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Older adults' quality of life – Exploring the role of the built environment and social cohesion in community-dwelling seniors on low income.

L. Engel [a, b, *], A.M. Chudyk [c, d], M.C. Ashe [c, e], H.A. McKay [c, e, f], D.G.T. Whitehurst [a, b], S. Bryan [b, g]

[a] Faculty of Health Sciences, Simon Fraser University, Canada
[b] Centre for Clinical Epidemiology and Evaluation, Vancouver Coastal Health Research Institute, Canada
[c] Centre for Hip Health and Mobility, Canada
[d] Experimental Medicine, The University of British Columbia, Canada
[e] Department of Family Practice, The University of British Columbia, Canada
[f] Department of Orthopaedics, The University of British Columbia, Canada
[g] School of Population and Public Health, The University of British Columbia, Canada

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ABSTRACT

The built environment and social cohesion are increasingly recognized as being associated with older adults' quality of life (QoL). However, limited research in this area still exists and the relationship has remained unexplored in the area of Metro Vancouver, Canada. This study examined the association between the built environment and social cohesion with QoL of 160 community-dwelling older adults (aged ≥ 65 years) on low income from Metro Vancouver. Cross-sectional data acquired from the Walk the Talk (WTT) study were used. Health-related QoL (HRQoL) and capability wellbeing were assessed using the EQ-5D-5L and the ICECAP-O, respectively. Measures of the environment comprised the NEWS-A (perceived built environment measure), the Street Smart Walk Score (objective built environment measure), and the SC-5PT (a measure of social cohesion). The primary analysis consists of Tobit regression models to explore the associations between environmental features and HRQoL as well as capability wellbeing. Key findings indicate that after adjusting for covariates, older adults' capability wellbeing was associated with street connectivity and social cohesion, while no statistically significant associations were found between environmental factors and HRQoL. Our results should be considered as hypothesis-generating and need confirmation in a larger longitudinal study.

1. Introduction

Associations between environmental conditions, health-related behaviours, and health outcomes are long recognized in theory (Cunningham and Michael, 2004; Lawton, 1977; Owen et al., 2000; Wilson and Clearly, 1995), and supported by empirical evidence in areas such as obesity (Booth et al., 2001), physical activity (Humpel et al., 2002), and chronic diseases (Freedman et al., 2011). Characteristics of the environment are, generally, broken down into two components: social and physical characteristics. The latter refers to the natural environment (e.g., plants, water, earth, air quality, climate) and the built environment. Features of the built environment comprise the *urban design* (the design of the city and the elements within it), *land-use* (the distribution of activities across space), and the *transportation system* (including the physical infrastructure of roads, sidewalks, bike paths, railroad tracks, bridges and services provided) (Handy et al., 2002). The social environment, on the other hand, encompasses *interpersonal relationships* (e.g., social support and social networks), *social inequalities* (e.g., socioeconomic position and income inequality, racial discrimination), and *neighbourhood and community characteristics* (e.g., social cohesion and social capital, neighbourhood factors) (Mcneill et al., 2006a). It comprises broader factors that

* Corresponding author. Faculty of Health Sciences, Simon Fraser University, 8888 University Drive, Burnaby, BC, V5A 1S6, Canada.
E-mail address: lengel@sfu.ca (L. Engel).

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could affect large groups or entire communities such as culture, norms, indicators of social disorder, as well as place attachment that can be understood as a sense of belonging to the neighbourhood (Barnett and Casper, 2001; Rowles, 1983; Sallis, 2009).

The built environment and social environment are of particular importance for older adults. The extent to which older adults engage with their environments is different compared with most other people, mainly because as individuals age, their environment tends to shrink to the locale of their home or immediate neighbourhood (King, 2008). The environmental press theory by Lawton suggests that the environment places a certain degree of 'press' or stress on individuals (Lawton, 1977). How well individuals function in their environment is a reflection of the degree to which individuals' competence meets the press imposed by the environment (Lawton, 1977). As physical health declines, older adults are less able to function within their surroundings and, therefore, are more vulnerable to the forces within their environment (Noreau and Boschen, 2010). Environmental challenges include, for example, uneven sidewalks, high curbs, increased traffic, or short timing for crosswalks. A combination of physical impairments and lower neighbourhood walkability presents challenges to moving about, which may lead to loss of independence, social isolation, and the inability to remain in a familiar social environment (Hanson et al., 2013). Social isolation, in turn, can lead to depression and other adverse mental health outcomes (Rosso et al., 2011). The relationship between ageing, chronic diseases and physical inactivity is well established in the literature (Garin et al., 2014; Levasseur et al., 2015; Liu-Ambrose et al., 2010). Treating diseases related to physical inactivity come at a price. Around $2.1 billion, or 2.5% of the total direct health care costs in Canada, were attributable to physical inactivity in 1999 (Katzmarzyk et al., 2000). As the proportion of older adults in society continues to rise, the attendant increases in public spending on social and health care services are seen as a threat to worldwide economic stability in the 21st Century (Prince et al., 2015). Chronic diseases and disabilities can be prevented or delayed and physical activity can be increased by public health interventions, such as urban planning. As shown in previous studies, a supportive environment with fewer barriers can promote physical activity (Morris et al., 2008) as well as social interaction (Day, 2008), and is associated with better perceived quality of life (QoL) (Rantakokko et al., 2010).

