeful movement can increase engagement and maintain a person's health and wellbeing. It is encouraged by providing a well-defined pathway, free of obstacles and complex decision points, that guides people past points of interest and opportunities to engage in activities or social interaction. The pathway should be both within the nursing home and in the external areas, providing an opportunity and reason to go outside when the weather permits.

7. Create a familiar place

A person with dementia is more able to use and enjoy places and objects that are familiar to them from their early life. The environment should provide them with the opportunity to maintain their competence through the use of familiar building design, furniture, fittings and colours. The personal backgrounds of the residents need to be reflected in the environment. The involvement of the person with dementia in personalising the environment with their familiar and culturally appropriate objects should be encouraged.

8. Provide a variety of places to be alone or with others – in the unit

People with dementia need to be able to choose to be on their own or spend time with others. This requires a variety of places in the unit, some for quiet conversation and some for larger groups, as well as places where people can be by themselves. These places should have a variety of characters, e.g. a place for reading, looking out of the window or talking, to cue the person to engage in relevant activity and stimulate different emotional responses.

9. Provide a variety of places to be alone or with others – in the community

Without constant reminders of who they are, a person with dementia will lose their sense of identity. Frequent interaction with friends and relatives can help to maintain that identity and visitors should be encouraged to drop in by the provision of comfortable places that encourage interaction.

Stigma remains a problem for people with dementia, so the unit should be designed to blend with the existing community and not stand out as a ‘special’ unit. Where possible a place that is shared by the community and the people with dementia in the nursing home should be provided. A coffee shop, for example, may enable people with dementia to meet friends, family and other members of the community in a normal setting. Where the unit is a part of a larger site, there should be easy access around the site so people with dementia, their families and friends can interact with other people who live there.

10. Design in response to vision for a way of life

The choice of lifestyle will vary between facilities. Some will be focused on engagement with the ordinary activities of daily and have, for example, fully functioning kitchens where the residents help with food preparation. Others will focus on the ideas of providing a full service so that residents do not take any part in the activities of daily living and are

occupied in recreational activities. There are many lifestyles that could be made available to residents, e.g. a healthy lifestyle or, perhaps, spiritual reflection. The way of life offered needs to be clearly stated and the building designed both to support it and to make it evident to the residents and staff.

Undertaking the Assessment

The SEAT is available in two formats, one document that is structured according to the principles of design and another structured according to spaces found in the environment. Should the user take up the SEAT structured according to spaces, to obtain a score according to the principles of design, users will have to transfer the scores from the “spaces” tool to the “principles of design” assessment tool.

Before commencing the SEAT, it is important to clearly define the area that is to be assessed i.e. the extent of the unit and what features are included in it. Is the courtyard garden, for example, part of the unit being assessed, another unit or both? In a large facility, it may be helpful to assess units separately as this will allow for more accurate responses to questions. Ask someone who knows the unit well about the boundaries of the unit so that the area that is to be assessed is accurately defined.

Basic Singaporean Housing Development Flat	A Unit
A unit is the space where the residents live, and must comprise of the living space, bedroom, food preparation and/or food service area, dining area and toilet/bathroom with optional areas such as garden and activity spaces. For instance, a unit in Singapore may be as small as six people sharing one living room/space or it can be large with more than thirty people sharing one living room.	
<p>Inside</p> <ul style="list-style-type: none"> ✓ A living space ✓ Dining Space ✓ A kitchen ✓ Bedroom(s) ✓ Toilets/Bathroom <p>Outside</p> <ul style="list-style-type: none"> ✓ Garden ✓ Activity Space ✓ Social/Community Space 	<p>Inside</p> <ul style="list-style-type: none"> ✓ A living space (can also be known as a day room/multi-purpose room/activity room etc.) ✓ A kitchen/kitchenette/dry pantry/Dining ✓ Bedroom(s) ✓ Toilets/Bathroom <p>Outside (Optional)</p> <ul style="list-style-type: none"> ✓ Garden ✓ Activity Space ✓ Social/Community Space

Spending time in the unit and observing daily life will help generate a feel for the place and help to ensure that the questions are answered accurately. It will also create opportunities for interaction with residents so that they have an opportunity to enjoy the visit. It is very important to avoid making the residents feel that they are the subject of scrutiny. It would be much better if they felt they were showing you around their home.

Some questions are best answered by sitting in a central position and others by moving around. If the correct answer is not obvious, ask a staff member who works in that part of the facility, e.g. 'Is there a switch to turn off electricity to power points in the kitchen(s) the residents use?' It may be that there is a difference of opinion between the staff and the person completing the SEAT, for example as to whether glare can be avoided by using curtains and blinds. In this case the person completing the SEAT will need to determine the correct response. If in doubt as to the intent or aim of the question, refer to part 4 of this handbook where information about each question is provided. It may be that on the day of the visit something is observed that is unusual and not representative of a typical day. Use the spaces provided for comment to record this so that it can be taken into account when the results of the completion of the SEAT are used to guide decisions on changing the environment. It is useful to discuss the results with the manager (or the liaison person) before leaving the unit. This will provide a final check of the accuracy of the scores and ensure that the manager knows that his/her opinion is being respected.

Understanding the numbers in the SEAT

The numbers in the extreme left column refer to the principles and the question that can be found in the User Guide. The numbers on the right are the scores attained when using the assessment tool.

Example: The information regarding question number 2.1 refers to Principle 2, Question 1 of the handbook.

No.	Question	1-10	11-16	17-29	30+	Enter Score
		Score	Score	Score	Score	
2.1	How many people live in the unit?	3	2	1	0	
No.	Question	No		Yes		
		Score		Score		
2.2	Does the scale (height and width) of the common areas allow a person to feel comfortable (and not uneasy because they are too big or too small)?	0		1		

Understanding highlighted items in the SEAT

The items in the SEAT have been tested for validity and reliability. Items that are highlighted have reviewed lower psychometric properties. However, they have been retained within the SEAT due to research participants feedback on the value of these items and their contributions to the quality of life and care for people living with dementia. More research and testing will have to be done to assess the following items. Education and training in dementia enabling environments is advised for users who endeavour to undertake these items.

Sample

No.	Question	N/A	25% or less	26%- 50%	51%- 75%	76% or more	Enter Score	Spaces
			Score	Score	Score	Score		
3.1	What percentage of residents can see the inside of a living room as soon as they leave their bedroom?		0	1	2	3		Bedrooms
3.2	What percentage of residents can see their bedroom entry as soon as they leave a living room?		0	1	2	3		Bedrooms
3.3	What percentage of residents can see the inside of a dining room as soon as they leave their bedroom?		0	1	2	3		Bedrooms
No.	Question	N/A	No	Yes	Enter Score			Enter Score
		Score	Score	Score				
3.4	Can the exit to a garden or outside area be seen from the living or dining room that is used by most residents?	1	0	1				Dining & Kitchen/Pantry
3.5	Can the dining room be seen into from the living room?	1	0	1				Dining & Kitchen/Pantry
3.6	Can a toilet be seen from the dining room that is used by most residents?	1	0	1				Bathroom & Toilets

Part 2:
A Guide to the Questions

Principle 1: Inconspicuously/Unobtrusively Reduce Risks

Question 1.1: Can people who live in the unit be prevented from leaving the garden/outside area by getting over or under the perimeter?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.1	Can people who live in the unit be prevented from leaving the garden/outside area by getting over or under the perimeter? (Only applicable to nursing homes that have a secured perimeter.)	2	0	1	1	

It may be important that the environment is secure to prevent residents leaving the unit if they shouldn't. A fence that is sturdy and difficult to climb (or go under) is often used to achieve this.

The fence needs to be high enough to make it difficult for residents (and non-residents) to climb over when it is important that the unit is secure. The fence should be at least 1.8m high. It should also be continuous and well maintained, and the fence design must not allow for climbing (in or out). It is important that measures to create a secure garden are as discreet/unobtrusive as possible to avoid frustration, agitation and anger.

Scoring the Question: The question obtains 1 point if the answer is "Yes" and an additional point if the perimeter is unobtrusive or inconspicuous. Please refer to the example above. If the perimeter cannot be secured, please select "No". If there are no restrictions on movement please circle '2' in the 'N/A' column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the 'No', 'Yes' and 'If Unobtrusive' columns (do not include the 'N/A' column) in the 'Enter Score' column.

Question 1.2: Can people who live in the unit be prevented from leaving the garden/outside area through the gate?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.2	Can people who live in the unit be prevented from leaving the garden/outside area through the gate? (Only applicable for nursing homes that have a gate at the entrance or exit to the facility.)	2	0	1	1	

It may be important that the environment is secure to prevent residents leaving the nursing home if they shouldn't. Having a gate that is sturdy and difficult to climb (or go under) is vital in this regard.

The gate needs to be able to be locked while allowing for exit in an emergency (if this is part of an emergency evacuation route). Technology such as mechanical keypads or keypads which are linked to a staff call system can be installed on gates. (If keypads are linked to a staff call system, they will release automatically in the event of a fire). It is important that measures to create a secure garden are not obvious and do not attract attention to avoid frustration, agitation and anger.

Double handles/latches may also be effective to prevent easy opening by residents from within the grounds. It is also important that residents cannot reach over a gate and open it from the outside while inside the grounds.

Scoring the Question: The question obtains 1 point if the answer is "Yes" and an additional point if the gate is unobtrusive or inconspicuous/unobtrusive. Please refer to the example above. If people cannot be prevented to leave through the gate, please select "No". If there are no perimeters, please circle '2' in the 'N/A' column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the 'No', 'Yes' and 'If Unobtrusive' columns (do not include the 'N/A' column) in the 'Enter Score' column.

Question 1.3: Can the front door leading out of the unit be secured?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.3	Can the front door leading out of the unit be secured?	2	0	1	1	

It is important that the front door of the unit/floor for residents with dementia can be secure to prevent residents leaving the area if they shouldn't, and to prevent people coming in and bothering residents. The location of the front door within the facility and the type of security mechanism or technology selected will be important to allow for ease of use by staff and visitors.

It is important that measures to create a secure front door are not obvious and do not attract attention to avoid frustration, agitation and anger.

Scoring the Question: The question obtains 1 point if the answer is "Yes" and an additional point if the front is inconspicuous/unobtrusive. Please refer to the example above. If the front door cannot be secure, please select "No". If there are no perimeters, please circle '2' in the 'N/A' column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the 'No', 'Yes' and 'If Unobtrusive' columns (do not include the 'N/A' column) in the 'Enter Score' column.

Question 1.4: Outside, is there step free access to all areas?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.4	Outside, is there step free access to all areas?	1	0	1		

As many residents use mobility aids, step free access is important so that residents can easily move about outside. Step free access outside means that there are no steps between different surfaces and no changes of level between inside and outside, or between outside areas (such as a shelter and a path). Steps with risers of varying heights and small changes of level are unacceptable.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If there are no step free access to all areas utilised by the resident, or only some of the areas are step-free, please select “No”. Please note this is not applicable to emergency exit staircases or fire isolated staircases commonly found in a high-rise building. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 1.5: Outside, are all floor surface materials safe from being slippery when wet?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.5	Outside, are all floor surface materials safe from being slippery when wet?	1	0	1		

A fall can result in a significant injury for an older person and, so it is important to create an environment which minimises the risk of slipping and tripping. Outside floor finishes need to be slip resistant, even when they are wet.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If none of the floor surface materials are safe from being slippery when wet, or only some of floor surface materials are safe, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 1.6: Outside, is the path surface even?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.6	Outside, is the path surface even?	1	0	1		

An even path surface will reduce the likelihood of residents tripping. Paths should be free from undulations (uneven, wave-like surfaces), holes and ragged edges.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside if none of the path surface is even, or only some of the surfaces are even, please select “No”. If this

question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 1.7: Outside, are the paths that are exposed to external elements such as the weather, plants and trees; clear of obstacles (e.g. trees, thorny plants) along and over the path?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.7	Outside, are the paths that are exposed to external elements such as the weather, plants and trees; clear of obstacles (e.g. trees, thorny plants) along and over the path?	1	0	1		

Obstacles along a path present a great hazard to residents. Trees, plants and bushes can project onto paths (reducing their width) and creating tripping hazards. Twigs and leaves falling from trees can also be dangerous for residents. Branches which hang over the path can also be a hazard if they hang near head height.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if none of the surfaces are even, or only some of the surfaces are even, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 1.8: Outside, are the paths wide enough to allow two wheelchairs to pass?**(Minimum width is 1.8 metres)**

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.8	Outside, are the paths wide enough to allow two wheelchairs to pass? (Minimum width is 1.8 metres)	1	0	1		

Many residents in nursing homes use walking aids such as wheelchairs or walking frames. It is important that two people can walk together or pass each other along the path.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if the paths are not wide enough to allow two wheelchairs to pass, or are wide enough, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 1.9: Outside, are all ramps of a gradient suitable for wheelchair use?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.9	Outside, are all ramps of a gradient suitable for wheelchair use?	1	0	1		

If a ramp is too steep, it will be difficult for both residents and carers (who may be pushing residents) to use them.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if all of the ramps are too steep for wheelchair use, or some of them may be too steep, please select

“No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 1.10: Is there a way to keep residents out of the kitchen/kitchenette/dry pantry if required?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.10	Is there a way to keep residents out of the kitchen/kitchenette/dry pantry if required?	2	0	1	1	

Some residents, and visitors, may present a danger to themselves or to others in a kitchen, and so access to the resident kitchen needs to be able to be controlled. It is important, however, that this does not result in all residents being denied access to the kitchen. The design and layout of the kitchen will be key in allowing controls to be well designed and effective. The measures used (such as a half door) need to be discreet and integrated into the design, so that they cannot be easily removed and so that the limitations which are being put in place are not being emphasised. It is important that measures to keep residents out are not obvious and do not attract attention to avoid frustration, agitation, and anger.

