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Memory Improvement in Assisted Living Elders

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Abstract

The Cognitive Behavioral Model of Everyday Memory (CBMEM), an eight-session cognitive enhancement program, entitled "MEMORIES, MEMORIES, Can We Improve Ours?" was tested with older adults living in an assisted living facility in the Middle West. The aims of this quasi-experimental study were: to improve everyday memory, memory self-efficacy, and metamemory. A total of 19 older adults (14 female, 5 male) with an average age of 83 years and an average MMSE score of 26 participated. At pretest there were 16 individuals in the experimental and 3 individuals in the comparison group. There were no differences between experimental and comparison groups on the study variables. The experimental group was post tested at one week after completing the intervention. At posttest memory self-efficacy scores significantly increased in the experimental group ($\underline{M}_1 = 52.13$, $\underline{M}_2 = 68.50$). Total memory performance scores were not significantly different at posttest; however the prospective memory items of asking for an appointment ($\underline{M}_1=.56$, $\underline{M}_2=1.25$), asking for a belonging $\underline{M}_1=.62$, $\underline{M}_2=.88$), and delivering a message ($\underline{M}_1=1.00$, $\underline{M}_2=1.19$) significantly improved.

There is growing demand from residents of assisted living and their family members to allow these residents to "age in place," rather than moving them from assisted living to nursing home settings. Yet, the average assisted living resident, 84 years of age and requiring help with ADLs and IADLs, today looks like the average nursing home resident of ten years ago (Furner, Rudberg, & Cassel, 1995; Morton, 1995). About 15 percent exhibit daily incontinence, and 63 percent need medication reminders. Elders in long-term care facilities are at-risk for decreasing cognitive ability and are particularly vulnerable to the devastating effects of depression (Hayslip, Kennelly, & Maloy, 1990). McDougall and Balyer (1998) described this phenomenon as mental frailty. Studies by the Assisted Living Facilities Association of America found that 30 to 40 percent of assisted living residents had Alzheimer's disease or other dementing illnesses. A survey of 33 assisted living facilities in Massachusetts by Stocker and Silverstein (1996) determined that 50 percent of the discharges to nursing homes were for cognitive decline and 60 percent were for functional decline.

Older adults are fearful of losing memory ability, and studies indicate that declining memory is one of the most widespread complaints about aging (Bolla, Lindgreen, Bonaccorsy, & Bleecker, 1991; Grut, Jorm, & Fratiglioni, 1993). This fear is based on the reality that memory declines with age (Rinn, 1988). A complicating factor, however, in the relationship between perceived memory loss and actual memory performance is depression (Dellefield & McDougall,1996; Lichtenberg, Ross, Millis, & Manning, 1995; Nussbaum & Sauer, 1993). The confounding effects of depression have particular relevance for episodic remembering in very old adults (Backman, Hassing, Forsell, & Viitanen, 1996).

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Long-term care residents have major depressive disorders and depressive symptoms (McDougall, 1998b; Rovner et al., 1991). Foster and Cataldo (1993) followed a cohort of 104 newly admitted residents to long-term care for one year and found nine residents (6 males and 3 females) became clinically depressed over a six month period. Individuals with depression may underestimate their memory ability, in contrast to individuals with dementia, who may overestimate their memory performance (Feehan, Knight, & Partridge, 1991). Further, depressed mood increases the risk of developing Alzheimer's disease and is an important component of the disease process (Devanand et al., 1996; Migliorelli et al., 1995; NIH Consensus Conference, 1992; Weiner, 1994).

Memory Training

Two meta-analytic reviews indicated that healthy community-dwelling elderly participants in memory training programs improved their memory performance with large effects, and they improved subjective memory functioning with small effects (Floyd & Scogin, 1997; Verhaeghen, Marcoen, & Goossens, 1992). The overall findings were positive since the elderly benefited more from mnemonic training than from either control or placebo treatments. However, in these memory intervention studies the participants were high functioning elderly, unlike the frail elders in assisted living who are at risk for cognitive decline.

