A mixed methods study of changes in physical activity following residential relocation

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Introduction

- The built environment can influence physical activity choice and participation[1 2].
- Neighbourhood connectivity, residential density, land use mix, diversity of destinations and Walk Score® have been associated with physical activity in longitudinal residential relocation studies[3 4 5].
- Further, changes in neighbourhood safety, availability of outdoor spaces, aesthetics, access to public transport, and physical activity opportunities have been associated with perceived physical activity change in "quasi-longitudinal" residential relocation studies[6 7 8].
- No studies, have used mixed methods (combined quantitative and qualitative approaches) to investigate how relocating neighbourhood, and subsequent changes in the built environment, may influence changes in physical activity.

Objectives

This sequential mixed methods study:

1) estimated the associations between perceived changes in walking and cycling for transportation and overall physical activity and changes in objectively-assessed neighbourhood walkability (Walk Score®)

2) described perceived built environment barriers and supports to physical activity following neighbourhood relocation.

Methods

Sample and Study Design

- Random sample of adults (n=1023; age ≥20 years) residing in Calgary completed online or postal surveys.
- Participants recruited from 12 neighbourhoods stratified by socioeconomic status and street pattern.
- N=97 participants reported relocating neighbourhood with a different Walk Score® in the past 12 months from which n=14 (12 women and 2 men) completed semi-structured qualitative interviews.

Variables

- **Self-reported physical activity change (transportation walking, transportation cycling, and overall physical activity) since relocation:** (1) a lot less now, (2) a little less now, (3) the same, (4) a little more now and (5) a lot more now.
- **Walkability change:** Walk Score® linked to participants previous and current neighbourhoods via postal code captured change (increase or decrease) in objective walkability[9].
- **Sociodemographic characteristics**: age, gender, ethnicity, dog ownership, education, income, marital status, presence of dependents and presence of injury.

Quantitative Analysis

- Independent t-tests estimated differences in physical activity change by Walk Score®.

Qualitative Analysis of Narratives

- Our narrative informed framework relies on stories that have a linear timeline with a beginning, a plot and a denouement thus allowing us to understand present choices by linking them to prior events in time[10].

Quantitative Findings

No significant differences in sociodemographic characteristics between participants who increased versus decreased Walk Score®.

- Transportation cycling increased ($p<.05$) after relocation to a neighbourhood with an increased Walk Score®.
- Transportation walking increased (approaching $p<.05$) after relocation to a neighbourhood with an increased Walk Score®.
- No change in overall physical activity in relation to change in neighbourhood Walk Score®.

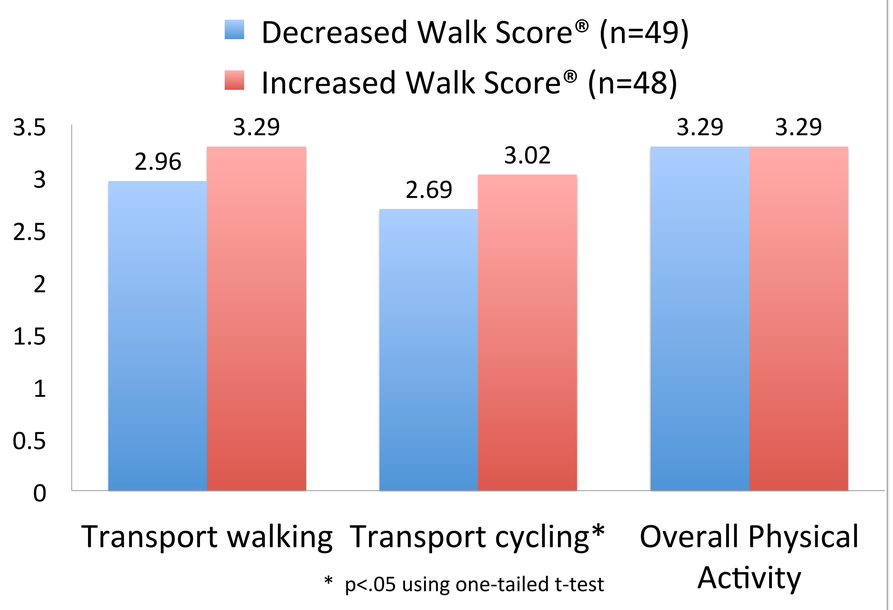

Figure 1: Differences in mean activity change by relocation group

Qualitative Findings

Among those interviewed, 9 participants relocated to a neighbourhood with a higher Walk Score® and 5 relocated to a neighbourhood with a lower Walk Score®.

We generated three broad themes of neighbourhood influences on physical activity changes after the relocation:

1) Factors in the built environment that allowed participants to get around.

- Those who moved to neighbourhoods with direct walking and cycling paths to destinations that are not exposed to high traffic increased their transportation walking and cycling.
- Those who moved next to large, unaesthetic traffic areas decreased their transportation and leisure walking.
- Increase in aesthetic elements such as views/greenery/architecture encouraged leisure walking.
- Access to public transit and nearby destinations changed transportation walking habits.

2) Environmental factors that allowed participants to connect with community and with nature.

- Participant's physical activity increased when local amenities allowed them to be active while connecting with family, neighbours, and nature (i.e., large parks, sports fields, skating rinks, pathways and community centers).

3) Factors that allowed participants to have a sense of purpose for their physical activity.

- The purpose given to different physical activities depended on the individual's stage in life. Some parents engaged in physical activity and active transportation to be a role model for healthy lifestyle and sustainability for their children. Others engaged as a way to give back to the community. Moving to a neighbourhood that does not support physical activity however, decreased physical activity despite a desire to be active for these personal reasons.

Conclusions

- Our findings help explain why changes in transportation walking and cycling were observed after moving to a neighbourhood with a different Walk Score®. However, Walk Score® poorly captures neighbourhood characteristics that may encourage leisure walking, cycling and overall physical activity, which likely explains no relationship between overall physical activity and Walk Score®. Factors, in addition to built environment changes (e.g., stage in life), not captured by our quantitative measures but presented in our qualitative data, seem to influence physical activity changes following residential relocation.

Implications

- Our findings could help inform urban and transportation policy to improve the supportiveness of neighbourhood built environments for physical activity.
- Policies that reduce local motorized traffic, support public transportation, create direct and connected walking and cycling pathways separated from motorized traffic, create natural elements, and encourage family friendly facilities could support physical activity improvements.

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