



Implementation of a community-based mature driver screening and referral program: A feasibility study

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ABSTRACT

We tested the feasibility of implementing a community mature driver screening and referral program utilizing the Roadwise Review screening instrument. We recruited a convenience sample of 151 mature drivers (age 65 and over) at six community senior centers in suburban Connecticut. A 30 item survey collected demographic information, driving history, and self-reported vision, physical fitness, and attention problems. Participants completed a 30 min computer screening program that assessed 8 areas associated with driving ability. Referrals were provided to participants with identified impairments. A post survey measured program satisfaction; a two week follow-up determined intent to address impairments. Among the problems/issues reported: reading highway/street signs or seeing other vehicles at night (25%), trouble looking over shoulder when changing lanes (18%), avoidance of night driving (22%) or in unfamiliar places (31%). Screening found mild impairments in 86% of participants and 52% with serious impairments. Referrals were given to 75%; at follow-up, 74% reported intent to complete referrals. Most participants (94%) would recommend the program to family/friends. In conclusion, this study was feasible to implement and identified driving impairments among mature drivers. Most participants intended follow-up with driving recommendations and program satisfaction was high.

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1. Introduction

Motor vehicle crashes (MVCs) among mature drivers age 65+ are an important traffic safety and public health issue. In 2008, there were 5569 fatal MVCs in the U.S. involving a driver 65 years or older. This represents 11% of all fatal MVCs (National Highway Traffic Safety Administration, 2008). Compared to younger drivers, mature drivers have more vehicle-to-vehicle collisions, more intersection crashes, and fewer alcohol-involved crashes (NHTSA, 2008; Dulisse, 1997; Eby, 1995; Hakamies-Blomqvist, 1994, 2004; Hauer, 1988). As a group, mature drivers adjust their driving to reduce the demands of the driving task (Gallo et al., 1999; Kostyniuk et al., 2000); that is, mature drivers tend to travel slower and choose times, roadways, and routes that make them feel safest. Mature drivers are also more likely to wear seat belts (NHTSA, 2008; Gallo et al., 1999).

Unlike crashes among younger drivers, mature driver crashes appear to result not from deliberate risk-taking and immaturity but rather from age-related declines in driving abilities (Staplin et al., 1998). It is well-established that aging can lead to declines in perceptual, cognitive, and psychomotor function (Eby et al., 1998). These declines result from age-related medical conditions and the medications used to treat them, as well as from the effects that increasing age has on the various systems of the human body. Accurately assessing declines in driving abilities and relating them to increased crash risk has been a goal of traffic safety professionals for many years.

1.1. Benefits of mature driver screening

The benefits of mature driver screening may include discovering declines at an earlier stage, and increased general awareness and self-awareness relative to declines in driving-related abilities, as well as providing recommendations for behavioral changes or safety tips to maintain safe driving. In addition, mature driver screening provides an opportunity for a further evaluation from a physician or other health professional, or vehicle modifications to help compensate for driving-related declines. Despite

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clear efficacy, this method is underutilized. In most states, driver screening and referrals are not standardized or systematically provided.

Several self-screening instruments are available for older drivers, including two paper & pencil instruments, *Drivers 65 Plus* (AAA Foundation for Traffic Safety, 2003) and *Driving Decisions Workbook* (Eby et al., 2003), and a computer-based screening tool, *AAA Roadwise Review*TM (AAA Public Affairs, 2010).

1.2. Screening instrument: Roadwise Review

The *AAA Roadwise Review*TM was developed from the *DrivingHealth Inventory*[®] (DHI) program (Staplin and Lococo, 2003), a clinical screening tool developed for use by driver rehabilitation specialists. The DHI is based on empirical research that validated crash predictors among older drivers, specifically in the areas of physical and cognitive abilities (Staplin and Dinh-Zarr, 2006). They reported that functional abilities were scored based on predictors of at-fault crashes reported in a Maryland study that was sponsored by the National Highway Traffic Safety Administration and the National Institute on Aging. The program provides a report to the participant for each task completed, indicating “no deficit”, “mild deficit” or “serious deficit” along with recommendations on how to address them. The scoring of the tasks, as reported by Porter and Tuokko (2011) and based on the work by Staplin and Lococo (2003), was determined from a range of values identified through the data collection and analysis of the measures of functional performance. Lower cut-points that determine mild deficit indicate a need for prevention; higher cut-points are set for serious deficits, and these indicate a need for intervention. For example, the visual search task is timed in seconds (s), and a score under 80 s would indicate no deficit. A score between the cut-points of 80 and 180 s identifies a mild deficit, while anything over the cut-point of 180 s would indicate a serious deficit. The feedback and recommendations that are provided were based upon the individual's score: messages that speak to prevention are provided for those whose scores show no deficits; referrals to appropriate professionals for further evaluation are provided if mild or serious deficits are found.

