Influence of active transportation to school on daily physical activity: An investigation of children in Northeastern Ontario elementary schools


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BACKGROUND

- Active transportation to school (ATS) (e.g., walking, cycling) is a viable means of increasing physical activity (PA). However, worldwide rates of ATS have declined in recent years, with 62% of Canadian parents indicating their children are typically driven to school.
- In Canada, according to the Active Healthy Kids 2016 Report Card, less than 50% of Canadian children and youth engage in ATS.
- There is little evidence examining ATS in northern contexts, despite the suggestion that context-specific interventions are most beneficial for improving ATS.

PURPOSE

To assess whether PA accumulated through ATS predicts total daily PA, and if there was a difference in daily PA between children who engage in ATS compared to passive transportation to school (PTS).

METHODS

- **Setting.** Mid-sized city (pop. 54,000) in Northeastern Ontario.
- **Participants.** Students (ages 6 to 12; Table 1) were recruited from 2 schools (School 1: specialized for French immersion; School 2: neighbourhood) at 2 time points (April/May 2015, April 2016, June 2016).
- **Apparatus & Procedures.** Demographic and anthropometric data (i.e., sex, age, height, weight) were collected and used to initialize Actical wGT3X-BT accelerometers (Phillips – Respironics, OR, USA).
- **Data.** Acceleration counts (3Hz sampling rate) were summed and recorded on the device every 2 seconds. Sedentary (<100 counts/min) and active minutes were identified during the entire day, and during the 50-minute window before school. Active minutes were divided into light (100-1499 counts/min), moderate (1500-6499 counts/min), vigorous (>6500 counts/min), and moderate-to-vigorous (>1500 counts/min).
- **Distance travelled to school, and mode of transportation to school (i.e., ATS: walk, bike, scooter; PTS: car, bus) were collected.
- **Data analysis.** ANCOVA were performed with distance to school, age, and measurement on way to school as covariates, and transportation and school as fixed factors.

RESULTS

- **Measurement on the way to school.** Positive school distances predicted total daily measurements for all dependent variables except sedentary minutes.
- **Distance travelled to school.** Distance travelled to school did not predict any of the dependent variables.
- **At School.** At School 2, mean travel distance was shorter, more students engaged in ATS, and students accumulated more active and light minutes.
- **Age.** Age positively predicted sedentary minutes; however, did not predict any other dependent variables.

Table 1. Participant information

<table>
<thead>
<tr>
<th>School</th>
<th>N</th>
<th>Age Mean ± SD</th>
<th>M : F</th>
<th>ATS : PTS</th>
<th>Distance (km) Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>School 1</td>
<td>44</td>
<td>8.95 ± 1.93</td>
<td>20 : 24</td>
<td>13 : 31</td>
<td>2.91 ± 3.10</td>
</tr>
<tr>
<td>School 2</td>
<td>19</td>
<td>9.05 ± 1.78</td>
<td>11 : 14</td>
<td>12 : 13</td>
<td>1.98 ± 2.44</td>
</tr>
</tbody>
</table>

- **Total steps accumulated.** Students who engaged in ATS accumulated significantly more total steps ($p=.018$; Fig. 1).

Figure 1. Total steps accumulated throughout the day.

- **Time spent, sedentary or active.** Students who engaged in ATS accumulated significantly more daily active ($p=.011$), and light minutes ($p=.028$) compared to those who used PTS. No differences emerged in sedentary ($p=.493$), moderate ($p=.090$), vigorous ($p=.740$), or moderate-to-vigorous minutes ($p=.131$; Fig. 2).

Figure 2. Time spent as sedentary or active during the day.

DISCUSSION

- Findings align with studies in larger urban/suburban areas (i.e., in Ontario, Canada, and worldwide) in that students who actively commute to school are generally more active and accumulate more active minutes throughout the school day.
- ATS increased light intensity minutes, but did not change levels of MVPA.
- Specific features of schools/neighborhoods influence PA.
- Findings extend previous work from a sample of Canadian adolescents, indicating that ATS does not decrease sedentary time.

CONCLUSIONS

ATS is one way to help elementary students increase light activity, but may not augment or replace MVPA that should be happening at school, or elsewhere.

This study provides evidence to support policy initiatives to promote ATS and other initiatives that aim to increase PA in children and youth.

REFERENCES