

学位論文の要約

**Built Environment and Frailty: Understanding the
influence of neighbourhood on older people's health**

構築環境とフレイル：
高齢者の健康への近隣環境の影響に関する理解

名古屋大学大学院医学系研究科

名古屋大学・アデレード大学国際連携総合医学専攻
発育・加齢医学講座 地域在宅医療学・老年科学分野

(指導：葛谷 雅文 教授)

Beatriz Arakawa Martins

【Introduction】

Never in the history of the world have so many humans lived for so long, with over 11% of the world's current population being 60 years old and older. Australia and Japan are the countries in the Western Pacific region with the highest proportion of older people, aged 65 years old and over, estimated to reach 18.3% and 31.2% respectively by 2030. This demographic transition represents a significant challenge for health and social care systems. In this context, a study of frailty is of particular interest as we move away from disease-oriented models of care to more patient-oriented integrated care, considering biological and non-biological causes of disease. Frailty is defined as a state of extreme vulnerability to intrinsic and extrinsic stressors leading to an increased risk of adverse outcomes, such as hospitalisation, institutionalisation and death. The risk of frailty increases with age, with worldwide prevalence varying from 4.0% to 59.1%, depending on which criteria used and clinical context.

【Objectives】

The role of place in older adults' health is not a new concept but has only recently been recognised as important for the achievement of healthy ageing. Although there is some research suggesting that the neighbourhood built environment is associated with walking, physical activity and well-being in older adults, very little has been done to investigate the relationships between frailty, objective neighbourhood environment and individual perceptions of the neighbourhood environment. This research sought to understand relationships between these factors in two culturally different cities, Nagoya, Japan and Adelaide, Australia. The interdisciplinary nature of the research required the development of new methods and the conduct of quantitative and mixed-method projects.

【Methodology】

Firstly we (1) assessed the level of importance medical students assigned to the topic of frailty after taking a geriatric medical course and their self-perceived competence in the area of frailty diagnosis and care. Then, a range of projects were undertaken to investigate the associations between neighbourhood environment and frailty: (2) a feasibility study of the research tools; (3) a mixed-method study investigating older adults' experiences and perceptions of the public space of a hospital; (4) the development of a frailty index for the analysis of (5) the association between frailty and neighbourhood perceptions in older adults from Nagoya and (6) with similar methodology, investigation of the same associations in older adults from Adelaide, with adjustment for the objective environment.

【Results】

The initial feasibility study (2) identified successful recruiting strategies of frail older

adults, as well as issues that needed to be adapted to improve execution and acceptance by older adults. The mixed-method study (3) identified aspects of the built environment that could be directly associated with older adults' intrinsic capacity and elements that were facilitators or barriers to the use of the built space. Several themes were identified as associated with older adults' experiences as outpatients, such as lighting, noise, temperature, design, seating, wayfinding and access/transportation. In the Nagoya Longitudinal Study for Healthy Elderly, using the frailty index (4) we identified the prevalence of frail and pre-frail older adults in the sample, and age, polypharmacy, physical activity, walking speed and waist circumference were significantly associated with being frail and pre-frail. Using this frailty index, the cross-sectional analysis of associations between frailty and neighbourhood environment in Nagoya (5) revealed that increased frailty was independently associated with worse perceptions of neighbourhood environment. There were inverse linear associations between the frailty index and neighbourhood environment perceptions, and higher frailty was associated with poorer perceptions of land use mix diversity, land use mix access, street connectivity, walking infrastructure, aesthetics, and crime safety. In Adelaide (6), with the inclusion of an objective record of the environmental characteristics of place, the neighbourhood environment variables retained a significant association with frailty. In Adelaide, specific associations were found between worse land use mix and accessibility and worse crime safety and frailty and pre-frailty. Finally, fifth-year medical students' perceived competence and the level of importance assigned to assessing, diagnosing and managing frailty significantly improved after a geriatric medical course in the University of Adelaide (1). Increasing medical students' awareness of frailty topic and attitudes towards ageing will help shape future health professionals in the better care of older adults in Australia.

【Discussion】

Research from this doctoral thesis contributes to the understanding of the complex relationship between the neighbourhood environment and frailty in older adults, delivering insights that need to be taken into consideration when assessing the impact of community settings on frailty, as well as the impact of frailty on perceptions of the built environment of the community. Frailty is a common and prevalent condition in older adults from Australia and Japan, and several modifiable risk factors have been identified in relation to frailty with the neighbourhood environment being one of them. The worse neighbourhood characteristics identified in relation to frailty might lead to detrimental behavioural adaptations that constrict individual life-spaces, as well as impacting in the older adults' physical and social activity levels, all factors that might lead to worsening frailty states. To achieve healthy ageing depends on extrinsic and intrinsic factors and understanding how these factors relate to each other is one of the challenges in the management of frailty.

【Conclusion】

In conclusion, increasing medical doctors' importance and competence in the topic of frailty is a vital strategy to improve the care of frail older adults. Additionally, considering the effects of neighbourhood environment on public health is an important public health and therapeutic strategy to help manage and prevent frailty in the community.