Please note that “kitchen” does not refer to the staff or central kitchen but a space that residents can engage in meal preparation activities.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If the design of kitchen/kitchenette/dry pantry is unable to keep residents out when required, please select “No”. If this question is not applicable, please circle ‘2’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, ‘Yes’ and ‘If Unobtrusive’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 1.11: Can appliances be locked away in the kitchen/kitchenette/dry pantry the residents use?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.11	Can appliances be locked away in the kitchen the residents use? (Applicable to homes providing residents to kitchenette/dry pantry to engage in activities of daily living.)	2	0	1	1	

Some residents (and visitors) may present a danger to themselves or to others when using appliances and so access to these needs to be restricted, for example by placing them in a lockable cupboard. It is important, however, that this does not result in all residents being denied access to appliances. It is important that measures to store appliances safely are not obvious and do not attract attention to avoid frustration, agitation and anger.

Scoring the Question: The question obtains 1 point if the answer is “Yes” and an additional point if the appliances can be inconspicuously/unobtrusively locked away in the kitchen/kitchenette/dry pantry. Please refer to the example above. If the front door cannot be secure, please select “No”. If this question is not applicable, please circle ‘2’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, ‘Yes’ and ‘If Unobtrusive’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 1.12: Is there a switch to turn off electricity to power points in the kitchen the residents use?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.12	Is there a switch to turn off electricity to power points in the kitchen the residents use? (Applicable to homes providing residents to kitchenette/dry pantry to engage in activities of daily living.)	2	0	1	1	

It is important that electrical power to the resident kitchen is able to be controlled so that residents who are not able to use appliances and power points safely are not prevented from entering the kitchen to undertake other tasks, such as washing dishes and wiping benches. The ability to isolate the power will also mean that those residents who can use electrical appliances safely can continue to do so. This control should not be obvious, so that it cannot be easily overridden and so that the limits which are being put in place are not being emphasised.

Scoring the Question: The question obtains 1 point if the answer is “Yes” and an additional point if the switch is inconspicuous/unobtrusive. Please refer to the example above. If there is no switch, please select “No”. If this question is not applicable, please circle ‘2’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, ‘Yes’ and ‘If Unobtrusive’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 1.13: Inside, are all floor surfaces safe from being slippery when wet?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.13	Inside, are all floor surfaces safe from being slippery when wet?		0	1		

A fall can result in a significant injury for an older person, so it is important to create an environment which minimises the risk of slipping. All internal floor finishes need to be slip resistant when wet, as any surface can become wet. An appropriate cleaning regime is essential to ensure that the slip resistance of the floor finish is maintained. Slip resistant inside floor finishes are also required to enable staff to assist residents safely.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If none of the floor surface materials are safe from being slippery when wet, or only some of floor surface materials are safe, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 1.14: Inside, is contrast between floor surfaces avoided (e.g. sharp distinction between bedroom floor and corridor)?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.14	Inside, is contrast between floor surfaces avoided (e.g. sharp distinction between bedroom floor and corridor)?		0	1		

A person with dementia may perceive floor surfaces that have a high level of contrast between them as a hole or step or barrier. A resident may not wish to leave their bedroom, for

example, as he/she perceives the corridor floor (which has a high level of contrast with the adjacent bedroom floor) as a dangerous step. This can lead to falls, anxiety and limit a person's ability to move about freely and be independent. Patterns in floor finishes can have the same effect as residents try to step over or around patterns.

Scoring the Question: The question obtains 1 point if the answer is "Yes". If none of the contrast between floor surfaces are avoided, or only are avoided, please select "No". The final step is to enter the total of the numbers circled in the 'No' and 'Yes' columns in the 'Enter Score' column.

Question 1.15: Inside, are all ramps of a gradient suitable for wheelchair use?

No.	Question	N/A	No	Yes
1.15	Inside, are all ramps of a gradient suitable for wheelchair use?		0	1

It is not only important that ramps are used to respond to changes in level, but that these ramps are of a suitable gradient. If a ramp is too steep, it will be difficult for both residents and carers (who may be pushing residents) to use them.

Scoring the Question: The question obtains 1 point if the answer is "Yes". If the gradient is too steep, or difficult for the user or the resident to push a wheelchair up the ramp, please select "No". The final step is to enter the total of the numbers circled in the 'No' and 'Yes' columns in the 'Enter Score' column.

Question 1.16: Is it easy to transfer a non-ambulant person from their bed to the bathroom (using appropriate equipment)?

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.16	Is it easy to transfer a non-ambulant person from their bed to the bathroom (using appropriate equipment)?		0	1		

It is important when a resident is non-ambulant that he/she can be easily assisted using mobility aids and lifting equipment. This should not, however, take away the ability for the resident and their family to furnish their bedroom. Room size and shape will have an effect on the easy use of equipment, and the furnishing of the room may also need to be taken into account.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If it is not easy to transfer a non-ambulant person from their bed to the bathroom, or only some people can be transferred easily, please select “No”. If in doubt, please approach staff for more information. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 1.17: Is technology utilised to enhance the safety and security of the unit? (Key card access, digital locks, sensors etc.)

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.17	Is technology utilised to enhance the safety and security of the unit? (Key card access, digital locks, sensors etc.)	2	0	1	1	

Modern technology has been evolving and improving, creating inconspicuous hardware that can provide a safer and more secure environment for residents. However, to be able to implement the use of technology, basic infrastructure is required to ensure that the technology can be made available throughout the building.

Scoring the Question: The question obtains 1 point if the answer is “Yes” and an additional point if the switch is inconspicuous/unobtrusive. Please refer to the example above. If there is no switch, please select “No”. If this question is not applicable, please circle ‘2’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, ‘Yes’ and ‘If Unobtrusive’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Acquiring the Total and Percentage Score for Principle 1

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score
		Score	Score	Score	Score	
1.1	Can people who live in the unit be prevented from leaving the garden/outside area by getting over or under the perimeter?	2	0	①	①	2
1.2	Can people who live in the unit be prevented from leaving the garden/outside area through the gate?	2	0	①	1	1
1.3	Can the front door leading out of the unit be secured?	②	0	1	1	NA
1.4	Outside, is there step free access to all areas?	1	0	①		1
1.5	Outside, are all floor surface materials safe from being slippery when wet?	1	0	①		1
1.6	Outside, is the path surface even?	1	①	1		0
1.7	Outside, are the paths that are exposed to external elements such as the weather, plants and trees; clear of obstacles (e.g. trees, thorny plants) along and over the path?	1	0	①		1
1.8	Outside, are the paths wide enough to allow two wheelchairs to pass? (Minimum width is 1.8 metres)	1	0	①		1
1.9	Outside, are all ramps of a gradient suitable for wheelchair use?	1	①	1		0
1.10	Is there a way to keep residents out of the kitchen/kitchenette/dry pantry if required?	2	0	①	1	1
1.11	Can appliances be locked away in the kitchen/kitchenette/dry pantry the residents use?	②	0	1	1	NA
1.12	Is there a switch to turn off electricity to power points in the kitchen/kitchenette/dry pantry the residents use?	2	①	1	1	0
1.13	Inside, are all floor surfaces safe from being slippery when wet?		0	①		1
1.14	Inside, is contrast between floor surfaces avoided (e.g. sharp distinction between bedroom floor and corridor)?		①	1		0
1.15	Inside, are all ramps of a gradient suitable for wheelchair use?		①	1		0
1.16	Is it easy to transfer a non-ambulant person from their bed to the bathroom (using appropriate equipment)?		①	1		0
1.17	Is technology utilised to enhance the safety and security of the unit? (Key card access, digital locks, sensors etc.)	2	0	①	1	1
Total N/A Score		4	Total Score			10
			% Score $\frac{\text{Total Score} \times 100}{24 - \text{Total N/A Score}}$			50%

Please note that the table above is an example. (1) Please add the scores obtained for each question and enter the scores in the "Enter Score" column as seen in the column. In the example the score obtained for question 1.1 is "2". (2) Please add the scores from the enter score column to obtain the total score. The score obtained in the example is "14". Add the total score for all N/A questions. In the example the total N/A score is "4". To obtain your percentage score please multiply your total score by 100 and divide it by the number obtained when the total N/A score is subtracted from 24.

$$\frac{\% \text{ Score}}{\frac{\text{Total Score} \times 100}{24 - \text{Total N/A Score}}} = \frac{\% \text{ Score}}{\frac{10 \times 100}{24 - 4}} = \frac{1000}{20} = 50\%$$

Principle 2: Provide a Human Scale

Question 2.1: How many people live in the unit?

No.	Question	1-10	11-16	17-29	30+	Enter Score
		Score	Score	Score	Score	
2.1	How many people live in the unit?	3	2	1	0	

It has been shown that small scale settings are beneficial for older people and especially for older people with dementia. Group size, or the number of people in a unit, is the most important factor in achieving a small-scale setting. In a small unit, a resident need to relate to fewer people, and is able to do things in a group which is more familiar to them.

The number of residents in a unit has a big impact on the overall size of the unit, as the number of bedrooms and the amount of circulation space that is required increase with more people. A smaller group size means a smaller unit.

Basic Singaporean Housing Development Flat	A Unit
A unit is the space where the residents live, and must comprise of the living space, bedroom, kitchen/dining and toilet/bathroom with optional areas such as garden and activity spaces. For instance, a unit in Singapore may be as small as six people sharing one living room/space or it can be large with more than thirty people sharing one living room.	
<p>Inside</p> <ul style="list-style-type: none"> ✓ A living space ✓ A kitchen ✓ Bedroom(s) ✓ Toilets/Bathroom <p>Outside</p> <ul style="list-style-type: none"> ✓ Garden ✓ Activity Space ✓ Social/Community Space 	<p>Inside</p> <ul style="list-style-type: none"> ✓ A living space (can also be known as a day room/multi-purpose room/activity room etc.) ✓ A kitchen/kitchenette/dry pantry/Dining ✓ Bedroom(s) ✓ Toilets/Bathroom <p>Outside (Optional)</p> <ul style="list-style-type: none"> ✓ Garden ✓ Activity Space ✓ Social/Community Space

Scoring the Question: The question obtains a score of “0” if there are 30 or more people living in the unit. 1 point is scored If there are 17 to 29 people living in the unit, 2 points for 11 to 16 people and 3 points if there are 1 to 10 people living in the unit. If in doubt, please approach staff for more information. The final step is to enter the total of the numbers circled in the ‘1-10’, ‘11-16’, ‘17-29’ and ‘30+’ columns in the ‘Enter Score’ column.

Question 2.2: Does the scale (height and width) of the common areas allow a person to feel comfortable (and not uneasy because they are too big or too small)?

No.	Question	No	Yes	Enter Score
		Score	Score	
2.2	Does the scale (height and width) of the common areas allow a person to feel comfortable (and not uneasy because they are too big or too small)?	0	1	

The internal scale and detailing of a unit is important in creating a human scale. Common areas need to be of a size that allows people to feel comfortable and at ease, rather than lost or alone. The size of room for 4 people to sit in, for example, is quite different from the size of a room designed for 12 people to sit in. The meaning of human scale will vary according to people’s experiences, and so it is important to use a typical house such as a Housing Development Board (HDB) flat as a reference.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If the scale (height and width) of the common areas allow a person to feel uncomfortable (and uneasy because they are too big or too small) please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Acquiring the Total and Percentage Score for Principle 2

No.	Question	1-10	11-16	17-29	30+	Enter Score
		Score	Score	Score	Score	
2.1	How many people live in the unit?	3	②	1	0	2

← 1

No.	Question	No	Yes	Enter Score
		Score	Score	
2.2	Does the scale (height and width) of the common areas allow a person to feel comfortable (and not uneasy because they are too big or too small)?	0	①	1

← 2

Total Score	3
$\frac{\% \text{ Score}}{\text{Total Score} \times 100}$ $\frac{3 \times 100}{4}$	75%

Please note that the table above is an example. (1) Please add the scores obtained for each question and enter the scores in the "Enter Score" column as seen in the column. In the example the score obtained for question 2.1 is "2". (2) Please add the scores from the enter score column to obtain the total score. The score obtained in the example is "3". To obtain your percentage score please multiply your total score by 100 and divide it by 4.

$$\frac{\% \text{ Score}}{\text{Total Score} \times 100} = \frac{\% \text{ Score}}{3 \times 100} = \frac{300}{4} = \underline{75\%}$$

Principle 3: Allow People to See and be Seen

Question 3.1: What percentage of residents can see the inside of a living room as soon as they leave their bedroom?