The World Health Organization (WHO) defined QoL as a 'broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment' (World Health Organization, 1997). Occasionally, QoL is equated with the concepts of life satisfaction or subjective wellbeing, and often an explicit reference to health is made (e.g., health-related QoL [HRQoL]) to narrow the focus to the effects of health, illness, and treatment on QoL. Although previous conceptual frameworks have emphasized the importance of environmental characteristics on QoL (Ferrans et al., 2005; Wilson and Clearly, 1995; World Health Organization, 2002), a recent review has identified only ten studies that explored this association in an older adult population (Garin et al., 2014). These studies, published after 2005, were predominantly from Europe, used a cross-sectional design (two were longitudinal studies), and included a mix of objective and self-rated built environment measures. It was shown that accessibility, residential satisfaction, home size, housing type, heavy traffic, higher usability, exterior environment, interior environment, street noise, and safety from traffic were associated with QoL, wellbeing, life satisfaction or successful aging (Garin et al., 2014). However, the authors stress the difficulty to hypothesize on the nature of the relationship due to the different use of environmental variables that may have resulted in conflicting findings. With regard to the social environment, social cohesion has the potential to influence older adults' QoL. Social cohesion can be understood as the extent of connectedness and solidarity among groups in society (Kawachi and Berkman, 2000). Previous literature indicated that neighbourhood cohesion was predictive of good health, wellbeing and QoL (Elliott et al., 2014; Friedman et al., 2012; Gale et al., 2011).

Limited research in this area exists and the association between the built environment and social cohesion with older adults' QoL has never been explored within the region of Metro Vancouver, Canada – a city with some unique characteristics within which these relationships need to be explored further. Compared with most other North American regions, Metro Vancouver tends to have a much smaller land base, a higher population density, and the residents are relatively healthy and physically active (Frank et al., 2009). Like many other cities, Metro Vancouver is facing a major demographic shift and by 2036 the 65 + population is expected to more than double (United Way of the Lower Mainland, 2011). A recent report looking at how to better serve and support the region's aging population recommended investigation of the travel patterns of older adults and the connection of the built environment to various health outcomes (United Way of the Lower Mainland, 2011). While previous studies have examined the relation between the built environment and travel behaviour, as well as physical activity within Metro Vancouver (Chudyk et al., 2014; Winters et al., 2014), the link between the built environment and social cohesion with health outcomes (including QoL) still remains to be explored. In addition, 12% of Canadian older adults are of low economic status based on Statistics Canada's low income cut-off measure (The Conference Board of Canada, 2013). The relationship between environmental characteristics and QoL is expected to be different for this study population. Older adults on low income may rely more on their local neighbourhood and amenities that are reachable by walking, as owning a car or taking public transportation may be unaffordable for them. Because of these unique mobility-related needs and characteristics, this population group requires further consideration. The objective of this study is to explore the association between the built environment and social cohesion with QoL of low income, community-dwelling older adults (aged $\geq$ 65 years) living in Metro Vancouver.

2. Methods

2.1. Data source

The data used for this secondary analysis are from the 'Walk the Talk (WTT): Transforming the Built Environment to Enhance Mobility in Seniors' project. Detailed information on study design and methods have been published elsewhere (Chudyk et al., 2014). Briefly, this cross-sectional study consists of qualitative and quantitative components that investigate the impact of the built environment on the mobility and health of older adults living on low income. Study participants were older adults that were in receipt of a Shelter Aid for Elderly Renters (SAFER) rental subsidy from BC Housing (BC Housing, n.d.). The rental subsidy is available to British Columbia residents aged $\geq$60 years who pay more than 30% of their gross monthly household income towards the rent of their residence. This, however, does not imply that SAFER recipients necessarily reside in low income