



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 interventions to address cognitive and visual function, motor function, driving skills intervention, self-regulation/self-awareness, and the role of passengers and family involvement in the driving ability, performance, and safety of the older adult? Intervention approaches include adaptation, remediation, prevention, and maintenance.

Janke, M. K. (1994). Mature driver improvement program in California. *Transportation Research Record, 1438*, 77–83.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)

State the problem the authors are investigating in this study.

It has been reported that defensive driving courses offered to all age groups have no effect on crashes and only a slight effect on violations. Although the courses presented the information effectively, it was felt that the difficulty was that drivers had little intention of changing their driving habits sufficiently to modify their accident risk. According to the authors, the courses aimed at older drivers need to be reviewed separately since the crashes may be due to declining ability, and it is unknown if that factor can be rectified by classroom instruction.

RESEARCH OBJECTIVE(S)

List study objectives.

To determine whether a driving improvement course for older adults has an effect on crash rates.

DESIGN TYPE:

Cohort—nonrandomized controlled trial

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.

Convenience sample—volunteers

Inclusion Criteria

Drivers 55 and above completing the California Mature Driver Improvement (MDI) course between July 1, 1987, and June 30, 1988, later studies (5 in total) addressed successive yearly cohorts of first-time graduates.

The comparison group was drivers who had never taken the MDI course, and were obtained by randomly sampling the department's automated driver file for drivers 55 and above.

Exclusion Criteria

None

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes

No

Attention

Yes

No

Others (list and explain):

SAMPLE CHARACTERISTICS

$N = 564,444$ (MDI group - 197,452 Comparison group - 366,992)

% Dropouts	<input type="text"/>		
#/(%) Male	<input type="text"/>	#/(%) Female	<input type="text"/>
Ethnicity	<input type="text"/>		
Disease/disability diagnosis	<input type="text" value="NA"/>		

Check appropriate group:

<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	<input type="text"/>
No	<input checked="" type="checkbox"/> The MDI group was predominantly women (60%), and the comparison group had more than 50% men. In addition, the comparison group average age (66) was younger than that of the MDI group (69), and the comparison group was more likely to hold a heavy-vehicle operator license than the MDI group (the number was low in both groups, however). These differences were controlled for in the analysis through adjustment.

Were the reasons for the dropouts reported?

Yes	<input type="text"/>
No	<input checked="" type="checkbox"/> N/A

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

Add groups if necessary.

Group 1

Brief Description	Mature driving course that included information on how impairment of visual and audio perception affects driving performance and how to compensate for that impairment; the effects of fatigue, medications, and alcohol on driving performance, and precautionary measures to prevent or offset ill effects; updates on rules of the road and equipment; how to plan travel time and select routes for safety and efficiency; how to make crucial decisions in dangerous, hazardous, and unforeseen situations. Participation in the course resulted in reduction in automobile insurance premiums.
Setting	
Who Delivered?	Course providers monitored by DMV
Frequency?	
Duration?	400 minutes

Group 2

Brief Description	No course involvement—Comparison group
Setting	
Who Delivered?	
Frequency?	
Duration?	

Intervention Biases: *Explain, if needed.*

Contamination

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:

Rates

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

Rates per 100 drivers for total accidents, fatal/injury accidents, and total citations.

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

NR = Not reported.

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

Rate taken for 3 years before the course, and at 6 months, 18 months, and 30 months of follow-up.

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.

Unadjusted 6-, 18-, and 30-month subsequent total crash rates of MDI and comparison drivers did not differ significantly between groups ($p < .10$, 2-tailed) for any cohort and record length. Analysis of covariance showed, in 2 of the cohorts, that the comparison group had fewer adjusted crashes than the MDI group. In 2 cohorts, there were significant differences on adjusted fatal and injury crashes, 1 favoring the MDI group, and 1 favoring the comparison group. When using another statistical analysis (2-stage least-squares regression) the 2 cohorts results of the data from the 2 cohorts' 6-month data indicated that completion of the MDI program was associated with more total crashes and fatal and injury crashes. The MDI program had fewer citations than the comparison group using both ANCOVA and 2-stage least-squares regression.

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 California based program, Mature Driver Improvement (MDI), was established by legislation to encourage older drivers to update their driving related knowledge by enrolling in a classroom driver improvement course. This study measured the effectiveness of this program. Conclusions showed that program completions were associated with more total and fatal/injury crashes, yet fewer citations. This data may reflect the fact that law enforcement may not issue citations to older adults as frequently as they do to younger populations. Plus, the classroom instruction may give older drivers a false sense of the ability to drive, while visual and cognitive factors remain unexplored.

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.

Learning and retaining information and skills are best accomplished when the learning process is actual engagement in that activity. Information conveyed by lecture and reading is less well remembered. This engagement in the activity to be learned is at the heart of occupational therapy practice. The reasons in-class-only instruction is unsuccessful is because the learner is passive. Additionally, occupational therapists know that underlying skill assessment is essential to understanding learning ability. For example, there is no knowledge of the participants' cognitive skills or visual skills that could affect learning. Furthermore, because these prerequisite skills were not assessed, it is not certain whether these participants had medical or aging conditions that could have impaired their learning and their actual driving behaviors.

This work is based on the evidence-based literature review completed by Linda Hunt, PhD OTR.

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.



Copyright 2007 American Occupational Therapy Association, Inc. All rights reserved.
For personal or educational use only. All other uses require permission from AOTA.
Contact: copyright@aota.org