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Perceived neighbourhood environmental attributes and prospective changes in TV viewing time among older Australian adults

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Abstract

Background: There has been a growing interest in environmental initiatives to reduce sedentary behaviour. A few existing studies on this topic are mostly cross-sectional, focused on the general adult population, and examining neighbourhood walkability. This study examined associations of perceived environmental attributes with change in TV viewing time over seven years among older Australian adults in the Australian Diabetes, Obesity and Lifestyle (AusDiab) study.

Methods: The AusDiab study is a population-based study on diabetes and its risk factors in adults. We used the data on 1072 older adults (60+ years at baseline) collected in 2004–05 (baseline) and in 2011–12 (follow-up; 45, 49% men, mean age 67.5 years). Generalized Linear modelling examined associations with 7 years change in TV viewing time of nine perceived neighbourhood-environment attributes relating to local shops, alternative routes, footpaths, parks, attractiveness, natural features, bicycle/walkway tracks, local traffic, and safety.

Results: On average, participants increased their TV viewing time from 127 min/day to 137 min/day over the 7 years period. Adjusted for baseline TV viewing levels, TV viewing time at follow-up was 8% lower (95%CI 0.85, 0.99) among those who did not perceive local traffic as a deterrent compared to those who perceived traffic as a deterrent. A trend for significant interaction between working status and the presence of a parks nearby indicated that, for those who were not working, those who reported having parks nearby had a marginal association with lower TV viewing time at follow-up than those who did not (p = 0.048).

Conclusions: Overall TV viewing time increased on average by 10 minutes/day over 7 years among older Australian adults. Local traffic that makes walking difficult or unpleasant may increase older adults’ leisure-time sedentary behaviours such as TV viewing, possibly by deterring outdoor activities.

Keywords: Sedentary behaviour, Built environment, Traffic, Prospective study

Background

Too much sitting – as distinct from too little physical activity – is associated with adverse health outcomes [1,2], including for older adults [3]. Television (TV) viewing time is a common sedentary behaviour that occupies a large proportion of leisure-time [4]. For the general adult population, after accounting for the influence of leisure-time moderate- to vigorous-intensity physical activity, TV viewing time has been shown to be independently associated with increased cardio-metabolic risk and all-cause mortality [5-8]. In older adults, prolonged TV viewing time is also linked with poorer health outcomes [9,10] and deterioration of cognitive function [11,12].

Prolonged TV viewing time is more prevalent among older adults than other age groups [13,14]. In the United States, more than 80% of adults aged 60 years and older...
watch television for at least 2 hours per day, compared to 60–65% of those aged 20 to 59 years [13]. Considering rapidly aging populations in many industrialized nations and the high prevalence of sedentary behaviour in this age group, there is likely to be public health benefit from population-based strategies for reducing TV viewing time among older adults.

There has been a growing interest in environmental initiatives to promote physical activity through its potential to support large-scale, sustainable behavioural changes [15,16]. Immediate neighbourhood environments may be particularly relevant to older adults’ participation in physical activity as a result of retirement and decreased mobility [17]. Recent studies have shown attributes of neighbourhood environments, such as safety and access to destinations, to be associated with older adults’ physical activity [18,19]. Neighbourhood environmental attributes may also play a role in older adults’ sedentary behaviours, particularly TV viewing. For example, older adults who perceive their neighbourhood to be unsafe or unsupportive of physical activity may be more likely to remain indoors and watch TV. However, only a small number of studies to date have examined these relationships in general adults [20–23].

Previous research has found that high walkability (a composite measure of residential density, intersection density, land use mix, and net retail area ratio) is associated with less TV viewing time among adults [20,21]. Other environmental factors such as living in major cities and the presence of places to shops have been shown to be associated with less TV viewing time [14,24,25]. These studies suggest that broader contextual factors, including neighborhood environmental attributes, may be related to residents’ leisure-time sedentary behaviour, potentially through affecting time spent indoors. However, none of these studies have focused on older adults. Furthermore, with the exception of one recent study in adults [23], the existing studies on this topic are restricted to the examination of neighbourhood walkability only. Thus, how TV viewing time is associated with specific environmental attributes (e.g., access to shops and services, traffic, and personal safety) is not known, despite that such investigation can potentially provide more practical and policy-relevant information. Furthermore, there has been only one longitudinal study – among adults aged up to 65 years – that has found high walkability to be associated with a lower increase in TV viewing time only among non-workers [26].

The present study examined the associations of multiple neighbourhood environmental attributes with changes in TV viewing time over seven years and effect modification of the associations by gender and working status, among older Australian adults, using data from the Australian Diabetes, Obesity and Lifestyle (AusDiab) study.

Methods
Procedure and participants
The AusDiab is a national cohort study of Australian adults aged 25 years or older that initially examined the national prevalence of diabetes and related risk factors. The first round of AusDiab study was undertaken in 1999–2000 (AusDiab 1), the second round in 2004–2005 (AusDiab 2), and the third round in 2011–2012 (AusDiab 3). The study sample was drawn from private dwellings within 42 clusters of Census Collection Districts (CCD, a geographic unit defined by the Australian Bureau of Statistics with an average of 225 dwellings each). Six CCD clusters were randomly selected from each of seven Australian states and territory. Detailed study methods and attributes of participants in AusDiab 1 [27] and AusDiab 2 [28,29] have been previously reported.

The present study utilized data collected in AusDiab 2 (baseline) and AusDiab 3 (follow-up). The study sample consisted of adults aged 60 years or older in 2004–2005, who also participated in AusDiab 3 (2011–2012; n = 1549, 62.6% of the 2004–2005 sample). Of those, 477 were excluded because of the change in residence during the study period (n = 311) and missing data for relevant variables (n = 166). The final study sample size was 1072 (45.4% men). Compared to those who were excluded (n = 477), participants who were retained in the final sample were more likely to be married (p < 0.05), and have smaller waist circumference (p < 0.05). However, these two groups did not differ in age, gender proportion, educational attainment, household income, work status, change in mobility, TV viewing time, and leisure-time physical activity (LTPA). The study was approved by the Ethics committees of the International Diabetes Institute and Alfred Hospital, and written informed consent was obtained from all participants.

Measures
TV viewing time
In both 2004–2005 and 2011–2012, participants reported total time spent watching TV or video/DVD on weekdays and weekends during the past week. This measure has been shown to have acceptable level of test-retest reliability (intraclass correlation = 0.82) and criterion validity (Spearman rank-order correlation with a 3-day log = 0.3) among adults [30]. The sum of weekday and weekend day TV viewing time was calculated, and then divided by seven to determine daily TV viewing time (min/day).

Perceived attributes of neighbourhood environments
Neighbourhood environment attributes were measured in 2004–2005 using the following nine items representing selected environmental attributes identified in previous studies of neighbourhood walkability [31,32]: presence of