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Original Research

The relationship between perceptions of discounted public transit and physical activity: Cross-sectional online survey in Canada

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ABSTRACT

Students may accumulate additional physical activity within their daily commutes by public transit, but current research is inconsistent. The purpose of this study was to explore the relationship between undergraduate students': (a) perceptions of having a discounted bus pass and transit-related physical activity; (b) perceptions of having a discounted bus pass and weekly physical activity levels; and (c) transit-related physical activity and weekly physical activity levels. Undergraduate students from a Canadian university completed a 61-item online questionnaire. Data was analyzed using descriptive statistics, three bivariate correlations, and three independent samples *t*-tests. Inductive content analysis was conducted on the open-ended responses to identify major themes from quotations. Students' perceptions of the discounted bus pass and their transit-related physical activity had a significant relationship ($p < 0.001$). There were non-significant relationships between participants' perceptions of the discounted bus pass and weekly physical activity scores ($p = 0.18$), and participants' transit-related physical activity and weekly physical activity scores ($p = 0.37$). Students perceived the discounted bus pass as a facilitator, barrier, or having no influence on their physical activity. In conclusion, students who are provided with discounted transit passes may enhance their transit-related physical activity. Additional research using objective physical measures are warranted.

1. Introduction

Regular participation in physical activity, defined as 150 min per week of aerobic moderate- to vigorous-intensity physical activity, is a health promoting behavior with substantive physiological and psychological health benefits for people of all ages (Tremblay et al., 2011; Warburton et al., 2006). While young adulthood is characterized by the development of individuals' lifestyles, it is also associated with a decline in physical activity levels (Irwin, 2004; Keating et al., 2005). University students, most of whom are young adults aged 18–24 years (Statistics Canada, 2010), are at risk for insufficiently active lifestyles, thus leading to missed opportunities to gain health benefits that regular participation in physical activity would otherwise provide (Irwin, 2004; Keating et al., 2005; Tremblay et al., 2011; Warburton et al., 2006). In addition, physical activity also serves as a preventative measure for many health problems, including obesity, cardiovascular disease, type II diabetes mellitus, and some cancers (Tremblay et al., 2011; Warburton et al., 2006). Young adults may obtain health-related benefits from using various modes of active transportation such as walking or biking, or by using public transit (Besser and Dannenberg, 2005; Morency et al., 2011; Rissel et al., 2012; Wasfi et al., 2013; Wener and Evans, 2007; Villanueva et al., 2008). Participation in moderate-intensity physical activity, such as walking to/from public transit stops during daily commutes, *might* lead to increased physical activity levels for university students (Besser and Dannenberg, 2005; Morency et al., 2011; Rissel et al., 2012; Wasfi et al., 2013; Wener and Evans, 2007; Villanueva et al., 2008). Hence, a discounted transit pass program could have a meaningful impact on university students' daily physical activity levels.

1.1. Literature review

Researchers have indicated that there are physical activity-related benefits for public transit users (e.g., additional walking time during daily commutes), which could potentially help student

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commuters accumulate higher physical activity levels (Besser and Dannenberg, 2005). Wasfi et al. (2013) found that approximately 11% of Canadian transit users accumulated 30 min of physical activity during their commute to school/work, but Canadians travelling by bus usually achieved fewer steps per commute than train users (Morency et al., 2011). Similarly, Villanueva et al. (2008) concluded that the odds of achieving 10,000 steps per day for university students who commuted by public transit was approximately four times higher compared to those travelling by cars. A systematic review of 27 articles by Rissel et al. (2012) explored the association between physical activity and public transit use, and concluded that public transit may help inactive adults achieve between 8 and 33 min of transit-related physical activity. As such, unlimited access to public transit services (e.g., fare-free public transit services via a discounted transit pass) can potentially enhance physical activity levels among university students (Brown et al., 2001). However, Jones et al. (2012) suggested that students might not benefit from unlimited access to public transit services because some individuals might only ride for short distances (e.g., students who only travel on the bus for one transit stop), thereby, decreasing their chances for physical activity. In other words, commutes by public transit may decrease physical activity levels for those who are only using it for short periods instead of walking or biking to their destination. Additionally, Edwards et al. (2013) found that the number of short distance trips made by transit increased from 2% to 5% among students (aged 12–17 years) in England who were provided with free transit passes. Therefore, it is unclear whether there are more potential physical activity-related benefits or detriments for college and university students who regularly commute by public transit.