As a by-product, though not always, memory-training programs often augment participants' beliefs in their ability to remember (Bandura, 1989; Rebok and Balcerak, 1989). Dellefield and McDougall (1996) tested the effects of a 2-week, four-session, 1 1/2 hour classroom group intervention with older adults designed to increase metamemory and to evaluate the association of memory performance and depression with metamemory. Operationally, this involved altering perceptions and beliefs about one's memory capacities, the stability or decline of memory skills, personal control over remembering abilities and feelings of anxiety related to memory performance. A total of 145 community dwelling older adults (M=71 years) participated in the study. The intervention significantly increased both metamemory and memory performance in the treatment group (n=74). The control group (n=71) did not improve; in fact, they experienced a significant decline in metamemory over time. Those individuals with depression had significantly lower metamemory scores than those without depression; however, there was no difference in memory performance between the depressed and non-depressed subjects.

Everyday memory

The impact of mnemonic training on everyday memory performance or on metamemory is unclear. Older adults want to improve their everyday memories in specific domains that are of concern: people's faces and names, important dates and telephone numbers, things and household objects, recent and past events, meetings and appointments, information and facts, and directions (Bolla, Lindgren, Bonaccorsy, & Bleecker, 1991; Leirer, Morrow, Sheikh, & Pariante, 1990). Studies have demonstrated that in their everyday lives older adults use memory strategies less often than younger adults (Devolder & Pressley, 1992). When memory strategies are used they are more often external (list, notes, person) rather than internal (association, rehearsal, memory strategies (Intons-Peterson & Fournier, 1986; McDougall, 1995b).

Episodic memory stores information about when events happened and the relationship between those events. Everyday memory relates to how memory operates in ordinary situations and circumstances--norms and habits (Cohen, 1989). Prospective memory, memory for intentions, or remembering to do things is important for maintaining independence, or remaining in an assisted living facility. There are three elements to successful prospective memory: 1) intention to do something in the future, 2) memory of the actual action to be performed, and 3) memory of the scenario in which the action will be performed as intended. Recent studies have identified

age-related differences in prospective memory. Age effects were absent in situations in which the prospective memory task was relatively simple and unchallenging, but age differences became more prominent in situations in which requirements for self-initiated processing were high (Cockburn & Smith, 1991; Cockburn & Smith, 1994; Einstein, Holland, McDaniel, & Guynn, 1992; Einstein, Smith, McDaniel, Shaw, 1997; Mantyla, 1993).

The purpose of this study therefore was to test the effectiveness of the Cognitive-Behavioral Model of Everyday Memory (CBMEM) in older adults living in assisted living facilities. The intervention was designed to improve everyday memory, metamemory, and memory self-efficacy. The hypothesis tested was that those individuals who participated in the CBMEM cognitive intervention would have greater everyday memory, metamemory, and memory self-efficacy.

In the study we used the format of the Cognitive-Behavioral Model of Everyday Memory (CBMEM), which includes a stress and relaxation component based on previous work (Hayslip, Maloy, & Kohl, 1995). Bandura's (1989, 1997) theory of self-efficacy provided the theoretical underpinning for the cognitive intervention. Self-efficacy beliefs have been addressed in a few memory improvement studies, but primarily as a control for memory training, or as a training component without pre- and post-measurements (McDougall, In Press).

DESIGN AND METHODS

A quasi-experimental pretest-posttest design was used to test the effectiveness of the CBMEM intervention for older adults in an assisted living facility. Participation in the study involved attendance at group sessions two times a week for four weeks, each lasting 90 minutes. Sessions were preceded and followed by face-to-face interviews lasting about 30- 45 minutes, during which time the subjects completed instruments measuring study variables. Subjects were paid a total of $30 in grocery coupons. They were given $10 at the first and final interviews and after the final group session.

