



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?

Hakamies-Blomqvist, L., Johansson, K., & Lundburg, C. (1996). Medical screening of older drivers as a traffic safety measure: A comparative Finnish–Swedish evaluation study. *Journal of the American Geriatrics Society, 44*, 650–653.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)

State the problem the authors are investigating in this study.

There has been extensive discussion about the need to implement age-based testing for older drivers to reduce crashes, injuries, and fatalities among the older cohort of drivers. Arguments both for and against age-based testing have been able to only speculate about the outcome of imposing such testing. The authors of this study examined the crash rates of older road users across 2 countries with different age-related testing licensing laws to empirically identify the impact of age-based testing.

RESEARCH OBJECTIVE(S)

List study objectives.

The purpose of this study was to evaluate the safety effect of age-based medical screening on drivers in Finland and Sweden. The results of this study will support or refute the argument to implement age-based driver license testing in the United States.

DESIGN TYPE:

Cohort study of crash rates with regard to licensing variables

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 study of all citizens born in 1960 or earlier

Inclusion Criteria

Licensed drivers born in or before 1960, ages 30 years or older in the year of the study

Exclusion Criteria

NR

NR = not reported.

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes

No

Attention

Yes

No

Others (list and explain):

SAMPLE CHARACTERISTICS

% Dropouts

#/(%) Male

#/(%) Female

Ethnicity

Disease/disability diagnosis

Check appropriate group: *N/A - Study was population based and included all licensed drivers in Sweden and Finland.*

| | | | | |
|-----------------|-------------------|--------------------|---------------------|---------------------|
| <20/study group | 20–50/study group | 51–100/study group | 101–149/study group | 150–200/study group |
|-----------------|-------------------|--------------------|---------------------|---------------------|

Sample Characteristics Bias: *If no, explain.*

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

Yes

No

Were the reasons for the dropouts reported? *N/A*

Yes

No

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

No interventions; the groups who were from different countries were governed by different licensing laws.

Sweden has no age-related screening or medical review associated with license renewal. The right to hold a license is life long. Physicians must report patients who are unfit to drive for health reasons; however, this is implemented on a very small scale. Less than 0.1% of older drivers' licenses are revoked as a result of a physician report.

Finland has strict medical–legal screening associated with license renewal. The right to hold a license after age 45 is conditional, as drivers must pass a medical and vision exam every 5 years to renew their license. At age 70, the license expires, and those wishing to continue to drive must pass a medical review and submit a new application. The application must include documentation from 2 reliable people stating the applicant has kept up his or her driving skills. The period of renewal is 5 years or shorter depending on the physician's analysis of the materials in the application and medical review. Renewal periods shorten after age 80.

Add groups if necessary

Group 1 *Described above; the study was an analysis of crash rates in Finland and Sweden*

| | |
|-------------------|--|
| Brief Description | |
| Setting | |
| Who Delivered? | |
| Frequency? | |
| Duration? | |

Intervention Biases: Explain, if needed.

Contamination

Yes

No

Co-intervention

Yes

No

Timing

Yes

No

Site

Yes The groups are licensed and reside in different countries where traffic conditions, roadways, human–vehicle interactions, and social norms differ.

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:

Licensure rates

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

Licensed or not licensed

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

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

One-time cross-sectional measure

Name of measure:

Accident rates of private car drivers

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

Rate of police-reported accidents per 10,000 population

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No Only police-reported crashes were included, which eliminates all other traffic incidents that may go unreported yet are indicative of impaired driving.

NR

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

One-time cross-sectional measure

Name of measure:

Fatality rates of private car drivers and passengers

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

Fatalities per 10,000 population

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

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

One-time cross-sectional measure

Name of measure:

Fatality rates of unprotected road users

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

Fatalities of mopedists, cyclists, and pedestrians per 10,000 population

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

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

One-time cross-sectional measure

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.*

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.

Licensing Rates: The licensing rates between the 2 countries were vastly different for drivers over age 70: 44.2% of those over 70 in Sweden were licensed, while only 14.6% of the same age group in Finland were licensed.

Accident Rates of Private Car Drivers: Reported graphically and discussed as trends; the accident rates were similar in both countries, showing similar trends of decreasing crashes after age 30. Both countries' male drivers were consistently involved in more crashes than women across all ages. The odds ratio of men between the countries was close to 1.

Fatality Rates of Private Car Drivers and Passengers: Reported graphically, fatality rates were similar between the 2 countries, revealing an increase in fatalities for older men and a decrease in fatalities for older women. Comparison on the countries revealed an odds ratio slightly over 1, indicating a higher risk in Finland.

Fatality Rates of Unprotected Road Users: Reported graphically, the fatality rates were similar until age 60, when there was a marked increase in fatalities for Finnish older men. The odds ratios remained near 1 through the middle-age group then escalated to greater than 2 for the older age groups, revealing a gross increase in unprotected older road users in Finland.

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.

The authors revealed no notable difference in crash or fatality rates between 2 countries having vastly different licensure renewal requirements for older drivers. They did, however, note that, although there was not a decrease in crashes or injuries related to stricter licensure renewal laws, there was a significant increase in fatalities for nondrivers using other modes of transportation that were less protective (mopeds, bicycles, and walking). Based on the authors' conclusions, implementing age-based testing will not decrease automobile-related fatalities, but community mobility-related fatalities may increase.

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 for practice include collaboration with licensing agencies for appropriate revocation of driver licenses based on medical and performance issues rather than merely age-based review. Additionally, the results of this study provide compelling evidence in support of prevention/intervention programs for multimodal transportation when seniors can no longer drive safely. Clearly individuals continue their occupational engagement, and the need for mobility in the community continues, resulting in the need for more comprehensive pedestrian safety, bicycle safety, and roadway design programs. These programs should incorporate the occupational therapy perspective, which includes investigation of meaningful occupations among this age group and subsequent support for occupational engagement in those areas.

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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