No.	Question	N/A	25% or less	26%-50%	51%-75%	76% or more	Enter Score
			Score	Score	Score	Score	
3.1	What percentage of residents can see the inside of a living room as soon as they leave their bedroom?		0	1	2	3	

The living room is a place where residents are likely to want to spend time relaxing and socialising. It needs to be easy to find and recognise. If residents can see enough of the inside of a living room as they need to recognise it as living room, as soon as they leave their bedroom this will help them know how to get there.

Scoring the Question: The question obtains a score of “0” if 25% of the residents or less can see the inside of a living room as soon as they leave their bedroom. Residents should be able to see minimally half of the living room, enough to identify the space. 2 points are scored If between 26% to 50% of residents can see the living room and 3 points if 76% of residents or more can see the inside of the living room. The final step is to enter the total of the numbers circled in the ‘25% or less’, ‘26%-50%’, ‘51%-75%’ and ‘76% or more’ columns in the ‘Enter Score’ column.

Question 3.2: What percentage of residents can see their bedroom entry as soon as they leave a living room?

No.	Question	N/A	25% or less	26%-50%	51%-75%	76% or more	Enter Score
			Score	Score	Score	Score	
3.2	What percentage of residents can see their bedroom entry as soon as they leave a living room?		0	1	2	3	

A resident's bedroom needs to be easy to find and recognise. The easiest ones to find are those where the door (or entry) is visible from the living room where they spend most of their time. Bedroom doors offer residents an important way to recognise their room, and consideration should be given to making the door (or entry) individualised so that the resident can see that his/her door is different to others. The placement of features near the door can also be important in highlighting the entry to a bedroom.

Scoring the Question: The question obtains a score of "0" if 25% of the residents or less can see the bedroom entry as soon as they leave a living room. Residents should be able to see minimally half of the bedroom, enough to identify the space. 2 points are scored If between 26% to 50% of residents can see their bedroom entry and 3 points if 76% of residents or more can see their bedroom entry as soon as they leave a living room. The final step is to enter the total of the numbers circled in the '25% or less', '26%-50%', '51%-75%' and '76% or more' columns in the 'Enter Score' column.

Question 3.3: What percentage of residents can see the inside of a dining room as soon as they leave their bedroom?

No.	Question	N/A	25% or less	26%-50%	51%-75%	76% or more	Enter Score
			Score	Score	Score	Score	
3.3	What percentage of residents can see the inside of a dining room as soon as they leave their bedroom?		0	1	2	3	

The dining room is a place where residents are likely to want to find several times a day. It needs to be easy to find and recognise. If residents can see enough of the inside of the dining room as they need to recognise it as a dining room, as soon as they leave their bedroom this will help them know how to get there.

Scoring the Question: The question obtains a score of “0” if 25% of the residents or less can see the inside of a dining room as soon as they leave their bedroom. Residents should be able to see minimally half of the dining room, enough to identify the space. 2 points are scored If between 26% to 50% of residents can see their bedroom entry and 3 points if 76% of residents or more can see the inside of a dining room as soon as they leave their bedroom. The final step is to enter the total of the numbers circled in the ‘25% or less’, ‘26%-50%’, ‘51%-75%’ and ‘76% or more’ columns in the ‘Enter Score’ column.

Question 3.4: Can the exit to a garden or outside area be seen from the living or dining room that is used by most residents?

No.	Question	N/A	No	Yes	Enter Score	Enter Score
		Score	Score	Score		
3.4	Can the exit to a garden or outside area be seen from the living or dining room that is used by most residents?	1	0	1		

Spending time outside is important and, so it is vital that residents can see the way to go outside from the living and the dining room where they likely to be spending a lot of their time.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If the exit to a garden or outside area cannot be seen from the living or dining room that is used by most residents, or less than half of the exit can be seen, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 3.5: Can the dining room be seen into from the living room?

No.	Question	N/A	No	Yes	Enter Score	Enter Score
		Score	Score	Score		
3.5	Can the dining room be seen into from the living room?	1	0	1		

Important areas such as living room and dining room should be visually connected. This will mean that a resident can easily see other places that will be of interest to them and can also

see how they can go from one of these places to another.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If the dining room cannot be seen into from the living room, or less than half of the dining room can be seen, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 3.6: Can a toilet be seen from the dining room that is used by most residents?

No.	Question	N/A	No	Yes	Enter Score	Enter Score
		Score	Score	Score		
3.6	Can a toilet be seen from the dining room that is used by most residents?	1	0	1		

A toilet needs to be easily located if residents are not to feel anxious. It is important that it is not only close to the dining room but also visible from the dining room.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If a toilet cannot be seen from the dining room that is used by most residents, or less than half of the entry to the toilet can be identified, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 3.7: Can a toilet be seen from the living room that is used by most residents?

No.	Question	N/A	No	Yes	Enter Score	Enter Score
		Score	Score	Score		
3.7	Can a toilet be seen from the living room that is used by most residents?	1	0	1		

A toilet needs to be easily located if residents are not to feel anxious. It is important that it is not only close to the living room but also visible from the living room.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If a toilet cannot be seen from the living room that is used by most residents, or less than half of the entry to the toilet can be identified, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 3.8: Can the living room that is used by most residents be seen into from where staff spend most of their time?

No.	Question	N/A	No	Yes	Enter Score	Enter Score
		Score	Score	Score		
3.8	Can the living room that is used by most residents be seen into from where staff spend most of their time?	1	0	1		

Residents are likely to be reassured if they know staff are around, so being able to see them, and be seen by them, is important. The living room is where residents probably spend most of

their time, so it is important that staff can look into it from where they spend most of their time. This is sometimes the nurses station.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If the living room that is used by most residents be seen into from where staff spend most of their time, or less than half of the living room can be seen, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 3.9: Can the dining room that is used by most residents be seen into from where staff spend most of their time?

No.	Question	N/A	No	Yes	Enter Score	Enter Score
		Score	Score	Score		
3.9	Can the dining room that is used by most residents be seen into from where staff spend most of their time?	1	0	1		

Residents are likely to be reassured if they know staff are around, so being able to see them, and be seen by them, is important. Residents are often in the dining room, so it is important that staff can look into it from where they spend most of their time. This is sometimes the nurses station.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If the dining room that is used by most residents be seen into from where staff spend most of their time, or less than half of the dining room can be seen, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 3.10: Can a garden or outside area for the residents be seen from where staff spend most of their time?

No.	Question	N/A	No	Yes	Enter Score	Enter Score
		Score	Score	Score		
3.10	Can a garden or outside area for the residents be seen from where staff spend most of their time?	1	0	1		

Residents are likely to be reassured if they know staff are around, so being able to see them, and be seen by them, is important. If residents are to feel safe outside and if staff are to feel comfortable about letting the go outside, it is important that staff can see them in the outside area from where they spend most of their time. This is sometimes the nurses station.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If the garden or outside area that is used by most residents be seen into from where staff spend most of their time, or less than half of the area can be seen, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Acquiring the Total and Percentage Score for Principle 3

No.	Question	N/A	25% or less	26%-50%	51%-75%	76% or more	Enter Score
			Score	Score	Score	Score	
3.1	What percentage of residents can see the inside of a living room as soon as they leave their bedroom?		0	①	2	3	1
3.2	What percentage of residents can see their bedroom entry as soon as they leave a living room?		0	①	2	3	1
3.3	What percentage of residents can see the inside of a dining room as soon as they leave their bedroom?		0	①	2	3	1
No.	Question	N/A	No	Yes			Enter Score
		Score	Score	Score			
3.4	Can the exit to a garden or outside area be seen from the living or dining room that is used by most residents?	1	①	1			0
3.5	Can the dining room be seen into from the living room?	1	①	1			0
3.6	Can a toilet be seen from the dining room that is used by most residents?	1	0	①			1
3.7	Can a toilet be seen from the living room that is used by most residents?	1	0	①			1
3.8	Can the living room that is used by most residents be seen into from where staff spend most of their time?	1	①	1			0
3.9	Can the dining room that is used by most residents be seen into from where staff spend most of their time?	1	0	①			1
3.10	Can a garden or outside area for the residents be seen from where staff spend most of their time?	①	0	1			NA
Total N/A Score		1	Total Score				6
			<div>% Score Total Score x 100 16 – Total N/A Score</div>				40%

Please note that the table above is an example. (1) Please add the scores obtained for each question and enter the scores in the "Enter Score" column as seen in the column. In the example the score obtained for question 3.1 is "1". (2) Please add the scores from the enter score column to obtain the total score. The total score obtained in the example is "6". Add the total score for all N/A questions. In the example the total N/A score is "1". To obtain your percentage score please multiply your total score by 100 and divide it by the number obtained when the total N/A score is subtracted from 16.

$$\frac{\text{Total Score} \times 100}{16 - \text{Total N/A Score}} = \frac{\text{Total Score} \times 100}{16 - 1} = \frac{600}{15} = 40\%$$

Principle 4: Manage Levels of Stimulation – Reduce Unhelpful Stimulation

Question 4.1: Are doors to cleaner’s cupboards, storerooms and other areas where residents may find danger easily seen?

No.	Question	No	Yes	Enter Score
		Score	Score	
4.1	Are doors to cleaner’s cupboards, storerooms and other areas where residents may find danger easily seen?	1	0	

Residents have no need to open doors to cleaners’ cupboards or storerooms. More importantly, these will contain equipment that could be harmful. It is important that residents’ attention is drawn only to those doors which they need to open and may lead to somewhere of interest, rather than to those which present a potential danger or lead to areas of no interest or use to the resident.

Scoring the Question: The question obtains 1 point if the answer is “No”. If the doors to cleaner’s cupboards, storerooms and other areas where residents may find danger easily seen, or some of doors are easily seen, please select “Yes”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 4.2: Is the wardrobe (or cupboard) that the resident uses empty or full of a confusing number of clothes and/or irrelevant objects?

No.	Question	No	Yes	Enter Score
		Score	Score	
4.2	Is the wardrobe (or cupboard) that the resident uses empty or full of a confusing number of clothes and/or irrelevant objects? (Only applicable to nursing homes that have a personal wardrobe for residents, wardrobes are not the same as a bedside lockers or cabinets.)	1	0	

It is important that residents have the opportunity to put their clothes or possessions away. Sometimes, however, this results in no choices or too many choices being available when the resident opens the door of the wardrobe. This isn't helpful and can leave a person feeling frustrated and confused. Limiting the number of things that can be easily accessed in a wardrobe is a good way of minimising this. For wardrobes that are too full, a second, hidden, wardrobe (or part of the existing wardrobe) can be used to store things that are not needed immediately.

Scoring the Question: The question obtains 1 point if the answer is "No". If the wardrobe (or cupboard) that the resident uses empty or full of a confusing number of clothes and/or irrelevant objects, or some of the wardrobes may meet the criteria stipulated, please select "Yes". The final step is to enter the total of the numbers circled in the 'No' and 'Yes' columns in the 'Enter Score' column.

Question 4.3: Is there a public address, staff paging or call system with bells, loudspeakers or flashing lights in use?

No.	Question	No	Yes	Enter Score
		Score	Score	
4.3	Is there a public address, staff paging or call system with bells, loudspeakers or flashing lights in use?	1	0	

The noise from public address and staff paging systems can be disturbing. Bells, lights and public announcements can interrupt residents' daily life and cause distraction and confusion. They often give information, which is not directed to the residents, and so provide an unnecessary interruption. A call system that uses individual pagers or phones provides a less disturbing way to communicate.

Scoring the Question: The question obtains 1 point if the answer is "No". If there is a public address, staff paging or call system with bells, loudspeakers or flashing lights in use, or some areas may contain these items that may meet the criteria stipulated, please select "Yes". The final step is to enter the total of the numbers circled in the 'No' and 'Yes' columns in the

‘Enter Score’ column.

Question 4.4: Does the noise from closing doors disturb residents, (e.g. flapping kitchen doors, noisy automatic doors)?

No.	Question	No	Yes	Enter Score
		Score	Score	
4.4	Does the noise from closing doors disturb residents, (e.g. flapping kitchen doors, noisy automatic doors)?	1	0	

The sound of doors closing in a unit can be very distracting for a resident. It is important that doors can be closed quietly, and door closers are adjusted to close doors quietly.

Scoring the Question: The question obtains 1 point if the answer is “No”. If the noise from closing doors disturb residents, or some areas may meet the criteria stipulated, please select “Yes”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 4.5: Is there a lot of visual clutter in the unit (i.e. notices, objects, furniture that are either irrelevant to residents or make it hard for them to interpret their environment)?

No.	Question	No	Yes	Enter Score
		Score	Score	
4.5	Is there a lot of visual clutter in the unit (i.e. notices, objects, furniture that are either irrelevant to residents or make it hard for them to interpret their environment)?	1	0	

Visual stimulation in a unit can be very distracting for residents. A room full of signs, notices, objects or furniture can make it difficult for someone to see what they are looking for. Attracting the attention of people with dementia when they are walking has been shown to increase the chances of them falling.

Scoring the Question: The question obtains 1 point if the answer is “No”. If there a lot of visual clutter in the unit, or some areas may meet the criteria stipulated, please select “Yes”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 4.6: Inside, can glare be avoided by using curtains and blinds?