The Roadwise Review (RWR) is marketed as a personal screening tool to be used in the privacy of one's home in order to identify physiological changes that could affect driving (AAA Public Affairs, 2010). In the translation from clinical instrument to one for personal use, the formatting was changed in order to appeal to its audience. Although the term “deficit” was replaced with “impairment,” the screening tasks remained the same thereby ensuring the validity of the RWR tool as established in the previous research (Staplin and Dinh-Zarr, 2006).

A process evaluation of the RWR revealed that, although impressions were generally favorable, researcher observations and participant feedback raised a number of concerns: computer mouse proficiency, adherence to instructions, partner assistance, accuracy and interpretation of results (Myers et al., 2008). Although AAA reports widespread distribution of the RWR CD-ROM, its rate of actual use is unknown because it is designed to be used in-home.

Several studies of the RWR have been conducted in the last few years. Nelson et al. (2006) reported that this computer-based tool may be an effective way to educate older drivers on safety risks associated with aging and driving and thereby lead to greater self-regulation and possible reduction in crash risk. Scialfa et al. (2010) looked at the RWR and its ability to predict self-reported difficulties in driving. They did not find this to be the case. Most recently, a study by Bédard et al. (2011) compared on-the-road driving performance and the results of the RWR screening in a group of 30

older drivers. They were not able to find any significant associations between the RWR score and the driving performance evaluation.

1.3. Study purpose

We selected the RWR program because the tool could be easily adapted both to utilize an administrator for screening and to make the screenings available in the community. To date, there are no published reports of adapting RWR in this way and testing the feasibility of this approach. We hypothesized that this approach would (1) provide documentation of RWR completion and results, and (2) allow for in-person explanation and counseling of results, referrals to be made, and an evaluative follow-up for the participants.

The purpose of this study was to (1) test the feasibility of implementing a standardized mature driver screening and referral program in community senior centers, (2) compare self-report driving concerns and behaviors with “impairments” identified by the RWR screening program, and (3) determine intent to follow up on referrals.

2. Methods

The study was approved by the Institutional Review Board of Connecticut Children's Medical Center. All participants gave written informed consent to participate in the study and received a \$10 gift card upon completion.

2.1. Participants

We enrolled a convenience sample of community dwelling mature drivers in the senior centers of six towns in central Connecticut during the spring of 2010. Adults 65+ years who held a valid Connecticut drivers license and own or have access to a vehicle were included in our sample. Excluded were adults 65+ years without a valid Connecticut drivers license, adults <65 years of age, or those who do not own or have access to a vehicle. Senior center staff helped publicize the program and coordinated sign-up sheets to schedule appointments for interested participants. Study staff enrolled, consented participants, and completed all other research activities.

2.2. Survey

Each participant completed a 30 question survey which was developed in part from materials included in the National Highway Traffic Safety Administration's Model Driver Screening and Evaluation Program (NHTSA, 2003). We collected demographic information along with answers on driving history, vision, fitness, attention, and response problems related to their driving, and general driving behavior. We also collected data regarding driving frequency (# of days/week normally drive) and driving amount (average miles/week, average miles/year).

2.2.1. Survey measures

The following sets of survey questions asked the participants to answer using a 5-point ordinal scale (always to never). We asked four questions regarding vision: do they have problems reading highway/street signs, problems seeing other vehicles at night, problems from the glare of oncoming headlights at night, and whether they wear glasses while driving. We also asked when the last vision check with an eye doctor was.

We asked four questions about physical fitness as it relates to operating a motor vehicle: do they have trouble looking over their shoulder, trouble turning their head left or right to change lanes, trouble turning the steering wheel, and trouble moving their foot from the gas to the brake pedal.

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