Available online at www.sciencedirect.com
ScienceDirect
Preventive Medicine 47 (2008) 265–269
Preventive Medicine
www.elsevier.com/locate/ypmed

Travel perceptions, behaviors, and environment by degree of urbanization

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Available online 9 February 2008

Abstract

Objectives. This study examines how engagement in transport-related physical activity (TPA), perceptions of the commute route, actual travel distance, and perceptions of travel distance vary by degree of urbanization in rural and remote areas of Central Queensland, Australia.

Method. A random, cross-sectional sample of 1230 adults aged 18 years and over residing in rural and remote Central Queensland were surveyed by telephone in October–November 2006. Engagement in and attitudes towards TPA, perceptions of the commute route, actual travel distances, and perceived appropriate travel distances for TPA were assessed.

Results. For this study 765 adults were eligible for the analysis as they traveled to an occupation. Overall, 86% of the sample commuted to their occupation by motorized modes, 71% of individuals recognized 5 km or less as an appropriate distance to travel via TPA modes, and 45% of respondents reported travel distances less than five kilometers (km) to reach their workplace. Participants from small rural and remote settings more frequently traveled greater than 20 km to reach their occupation, reported fewer sidewalks and shops, and less heavy traffic enroute compared to respondents in large rural settings.

Conclusion. Infrastructure for, and participation in TPA varies according to degree of urbanization. Future work in this area should target the substantial population that recognizes they could engage in TPA. As such, increasing TPA participation in these settings likely requires a cultural shift and infrastructure improvements.

Keywords: Perceived travel distance; Urbanization; Transport-related physical activity; Infrastructure

Introduction

Increasing population-level physical activity engagement is an important public health priority for many developed countries (Department of Health Physical Activity Health Improvement and Promotion, 2004; US Department of Health and Human Services, 2000), yet many countries continue to report low levels of activity engagement (US Department of Health and Human Services, 2000; World Health Organization, 2004). Understanding the contextual environment and providing appropriate infrastructure that supports physical activity are important steps to addressing these current trends (Saelens et al., 2003; Badland and Schofield, 2005).

Research has shown that distinct aspects of the physical environment facilitate or inhibit different types of physical activity (Lee and Moudon, 2006; Pikora et al., 2006). An Australian study identified that destination accessibility (shops, public transport stops) was positively associated with self-reported walking for transport in adults, whereas a high level of environmental functionality (paths maintained, surfaced, continuous, and direct) was positively related with recreational walking (Pikora et al., 2006). Similarly, Lee and Moudon (2006) compared objectively-measured (determined using geographical information systems (GIS)) environmental variables with walking in US adults. Walking for transport was positively associated with presence of utilitarian destinations, and negatively associated with presence of hills. Conversely, recreational walking was positively related to hill and sidewalk presence. Another important consideration when examining the association between the environment and physical activity, particularly transport-related physical activity (TPA) engagement, is commute distance. Recent work has shown occupational commute distance was the most important contributor to

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doi:10.1016/j.ypmed.2008.01.021

work-related TPA engagement (Cerin et al., 2007), and distances less than 5 km were generally perceived as acceptable for TPA engagement amongst adults (Badland et al., 2007).

Overall physical activity levels and perceived environmental barriers to activity engagement have been compared by town size (Badland and Schofield, 2006). Although town size showed mixed associations with total physical activity accumulation, clear relationships were identified with barriers to physical activity engagement by region. Lack of infrastructure was reported as a significant barrier to overall physical activity engagement for residents of small towns, whereas time constraints were more frequently reported for residents from large cities (Badland and Schofield, 2006). Other studies have shown a lower proportion of rural residents reported the presence of micro-scale infrastructure such as sidewalks, recreation facilities, and parks, and were less active overall when compared to their metropolitan counterparts (Wilcox et al., 2000; Parks et al., 2003).

In summary, the aforementioned studies identified disparate physical activity domains are associated with different environmental characteristics, and regional settings exhibit diverse environments that can facilitate or inhibit physical activity engagement. This study seeks to build upon the existing literature by specifically investigating occupation-related TPA behaviors and perceptions by degree of urbanization for large and small rural settings and remote areas, commute distance, and perceptions of physical environment variables enroute for Central Queensland adults.