No.	Question	No	Yes	Enter Score
		Score	Score	
4.6	Inside, can glare be avoided by using curtains and blinds?	0	1	

Natural and artificial lighting should be designed to avoid glare to ensure that residents can see easily within a room and to outside. Glare is often interpreted as a pool of water or a slippery surface by people with dementia, so it must be minimised.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If glare cannot be avoided by using curtains and blinds throughout the environment, or in selected areas glare cannot be avoided, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Acquiring the Total and Percentage Score for Principle 4

No.	Question	No	Yes	Enter Score
		Score	Score	
4.1	Are doors to cleaner's cupboards, storerooms, and other areas where residents may find danger easily seen?	①	0	1
4.2	Is the wardrobe (or cupboard) that the resident uses empty or full of a confusing number of clothes and/or irrelevant objects?	①	0	1
4.3	Is there a public address, staff paging or call system with bells, loudspeakers, or flashing lights in use?	1	①	0
4.4	Does the noise from closing doors disturb residents, (e.g. flapping kitchen doors, noisy automatic doors)?	1	①	0
4.5	Is there a lot of visual clutter in the unit (i.e. notices, objects, furniture that are either irrelevant to residents or make it hard for them to interpret their environment)?	1	①	0
4.6	Inside, can glare be avoided by using curtains and blinds?	①	0	1
Total Score				3
% Score $\frac{\text{Total Score} \times 100}{6}$				50%

Please note that the table above is an example. (1) Please add the scores obtained for each question and enter the scores in the “Entre Score” column as seen in the column. In the example the score obtained for question 4.1 is “1”. (2) Please add the scores from the enter score column to obtain the total score. The total score obtained in the example is “3”. To obtain your percentage score please multiply your total score by 100 and divide it by 6.

$$\frac{\% \text{ Score}}{\text{Total Score} \times 100} = \frac{\% \text{ Score}}{3 \times 100} = \frac{300}{6} = \underline{50\%}$$

Principle 5: Manage Levels of Stimulation – Optimise Helpful Stimulation

Question 5.1: Does each room have a distinctive character and feel? e.g. is it easy to identify a room as a dining room or a living room?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.1	Does each room have a distinctive character and feel? e.g. is it easy to identify a room as a dining room or a living room?		0	1		

The environment can give us a strong indication of how we are to behave and what we are to do in a certain place. If a person is no longer able to initiate an action or remember what a certain room is for, it is especially important that he/she is able to receive this information from the environment and receive a cue as to the room's purpose. Each room should have its own distinctive characteristics so that its use is clearly identifiable, for example as a living or dining room. This also means that residents are offered a variety of experiences as they walk through the unit.

Scoring the Question: The question obtains 1 point if the answer is "Yes". If each room does not have a distinctive character and feel, or only selected rooms have a distinctive character and feel, please select "No". The final step is to enter the total of the numbers circled in the 'No' and 'Yes' columns in the 'Enter Score' column. The final step is to enter the total of the numbers circled in the 'No' and 'Yes' columns in the 'Enter Score' column.

Question 5.2: Is the dining room clearly recognisable from outside the room?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.2	Is the dining room clearly recognisable from outside the room?	1	0	1		

In most residential settings for older people the dining room is a key social place. Therefore, it is important that it can be easily recognisable when it is seen, and/or through signs or symbols so that residents find it easy to locate the dining room. An indication from outside the room as to what is inside can help highlight the room for residents.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If the dining room clearly not recognisable from outside the room, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 5.3: What percentage of residents have a clearly defined path from their room to the dining room (e.g. by using colour, objects and signage, or can see the dining room from their room)?

No.	Question		25% or less	26%-50%	51%-75%	76% or more	Enter Score
			Score	Score	Score	Score	
5.3	What percentage of residents have a clearly defined path from their room to the dining room (e.g. by using colour, objects and signage, or can see the dining room from their room)?		0	1	2	3	

The dining room is a key social place in most residential settings for older people. Therefore, it is important that it can be easily found and that residents can make their way there with little assistance. While it is desirable for residents to see the dining room from their bedrooms, this may not always be possible and so attention needs to be paid to the use of colour on corridor walls, the positioning of objects as landmarks and signage to assist residents follow the path to the dining room.

Scoring the Question: The question obtains a score of “0” if 25% of the residents or less have a clearly defined path from their room to the dining room. 2 points are scored If between 26% to 50% of residents have a clearly defined path and 3 points if 76% of residents have a clearly defined path to the dining room. The final step is to enter the total of the numbers circled in the ‘25% or less’, ‘26%-50%’, ‘51%-75%’ and ‘76% or more’ columns in the ‘Enter Score’ column.

Question 5.4: Is the living room clearly recognisable from outside the room?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.4	Is the living room clearly recognisable from outside the room?	1	0	1		

In most residential settings for older people the living room is a key social place. Therefore, it is important that it can be easily recognisable when it is seen, and/or through signs or symbols so that residents find it easy to locate the living room. An indication from outside the room as to what is inside can help highlight the room for residents.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If the living room clearly not recognisable from outside the room, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do

not include the 'N/A' column) in the 'Enter Score' column.

Question 5.5: Are different corridors clearly recognisable so residents can identify where they are?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.5	Are different corridors clearly recognisable so residents can identify where they are?	1	0	1		

There can be many corridors within a unit and each corridor can be quite long if it leads to a number of rooms. It is therefore important that the corridors do not all appear the same, and that each corridor is broken up into different parts, to highlight, for example, a group of bedrooms, a sitting area, a view, or a door leading to outside. This may be seen in, for example, the use of lighting (both natural and artificial), colour, a change in ceiling height or treatment, varied placement of windows, or by varying the width of the corridor.

Scoring the Question: The question obtains 1 point if the answer is "Yes". If different corridors clearly not recognisable and residents cannot identify where they are, please select "No". If this question is not applicable, please circle '1' in the 'N/A' column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the 'No', and 'Yes' columns (do not include the 'N/A' column) in the 'Enter Score' column.

Question 5.6: Are personalised signs, symbols or displays easily seen to identify bedrooms?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.6	Are personalised signs, symbols or displays easily seen to identify bedrooms?		0	1		

It is important to be able to identify the room before the door is opened so that residents can find it and feel confident it is their room. Look for variations in texture or colour, name plates, photos, art work and memory boxes (which allow a person to display some of their favourite things outside their door).

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If there are no personalised signs, symbols or displays easily seen to identify bedrooms, or only selected bedrooms are personalised, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 5.7: Are shared ensuites/bathrooms/toilets clearly marked with a sign (text and symbol) or colour coded door?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.7	Are shared ensuites/bathrooms/toilets clearly marked with a sign (text and symbol) or colour coded door?	1	0	1		

Shared ensuites, bathrooms and toilets need to be clearly recognisable. These rooms will be used frequently, and if they can be easily found when they are needed it will reduce the stress

and anxiety in older people. The finish to doors to shared ensuite, bathrooms and toilets should be different from bedroom doors. Any signage should be meaningful and appropriate in size, language, contrast and colour. Signs should combine words and symbols, be placed at eye level or lower and contrast with the background.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If shared ensuite/bathrooms/toilets are not clearly marked with a sign (text and symbol) or colour coded door, or only some ensuite/bathrooms/toilets utilised by residents are marked, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 5.8: Is, or can, the bed be placed so that it possible to see the toilet from the bed when lying down?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.8	Is, or can, the bed be placed so that it possible to see the toilet from the bed when lying down?		0	1		

If residents can see the toilet as soon as the door is opened it will assist them to recognise the room and to use it. If the toilet pan is in a prominent position the chance of confusion will be reduced. In particular, at night, the visibility of a toilet pan will help an older person to maintain independence. This can reduce inappropriate use of other parts of a room and minimise discomfort and embarrassment for the older person, their family and staff.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If it is not possible to see the toilet from the bed when lying down, or selected beds meet the above criteria, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 5.9: Do the toilet seats contrast with the background?

No.	Question		25% or less	26%-75%	76% or more		Enter Score
			Score	Score	Score		
5.9	Do the toilet seats contrast with the background?		0	1	2		

It is vital that toilet seats contrast with the background so that they can be easily seen and identified by the resident.

Scoring the Question: The question obtains a score of “0” if 25% of the toilet seats contrast with the background. 1 point is scored If 26% to 75% toilet seats contrast with the background and 2 points if 76% or more of the toilet seats meet the stipulated criteria. The final step is to enter the total of the numbers circled in the ‘25% or less’, ‘26%-75%’, and ‘76% or more’ columns in the ‘Enter Score’ column.

Question 5.10: What percentage of residents have a window that provides an attractive view to the outside from their bed?

No.	Question		25% or less	26%-50%	51%-75%	76% or more	Enter Score
			Score	Score	Score	Score	
5.10	What percentage of residents have a window that provides an attractive view to the outside from their bed?		0	1	2	3	

Residents may spend more time in their bed if they are less mobile or are ill. It is particularly important that residents are not removed from contact with nature and the community just because it is difficult for them to go outside. An attractive view to outside gives residents the opportunity to connect with nature and/or the community, to be aware of the time of day, the season and the changes that take place in any day. An attractive view can provide an important source of stimulation and provide a good conversation point.

Scoring the Question: The question obtains a score of “0” if 25% of the residents or less have a window that provides an attractive view to the outside from their bed. 2 points are scored If between 26% to 50% of residents have a window that provides an attractive view to the outside from their bed and 3 points if 76% of residents meet the stipulated criteria. The final step is to enter the total of the numbers circled in the ‘25% or less’, ‘26%-50%’, ‘51%-75%’ and ‘76% or more’ columns in the ‘Enter Score’ column.

Question 5.11: Inside, are contrasting materials used so that edges of surfaces and objects can be easily seen (e.g. coloured borders, different floor, wall and ceiling colour)?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.11	Inside, are contrasting materials used so that edges of surfaces and objects can be easily seen (e.g. coloured borders, different floor, wall and ceiling colour)?		0	1		

If a resident is unable to see an object such as a chair, it is unlikely that they will be able to sit down safely. It is important that there is contrast between horizontal surfaces, e.g. chair seat and floor, table and seat, bench top and floor so that object stands out. Contrast between vertical surfaces is also necessary, for example so that doors can be easily seen, handles stand out against cupboard doors etc.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Inside, if no contrasting materials are used, or only some contrasting materials are used, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 5.12: Inside, are olfactory cues (such as perfumed flowers or kitchen smells) used to provide a variety of experiences for a person with dementia and help them know where they are?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.12	Inside, are olfactory cues (such as perfumed flowers or kitchen smells) used to provide a variety of experiences for a person with dementia and help them know where they are?		0	1		

There are many cues that can be helpful to a person with dementia. It is important that all of the senses are considered when providing cues and the sense of smell has an important role to play. The smell of coffee brewing or toast being prepared can stimulate memories and help people find their way toward a kitchen or dining room. These cues need to be used carefully so that they do not compete with each other or become overwhelming and confusing. Residents may have positive or negative associations with certain aromas and these needs to be considered when using olfactory cues.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Inside, if no olfactory cues are used, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 5.13: Inside, are tactile cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. different floor finishes, fittings such as door handles)?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.13	Inside, are tactile cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. different floor finishes, fittings such as door handles)?		0	1		

There are many cues that can be helpful to a person with dementia. It is important that all of the senses are considered when providing cues and the sense of touch has an important role to play. The feel of different materials and surfaces can stimulate memories and give residents varied and rewarding experiences. Walking on tiles, for example, is a different experience to walking on carpet or timber and provides a cue to the resident about where they are. These cues need to be used carefully so that they do not compete with each other or become overwhelming and confusing.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Inside, if no tactile cues are used, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 5.14: Inside, are auditory cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. music, sound of a water feature)?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.14	Inside, are auditory cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. music, sound of a water feature)?		0	1		

There are many cues that can be helpful to a person with dementia. It is important that all of the senses are considered when providing cues and the sense of sound has an important role to play as sounds can stimulate memories, alter moods, give residents a variety of experiences and remind them of exactly where they are. Auditory cues need to be used carefully so that they do not compete with each other or become overwhelming and confusing. Residents may have positive or negative associations with certain sounds and this also needs to be taken into account when using auditory cues.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Inside, if no auditory cues are used, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 5.15: Outside, are a variety of materials and finishes used to create an interesting and varied environment for a person with dementia and help them know where they are (e.g. brick, timber stone, grass)?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.15	Outside, are a variety of materials and finishes used to create an interesting and varied environment for a person with dementia and help them know where they are (e.g. brick, timber stone, grass)?	1	0	1		

When a variety of materials is used, important stimuli can be emphasised, scale can be reduced (by avoiding repetition) and a more familiar environment can be created. The feel of different materials and surfaces can stimulate memories and give residents varied and rewarding experiences. Walking on pavers feels different to walking on carpet or timber and provides a cue to the resident about where they are. Materials need to be used carefully so that they do not compete with each other or become overwhelming and confusing.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if there are a lack of a variety of materials and finishes used to create an interesting and varied environment, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 5.16: Outside, are olfactory cues (such as perfumed plants) used to provide a variety of experiences for a person with dementia and help them know where they are?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.16	Outside, are olfactory cues (such as perfumed plants) used to provide a variety of experiences for a person with dementia and help them know where they are?	1	0	1		

There are many cues that can be helpful to a person with dementia. It is important that all of the senses are considered when providing cues and the sense of smell has an important role to play. The smell of lavender or basil can stimulate memories and help people find their way to a pergola or kitchen door. These cues need to be used carefully so that they do not compete with each other or become overwhelming and confusing. Residents may have positive or negative associations with certain aromas and so these need to be taken into account when using olfactory cues.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if no olfactory cues are used, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 5.17: Outside, are auditory cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. wind chimes)?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.17	Outside, are auditory cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. wind chimes)?	1	0	1		

There are many cues that can be helpful to a person with dementia. It is important that all of the senses are considered when providing cues and the sense of sound has an important role to play. The sound of wind chimes, for example, can draw people to that part of the garden. Auditory cues need to be used carefully so that they do not compete with each other or become overwhelming and confusing. Residents may have positive or negative associations with certain sounds and so this needs to be taken into account when using auditory cues.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if no auditory cues are used, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 5.18: Inside, is there an attractive view to outside from the living and/or dining room for a person seated or lying down?