Subjects were recruited from a Catholic-owned assisted living facility in the Middle West. There were approximately seventy five residents living in this facility. To recruit subjects a presentation was given by the principal investigator and an assistant during the lunch hour in the community dining room at the facility. Potential subjects were screened for cognitive impairment with the Mini-Mental State Exam and those with scores of ≥ 17 (includes the mildly impaired) were included in the study (Wilder et al., 1995). After an initial presentation describing the memory improvement program was made, 23 individuals signed up for the course. However, on the day scheduled for pretesting, a total of 19 older adults (14 female, 5 male) agreed to participate and were pretested. There were 16 subjects in the intervention group and 3 in the comparison group. At posttest all 16 subjects in the experimental group completed the memory performance measures; however, data was not available for the comparison subjects.

The intervention consisted of eight bi-weekly 1 1/2-hour sessions held at the assisted living facility and taught by the principal investigator, with assistance by a master's prepared instructor oriented to the intervention and supervised by the principal investigator. A large flip chart with giant letters was used to present the material. The CBMEM is a short-term, structured, time-limited intervention that teaches the cognitive-behavioral skills necessary to improve, maintain, or prevent decline in the everyday memory of older adults within the context of Bandura's self-efficacy theory. Feedback on performance accomplishments, vicarious experience, and verbal persuasion are used throughout the training. Skills taught include competence in the use of mnemonic techniques: organization, internal and external; visual

imagery skills; and concentration/relaxation, and health promotion components. Homework assignments are given and participants have the opportunity to practice in a group setting.

All participants were given a copy of the book Teaching Memory Improvement to Adults (Fogler & Stearn, 1994). Written materials were printed on light yellow paper in order to increase the contrast between the words and the paper. Serif type and a large font were used to enhance readability. Topics covered in the educational sessions included:

Week 1. How Memory Works; How Memory Changes as People Age

Week 2. Factors Affecting Memory for All Age Groups, Relaxation & Stress Inoculation

Week 3. Memory Improvement Techniques-Internal Strategies

Week 4. Memory Improvement Techniques-External Strategies

Data Collection

Face-to-face structured interviews were conducted by staff trained to encourage subjects to respond according to their own perspective. To minimize respondent burden, Time 1 interviews (pre intervention) were completed in 60 minutes and Time 2 interviews (post intervention) in about 45 minutes. Subjects were allowed rest periods as needed. Both interviews measured the study variables and provided information about the effectiveness of the intervention. All Time 2 interviews occurred within one week of the final intervention session. Memory performance was tested with the Rivermead Behavioral Memory Test. Two different measures were used for memory self-efficacy (Memory Self-Efficacy [50 items] and Memory Efficacy [4 items]; metamemory was tested with the Metamemory in Adulthood Questionnaire. Two questionnaires were used for depression, Geriatric Depression Scale (15 items) and the Center for Epidemiological Studies Scale (20 items). Functional ability and self-perceived health were also ascertained.

Measures

Memory

The Rivermead Everyday Behavioral Memory (RBMT) test was the memory performance measure (Cockburn & Smith, 1989). The test components are remembering a name (first and surname), hidden belonging, appointment, picture recognition, newspaper article, face recognition, new route (immediate), new route (delayed), message, orientation, and date. Each subtest is adjusted so that normal subjects would pass, but those individuals having everyday memory problems would fail. For each subtest, two scores are produced, a pass/fail screening score, and a standardized profile score with a possible score of 0-2 (0 points = abnormal; 1 point = bordeline; 2 points = normal). Thus each patient's evaluation results in two summarized scores, a Screening Score (SS) ranging from 0-12, and a Standardized Profile Score (SPS) ranging from 0-24. Test-retest reliability was reported as a correlation of .78 for the screening score and .85 for the profile score.

Prospective memory, or the remembering to complete an action in the future without the direct assistance of someone else, was tested with three items from the RBMT: Item #3 (remembering to ask for a belonging), Item #4 (remembering to ask about an appointment), and Item #11 (remembering to deliver a message).