Methods

The Central Queensland Social Survey (CQSS) is an annual omnibus computer-assisted-telephone-interview (CATI) survey assessing the health of adults (>18 years of age) residing in Central Queensland, Australia, and is conducted by the Population Research Laboratory, Central Queensland University. Participants ($n=1230$) were randomly selected with replacement from the electronic white pages; i.e., if a participant could not be contacted or refused to participate, another telephone number was randomly generated. Due to omnibus nature of the survey, the CQSS was powered to provide an accurate sample of the overall survey area to within 2.8% points 19 times out of 20. It was not designed to provide a representative sample of TPA behaviors across geographical locations. The survey was conducted in October 2006. The response rate was 41%, which was comparable to other recently conducted CATI surveys (Caperchione et al., in press; Mummery et al., 2007; Ainsworth et al., 2003; Badland and Schofield, in press). The Central Queensland University Human Research Ethics Committee approved the study and all participants provided verbal consent.

The CQSS 2006 assessed leisure time physical activity, TPA frequency, perceptions of micro-scale characteristics of the travel route and at place of work/study, TPA attitudes, perceived distances appropriate for TPA, and socio-demographic characteristics. Those who did not work ($n=431$) or had incomplete travel information ($n=34$) were excluded from this analysis, leaving a final sample of $n=765$.

TPA engagement

The question: "In a usual week, how often would you walk or cycle for the majority of the commute distance from your home to or from your usual place of work/study?" was used to assess TPA engagement frequency. Clarification was provided that travel to and from the workplace was classified as two separate journeys. Responses were collapsed into four categories — 0 trips, 1–2 trips, 3–5 trips and >5 trips.

Perceived distance appropriate for TPA engagement

Respondents were asked: "In kilometers, how far do you think it is appropriate for you to walk or cycle to reach a destination if you have the time, it was pleasant weather, and you did not have to carry anything?" to assess perceptions of distance appropriate for TPA engagement. Responses were collapsed into three kilometer (km) categories. This question was derived from a previously developed item (Rafferty et al., 2004) to assess general perceptions of TPA.

Perceived micro-scale characteristics

Respondents rated the presence of shops/commercial premises, footpaths, and heavy traffic along the commute route using a five-point Likert scale (strongly agree (1) to strongly disagree (5)). Responses were dichotomously recoded into categories: 'agree' (strongly agree, agree (1)) and 'not agree' (neither, disagree, strongly disagree (0)).

Physical activity engagement

Overall physical activity and non-specific destination TPA were assessed using items based on the Active Australia Questionnaire (Australian Institute of Health and Welfare, 2003). This questionnaire is a reliable instrument (Brown et al., 2004) that is used in national surveys to determine physical activity levels of Australian adults. The questionnaire assessed the frequency and duration of time spent in recreational and transportation walking, and moderate and vigorous intensity physical activity separately. Participation in sufficient levels of physical activity was determined using the minimum threshold of 150 min reported for all physical activities over five or more sessions per week (Department of Health, Physical Activity, Health Improvement, and Promotion, 2004).

Attitudes towards TPA

Participants rated their agreement with two questions assessing perceived health benefits and enjoyment of TPA using a five-point Likert scale (strongly agree (1) to strongly disagree (5)). The questions: "I can gain benefits to my health by regularly participating in walking/cycling for transport" and "I enjoy walking/cycling for transport purposes" were asked. Responses were dichotomously recoded into categories: 'agree' and 'not agree' using the same format as used for micro-scale characteristics.

Town classifications

The regional, remote, and metropolitan areas (RRMA) classification is used as a proxy measure of access to classify geographic areas in Australia (Australian Government Department of Health and Ageing, 2005). Areas were classified into one of the following seven categories: 1) capital cities, 2) other (non-capital) metropolitan centers (≥100,000 residents), 3) large rural centers (25,000–99,999 residents), 4) small rural centers (10,000–24,999 residents), 5) other rural areas (<10,000 residents), 6) remote centers (≥5000 residents), and 7) other remote areas (<5000 residents) (Australian Institute of Health and Welfare, 2004). Respondents' degrees of urbanization were determined by linking their reported postal code with the associated RRMA classification. RRMA classifications of 3, 4–5, and 6–7 were collapsed to create the 'large rural', 'small rural', and 'remote' classifications, respectively.

Statistical analyses

Comparisons between groups in contingency tables were made using Pearson's χ^2 test. Adjusted (controlling for gender, age, education, and annual household income) odds ratios (OR) were derived using multinomial logistic regression analyses to examine relationships between travel and physical activity variables for those who lived in small rural or remote areas versus those residing in large rural regions. The independent variable for this analysis was the degree of urbanization. Percent agreement values were used to determine