No.	Question	N/A	No	Yes		Enter Score
		Score	Score	Score		
5.18	Inside, is there an attractive view to outside from the living and/or dining room for a person seated or lying down?		0	1		

It is particularly important that residents are not removed from contact with nature and the community just because it is difficult for them to go outside. As residents will spend a lot of time sitting, or even lying, down it is important that the window is low enough to be seen through from a sitting, or lying, position. An attractive view to outside gives residents the opportunity to connect with nature and/or the community, to be aware of the time of day, the season and the changes that take place in any day. An attractive view can provide an important source of stimulation and provide a good conversation point.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If there is no view or the view does not contain an aspect of nature and/or the community, please select “No”.

The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Acquiring the Total and Percentage Score for Principle 5

No.	Question	N/A	No	Yes			Enter Score	
		Score	Score	Score				
5.1	Does each room have a distinctive character and feel? e.g. is it easy to identify a room as a dining room or a living room?		①	1			0	
5.2	Is the dining room clearly recognisable from outside the room?	1	①	1			0	
No.	Question		25% or less	26%-50%	51%-75%	76% or more	Enter Score	
	Score		Score	Score	Score			
5.3	What percentage of residents have a clearly defined path from their room to the dining room (e.g. by using colour, objects and signage, or can see the dining room from their room)?		0	①	2	3	1	
No.	Question	N/A	No	Yes			Enter Score	
		Score	Score	Score				
5.4	Is the living room clearly recognisable from outside the room?	1	0	①			1	
5.5	Are different corridors clearly recognisable so residents can identify where they are?	1	①	1			0	
5.6	Are personalised signs, symbols or displays easily seen to identify bedrooms?		①	1			0	
5.7	Are shared ensuite/bathrooms/toilets clearly marked with a sign (text and symbol) or colour coded door?	1	①	1			0	
5.8	Is, or can, the bed be placed so that it possible to see the toilet from the bed when lying down?		①	1			0	
No.	Question		25% or less	26%-75%	76% or more			Enter Score
			Score	Score	Score			
5.9	Do the toilet seats contrast with the background?		0	1	②			2
No.	Question		25% or less	26%-50%	51%-75%	76% or more	Enter Score	
			Score	Score	Score	Score		
5.10	What percentage of residents have a window that provides an attractive view to the outside from their bed?		0	1	②	3	2	
No.	Question	N/A	No	Yes			Enter Score	
		Score	Score	Score				
5.11	Inside, are contrasting materials used so that edges of surfaces and objects can be easily seen (e.g. coloured borders, different floor, wall and ceiling colour)?		0	①			1	
5.12	Inside, are olfactory cues (such as perfumed flowers or kitchen smells) used to provide a variety of experiences for a person with dementia and help them know where they are?		①	1			0	
No.	Question	N/A	No	Yes			Enter Score	
		Score	Score	Score				
5.13	Inside, are tactile cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. different floor finishes, fittings such as door handles)?		0	①			1

5.14	Inside, are auditory cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. music, sound of a water feature)?		0	1		0
5.15	Outside, are a variety of materials and finishes used to create an interesting and varied environment for a person with dementia and help them know where they are (e.g. brick, timber stone, grass)?	1	0	1		NA
5.16	Outside, are olfactory cues (such as perfumed plants) used to provide a variety of experiences for a person with dementia and help them know where they are?	1	0	1		NA
5.17	Outside, are auditory cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. wind chimes)?	1	0	1		NA
5.18	Inside, is there an attractive view to outside from the living and/or dining room for a person seated or lying down?		0	1		0
Total N/A Score		3	Total Score			8
			% Score $\frac{\text{Total Score} \times 100}{23 - \text{Total N/A Score}}$			40%

Please note that the table above is an example. (1) Please add the scores obtained for each question and enter the scores in the “Enter Score” column as seen in the column. In the example the score obtained for question 5.1 is “0”. (2) Please add the scores from the enter score column to obtain the total score. The score obtained in the example is “8”. Add the total score for all N/A questions. In the example the total N/A score is “3”. To obtain your percentage score please multiply your total score by 100 and divide it by the number obtained when the total N/A score is subtracted from 23.

$$\frac{\% \text{ Score}}{\text{Total Score} \times 100} = \frac{\% \text{ Score}}{8 \times 100} = \frac{800}{20} = 40\%$$

23 – Total N/A Score 23 – 3

Principle 6: Support Movement and Engagement

Question 6.1: Is there a clearly defined accessible path that avoids dead ends and locked exits and guides the resident from inside to outside and back to their starting point?

No.	Question	N/A	No	Yes	Enter Score
		Score	Score	Score	
6.1	Is there a clearly defined accessible path that avoids dead ends and locked exits and guides the resident from inside to outside and back to their starting point?	1	0	1	

It is important that residents can move freely and reach destinations that are meaningful. They should not end up at a dead end where they can go no further and cannot easily see how to go back. Outside paths need to be laid out so that residents can see their way back to their starting point easily, so that a pleasant walk outside doesn't become a nightmare because they feel lost and confused about where they are and where to go. This will also give residents more confidence to explore the outside environment, providing a greater level of comfort and reducing stress. Attention needs to be given to the selection of path surfaces, edges, width, camber, drainage, and obstacles.

Scoring the Question: The question obtains 1 point if the answer is "Yes". If there is no clearly defined accessible path that avoids dead ends and locked exits and guides the resident from inside to outside and back to their starting point, please select "No". If this question is not applicable, please circle '1' in the 'N/A' column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the 'No', and 'Yes' columns (do not include the 'N/A' column) in the 'Enter Score' column.

Question 6.2: Outside, is there a path that guides residents past areas that might invite participation in an appropriate activity?

No.	Question	N/A	No	Yes	Enter Score
		Score	Score	Score	
6.2	Outside, is there a path that guides residents past areas that might invite participation in an appropriate activity?	1	0	1	

The path is not there to keep residents moving, but rather to give them a rewarding experience. Residents may not have a clear idea of what they would like to do or what they are looking for. If places of interest are easy to see, it can give residents an idea of what they might like to do. This journey should offer residents opportunities to engage with others, engage with activities, a range of stimuli and other people or to sit quietly, for example to take in a view. In this way residents are offered experiences that are interesting and rewarding.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if there is no a path that guides residents past areas that might invite participation in an appropriate activity, please select “No”. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 6.3: Outside, is there a choice of activities for residents to participate in (such as sorting tools, seeing birds, gardening)?

No.	Question	N/A	No	Yes	Enter Score
		Score	Score	Score	
6.3	Outside, is there a choice of activities for residents to participate in (such as sorting tools, seeing birds, gardening)?	1	0	1	

The path should offer residents opportunities to engage with others, to sit quietly by themselves, to take in a view or engage in activities. In this way residents can choose what they wish to do and can be offered a variety of experiences that are interesting and engaging.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if there is there no choice of activities, please select “No”. Please select “N/A” if this question is not applicable. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 6.4: Outside, are there chairs or benches at frequent intervals so people can sit and enjoy the fresh air?

No.	Question	N/A	No	Yes	Enter Score
		Score	Score	Score	
6.4	Outside, are there chairs or benches at frequent intervals so people can sit and enjoy the fresh air?	1	0	1	

A resident can become tired while walking and may need a place to rest to prevent falls and injury, or to simply enjoy being outside. The provision of seats and benches at frequent

intervals around the path is important.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if there are no are there chairs or benches at frequent intervals, please select “No”. Please select “N/A” if this question is not applicable. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 6.5: Outside, are there both shady and sunny areas along the path?

No.	Question	N/A	No	Yes	Enter Score
		Score	Score	Score	
6.5	Outside, are there both shady and sunny areas along the path?	1	0	1	

There will be times when sunshine is sought after and others when shade is required. Residents can become hot and dehydrate if they are outside in the heat. Opportunities to be in the shade or in the sun are therefore important if residents are to enjoy being outside.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if there are no shady and sunny areas along the path, please select “No”. Please select “N/A” if this question is not applicable. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 6.6: Outside, does the path allow residents to be taken past a range of activities that they can passively participate in (such as looking at plants, watching birds)?

No.	Question	N/A	No	Yes	Enter Score
		Score	Score	Score	
6.6	Outside, does the path allow residents to be taken past a range of activities that they can passively participate in (such as looking at plants, watching birds)?	1	0	1	

Residents who are not independently mobile still need to be offered opportunities to engage with others, to sit quietly by themselves, to take in a view and enjoy a pretty garden. The path must make it easy for staff to take residents confined to a wheelchair on a journey past areas of interest. In this way, residents can be offered an experience that it is interesting and engaging, even though they are not able to move about independently.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if the path does not allow residents to be taken past a range of activities, please select “No”. Please select “N/A” if this question is not applicable. If this question is not applicable, please circle ‘1’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘No’, and ‘Yes’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 6.7: Are there verandas or shaded seating areas in close proximity to the building?

No.	Question	N/A	No	Yes	Enter Score
		Score	Score	Score	
6.7	Are there verandas or shaded seating areas in close proximity to the building?	N/A	0	1	

It is important that residents are encouraged to spend time outdoors, and that it is easy for them to do so. Verandas and shaded seating areas provide a great opportunity for residents to enjoy fresh air, without being unduly exposed to the weather, be it rain or heat.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If there are no verandas or shaded seating areas in close proximity to the building, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 6.8: Inside, is there a path that guides residents past areas that might invite participation in an appropriate activity (such as folding clothes, listening to music)?

No.	Question	N/A	No	Yes	Enter Score
		Score	Score	Score	
6.8	Inside, is there a path that guides residents past areas that might invite participation in an appropriate activity (such as folding clothes, listening to music)?		0	1	

The goal of providing an internal path is not to keep residents moving, but rather to give them a rewarding experience. Residents may not have a clear idea of what they would like to do or what they are looking for. If places of interest are easy to see, and there are clear landmarks along the way, the destination can be highlighted, and the journey will be more interesting. This journey could offer residents opportunities to engage with others, to sit quietly, to take in a view and to engage in some activities, e.g. look at a newspaper, fold some laundry or reminisce about some old photos. In this way residents, will be offered an experience that it is interesting and engaging.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Inside, if there is no path that guides residents past areas that might invite participation in an appropriate activity, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 6.9: Inside, does the path take residents past chairs that provide opportunities for rest and/or conversation?

No.	Question	N/A	No	Yes	Enter Score
		Score	Score	Score	
6.9	Inside, does the path take residents past chairs that provide opportunities for rest and/or conversation?		0	1	

It is important to recognise that residents may become tired while walking and so the environment needs to encourage them to take a rest when they need to do so. Seating areas should be readily seen and offer residents opportunities to engage with others, to sit quietly and/or to take in a view. The goal of providing a path within a building is not to keep residents moving, but rather to give them a rewarding experience. Places to sit are a key part of this experience.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Inside, if there is no path that take residents past chairs that provide opportunities for rest and/or conversation, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Acquiring the Total and Percentage Score for Principle 6

No.	Question	N/A	No	Yes	Enter Score
		Score	Score	Score	
6.1	Is there a clearly defined accessible path that avoids dead ends and locked exits and guides the resident from inside to outside and back to their starting point?	1	0	①	1
6.2	Outside, is there a path that guides residents past areas that might invite participation in an appropriate activity?	1	①	1	0
6.3	Outside, is there a choice of activities for residents to participate in (such as sorting tools, seeing birds, gardening)?	1	①	1	0
6.4	Outside, are there chairs or benches at frequent intervals so people can sit and enjoy the fresh air?	1	①	1	0
6.5	Outside, are there both shady and sunny areas along the path?	1	0	①	1
6.6	Outside, does the path allow residents to be taken past a range of activities that they can passively participate in (such as looking at plants, watching birds)?	1	0	①	1
6.7	Are there verandas or shaded seating areas <u>in close proximity to the building</u> ?		①	1	0
6.8	Inside, is there a path that guides residents past areas that might invite participation in an appropriate activity (such as folding clothes, listening to music)?		0	①	1
6.9	Inside, does the path take residents past chairs that provide opportunities for rest and/or conversation?		0	①	1
Total N/A Score		0	Total Score		5
		% Score $\frac{\text{Total Score} \times 100}{9 - \text{Total N/A Score}}$			55.5%

Please note that the table above is an example. (1) Please add the scores obtained for each question and enter the scores in the "Enter Score" column as seen in the column. In the example the score obtained for question 6.1 is "1". (2) Please add the scores from the enter score column to obtain the total score. The total score obtained in the example is "4". Add the total score for all N/A questions. In the example the total N/A score is "0". To obtain your percentage score please multiply your total score by 100 and divide it by the number obtained when the total N/A score is subtracted from 9.

$$\frac{\% \text{ Score}}{\text{Total Score} \times 100} = \frac{\% \text{ Score}}{5 \times 100} = \frac{500}{9} = 55.5\%$$

9 – Total N/A Score 9 – 0

Principle 7: Create a Familiar Place

Question 7.1: Are there any pieces of furniture in the living room that are of a design that are not familiar to the majority of residents?