Memory Self-Efficacy (Short)

The Memory Efficacy (ME) questionnaire (Lachman, & Leff, 1989) is a Guttman scale consisting of four questions. The ME questionnaire is derived from Bandura's self-efficacy method and is designed to obtain predictions from older adults regarding self-efficacy level

(SEL) and strength (SEST). Two memory concerns are emphasized: maintenance skills to prevent decline and use of strategies. Subjects make performance predictions regarding self-efficacy level (Yes or No), and strength and confidence in each performance prediction range from 10% to 100% (Lachman, Weaver, Bandura, Elliott, & Lewkowicz, 1992). Alpha reliabilities have been reported as .57 and .68 (Lachman, 1990).

Memory Evaluation

Memory evaluation was determined with one question, "How good is your memory now?" from the Memory Efficacy scale (Lachman ,1987). The quality of subjects' memory was rated on a 7-point scale from 1, "very poor" to 7, "excellent."

Memory Self-Efficacy (Long)

Memory self-efficacy was operationalized with the Memory Self-Efficacy Questionnaire (MSEQ), a Guttman scale consisting of 50 questions Berry, West, & Dennehey, 1989). Derived from Bandura's self-efficacy methodology, the MSEQ is a self-report assessment tool consisting of multiple indices to obtain direct memory predictions from older adults regarding self-efficacy level (SEL) and strength (SEST). Ten memory tasks are included that relate to groceries, phone, picture, location, word, digit, map, errands, photographs, and a maze. Internal consistencies for the eight scales are high: r (SEL) = .90 and r (SEST) = .92. Content validity is adequate. Criterion-related or predictive validity was determined by dividing the scales into two logical groupings: "laboratory" tasks (Word, Picture, Digit, and Maze) and "everyday tasks (Map, Location, Phone, and Grocery). Satisfactory internal consistency estimates were obtained for the laboratory tasks, r (SEL) = .88, r (SEST) = .90, and for everyday tasks, r (SEL) = .74, r (SEST) = .78.

Functional Ability

Functional ability was operationalized as Instrumental Activities of Daily Living (IADL) and measured by the IADL scale (Lawton & Brody, 1969; Lawton, Moss, Fulcomer, & Kleban, 1982; Lawton, 1988). The IADL items are complex skills, and since they require combinations of tasks to complete, the responses are very specific. The interviewer-administered instrument has a total of eight items which include home management activities such as using the telephone, going shopping, preparing meals, cleaning the house, doing the laundry, providing transportation, taking medications, and handling money. Response formats range from a minimum of three (finances, laundry, and medications), to four (cooking, shopping, and telephone), to five (housekeeping and transportation). The instrument has been tested in community residents with highest and minimal competence. An alpha reliability of .91 has been reported (Lawton, 1988).

Health

Health status was operationalized by the Health Scale, a subscale of the Multilevel Assessment Instrument (Lawton, Moss, Fulcomer & Kleban, 1982). Subjects rate the quality of their health using a 4-point response format. Total scores of the 4-item tool range from 4 to 13, with higher scores indicating better health. Anchors are "better" to "not so good" and "excellent" to "poor." Lawton et al. (1982) reported an alpha coefficient of .76 and test-retest correlation of .92. Alpha in the present study was .75. Subjects responded to a checklist of common chronic conditions that are known to affect cognitive functioning, and listed their prescription medications.

Depression

Depression was measured by the Center for Epidemiologic Studies Scale (CES-D), a measure of depression designed for research. Individuals respond on a 4-point Likert type scale from rarely or none of the time to most or all of the time. There are four subscales of depressed

affect, well being, somatic symptoms, and interpersonal relations; however, a composite score is acceptable (Hertzog et al., 1990; Radloff & Teri, 1986). Somatic complaints are not emphasized in the CES-D. Scores range from 0 to 60, with higher scores ≥ 15 indicating more depressive symptomatology. The CES-D has been tested with older adults and has been found to be stable when subscale and total scores are reported. High reliability coefficients from .85 to .91 have been obtained and factor structures have remained constant with older adults (Himmelfarb & Murrell, 1983).

