



**AOTA Critically Appraised Topics and Papers Series**

**Driving and Community Mobility  
for Older Adults**

*\*A product of the American Occupational Therapy Association's  
Evidence-Based Literature Review Project*

**CRITICALLY APPRAISED PAPER (CAP)**

***Focused Question***

**What is the evidence for the effect of policy and community mobility programs (e.g., alternative transportation, walkable communities, education, and pedestrian programs) on the participation of the older adult?**

Shipp, M. D. (1998). Potential human and economic cost-savings attributable to vision testing policies for driver license renewal, 1989–1991. *Optometry and Vision Science*, 75, 103–118.

**PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)**

State the problem the authors are investigating in this study.

There is limited empirical evidence for state vision testing policies for relicensing. Also, it is unknown whether current vision standards achieve the goal of protecting the public's health or inappropriately restrict the mobility of competent drivers. Due to the high prevalence of age-related ocular conditions and subsequent vision changes, this study seeks to determine the role of vision testing during the relicensing process in decreasing crashes, fatalities, and economic costs.

**RESEARCH OBJECTIVE(S)**

List study objectives.

To assess the impact of vision-related relicensing policies on traffic fatalities in the United States.

**DESIGN TYPE:**

Cohort

**Level of Evidence:**

II

Limitations (appropriateness of study design):

Was the study design type appropriate for the knowledge level about this topic? *If no, explain.*

Yes

No

**SAMPLE SELECTION**

How were subjects selected to participate? Please describe.

Population was used, thus no sampling was done.

**Inclusion Criteria**

All state entities with driver licensing in the contiguous United States and District of Columbia were included.

**Exclusion Criteria**

- States that do not allow for drivers to migrate freely across state lines, resulting in different opportunities for traffic incidents (Hawaii and Alaska)
- States that have extreme climatic conditions (Alaska)

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes

No

Attention

Yes

No

Others (list and explain):

**SAMPLE CHARACTERISTICS**

N = 49 (participants were state licensing entities, not individual people)

% Dropouts

#/(%) Male

#/(%) Female

Ethnicity

Disease/Disability Diagnosis

Check appropriate group:

<20/study group	20–50/study group <input checked="" type="checkbox"/>	51–100/study group	101–149/study group	150–200/study group
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**Sample Characteristics Bias: If no, explain.**

If there is more than one study group, was there a similarity between the groups? N/A

Yes

No

Were the reasons for the dropouts reported?

Yes

No

**INTERVENTION(S)**—Included are only those interventions relevant to answering the evidence-based question.

*Add groups if necessary.*

Group 1

Brief Description	
Setting	
Who Delivered?	
Frequency?	
Duration?	

Intervention Biases: Explain, if needed.

Yes

No

Co-intervention

Yes

No

Timing

Yes

No

Site

Yes

No

Use of different therapists to provide intervention

Yes

No

**MEASURES AND OUTCOMES**—Included are measures relevant to answering the focused question.

Name of measure:

Outcome(s) measured (what was measured?):

Is the measure reliable (as reported in article)?

Yes  No statistics to support this; however, the variability in the number of fatalities was controlled for by aggregating the fatalities over a 3-year period to reduce year-to-year variability. The variability of age-related sensory, motor, and psychomotor condition was controlled for through an age adjustment.

No

NR

NR = not reported.

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

One aggregate measure of three years of national database crash/fatality statistics

Measurement Biases

Were the evaluators blinded to treatment status? *If no, explain.*

Yes

No

Recall or memory bias? *If yes, explain.*

Yes

No

Others (list and explain):

Limitations (appropriateness of outcomes and measures) *If no, explain.*

Although the source of the data, the Fatal Accident Reporting System (FARS) database, is a widely used, well-respected national database, it includes only fatalities, not all traffic incidents. Particularly for older adults, the immediate result of a crash may be only injury, but death may ensue after a long difficult recovery from related conditions. In many of these cases, the official cause of death would not be the traffic crash and would not be included in the database. Additionally, many traffic incidents that could be attributable to vision concerns, including parking lot crashes, personal property damage, and running over curbs, do not result in fatalities, are not reported to any legal authority, and therefore do not appear in crash/fatality databases.

Did the measures adequately measure the outcome(s)?

Yes

No

## RESULTS

List results of outcomes relevant to answering the focused question.

Include statistical significance where appropriate ( $p < 0.05$ ).

Include effect size if reported.

Three phases of statistical analysis.

Phase 1 – ANOVA (4 separate matrices) measuring impact of vision-testing policies in relicensure on vehicle occupant fatalities

$$F(4,44) = 1.10; p = 0.37$$

$$F(3,45) = 1.03; p = 0.39$$

$$F(2,46) = 1.03; p = 0.36$$

$$F(1,47) = 1.71; p = 0.20$$

Not statistically significant but the results are suggestive of a beneficial effect of vision testing

Phase 2 – Multiple regression modeling with forward stepwise and interactive stepwise regression using vision policies and nonvision policies as independent variables with the dependent variable representing the vehicle occupant fatalities

Statistics not reported.

Phase 3 – Multiple regression analysis with forward stepwise and interactive stepwise regression using vision policies, nonvision policies, and nonpolicy factors (age, gender, socioeconomic status, population density, and environment) as independent variables with the dependent variable representing the vehicle occupant fatalities

$$F(5,43) = 9.111; p = <0.001; r^2 = 0.514$$

Was this study adequately powered (large enough to show a difference)? *If no, explain.*

Yes

No

Were appropriate analytic methods used? *If no, explain.*

Yes

No

Were statistics appropriately reported (in written or table format)? *If no, explain.*

Yes

No

## CONCLUSIONS

State the authors' conclusions that are applicable to answering the evidence-based question.

State-mandated vision testing as part of the license renewal process may enhance traffic safety and reduce the economic burden of fatal crashes. For the period studied, 1989–1991, an additional 222 fatalities of older adults may have been prevented, saving \$31 million in the eight states without vision testing.

Were the conclusions appropriate for the Study Design (Level of Evidence)? *If no, explain.*

Yes

No

Were the conclusions appropriate for the statistical results? *If no, explain.*

Yes

No

Were the conclusions appropriate given the study limitation and biases? *If no, explain.*

Yes

No

## IMPLICATIONS FOR OCCUPATIONAL THERAPY

This section provides guidance about clinical practice, program development, and other implications of the study findings as they relate to the focused question.

- The implications of this study most directly affect the policy makers at the state level who develop or maintain vision-testing legislation as part of the licensure renewal process. The financial impact on states of supporting the personnel and resources to implement this screening and processing of documentation is burdensome.
- The implications for occupational therapy practice could be (1) expanded practice in the states that do not currently have vision testing and (2) increased collaborative efforts in the remainder of the states that currently institute vision testing. This expanded practice could be in the form of vision-screening programs, employment through the licensing agencies, or increased volume in driver rehabilitation programs for individuals who are identified as at risk. Additionally, older adults may opt to surrender their driver license to avoid retesting. This decision by older adults generates a portion of the population needing occupational therapy services to remain mobile in the community and continue occupational engagement.
- If results were not statistically significant, describe the trends of these results and their implications for practice.

This work is based on the evidence-based literature review completed by Wendy B. Stav, PhD, OTR/L, SCDCM.

CAP Worksheet adapted from: Critical Review Form – Quantitative Studies ©Law, M., Stewart, D., Pollack, N., Letts, L., Bosch, J., & Westmorland, M., 1998, McMaster University. Used with permission.

For more information about the Evidence-Based Literature Review Project, contact the American Occupational Therapy Association, 301-652-6611, x 2052.



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