No.	Question	N/A	None	A Few	Many		Enter Score
		Score	Score	Score	Score		
7.1	Are there any pieces of furniture in the living room that are of a design that are not familiar to the majority of residents?	2	2	1	0		

Residents are likely to spend a large amount of time in the living and dining room. It is therefore important that these rooms are familiar to residents, as this can contribute to a sense of wellbeing and calm. The presence of familiar furniture will not only help to create a warm and inviting atmosphere in the room but will encourage residents to use the places and enjoy them. The presence of unfamiliar furniture may contribute to uncertainty in the minds of the residents about where they are and make them feel anxious.

Scoring the Question: The question obtains a score of “0” if there are many pieces of furniture that are familiar to the majority of the residents. 1 point is scored If there are a few pieces of furniture and 2 points if none of the furniture are familiar to the majority of residents. If this question is not applicable, please circle ‘2’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘None’, ‘A Few’ and ‘Many’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 7.2: Have most of the residents decorated their bedrooms (e.g. with photos, pictures, objects)?

No.	Question		None	A Few	Many		Enter Score
			Score	Score	Score		
7.2	Have most of the residents decorated their bedrooms (e.g. with photos, pictures, objects)?		0	1	2		

If residents' bedrooms are to be familiar to them, it will be vital that they can decorate them. This decoration can take many forms and will depend on the residents' life experiences, hobbies, likes and dislikes. For some people, a painting may suffice, for other photos of family and friends will be important. In a shared room, it is essential that residents can personalise a part of the room if they wish.

Scoring the Question: The question obtains a score of "0" if none of the residents decorated their bedrooms. 1 point is scored if a few residents have decorated their bedrooms and 2 points the bedrooms meet the stipulated criteria. Scoring the Question: Only one answer can be selected for this question which will result in the highest possible score of 2 points. The question obtains a score of "0" if there are many pieces of furniture that are familiar to the majority of the residents. 1 point is scored If there are a few pieces of furniture and 2 points if none of the furniture are familiar to the majority of residents. The final step is to enter the total of the numbers circled in the 'None', 'A Few' and 'Many' columns in the 'Enter Score' column.

Question 7.3: Do residents have their own furniture in their own bedrooms?

No.	Question		None	A Few	Many		Enter Score
			Score	Score	Score		
7.3	Do residents have their own furniture in their own bedrooms?		0	1	2		

If residents' bedrooms are to be familiar to them they, or their family, will need to be able to choose furniture that reflects their life experiences, hobbies, likes, and dislikes. For some people, a simple piece of furniture may suffice, for others having a number of pieces of furniture will be important. In a shared room, it is essential that residents can personalise a part of the room if they wish.

Scoring the Question: The question obtains a score of "0" if none of the residents have their own furniture. 1 point is scored if a few residents have their own furniture and 2 points many residents have their own furniture in their own bedrooms. The final step is to enter the total of the numbers circled in the 'None', 'A Few' and 'Many' columns in the 'Enter Score' column.

Question 7.4: Are there any pieces of furniture in the bedroom that are of a design that are not familiar to the majority of residents?

No.	Question	N/A	None	A Few	Many		Enter Score
		Score	Score	Score	Score		
7.4	Are there any pieces of furniture in the bedroom that are of a design that are not familiar to the majority of residents?	2	2	1	0		

Residents are likely to spend a large amount of time in the living and dining room. It is therefore important that these rooms are familiar to residents, as this can contribute to a sense

of wellbeing and calm. The presence of familiar furniture will not only help to create a warm and inviting atmosphere in the room but will encourage residents to use the places and enjoy them. The presence of unfamiliar furniture may contribute to uncertainty in the minds of the residents about where they are and make them feel anxious.

Scoring the Question: The question obtains a score of “0” if there are many pieces of furniture that are familiar to the majority of the residents. 1 point is scored If there are a few pieces of furniture and 2 points if none of the furniture are familiar to the majority of residents. If this question is not applicable, please circle ‘2’ in the ‘N/A’ column to show that this question is not applicable. The final step is to enter the total of the numbers circled in the ‘None’, ‘A Few’ and ‘Many’ columns (do not include the ‘N/A’ column) in the ‘Enter Score’ column.

Question 7.5: Is the room or rooms able to support the spiritual or religious practices of the residents?

No.	Question		No	Yes		Enter Score
			Score	Score		
7.5	Is the room or rooms able to support the spiritual or religious practices of the residents?		0	1		

Spiritual or religion may be a vital part of a resident’s self-identity and life experiences. It may also be an essential component of their family life. It is important that residents have the opportunity to carry out spiritual or religious activity in a safe and familiar space alone, with family, friends or spiritual/religious representatives, whilst receiving palliative care.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If there is no room or rooms able to support the spiritual or religious practices of the residents, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 7.6: Are there bedrooms available for couples?

No.	Question		No	Yes		Enter Score
			Score	Score		
7.6	Are there bedrooms available for couples?		0	1		

Many couples may have lived together for majority of their years and may wish to live together and share a room to prevent themselves to be living apart. Being able to live with their loved ones will also help to maintain the health and well-being of the individual and their partners or spouses. Nursing homes may wish to design rooms that can be converted into single or double rooms allowing couples to reside in privately.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If there are no bedrooms available for couples, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 7.7: Are there resources for residents to engage in spiritual or religious activities?

No.	Question		None	25% or less	26% - 50%	51% - 75%	76% or more	Enter Score
			Score	Score	Score	Score	Score	
7.7	Are there resources for residents to engage in spiritual or religious activities?		0	1	2	3	4	

In a multi-religious or spiritual space, resources may be required to allow the rooms to be able to be flexible; allowing it to be able to be converted for a range of religious or spiritual activities. Storage spaces should be made available to house religious and spiritual artefacts

and items, with clear signs to enable accessibility and ease of use and transition for different religious and spiritual needs.

Scoring the Question: The question obtains a score of “0” if there are no resources for residents. 1 point if 25% of the residents have resources to engage in their own religious or spiritual activity, and 2 points if 26% to 50% of residents have resources that meet their spiritual or religious needs. 3 points for 51% to 75% of residents, and 4 points if 76% of residents have resources that meets their needs. The final step is to enter the total of the numbers circled in the ‘None’, ‘25% or less’, ‘26%-50%’, ‘51%-75%’ and ‘76% or more’ columns in the ‘Enter Score’ column.

Acquiring the Total and Percentage Score for Principle 7

No.	Question	N/A	None	A Few	Many		
		Score	Score	Score	Score		
7.1	Are there any pieces of furniture in the living room that are of a design that are not familiar to the majority of residents?	②	2	1	0		
7.4	Are there any pieces of furniture in the bedroom that are of a design that are not familiar to the majority of residents?	2	2	1	①		
No.	Question		None	A Few	Many		
			Score	Score	Score		
7.2	Have most of the residents decorated their bedrooms (e.g. with photos, pictures, objects)?		0	①	2		
7.3	Do residents have their own furniture in their own bedrooms?		①	1	2		
No.	Question		No	Yes			Enter Score
			Score	Score			
7.5	Is the room or rooms able to support the spiritual or religious practices of the residents?		0	①			1
7.6	Are there bedrooms available for couples?		①	1			0
No.	Question		None	25% or less	26% - 50%	51% - 75%	76% or more
			Score	Score	Score	Score	Score
7.7	Are there resources for residents to engage in spiritual or religious activities?		0	①	2	3	4
Total N/A Score		2	Total Score				3
		% Score					
		$\frac{\text{Total Score} \times 100}{14 - \text{Total N/A Score}}$					

Please note that the table above is an example. (1) Please add the scores obtained for each question and enter the scores in the "Enter Score" column as seen in the column. In the example the score obtained for question 7.1 is "2". (2) Please add the scores from the enter score column to obtain the total score. The total score obtained in the example is "5". Add the total score for all N/A questions. In the example the total N/A score is "2". To obtain your percentage score please multiply your total score by 100 and divide it by the number obtained when the total N/A score is subtracted from 14.

$$\frac{\% \text{ Score}}{\text{Total Score} \times 100} = \frac{\% \text{ Score}}{3 \times 100} = \frac{300}{12} = 25\%$$

14 – Total N/A Score 14 – 2

Principle 8: Provide a Variety of Places to be Alone or with Others – in the Unit

Question 8.1: Within the unit, are there places where a small group of people can gather?

No.	Question	No	1	2 or more		Enter Score
		Score	Score	Score		
8.1	Within the unit, are there places where a small group of people can gather?	0	1	2		

People can do different things and feel different emotions when they gather in a small group. For example, in a small group people may have a private conversation, listen to music or play games. It is important that small groups of people can comfortably gather in the living or dining room without rearranging the furniture. If the furniture has to be rearranged for people to gather in this way, it is less likely to happen and so opportunities for residents to experience a more private gathering will be lost.

Scoring the Question: The question obtains a score of “0” if there are no places where a small group of people can gather. 1 point is scored if there is 1 place and 2 points for 2 or more places. The final step is to enter the total of the numbers circled in the ‘No’, ‘1’ and ‘2 or more’ columns in the ‘Enter Score’ column.

Question 8.2: Within the unit, are there places where a person can be on their own and/or in private conversation (e.g. nooks, sitting areas)?

No.	Question	No	1	2	3 or more	Enter Score
		Score	Score	Score	Score	
8.2	Within the unit, are there places where a person can be on their own and/or in private conversation (e.g. nooks, sitting areas)?	0	1	2	3	

All units need to have a number of places where residents, friends, staff and families can sit, either on their own or with others. Small areas or nooks are an important way to give people many choices. They can be an area to the side of a corridor, a space at the end of a corridor, a bay window in a larger room, or a little room off a living or dining room. The more of these small areas or nooks there are in a unit, the greater the opportunity for residents to enjoy privacy or community.

Scoring the Question: The question obtains a score of “0” if there are no places where people can be on their own. 1 point if there is one place available, 2 points if there are 2 places available and 3 points if there are 3 or more places available. The final step is to enter the total of the numbers circled in the ‘No’, ‘1’, ‘2’ and ‘3 or more’ columns in the ‘Enter Score’ column.

Question 8.3: How many different types of spaces are there within the unit (e.g. cosy living, TV room, activity space)?

No.	Question	1	2-3	4 or more		Enter Score
		Score	Score	Score		
8.3	How many different types of spaces are there within the unit (e.g. cosy living, TV room, activity space)?	0	1	2		

Residents will come to live in the unit from a variety of lifestyles. They will also feel like doing different things at different times of day. It is important that all social places are not the same, but instead offer the opportunity for a variety of experiences. They should also take different times of day into account, for example it may be that a room receives morning sun but is cool in the afternoon, offering residents two different experiences. Furnishings and furniture should also have different characteristics to appeal to residents' different likes and dislikes.

Scoring the Question: The question obtains a score of "0" if there is only 1 space within the unit for engagement. 1 point is scored for a variety of 2 to 3 different types of spaces and 2 points for 4 or more different types of spaces. The final step is to enter the total of the numbers circled in the '1', '2-3' and '4 or more' columns in the 'Enter Score' column.

Question 8.4: Does the dining room allow for a choice to eat alone?

No.	Question	No	Yes		Enter Score
		Score	Score		
8.4	Does the dining room allow for a choice to eat alone?	0	1		

Food often plays an important part in the lives of residents and their families. Eating alone is a very different experience to eating in a group. People's preferences for who they dine with will vary and be influenced by their life experiences and their culture. Residents' preferences can also change according to the climate and the day, as some days are a cause for celebration and others for quiet reflection. It is important that residents have the opportunity to eat on their own when they choose, as this is one way that they can influence how they live their lives.

Scoring the Question: The question obtains 1 point if the answer is "Yes". If the dining room does not allow for a choice to eat alone, please select "No". The final step is to enter the total of the numbers circled in the 'No' and 'Yes' columns in the 'Enter Score' column.

Question 8.5: Outside, are there places in the garden or outdoor area where a person can be on their own and/or in private conversation?

No.	Question	No	Yes		Enter Score
		Score	Score		
8.5	Outside, are there places in the garden or outdoor area where a person can be on their own and/or in private conversation?	0	1		

Residents should be able to choose to socialise in different ways. Sometimes people may choose to spend time on their own or in a private conversation. The outside space can provide opportunities for the resident to be alone or with a small number of family or friends for a private conversation.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. Outside, if there are no available places in the garden or outdoor area where a person can be on their own and/or in private conversation, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 8.6: Does the living room provide opportunities for people to be in private conversation?