Depression

Depression was also measured with the short Geriatric Depression Scale (GDS), a 15-item Yes/No questionnaire. Depressive responses are tallied, and the score indicates the level of depression (0-5 = normal; 5-10 = mild depression; 10-15 = moderate or major depression). The GDS correlates highly with other depression measures, and the authors have reported an alpha reliability coefficient of .94 and a split-half reliability of .94. The GDS has been successfully tested with cognitively intact and impaired elderly residents of nursing homes with alpha reliabilities reported as .83, .99 and .91.

Metamemory

Metamemory was operationalized with the Metamemory in Adulthood Questionnaire (MIA). The MIA is a measure of the memory components of knowledge, beliefs, and affect (Dixon, Hultsch, & Hertzog, 1988). The MIA consists of responses rated on a 5-point Likert scale. To reduce respondent burden only four of the seven subscales were administered: anxiety, change, locus, and strategy (internal and external). Anxiety is the rating of the influence of anxiety and stress on performance (+ = high knowledge). Change is the perception of memory abilities as generally stable or subject to long-term decline (+ = stability). Locus is the individual's perceived personal control over remembering abilities (+ = internal locus).

Strategy is knowledge of one's remembering abilities such that performance in given instances is potentially improved (+ = high use). Internal strategies are determined by 9 Likert-type questions. The internal strategies are rehearsal (4), elaboration (4), and effort (1). External memory strategies in the MIA include a total of 9 Likert-type questions related to the use of calendars (1), lists (2), notes (3), place (2), and someone (1). The MIA's psychometric characteristics have been examined with community-dwelling, middle-aged, and older adults. Cronbach's alphas for the subscales are reported as: Strategy, .85; Change, .92; Anxiety, .83; and Locus, .79.

Procedure

Data collection occurred over 2 months and all individuals in the intervention group were tested twice. At the time the first interview was conducted, the individual signed a consent form after a careful explanation and all questions were answered satisfactorily. A masters' prepared gerontological nurse researcher administered the MMSE face-to-face. Those individuals who scored between 17 and 23 on the MMSE were entered into the study.

The questionnaires were administered to all eligible subjects by four master's-prepared nurse data collectors and took approximately 60 minutes to complete. Intervention and comparison subjects were interviewed on a one-to-one basis. All subjects were assured of confidentiality and aggregate reporting of study results. At the completion of data collection the three individuals in the comparison group were offered the intervention but refused.

Results

The overall sample was elderly (M=83.47, SD=8.20), scored within normal limits on the MMSE (M=26.63, SD=2.81), college educated (M=14.0, SD=2.7), and not depressed. However, the three individuals in the comparison group were significantly more depressed by scores on the GDS than the experimental group (8.0. vs. 3.14), $p \leq .001$. The participants were physically compromised with many chronic conditions (M=2.95, SD=1.72); this was reflected in their moderate perceptions of their health status. Five participants were confined to wheelchairs or electric carts for mobility. There were no pretest differences between groups on IADLs, metamemory subscales of anxiety, change, locus, or internal or external memory strategies, memory self-efficacy and total profile and screening scores on memory, and individual memory performance tasks.

