Drivers with disabilities using modified vehicles: demographics, patterns of use and road safety issues for identifying requirements for targeted interventions.

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Introduction

Licence authorities consider drivers with disabilities who have functional limitations as vulnerable road users. Rehabilitation practitioners (usually Occupational Therapy Driver Assessors – OTDAs) routinely support such drivers to attain driving independence by optimising vehicle-driver interfaces via the application of vehicle modifications. Commonly these include alternative post production “add-on” or integrated primary and secondary vehicle controls.

From a review of international literature, little is known about either this driver group or their use of modified vehicles, including driver characteristics, types of modifications used, experiences relating to safety and usability, human factors issues and impacts on lifestyle of improved independent vehicle transportation. Such information is required to improve the prescription process, risk management, design of modifications and ultimately to contribute to the evidence base to support licensing and vehicle registration requirements for this driver group.

Using an action research framework, we conducted a descriptive cohort study which sought to investigate characteristics, and capture the views of, independent drivers with a range of disabilities who are using vehicle modifications. We gathered information about the devices they use and how they obtained them as well as their opinions about how to improve vehicle modification prescription processes.

Methods

A literature review, ergonomic task analysis and project advisory group including OTDAs, disabled driver advocacy groups and drivers with disabilities informed the development of a self-completion survey. Items addressed client characteristics, driver impairment, resources and assessments which assisted with modification choice, as well as the ‘fit’ to the driver’s capacity, safety, the driving needs and other system issues.

All members of two large national advocacy groups representing the needs of individuals with disabilities were invited to participate in the mail survey which could be completed hard copy or electronically. Drivers had to meet disability, recent driving, exposure and vehicle modification criteria in order to be eligible to participate.

Results

Ninety seven completed surveys were returned. Response rates could not be calculated as association member characteristics to establish eligibility criteria compliance were not available. Drivers were mostly male (66%), aged over 61 years (64%), living with another person (68%) and residing within metropolitan areas (72%). The majority rated their physical health as good/very good (67%). Most commonly, drivers reported spinal neurological damage (n=55) or polio (n=18) resulting in both legs being paralysed (52%) or restricted functionally (27%) and/or with further back/trunk restrictions (32%). Almost all drivers used a wheelchair for mobility (97%) and reported that driving was their preferred transport method (90%) and that most trips were of less than 1 hour duration (71%). Access to key destinations without independent vehicle mobility was reported as very difficulty/impossible for the majority of drivers (e.g. retail facilities 81%, medical 77%, employment 71% and family/friends 59%).

Just over half (n=49) of the cohort reported having had an OTDA driving assessment or OT input into modification choice. Other sources of advice included driving instructors, vehicle modifiers and local mechanics. Some drivers indicated they designed and implemented their own vehicle modifications.

A wide range of vehicle modifications were in use: most commonly hand controls (n=64), steering aids (n=48), ramps/hoists (n=26) and modified foot controls (n=23). Drivers differed in the length of time they
had used the modifications (range 1 – 60 years) with average years of use varying from 8 – 18 years. Drivers required different numbers of modifications: most commonly either one (n=39) or two (n=28) or less frequently three or more (n=26). The majority of drivers were mostly/very satisfied with modifications used. Drivers also reported a range of persistent safety (n=11) and maintenance (n=13) issues specifically related to “add on” modifications which raise road safety concerns for both these and other road users.

**Conclusion**

Drivers with a range of disabilities rely heavily on independent vehicle transportation to provide their access to key services including work, social and recreational activities, and clinical support. Different vehicle adaptations are currently in use and often more than one device/modification is needed. Whilst many drivers received the assistance of professionals not all accessed such services and the reasons for this are unclear. Currently some drivers report that they have designed, adapted and/or fitted their own modifications. Road safety concerns raised highlight the need for evidence based and consistent prescription and human factor assessment to optimise human-control-interface “fit”. Regular and rigorous review of the adequacy and appropriateness of modifications may be warranted to meet changing health/disability needs.

With an increased ageing population, improvements in health-related technologies and increasing demands for independence and participation in active work in Australia and internationally, more research is needed to better understand and address the needs of this driver group.

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