No.	Question	No	Yes		Enter Score
		Score	Score		
8.6	Does the living room provide opportunities for people to be in private conversation?	0	1		

Residents should be able to choose to socialise in different ways. Sometimes people may choose to spend time on their own or in a private conversation. The living room can provide

opportunities for the resident to be alone or with a small number of family or friends for a private conversation.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If the living room does not provide opportunities for people to be in private conversation, please select “No”.

The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Acquiring the Total and Percentage Score for Principle 8

No.	Question	No	1	2 or more		Enter Score
		Score	Score	Score		
8.1	Within the unit, are there places where a small group of people can gather?	0	1	②		2
No.	Question	No	1	2	3 or more	Enter Score
		Score	Score	Score	Score	
8.2	Within the unit, are there places where a person can be on their own and/or in private conversation (e.g. nooks, sitting areas)?	0	1	2	③	3
No.	Question	1	2-3	4 or more		Enter Score
		Score	Score	Score		
8.3	How many different types of spaces are there within the unit (e.g. cosy living, TV room, activity space)?	0	①	2		1
No.	Question	No	Yes			Enter Score
		Score	Score			
8.4	Does the dining room allow for a choice to eat alone?	①	1			0
8.5	Outside, are there places in the garden or outdoor area where a person can be on their own and/or in private conversation?	0	①			1
8.6	Does the living room provide opportunities for people to be in private conversation?	①	1			0
Total Score						7
$\frac{\% \text{ Score}}{\text{Total Score} \times 100}$						70%

Please note that the table above is an example. (1) Please add the scores obtained for each question and enter the scores in the “Enter Score” column as seen in the column. In the example the score obtained for question 8.1 is “2”. (2) Please add the scores from the enter score column to obtain the total score. The total score obtained in the example is “7”. To obtain your percentage score please multiply your total score by 100 and divide it by 10.

$$\frac{\% \text{ Score}}{\text{Total Score} \times 100} = \frac{\% \text{ Score}}{7 \times 100} = \frac{700}{10} = 70\%$$

Principle 9: Provide a Variety of Places to be Alone or with Others – in the Community

Question 9.1: Is there easy access to places which encourage interaction and engagement with the wider community (e.g. children, knitting groups, religious groups)?

No.	Question	No	Yes	Enter Score
		Score	Score	
9.1	Is there easy access to places which encourage interaction and engagement with the wider community (e.g. children, knitting groups, religious groups)?	0	1	

A person with dementia can become isolated and less engaged as the length of stay in the unit lengthens. Engagement with the wider community is vital to reinforce a person's identity, encourage interaction with other people and maintain the skills and interests of the person with dementia. When community groups meet at the facility it is easier for residents to take part in these activities. This also plays an important role in reducing the stigma that can be associated with residential aged care facilities.

Scoring the Question: The question obtains 1 point if the answer is "Yes". If there is no easy access to places which encourage interaction and engagement with the wider community, please select "No". The final step is to enter the total of the numbers circled in the 'No' and 'Yes' columns in the 'Enter Score' column.

Question 9.2: Is there a room where families can share meals and/or celebrations with their relatives?

No.	Question	No	Yes	Enter Score
		Score	Score	
9.2	Is there a room where families can share meals and/or celebrations with their relatives?	0	1	

Sharing a meal together is a pleasure for many people. Much of life in a residential setting is communal and although this is often familiar and desirable, it is important that residents and their families also have the opportunity to gather in a more private setting to eat and relax if they wish to. The inclusion of such places is likely to encourage family and friends to visit a facility as they feel welcome and can interact with their loved one in the way they are used to in the community.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If there is no room where families can share meals and/or celebrations with their relatives, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 9.3: Does the unit provide a room for palliative care that preserves the dignity, privacy, and quality of life for the resident?

No.	Question	No	Yes	Enter Score
		Score	Score	
9.3	Does the unit provide a room for palliative care that preserves the dignity, privacy and quality of life for the resident?	0	1	

The period at the end of a person’s life requires special attention as there is never an

opportunity to correct mistakes made during it. It is important that the facility provides a place for palliative or end of life care that preserves the dignity, privacy and quality of life for the resident and members of their family.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If the unit does not provide a room for palliative care that preserves the dignity, privacy and quality of life for the resident, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 9.4: Is there an easily accessible place where families and friends can feel comfortable while taking a break from visiting (e.g. when visiting a very sick person)?

No.	Question	No	Yes	Enter Score
		Score	Score	
9.4	Is there an easily accessible place where families and friends can feel comfortable while taking a break from visiting (e.g. when visiting a very sick person)?	0	1	

Visiting a very sick person or someone at the end of their life, can be very distressing and emotionally draining. It is important that the facility includes places where families can retreat or withdraw and take a break, so that they can continue to be with and support the person they are visiting.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If there is no easily accessible place where families and friends can feel comfortable while taking a break from visiting, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 9.5: Is there access to computers, for residents utilising technology for engagement or communication (e.g. videoconferencing with family and friends, making video calls, surfing the internet, sending emails etc.)?

No.	Question	No	Yes	Enter Score
		Score	Score	
9.5	Is there access to computers, for residents utilising technology for engagement or communication (e.g. videoconferencing with family and friends, making video calls, surfing the internet, sending emails etc.)?	0	1	

With the growing use of technology, residents moving into high care facilities may be familiar with the use of smart phones and tablets to communicate with family, friends with the wider community. The facility should be technologically ready to accommodate for information and communications technology (ICT) to enable residents to continue to engage with the wider community from the facility. Ensure that family and friends visiting the resident have the opportunity to utilise technology for social engagement, to carry out videocalls, video conferencing, or recorded voice messages from their tablets and phones as a means of communication between the resident and relatives or friends who are overseas or are unable to visit.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If there is no access to computers, for residents utilising technology for engagement or communication, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 9.6: Can a small group of people gather privately?

No.	Question	No	Yes	Enter Score
		Score	Score	
9.6	Can a small group of people gather privately?	0	1	

The social and emotional aspects of care must be supported to ensure that the resident maintains a good quality of life. Families and visitors need privacy to comfortably and confidently provide support and communicate with the resident.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If there are no areas where a small group of people can gather privately, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Question 9.7: Is there access, space and privacy for families and friends visiting a resident requiring palliative care?

No.	Question	No	Yes	Enter Score
		Score	Score	
9.7	Is there access, space and privacy for families and friends visiting a resident requiring palliative care?	0	1	

Allow family and friends to have the opportunity to be with the resident receiving palliative care. Visitors may only be able to visit the resident receiving palliation at unconventional hours due to the lack of transport, work or family commitments. It is important that visitors can have access to visit their loved ones in this crucial period. Due to this critical period, visitors may experience overwhelming feels and emotions and wish to be able to have their dignity and privacy respected.

Scoring the Question: The question obtains 1 point if the answer is “Yes”. If families and friends visiting relatives requiring palliative care do not have access, space and privacy, please select “No”. The final step is to enter the total of the numbers circled in the ‘No’ and ‘Yes’ columns in the ‘Enter Score’ column.

Acquiring the Total and Percentage Score for Principle 9

No.	Question	No	Yes	Enter Score
		Score	Score	
9.1	Is there easy access to places which encourage interaction and engagement with the wider community (e.g. children, knitting groups, religious groups)?	0	①	1
9.2	Is there a room where families can share meals and/or celebrations with their relatives?	0	①	1
9.3	Does the unit provide a room for palliative care that preserves the dignity, privacy and quality of life for the resident?	①	1	0
9.4	Is there an easily accessible place where families and friends can feel comfortable while taking a break from visiting (e.g. when visiting a very sick person)?	①	1	0
9.5	Is there access to computers, for residents utilising technology for engagement or communication (e.g. videoconferencing with family and friends, making video calls, surfing the internet, sending emails etc.)?	0	①	1
9.6	Can a small group of people gather privately?	①	1	0
9.7	Is there access, space and privacy for families and friends visiting a resident requiring palliative care?	0	①	1
Total Score				4
% Score $\frac{\text{Total Score} \times 100}{7}$				57%

Please note that the table above is an example. (1) Please add the scores obtained for each question and enter the scores in the “Enter Score” column as seen in the column. In the example the score obtained for question 9.1 is “1”. (2) Please add the scores from the enter score column to obtain the total score. The total score obtained in the example is “4”. To obtain your percentage score please multiply your total score by 100 and divide it by 7.

$$\frac{\% \text{ Score}}{\text{Total Score} \times 100} = \frac{\% \text{ Score}}{4 \times 100} = \frac{400}{7} = 57\%$$

Principle 10: Design in Response to Vision for a Way of Life

Question 10.1: What is the vision/purpose of the unit for people with dementia?

Question
<p>10.1. What is the vision/purpose of the unit for people with dementia? To provide: -</p> <p>Circle your option or options</p> <p>A homelike environment</p> <p>A hotel like environment with hotel like services</p> <p>A medical care facility</p> <p>A lifestyle environment focusing on recreation, exercise or another aspect of lifestyle</p> <p>Be a centre of excellence for people with dementia</p> <p>An environment that focuses on person-centred care</p> <p>Other: _____</p>

Residents are not all the same. They come to residential aged care with a variety of life experiences and preferences. They enjoy doing different things and will look to continue these as far as they are able in the nursing home. It may not be possible for a nursing home to meet the needs of the full range of potential residents. There is a danger of being a 'jack of all trades and master of none'. It may be better for a facility to focus on a particular group of potential residents and their abilities and lifestyles, rather than partially meeting the needs of many.

The development of a clear vision for a way of life in the residential facility is vital. The vision will influence the design of the unit, for example a fully functioning kitchen is essential if the vision is one of taking part in ordinary activities of daily life. However, if the focus is instead on social activities, the kitchen may be replaced with a media/computer room, or a place for playing mah-jong, chess or checkers. The vision will influence the priorities of a unit and how residents will spend their time within the unit and in the wider community. It will give the staff direction and help potential residents and their families decide whether the facility is likely to meet their needs.

Scoring the Question: There is no score to be obtained for this question. The objective of this question is to identify the vision/purpose of the unit providing care to people living with dementia.

Question 10.2: How well does the built environment enable this to happen? (Ask the manager or their representative for their view)

Circle one option*

No.	Design in response to vision for way of life					
10.2	How well does the built environment enable this to happen? (Ask the manager or their representative for their view)	1	2	3	4	5

*1 = not at all well, 5 = extremely well

There are many ways of life. It is important that the environment supports the vision for the way of life that is being offered to the residents. The manager is in a good position to be able to tell the assessor how much the built environment helps them to put the vision into practice.

Scoring the Question: Only one answer can be selected for this question which will result in the highest possible score of 5 points. Question 10.1 must be answered before attempting this question. The question obtains 1 point if the built environment does not strongly enable the unit to meet their vision. 2 points if the environment does not enable the unit and 3 points if the environment somewhat enables the unit. 4 points if the environment enables the unit and 5 points if the environment strongly enables this to happen.

Part 3:

Singaporean Environmental Assessment Tool (SEAT)

Singapore Environmental Assessment Tool (SEAT)

Name of Assessor:

Name of the Site:

Type of Site:

☐ Nursing Home ☐ Day Centre

Date:

Time:

Are you assessing?

☐ Dementia Specific ☐ Non-Dementia Specific

(Please select)

Year Built (Facility):

Year Built (Area Assessed):

1. Inconspicuously/Unobtrusively Reduce Risks

Mark only one box per row.

No.	Question	N/A	No	Yes	If Unobtrusive	Enter Score	Spaces
		Score	Score	Score	Score		
1.1	Can people who live in the unit be prevented from leaving the garden/outside area by getting over or under the perimeter?	2	0	1	1		External Spaces
1.2	Can people who live in the unit be prevented from leaving the garden/outside area through the gate?	2	0	1	1		External Spaces
1.3	Can the front door leading out of the unit be secured?	2	0	1	1		Internal Spaces
1.4	Outside, is there step free access to all areas?	1	0	1			External Spaces
1.5	Outside, are all floor surface materials safe from being slippery when wet?	1	0	1			External Spaces
1.6	Outside, is the path surface even?	1	0	1			External Spaces
1.7	Outside, are the paths that are exposed to external elements such as the weather, plants and trees; clear of obstacles (e.g. trees, thorny plants) along and over the path?	1	0	1			External Spaces
1.8	Outside, are the paths wide enough to allow two wheelchairs to pass? (Minimum width is 1.8 metres)	1	0	1			External Spaces
1.9	Outside, are all ramps of a gradient suitable for wheelchair use?	1	0	1			External Spaces

1.10	Is there a way to keep residents out of the kitchen/kitchenette/dry pantry if required?	2	0	1	1		Dining & Kitchen/Pantry
1.11	Can appliances be locked away in the kitchen/kitchenette/dry pantry the residents use?	2	0	1	1		Dining & Kitchen/Pantry
1.12	Is there a switch to turn off electricity to power points in the kitchen/kitchenette/dry pantry the residents use?	2	0	1	1		Dining & Kitchen/Pantry
1.13	Inside, are all floor surfaces safe from being slippery when wet?		0	1			Internal Spaces
1.14	Inside, is contrast between floor surfaces avoided (e.g. sharp distinction between bedroom floor and corridor)?		0	1			Internal Spaces
1.15	Inside, are all ramps of a gradient suitable for wheelchair use?		0	1			Internal Spaces
1.16	Is it easy to transfer a non-ambulant person from their bed to the bathroom (using appropriate equipment)?		0	1			Internal Spaces
1.17	Is technology utilised to enhance the safety and security of the unit? (Key card access, digital locks, sensors etc.)	2	0	1	1		Internal Spaces
Total N/A Score			Total Score				
			% Score $\frac{\text{Total Score} \times 100}{24 - \text{Total N/A Score}}$				

Notes:

2. Provide a Human Scale

Mark only one box per row.