Memory Self-Efficacy

In response to the memory evaluation question "How good is your memory now?" there were no differences between pre- and post test scores. Subjects rated their memories (4.31 vs. 4.19) "fair" to "average" on both occasions (Table 1). At posttest the experimental group scored significantly ($p \leq .005$) higher on the 50-item memory self-efficacy questionnaire (37.82 vs. 25.21) $t(10) = 9.07$, $P < .0001$ (Table 1). On the memory efficacy questionnaire (4-item) there were post-test differences between the average scores from pretest (52.13 vs. 68.50) $t(15) = 2.98$, $p < .009$. On the 4-item memory efficacy test subjects' posttest scores significantly improved for three questions and made no change for one questions ($p \leq .05$). Item #1 "keeping my memory from going downhill with age" improved (35.63 vs. 54.38). Item #2 "discovering ways by myself or with others to maintain my memory" declined (54.38 to 70.63). Item #4 "to get someone to remember things for me" (43.75 vs. 65.63) improved (Table 2). Item #3 "ways to keep my memory up, and make an effort to use them" was no different at posttest (75.00 to 83.13).

Memory Performance

At posttest the prospective memory tasks of asking for an appointment (1.25 vs. .56) $t(15) = 5.84$, $p < .001$, asking for a belonging (.88 vs. .63) $t(15) = 3.96$, $p < .05$ and delivering a message (1.19 vs. 1.00) $t(15) = 4.84$, $p < .001$ significantly improved. There were no differences from pre- to posttest on the total memory standard profile or screening scores (Table 1).

Metamemory

At post test subjects scored significantly higher on the metamemory factor of change (2.69 vs. 2.22) $t(12) = 2.76$, $p < .05$. However, there were no differences in post test scores on anxiety, locus, on internal and external memory strategies (Table 3).

Depression

On the GDS (M=3.58, SD=2.22) and CESD (M=13.50, SD=10.55) subjects' overall scores were in the nondepressed range. Both depression instruments classified three individuals as depressed. Males were significantly more depressed (5.80 vs. 2.54) than females. In fact, one male participant in the experimental group said during the pretesting that he was suicidal and a referral was made to his primary physician. He was hospitalized for depression and cardiac problems and could not participate in the intervention. He was therefore reassigned as a comparison subject.

Discussion

There was near perfect class attendance by the treatment group. Even though total standard profile memory scores did not change, at posttest the participants significantly improved the three prospective memory measures—appointment, belonging, and message. These findings are remarkable given the age and numbers of chronic conditions of the participants. The prospective memory components have particular relevance for continued independent living, and the ability to maintain the status quo, without requiring greater supervision, or service utilization. At pretest the participants had lower memory performance screening scores than the average scores of older adults reported in normative studies (5.11 vs. 8.80) from Great Britain (Cockburn & Smith, 1989). This finding is unexplainable since in this study the participants had greater education than the British elders.

The aim of the course was to change negative or stereotypical beliefs about declining memory. Participants reversed their negative beliefs on the metamemory factor "change." Change is the perception of memory abilities as generally stable or subject to long-term decline. An increase in the score following the intervention indicated that the participants believed their memories had greater stablity. Floyd & Scogin (1997) documented in a meta analysis that memory interventions improved subjective memory functioning with a small effect size and objective memory performance with larger effect sizes. In this study the effect size was smaller for the subjective measure "change" than the improvement noted on the memory performance "prospective" measures.

There were no differences at post-test in the subjective metamemory factor of "locus." Locus is the individuals' perceived personal control over remembering abilities with a higher score indicating greater internal control. Interestingly, change and locus are also the two aspects of metamemory that have consistently differentiated young adults from the elderly (Hultsch, Hertzog, & Dixon, 1987; Lachman, Steinberg, & Trotter, 1987). In the Dellefield and McDougall (1996) study older adults were able to change their "locus" scores in the direction of internality after participating in a memory intervention. The average age of the subjects' was 71 with high-perceived health; all were living in their own homes. The participants in this study were 83 years of age and had multiple chronic illnesses with moderate perceived health. In this study participants did not change their locus beliefs following the intervention.

