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.

Jacobs, K., Jennings, L., Forman, M., Benjamin, J., DiPanfilo, K., & LaPlante, M. (1997). The use of participation-oriented education in the rehabilitation of driving skills in older adults. *Work*, *8*, 281–291.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)

State the problem the authors are investigating in this study.

Although driving simulation is considered a valid means of reproducing the driving experience, it is unknown if it can be used as a successful tool with older drivers to retrain skills and teach strategies for successful on-road performance.

RESEARCH OBJECTIVE(S)

List study objectives.

The purpose of this study is to determine the effectiveness of participation-oriented education (i.e., driving simulation) in the rehabilitation of driving skills in older adults.

DESIGN TYPE:

Randomized controlled trial

Level of Evidence:

I

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

- Hold a valid driver's license
- Drive at least 1000 miles per year
- Have no prior experience with an adult re-education program

Exclusion Criteria

NR

NR = Not reported.

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes	
No	✓

Attention

Yes	✓ Participants in the simulator group and simulator film groups may have received greater attention than in the no-treatment group.
No	

Others (list and explain):

SAMPLE CHARACTERISTICS

N = 21

% Dropouts	1		
#/(%) Male	NR	#/(%) Female	NR
Ethnicity	NR		
Disease/disability diagnosis	NR		

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	
No	
NR	✓

Were the reasons for the dropouts reported?

Yes	✓ The subject was removed from the study since the participant required further evaluation by the state of Massachusetts. As a result, the participant's license was revoked.
No	

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

Add groups if necessary.

Group 1

Brief Description	Subjects drove through scenarios that may be troublesome for older drivers, using the Doron Precision Systems, Inc., Driving Simulator. The films used in the simulator provided education on proper driving techniques, crash avoidance techniques, and destination driving.
Setting	Simulator
Who Delivered?	NR
Frequency?	Once
Duration?	2 hours

Group 2

Brief Description	Participants watched 2 films taken from the driving simulator program provided by Doron Precision Systems, Inc. The films provided education on proper driving techniques and crash avoidance techniques.
Setting	Classroom
Who Delivered?	NR
Frequency?	Once
Duration?	1 hour

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 ☐

NR ✓

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

Name of measure:

On-road evaluation—The Road Evaluation of Safe Driving Skills from the Occupational Therapy Department of the New England Rehabilitation Hospital

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

Evaluates the following as intact/impaired: starting/stopping, steering, position in lane, speed, turns, braking reaction, merging, highway, intersections, traffic signs, maneuvers, judgment, and observation skills. Specific skills were subdivided further.

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?

Once, between 1 and 3 months after treatment

<u>Measurement Biases</u>

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

Yes	
No	
NR	✓

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	

Name of measure:

Clinical Evaluation of Safe Driving Skills from the Occupational Therapy Department of New England Rehabilitation Hospital

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

Physical considerations, such as motion/strength, grip, coordination, and proprioception, neck rotation, mobility in and out of vehicle, and sitting balance; vision; perception; cognition; traffic symbol knowledge; behaviors

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?

Once, between 1 and 3 months after treatment

Yes	
No	
NR	✓

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

Yes	
No	✓

Others (list and explain):

<u>Limitations (appropriateness of outcomes and measures)</u> *If no, explain.*

Did the measures adequately measure the outcome(s)?

Yes	✓
No	

Name of measure:

Subjective improvement questionnaire

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

Questionnaire to determine if participants felt increased confidence in their driving skills

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?

Once, between 1 and 3 months after treatment

Measurement Biases

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

Yes	
No	
NR	✓

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

Yes	✓ It is possible that those in treatment groups reported higher levels of increased confidence in driving skills.
No	

Others (list and explain):

Name of measure:

Self-reports

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

Self-reports of accidents, close calls, traffic violations

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?

Once, between 1 and 3 months after treatment

Measurement Biases

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

Yes	
No	
NR	✓

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

Yes	✓ It is possible that those in treatment group underreported accidents, close calls, and traffic violations.
No	

Others (list and explain):

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

Did the measures adequately measure the outcome(s)?

Yes	✓
No	
NR	

RESULTS

List results of outcomes relevant to answering the focused question.

Include statistical significance where appropriate ($p < 0.05$).
Include effect size if reported.

Participants in the simulator group had significantly ($p < .05$) higher scores on the on-road evaluation outcome measure than those in the film only and no-treatment groups. No significant differences were found between subjects' clinical evaluation scores following treatment and no treatment.

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

Yes	
No	✓ Small sample size to detect a difference in clinical evaluation
NR	

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

Yes	✓
No	
NR	

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

Yes	✓
No	
NR	

CONCLUSIONS

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

This study looked at small intervention groups that participated in simulation or viewed films. Although the simulation group had a slightly higher performance on the road test, it is not significant to warrant simulation as an intervention given the cost.

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

Yes	✓
No	
NR	

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

Yes	✓
No	
NR	

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

Yes	✓
No	
NR	

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 simulation group had only a slightly better result than the other 2 groups. Given the cost of simulators and the problem of older adults getting motion sickness, simulator use may not be cost effective. Since the researchers had access to an in-vehicle assessment, an option for the research could have been a study group that received training on the in-vehicle. In addition, there was no pretest to establish a baseline of performance, and it is difficult to state that the results were meaningful without this pretest data.

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.

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