No.	Question	1-10	11-16	17-29	30+	Enter Score	Spaces				
		Score	Score	Score	Score						
2.1	How many people live in the unit?	3	2	1	0		Internal Spaces				
No.	Question	No		Yes		Enter Score					
		Score		Score							
2.2	Does the scale (height and width) of the common areas allow a person to feel comfortable (and not uneasy because they are too big or too small)?	0		1			Internal Spaces				
<div>Total Score</div> <div>% Score</div> <div>$\frac{\text{Total Score} \times 100}{4}$</div>											

Notes:

3. Allow People to See and Be Seen

Mark only one box per row.

No.	Question	N/A	25% or less	26%- 50%	51%- 75%	76% or more	Enter Score	Spaces
			Score	Score	Score	Score		
3.1	What percentage of residents can see the inside of a living room as soon as they leave their bedroom?		0	1	2	3		Bedrooms
3.2	What percentage of residents can see their bedroom entry as soon as they leave a living room?		0	1	2	3		Bedrooms
3.3	What percentage of residents can see the inside of a dining room as soon as they leave their bedroom?		0	1	2	3		Bedrooms
No.	Question	N/A	No	Yes			Enter Score	
		Score	Score	Score				
3.4	Can the exit to a garden or outside area be seen from the living or dining room that is used by most residents?	1	0	1				Dining & Kitchen/Pantry

3.5	Can the dining room be seen into from the living room?	1	0	1			Dining & Kitchen/Pantry
3.6	Can a toilet be seen from the dining room that is used by most residents?	1	0	1			Bathroom & Toilets
3.7	Can a toilet be seen from the living room that is used by most residents?	1	0	1			Bathroom & Toilets
3.8	Can the living room that is used by most residents be seen into from where staff spend most of their time?	1	0	1			Living/Activity Space
3.9	Can the dining room that is used by most residents be seen into from where staff spend most of their time?	1	0	1			Dining & Kitchen/Pantry
3.10	Can a garden or outside area for the residents be seen from where staff spend most of their time?	1	0	1			External Spaces
Total N/A Score			Total Score				
		<div>% Score</div> <div>$\frac{\text{Total Score} \times 100}{16 - \text{Total N/A Score}}$</div>					

Notes:

4. Manage Levels of Stimulation - Reduce Unhelpful Stimulation

Mark only one box per row.

No.	Question	No	Yes	Enter Score	Spaces
		Score	Score		
4.1	Are doors to cleaner's cupboards, storerooms and other areas where residents may find danger easily seen?	1	0		Internal Spaces
4.2	Is the wardrobe (or cupboard) that the resident uses empty or full of a confusing number of clothes and/or irrelevant objects?	1	0		Bedrooms
4.3	Is there a public address, staff paging or call system with bells, loudspeakers or flashing lights in use?	1	0		Internal Spaces
4.4	Does the noise from closing doors disturb residents, (e.g. flapping kitchen doors, noisy automatic doors)?	1	0		Internal Spaces
4.5	Is there a lot of visual clutter in the unit (i.e. notices, objects, furniture that are either irrelevant to residents or make it hard for them to interpret their environment)?	1	0		Internal Spaces
4.6	Inside, can glare be avoided by using curtains and blinds?	0	1		Internal Spaces
Total Score					
$\frac{\% \text{ Score}}{\text{Total Score} \times 100}$ <div>6</div>					

Notes:

5. Manage Levels of Stimulation - Optimise Helpful Stimulation

Mark only one box per row.

No.	Question	N/A	No	Yes			Enter Score	Spaces
		Score	Score	Score				
5.1	Does each room have a distinctive character and feel? e.g. is it easy to identify a room as a dining room or a living room?		0	1				Common Internal Spaces
5.2	Is the dining room clearly recognisable from outside the room?	1	0	1				Dining & Kitchen/Pantry
No.	Question		25% or less	26%-50%	51%-75%	76% or more	Enter Score	
			Score	Score	Score	Score		
5.3	What percentage of residents have a clearly defined path from their room to the dining room (e.g. by using colour, <u>objects</u> and signage, or can see the dining room from their room)?		0	1	2	3		Bedrooms
No.	Question	N/A	No	Yes			Enter Score	
		Score	Score	Score				
5.4	Is the living room clearly recognisable from outside the room?	1	0	1				Living/Activity Space

5.5	Are different corridors clearly recognisable so residents can identify where they are?	1	0	1			Common Internal Spaces
5.6	Are personalised signs, symbols or displays easily seen to identify bedrooms?		0	1			Bedrooms
5.7	Are shared ensuites/bathrooms/toilets clearly marked with a sign (text and symbol) or colour coded door?	1	0	1			Bathroom & Toilets
5.8	Is, or can, the bed be placed so that it possible to see the toilet from the bed when lying down?		0	1			Bedrooms
No.	Question		25% or less	26%-75%	76% or more	Enter Score	
			Score	Score	Score		
5.9	Do the toilet seats contrast with the background?		0	1	2		Bathroom & Toilets
No.	Question		25% or less	26%-50%	51%-75%	76% or more	Enter Score
			Score	Score	Score	Score	
5.10	What percentage of residents have a window that provides an attractive view to the outside from their bed?		0	1	2	3	Bedrooms

No.	Question	N/A	No	Yes		Enter Score	
		Score	Score	Score			
5.11	Inside, are contrasting materials used so that edges of surfaces and objects can be easily seen (e.g. coloured borders, different floor, <u>wall</u> and ceiling colour)?		0	1			Common Internal Spaces
5.12	Inside, are olfactory cues (such as perfumed flowers or kitchen smells) used to provide a variety of experiences for a person with dementia and help them know where they are?		0	1			Common Internal Spaces
No.	Question	N/A	No	Yes		Enter Score	
		Score	Score	Score			
5.13	Inside, are tactile cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. different floor finishes, fittings such as door handles)?		0	1			Common Internal Spaces
5.14	Inside, are auditory cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. music, sound of a water feature)?		0	1			Internal Spaces

5.15	Outside, are a variety of materials and finishes used to create an interesting and varied environment for a person with dementia and help them know where they are (e.g. brick, timber stone, grass)?	1	0	1		External Spaces
5.16	Outside, are olfactory cues (such as perfumed plants) used to provide a variety of experiences for a person with dementia and help them know where they are?	1	0	1		External Spaces
5.17	Outside, are auditory cues used to provide a variety of experiences for a person with dementia and help them know where they are (e.g. wind chimes)?	1	0	1		External Spaces
5.18	Inside, is there an attractive view to outside from the living and/or dining room for a person seated or lying down?		0	1		External Spaces
Total N/A Score			Total Score			
		% Score $\frac{\text{Total Score} \times 100}{23 - \text{Total N/A Score}}$				

Notes:

6. Support Movement and Engagement

Mark only one box per row.

No.	Question	N/A	No	Yes	Enter Score	Spaces
		Score	Score	Score		
6.1	Is there a clearly defined accessible path that avoids dead ends and locked exits and guides the resident from inside to outside and back to their starting point?	1	0	1		Internal Spaces
6.2	Outside, is there a path that guides residents past areas that might invite participation in an appropriate activity?	1	0	1		External Spaces
6.3	Outside, is there a choice of activities for residents to participate in (such as sorting tools, seeing birds, gardening)?	1	0	1		External Spaces
6.4	Outside, are there chairs or benches at frequent intervals so people can sit and enjoy the fresh air?	1	0	1		External Spaces
6.5	Outside, are there both shady and sunny areas along the path?	1	0	1		External Spaces
6.6	Outside, does the path allow residents to be taken past a range of activities that they can passively participate in (such as looking at plants, watching birds)?	1	0	1		External Spaces
6.7	Are there verandas or shaded seating areas in close proximity to the building?		0	1		External Spaces

6.8	Inside, is there a path that guides residents past areas that might invite participation in an appropriate activity (such as folding clothes, listening to music)?		0	1		Internal Spaces
6.9	Inside, does the path take residents past chairs that provide opportunities for rest and/or conversation?		0	1		Internal Spaces
Total N/A Score			Total Score			
			% Score $\frac{\text{Total Score} \times 100}{9 - \text{Total N/A Score}}$			

Notes:

7. Create a Familiar Place

Mark only one box per row.

No.	Question	N/A	None	A Few	Many		Enter Score	Spaces
		Score	Score	Score	Score			
7.1	Are there any pieces of furniture in the living room that are of a design that are not familiar to the majority of residents?	2	2	1	0			Living/Activity Space
7.4	Are there any pieces of furniture in the bedroom that are of a design that are not familiar to the majority of residents?	2	2	1	0			Bedrooms
No.	Question		None	A Few	Many		Enter Score	
			Score	Score	Score			
7.2	Have most of the residents decorated their bedrooms (e.g. with photos, pictures, objects)?		0	1	2			Bedrooms
7.3	Do residents have their own furniture in their own bedrooms?		0	1	2			Bedrooms
No.	Question		No	Yes			Enter Score	
			Score	Score				
7.5	Is the room or rooms able to support the spiritual or religious practices of the residents?		0	1				Living/Activity Space

7.6	Are there bedrooms available for couples?		0	1					Bedrooms
No.	Question		None	25% or less	26% - 50%	51% - 75%	76% or more	Enter Score	
			Score	Score	Score	Score	Score		
7.7	Are there resources for residents to engage in spiritual or religious activities?		0	1	2	3	4		Living/Activity Space
Total N/A Score			Total Score						
			% Score $\frac{\text{Total Score} \times 100}{14 - \text{Total N/A Score}}$						

Notes:

8. Provide a Variety of Places to be Alone or With Others – in the Unit

Mark only one box per row.

No.	Question	No	Yes	2 or more		Enter Score	Spaces
		Score	Score	Score			
8.1	Within the unit, are there places where a small group of people can gather?	0	1	2			Living/Activity Space
No.	Question	No	1	2	3 or more	Enter Score	
		Score	Score	Score	Score		
8.2	Within the unit, are there places where a person can be on their own and/or in private conversation (e.g. nooks, sitting areas)?	0	1	2	3		Living/Activity Space
No.	Question	1	2-3	4 or more		Enter Score	
		Score	Score	Score			
8.3	How many different types of spaces are there within the unit (e.g. cosy living, TV room, activity space)?	0	1	2			Living/Activity Space
No.	Question	No	Yes			Enter Score	
		Score	Score				
8.4	Does the dining room allow for a choice to eat alone?	0	1				Dining & Kitchen/Pantry

8.5	Outside, are there places in the garden or outdoor area where a person can be on their own and/or in private conversation?	0	1			External Spaces
8.6	Does the living room provide opportunities for people to be in private conversation?	0	1			Living/Activity Space
					Total Score	
					% Score $\frac{\text{Total Score} \times 100}{10}$	

Notes:

9. Provide a Variety of Places to be Alone or With Others – in the Community

Mark only one box per row.

No.	Question	No	Yes	Enter Score	Spaces
		Score	Score		
9.1	Is there easy access to places which encourage interaction and engagement with the wider community (e.g. children, knitting groups, religious groups)?	0	1		Living/Activity Space
9.2	Is there a room where families can share meals and/or celebrations with their relatives?	0	1		Living/Activity Space
9.3	Does the unit provide a room for palliative care that preserves the dignity, <u>privacy</u> and quality of life for the resident?	0	1		Bedrooms
9.4	Is there an easily accessible place where families and friends can feel comfortable while taking a break from visiting (e.g. when visiting a very sick person)?	0	1		Living/Activity Space
9.5	Is there access to computers, for residents utilising technology for engagement or communication (e.g. videoconferencing with family and friends, making video calls, surfing the internet, sending emails etc.)?	0	1		Living/Activity Space
9.6	Can a small group of people gather privately?	0	1		Living/Activity Space
9.7	Is there access, space and privacy for families and friends visiting a resident requiring palliative care?	0	1		Living/Activity Space
Total Score					
% Score $\frac{\text{Total Score} \times 100}{7}$					

Notes:

10. Design in Response to Vision for a Way of Life

Mark only one box per row.

10.1. What is the vision/purpose of the unit for people with dementia? To provide: -

Circle your option or options

- a) A homelike environment
- b) A hotel like environment with hotel like services
- c) A medical care facility
- d) A lifestyle environment focusing on recreation, exercise or another aspect of lifestyle
- e) Be a centre of excellence for people with dementia
- f) An environment that focuses on person-centred care
- g) Other: _____

Circle one option*

No.	Design in response to vision for way of life					
10.2	How well does the built environment enable this to happen? (Ask the manager or their representative for their view)	1	2	3	4	5

*1 = not at all well, 5 = extremely well

Notes: