Title: SCHOOL TRANSPORTATION SAFETY: AN OBSERVATIONAL STUDY OF DRIVERS AND PUPILS ON THE SCHOOL BUS

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Abstract:
Introduction: The safety of children traveling to and from school is a global issue. The school bus is a common means for children to travel to and from school, both locally and globally. In Israel, 90% of the pupils living in rural communities travel daily by school transportation. School bus safety is dynamic, in that regulations are often changing. As of September 1, 2006, in all vehicles used for school transportation in Israel, not only is the number of pupils limited, but also seatbelts are mandatory. This policy was the response to a single mass casualty event, in which three pupils were killed and 40 were injured after a school bus and jeep collided on the way home from school on the last day of the 2004 school year.

Objective: To observe seatbelt usage, pupil and bus driver behavior and potential safety hazards on buses used for school transportation.

Methods: An observational study on vehicles used for school transportation in the general education system in rural communities in Israel. A questionnaire was designed for data collection, and was completed by observers who were on the bus ride from the beginning to the end of the route. The study focused on student, bus driver, and chaperone behaviors as well as vehicle and bus stop related hazards.

Findings: Observations were performed on 362 bus rides, using 125 buses on which 11,000 pupils traveled to and from school. Seatbelt use among the pupils was scarce: On 42% of the rides none of the students fastened seatbelts. Pupils in elementary were more likely to fasten seatbelts compared to middle/high school students (80% and 26%, respectively for not fastening seatbelts $p<.0001$). Precarious pupil behavior was greater on afternoon bus rides (OR:3.2, 95%CI:2.1-5.3), on routes with 5 or more bus stops (OR:4.1;95%CI 2.5-6.5) and on rides with elementary school pupils (OR:1.8; 95%CI:1.2-2.9). Older buses (over 10 years) were almost four times more likely to have a hazard than new buses. Bus drivers were observed using a cellular phone while driving (11%), allowing students to get on/off the bus using the rear door (10%), allowing young students to sit in the first seat (35%) and disobeying traffic laws. In addition, students were observed boarding or get off the bus at non-designated bus stops and were left in the bus without supervision while the engine was running. Drivers who drove the route once a week or less were more likely to engage in risky behavior compared to permanent drivers.

Conclusions: This study is the largest study of its kind to observe on-bus behaviors. Government regulations and seatbelt availability are not enough to confirm seatbelt usage among pupils. Furthermore, it is not realistic to require the bus driver to enforce seatbelt use and tackle pupil misconduct, while being expected to drive safely. In an effort to increase pupil safety, innovative strategies for improving pupil behavior on the school bus needs to be developed and implemented, while bus driver conduct and driving skills need to be regularly monitored. Finally, rules and regulations need to be implemented on the basis of evidence based research and not the outcome of one tragic mass casualty event.