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AN EVALUATION OF GOOGLE STREET VIEW AS AN ENVIRONMENTAL DATA SOURCE FOR CONDUCTING PARK AUDITS

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INTRODUCTION

In Canada, physical inactivity is responsible for an estimated $6.8 billion of direct and indirect health care costs [1]. Many adults do not accrue the levels of physical activity necessary to ensure optimal health benefits [2]. Growing evidence suggests that the built environment, including convenient access to high quality public open space, has the potential to influence physical activity [3]. Google Street View (GSV) has been shown to be a feasible data source for auditing community walkability [4] and recreational facilities [5]; however, few studies [6] have taken advantage of GSV to audit public open space and park specific features that can influence physical activity. This study evaluates the feasibility, reliability, and validity of conducting virtual park audits using environmental park attribute data sourced from GSV.

METHODS

Parks (n=34) were purposively sampled from 11 neighbourhoods with differing socioeconomic status (low, low-medium, high-medium, and high) and urban form (grid, warped-grid, and curvilinear street patterns). The Public Open Space Tool (POST; adapted to the Canadian context) [7] was used to measure the quality of each park in terms of supporting physical activity behaviour. Two raters systematically audited parks using the POST via GSV and Google Maps aerial images at two time points (ten days between each audit round). Raters' combined GSV audit data was compared at time one and time two using Kappa coefficients, intraclass correlations (ICC) and percent of overall agreement (POA) to evaluate intra-rater reliability. Inter-rater reliability was determined by comparing the raters' time two GSV audit data using Kappa, ICC and POA.

RESULTS

Intra-rater reliability for all POST items using GSV audits was poor to excellent (POA = 70.6-100% and kappa/ICC = 0.32-1.00), as was intra-rater reliability for the aerial image audits (POA = 83.8% - 100% and kappa/ICC = 0.31-1.00). Inter-rater reliability for all POST items using GSV audits also ranged from poor to excellent (POA = 52.9-100% and kappa/ICC = 0.10-1.00), as did the aerial image audits (POA = 50%-100% and kappa/ICC = 0.28-1.00). Concurrent validity of GSV compared with aerial image audits ranged from poor to excellent (POA = 63-100% and kappa/ ICC = 0.12-1.00). GSV audits took an average of 13±4 minutes, while aerial image audits took 7±2 minutes, to complete.

DISCUSSION AND CONCLUSIONS

Previous studies have measured the physical and social characteristics of parks using audits whereby researchers visit park sites and systematically record park features (e.g., pathways, amenities) hypothesized to influence physical activity [9]. However, this method of data collection is resource-intensive and therefore limits its use in population-based studies investigating the relationship between the built environment and physical activity. GSV is a less resource intensive method of auditing parks and could reduce the financial and time costs of auditing parks by researchers as well as municipal park planners.

GSV is a potentially reliable and valid method for conducting park audits. Most POST items had good to excellent intra- and inter-rater agreement, as well as adequate concurrent validity with the aerial image audits. GSV audit times in this study were comparable to those found elsewhere [8]. Findings suggest that conducting virtual park audits with the POST using GSV data is a feasible, reliable, and valid approach.

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