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Rehabilitation of Memory and Memory Self-Efficacy in Cognitively Impaired Nursing Home Residents

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Abstract

This quasi-experimental study examined the effectiveness of the Cognitive Behavioral Model of Everyday Memory (CBMEM) on memory self-efficacy and memory performance of the elderly. Thirty residents from a county nursing home in Northeast Ohio participated. Forty-three percent of the sample were depressed and 57% were cognitively impaired. There were 30 subjects in the experimental group. Class attendance was low ($M = 4.48$); the dropout rate was 58%. As a result, among the 30 individuals in the experimental group, posttest data were available for only 13 subjects. There were no pre- to posttest differences in total memory performance scores. However, immediate story recall significantly ($p \leq .01$) increased ($M_1 = .67$; $M_2 = 1.33$). The experimental group also made significant gains ($p \leq .0001$) in memory self-efficacy ($M_1 = 35.84$; $M_2 = 41.87$). While the intervention helped these vulnerable individuals improve their memory, future interventions may need to specifically target the problems of individuals with depression and those with cognitive impairments. Nevertheless, there is hope for improvement, as shown both here and in other memory improvement studies, and therefore the efforts to develop effective interventions need to continue.

Keywords

Memory intervention; memory self-efficacy; memory performance; depression

Both short- and long-term memory loss are manifest in 53% of the nation's 1.56 million nursing home residents—of whom 48% have Alzheimer's disease and related dementias (Krauss & Altman, 1998). Interestingly, Huppert and Beardsall (1993) found that elderly with minimal dementia performed as poorly on prospective memory items as elderly with severe dementia. In addition, according to the 1996 Medical Expenditure Panel Survey (MEPS) report, 20% of nursing home residents have a diagnosis of depression. Memory complaints may be a sign of depression, a lack of confidence in memory-demanding tasks, a sign of anxiety about performance, or a way to mask cognitive abilities so that attention to daily care is not compromised. Analyzing 99 studies of recall and 48 studies of recognition, Burt, Zembar, and Niederehe (1995) found a significant association between depression and memory impairment. In a study of anosognosia (unawareness of neurological or neuropsychological deficit) for dementia, McDougall (1998a) found that the metamemory components of capacity and change differed significantly between individuals with cognitive impairment who were not depressed

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and those who were depressed. More depression was associated with self-assessment of poorer memory capacity and less perceived loss of memory.

Clearly, elderly with both depression and cognitive impairment are mentally frail (McDougall, 1998b). Memory problems can be a major source of distress among the elderly and interfere with the successful performance of activities of daily living (ADLs). Many intervention studies designed for nursing home residents have focused on reducing problem behaviors, increasing positive affect, and improving ADLs (Beck et al., 1997; Orsulic-Jeras, Judge, & Camp, 2000; Matteson, Linton, Cleary, Barnes, & Lichtenstein, 1997). Memory loss, disorientation or confusion, and the ability to follow simple instructions are of primary interest.

Studies of behavioral interventions to improve memory performance have produced mixed findings. Zanetti et al. (1989) found that when 10 patients with mild and moderate Alzheimer's disease were trained for 3 weeks in procedural memory stimulation, the progression of their disability with instrumental activities of daily living (IADLs) slowed. Similarly, Jennett and Lincon (1991) found that attendance at a memory group increased the use of memory aids, though it did not affect the degree of memory impairment. Among adults between the ages of 75 and 89 years, memory and psychomotor training reduced dementia symptoms for up to 2 years following the intervention (Oswald, Rupprecht, Gunzelmann, & Tritt, 1996). Even after the pager was withdrawn, neurological patients (N = 15) with frontal lobe damage and everyday memory problems who were trained to use NeuroPage (paging system) continued taking their medication on time, making to-do lists, and using checklists (Wilson, Evans, Emslie, & Malinek, 1997). Rosswurm's (1991) attention-focusing program for persons with dementia (N = 30) produced significant improvements in perceptual processing and social interactions, but the gains did not transfer to functional performance and the psychomotor skills needed for activities of daily living. Similarly, after providing a four-component program of case management, psychosocial rehabilitation, individual counseling, and training of staff for elderly in 13 licensed residential care facilities, Gottesman, Peskin, Kennedy, and Mossey (1991) found no change in cognition, instrumental activities, or psychiatric symptoms. However, recently Clare et al. (2000) found that five participants with dementia (MMSE scores 21–26) who received individual interventions improved their everyday memory function, and maintained the gains at 6 months. Yet few nursing homes offer cognitive rehabilitation programs (Gabrel, 2000; Kane, Chen, Blewett, & Sangl, 1996; Lopez & Mermelstein, 1995; Moseley, 1995; Wilson, 1993).