Student commuters' overall perceptions of public transit may potentially impact their decisions for utilizing a particular mode of transportation (e.g., using public transit or a personal vehicle), which could have a significant influence on their physical activity levels. Notably, it is important to assess the student population to determine their perspectives (e.g., individuals' views and opinions), concerns, and preferences in order to have a clear understanding of how best to support their physical activity needs (McKenzie et al., 2013). Behrens et al. (2005) described that research involving students' perceptions of physical activity-related behaviors provides insight concerning their understanding and awareness of the health-related benefits that are achievable through health promotion programs. As such, gaining an understanding of the views of the target population is a necessary first step for any health promotion program (McKenzie et al., 2013). Thus, it is essential to explore post-secondary students' perceptions of particular programs (e.g., discounted public transit programs) that could potentially impact their physical activity levels in order to have an understanding of the relationship. Furthermore, it is important that university administrations consider promoting healthy lifestyles among students during early adulthood, so they can be encouraged to form habits and continue to participate in active behaviors throughout adulthood (Keating et al., 2005). Policies and interventions targeting university students are particularly important because these individuals are in a position to become the future generations of professionals and knowledge providers (e.g., policymakers, teachers, physicians, etc.) involved in decision making processes that could impact the health of others (Stewart-Brown et al., 2000).

To date, no known Canadian study has been conducted exploring the relationship between a discounted transit pass program and physical activity levels. Full-time undergraduate Western University students receive an unlimited access city transit pass as part of their tuition package. As such, this situation provides a unique opportunity to begin investigating the relationship between university students' physical activity levels and a discounted bus pass program in a Canadian context. The purpose of this study was to explore the relationship between full-time undergraduate students': (a) perceptions of having a discounted bus pass and transit-related physical activity; (b) perceptions of having a discounted bus pass and weekly physical activity levels; and (c) transit-related physical activity and weekly physical activity levels. Respondents' demographic information and mode of transportation behaviors were also collected in order to provide contextual background in which to situate the study findings.

2. Methods

2.1. Participants and recruitment

There are approximately 28,000 full-time undergraduate students at Western University and its affiliated colleges (Western University, 2015). The current cross-sectional study included a convenience sample of 545 full-time undergraduate university students from the host institution (an urban campus in Canada). Recruitment began following ethical approval from the Western University Research Ethics Board. Recruitment flyers were posted around campus, and email requests were sent to course instructors from nine faculties requesting announcements be made in their classes and/or messages posted on their course websites inviting students to participate.

2.2. Measures

2.2.1. Perception of Transit-Related Physical Activity Student Survey

The Perception of Transit-Related Physical Activity Student Survey (PT-PASS) was developed by the investigators for this study and included pointed public transit and bus pass-related questions (e.g., students' perceptions of its physical activity influence and their frequency of using public transit). The PT-PASS is a self-administered questionnaire that contained three sections (Modes of Transportation, Bus Pass and Transit Trips, and Transit Behaviors), and included 44 questions answered on a five-point Likert scale (anchored at [1] strongly disagree and [5] strongly agree), and one open-ended question. The first section of the PT-PASS asked students about their commuting habits and this section was used to report students' general preferences for different modes of transportation. Section two was used to determine students' perceptions of the discounted bus pass (e.g., individuals' attitudes toward the discounted bus pass and their reasons for using it), and section three assessed their transit-related physical activity behaviors. Questions pertaining to experiences with public transit (e.g., reasons for using public transit) were adapted from previously validated transit questionnaires (Páez and Whalen, 2010; Shannon et al., 2006). Additional questions were written specifically to address the current study's purpose after an in-depth investigation into the Western University Bus Pass program was completed, in which the investigators conducted interviews with administrative staff from the institution and reviewed the gray literature that was available to the public. The PT-PASS was pilot-tested with 10 Western undergraduate students and five graduate students to assess face validity. Investigators engaged with students while they were completing the questionnaire and/or asked them to make notes on the questionnaire to find out what they thought/interpreted about the questions and their meaning. The pilot-testing students deemed the questions to be appropriate in content and wording, and accurately reflected what they were intended to assess. Lastly, this questionnaire contained no reverse coding for any questions and students were advised to choose the most appropriate response for each question within the instructions.

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