

# **Behind the Wheel: a randomised controlled trial evaluating a safe transport program for older drivers**

Lisa Keay<sup>a</sup>, Kristy Coxon<sup>a</sup>, Anna Chevalier<sup>a</sup>, Elizabeth Clarke<sup>b</sup>, Laurent Billot<sup>a</sup>, Soufiane Boufous<sup>c</sup>, Rebecca Ivers<sup>a</sup>, Julie Brown<sup>d</sup>

<sup>a</sup> The George Institute for Global Health, The University of Sydney, Sydney, NSW, Australia, <sup>b</sup> Kolling Institute, The University of Sydney, Sydney, NSW, Australia, <sup>c</sup> Transport and Road Safety, The University of New South Wales, Sydney, NSW, Australia, <sup>d</sup> Neuroscience Research Australia, The University of New South Wales, Sydney, NSW, Australia

## **Extended Abstract**

### **Introduction:**

Age-related changes to vision (Rubin et al., 2007), visual attention (Ball, Owsley, Sloane, Roenker, & Bruni, 1993), cognitive and physical function (Anstey, Wood, Lord, & Walker, 2005) can negatively impact on driving ability and increase crash risk. Though self-regulation of driving is common (Molnar & Eby, 2008) and a promising strategy to promote safety (Classen et al., 2007), surveys find older drivers tend not to plan for driving cessation and are not familiar with alternative transport (Kostyniuk & Molnar, 2008).

The authors' hypothesised that an education based program can change actual driving practices and engage older drivers in planning for retirement from driving. Our aim was therefore to ascertain whether a one-on-one safe-transport program can change driving exposure while maintaining community participation in a group of older drivers using a randomised controlled trial.

### **Methods:**

We evaluated an adapted version of the KEYS® program (Stalvey & Owsley, 2003), in a randomised controlled trial involving 380 drivers aged 75 years and older, residing in the suburban outskirts of Sydney.

### ***Participants***

Volunteers aged 75 years or older were invited to participate through various media including newspaper advertisements, public meetings and letters of invitation sent by a motoring organisation. Participants were required to hold a valid drivers' license, speak English, and be the primary driver of their vehicle. Drivers who shared a vehicle or scored more than two errors on the Short Portable Mental Status Questionnaire were excluded from the study. We recruited 380 drivers (230 or 61% men, 150 women) and successfully installed in-vehicle monitoring devices in 362/380 (95%) vehicles. After baseline assessment, participants were randomised into the intervention or control group using remote login to an in-built randomisation feature of the study database. 190/380 (50%) participants were allocated to each group, and 366/380 (96%) completed the 12-month study.

### ***Program***

The intervention group received an education-based safe-transport program delivered in two sessions, one month apart. The safe transport program was based on the Knowledge Enhances Your Safety (KEYS) program, which was adapted for the Australian context. The program aimed to assist older drivers make safe and informed decisions about their driving exposure, while

maintaining community participation, and to plan for retirement from driving. The control group received no intervention.

### **Setting**

Assessment data was collected and education delivered in participants' homes located in the suburban outskirts of northwest Sydney.

### **Main outcome measure**

The main outcomes were distance driven (km) per week over 12-months measured by in-vehicle monitoring devices hardwired into participants' vehicles and community participation measured by the Keele Assessment of Participation. In-vehicle monitoring devices included a global positioning system (GPS) with data logger which captured time-stamped second-by-second GPS location during vehicle operation. Secondary outcomes included the stage of behaviour change with regards to self-regulation of driving and uptake of alternative transport at 12-months. Data were analysed using intention-to-treat. Generalised estimating equations modelled the impact of the safe-transport program on driving exposure, adjusting for repeated, weekly measures over 12-months. Ordinal regression was used to analyse differences in behaviour profiles between groups. Data were analysed by researchers blinded to group allocation. Three subgroup analyses based on sex, age and function were performed on the main outcome of distance driven. Function was assessed using DriveSafe, a computerised assessment of visual attention to the driving environment.

### **Results**

The mean age of participants was 80±4 years. On average, participants drove 140±167km per week. The safe-transport program was delivered as intended to 183/190 (96%) of drivers in the intervention group.

While there was no significant difference in distance driven per week over 12-months (between-group difference: -5.5km,  $p=0.57$ , 95% CI:-24.5 to 13.5km), participants in the intervention group were more engaged in self-regulatory driving practices than those in the control group (OR:1.6,  $p=0.02$ , 95% CI:1.1-2.3). These results are shown in Table 1.

**Table 1. Trial results**

	<b>n</b>	<b>Intervention mean±SD</b>	<b>n</b>	<b>Control mean±SD</b>	<b>Difference estimate (95%CI)</b>	<b>p value</b>
<b>Primary Outcomes</b>						
<b>Total distance driven per week (km)</b>	172	137.2±171.5	175	143.2±163.7	-5.5 (-24.5 to 13.5)	0.57
<b>Keele Assessment of Participation (score)</b>	183	1.3 (1.0-1.7)	182	1.4 (1.1-1.8)	-0.1 (-0.6 to 0.3)	0.59
<b>Secondary outcomes</b>						
<b>Behaviour profile, n (%)</b>	183	92 (50.3) 36 (19.7) 31 (16.9) 24 (13.1)	182	108 (59.3) 39 (21.4) 24 (13.2) 11 (6.0)	Odds ratio 1.8 (1.2 to 2.6)	0.006
<b>Use of alternative transport (trips)</b>	183	4.8 (3.7 to 5.8)	182	4.7 (3.6 to 5.7)	0.1 (-1.4 to 1.6)	0.90

At 12-months there was similar use of alternative transport, with participants taking 5 trips on average in the previous month (between-group difference: 0.1,  $p=0.90$ , 95% CI:-1.4 to 1.6). The interactive term for subgroup analyses did not reach significance. Importantly, there was no difference in community participation between those who received education and those who did not (between-group difference: -0.1,  $p=0.59$ , 95% CI:-0.6 to 0.3).

## Discussion

This research found an individualized, safe transport program can engage older drivers in the process of self-regulation. This finding is in agreement with the original evaluation of the KEYS program which found the program promoted self-regulation amongst older licensed drivers who were visually impaired and crash involved in the previous year (Owsley, Stalvey, & Phillips, 2003). However, using objective measurement of driving the analysis, we did not find a significant reduction in weekly mileage during a 12 month period.

This trial shows that an individualised safe-transport program can promote behaviour change, although did not translate into a significant difference in weekly mileage after 12-months. Though we did follow the study participants for 12 months, longer follow-up extending for a number of years may be required to account for gradual age-related changes and implementation of self-regulatory driving practices over time.

**Trial registration:** Australian New Zealand Clinical Trials Registry ACTRN12612000543886

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