Participants did change their memory self-efficacy beliefs following the intervention. Positive changes in beliefs are reflected in the memory self-efficacy question related to: "keeping my memory from going downhill with age" and "get someone to remember things for me." Rebok and Balcerak (1989) found that memory training failed to reduce age-related performance differences in the older subjects, neither did it lead to an increase in their memory self-efficacy. The CBMEM intervention improved participants' overall memory self-efficacy beliefs on both efficacy measures, even though post-test memory self-efficacy ($\underline{M}$=37.82) scores were significantly lower than previously reported. In the Berry et al. (1989) study, average MSEQ scores reported were 45.5, 49.7, and 51.1. McDougall (1994) found that community elders' average MSEQ scores were 53.81 among 55-64 year olds, 50.10 for 65 to 74 year olds, and 44.45 for adults greater than 75 years of age. Weaver and Lachman (1989) reported mean MSEQ scores of 37.18 in a sample of 45 community residing adults with a mean age of 68.40.

The course had a positive effect on efficacy beliefs and participants reported greater confidence on three of their memory efficacy responses following the intervention. They responded to the questions addressing "knowing how to keep their memory from going downhill with age," "discover ways either by myself or with the help of others to maintain my memory," and "being able to get someone to remember things for them as they age" with greater confidence. The overall question on memory evaluation declined at posttest but not significantly so. McDougall

(1998a) reported these findings in a memory improvement study with Hispanic community elders in which they changed beliefs on the first memory efficacy question, but not on other efficacy items, or overall memory evaluation.

Depression and diminishing cognitive abilities are a serious combination to cope with in aging. In this study men were significantly more depressed than women and their scores are an indication of the seriousness of the problem. One male subject had to be hospitalized for depression during the study and therefore dropped out of the intervention group. The three members of the comparison group were all male and none were willing to participate in the intervention. Dellefield and McDougall (1996) found that following the memory intervention those individuals with depression had significantly lower memory self-efficacy scores than those without depression; however, there was no difference in memory performance between the depressed and non-depressed subjects. Future studies must also take into account the effect of the intervention on depression.

Participants average IADL scores were in the 18 to 29 range and reflected their need for the services available to them in the assisted living facility. At this time no link has been established between a cognitive intervention to improve everyday memory and memory self-efficacy and older adults' ability to perform IADLs. Studies are needed to determine whether cognitive interventions can improve the instrumental activities necessary for older adults to remain independent.

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Table 1

Means and standard deviations of memory strategy and efficacy variables at T1 and T2 for experimental groups (n=16)

	TIME 1		TIME 2		
	X	SD	X	SD	p
Memory Evaluation	4.31	1.25	4.19	1.38	NS
Memory Efficacy Long	25.21	16.68	37.82	13.83	.003
Memory Efficacy Short	52.13	25.22	68.50	26.70	.009
Appointment	.56	.73	1.25	.86	.0001
Belonging	.63	.89	.88	.89	.0013
Message	1.00	.89	1.19	.98	.0002
Memory (Screen)	5.11	3.05	5.22	3.41	NS
Memory Std. Profile	12.31	6.14	13.75	6.72	NS

Table 2

Means and standard deviations of metamemory variables at T1 and T2 for experimental group (n=16)

	TIME 1		TIME 2		
	X	SD	X	SD	p
Anxiety	3.41	.57	3.19	.39	NS
Change	2.22	.54	2.69	.58	.017
Locus	3.34	.57	3.41	.40	NS
Internal strategy	3.29	.36	3.45	.48	NS
External strategy	3.64	.67	3.50	.66	NS

Table 3

Means and standard deviations of memory efficacy (short) variables at T1 and T2 for experimental group (n=16)

	TIME 1		TIME 2		
	X	SD	X	SD	p
Prevent Decline	35.63	35.02	54.38	38.47	.036
Maintain Memory	54.38	33.26	70.63	27.92	.035
Strategies General	75.00	29.67	83.13	21.52	NS
Strategy-Someone	43.75	26.80	65.63	38.29	.008
Memory Efficacy(Tot.)	52.13	25.22	68.50	26.70	.009