Decreased confidence, weak motivational processes, unchallenging environments, and negative beliefs may actually impair memory performance. Bandura's self-efficacy theory provides a useful explanation for the ways in which people influence their own motivation and behavior (1997). Self-efficacy refers to the strength of a person's belief that he or she possesses the capabilities to organize and execute whatever course of action may be required to reach a goal. Self-efficacy judgments determine the behavior that is chosen and affect the amount of effort devoted to a task. Recently, Johnson, Stone, Altmaier, and Berdahl (1998) found that domain-specific self-efficacy was related to aspects of successful adjustment to a nursing home, as reflected in greater positive affect and attendance at scheduled activities.

In one study reported here, an innovative program, the Cognitive Behavioral Model of Everyday Memory (CBMEM), based on self-efficacy theory, was tested with nursing home residents. We anticipated that it might be useful in increasing both memory self-efficacy and memory performance in vulnerable elderly.

METHOD

Sample

The CBMEM was pilot tested in a 175-bed county nursing home in northeastern Ohio. All residents who were able to give informed consent were eligible to participate. A total of 30 individuals participated in the study, 22 females, and eight males, with an average age of 73. All 30 individuals were in the experimental group; there was no control group.

Before the CBMEM program, cognitive function was assessed by the Mini-Mental State Exam (MMSE). The MMSE contains 11 questions, with scores ranging from 0–30. A score of 23 or less indicates cognitive impairment. Usually a score between 18 and 22 indicates mild cognitive impairment and a score between 0 and 17 indicates severe cognitive impairment (Pearson, Cherrier, & Teri, 1989; Tombaugh & McIntyre, 1992). Individuals with MMSE scores between 10 and 30 were included. The overall sample's scores were in the cognitively impaired range ($M = 22.03$, $SD = 4.56$). There were 13 individuals without cognitive impairment ($M = 25.92$, $SD = 1.61$), 10 individuals with mild impairment ($M = 21.80$, $SD = .63$), and seven individuals with severe cognitive impairment ($M = 15.14$, $SD = 2.12$).

In addition, other pretest measures were used to describe the sample including measures of health (Medical Outcomes Study [MOS-36]; McHorney, Ware, & Raczek, 1993), and metamemory change (Metamemory in Adulthood [MIA]; Dixon, Hultsch, & Hertzog, 1988). Participants had low physical functioning scores (MOS, $M = 28.24$), and their metamemory change scores indicated an unstable memory (MIA Change, $M = 2.18$).

Cognitive Behavioral Model of Everyday Memory Programming

In the Cognitive Behavioral Model of Everyday Memory (CBMEM), the program of memory improvement occurs in six phases. Participants progress from learning activities and content that are least challenging in the early phases to the most challenging content during the final week of the program (McDougall, 1999).

Phase 1. Modeling Techniques—Participants learn stress inoculating techniques and take part in non-threatening memory exercises that are enjoyable and constitute a level playing field for every individual. They learn to use intelligence acquired through experience and knowledge; no new learning is required to participate. The goal of a typical exercise is to identify common names, nouns, and places beginning with different letters given by the instructor.

Phase 2. Observing Their Memory—Group comfort increases the support needed to improve memory. Members of the group realistically assess the strengths and weaknesses of their own memory abilities and learn vicariously by observing each other participate and perform. They are challenged in an easy, interesting fashion. Participants use memory without being tested on new material.

Phase 3. Awareness—Participants develop an awareness of attention and concentration and begin to use more complex memory strategies such as association and visualization. Group memory exercises allow all members of the class to offer their unique contributions and develop confidence in their abilities through enactment of personal mastery. The group models the ability to self-reflect.

Phase 4. Mastery Coping—Confidence and enjoyment through effective learning override participants' anxiety about potential embarrassment or being called upon to perform beyond their level of confidence and comfort. Participants begin to spontaneously respond to the

instructor's general request to participate directly, e.g., through recalling content discussed at a previous class.

Phase 5. Controlled Handling—The instructor calls on specific individuals for participation in memory-demanding tasks. Participants use overhead drawings and other visual examples to build confidence.

Phase 6. Suspension—Participants relax their anxieties and defenses and develop the ability to observe themselves and their neighbors as they experience memory problems and their solutions, practice relaxation, and use deep breathing in memory-demanding situations, thereby building out-of-the-classroom confidence in their ability.

The CBMEM curriculum was presented in two sessions a week, for 4 weeks, in a quiet and brightly lighted porch 40 × 10 feet, separated from the daily activities of the nursing home staff. However, it was located next door to the television viewing room. The intercom system was not highly effective. At the conclusion of data collection, the eight classes were offered again to individuals wishing to repeat the classes. Three individuals who attended some of the initial eight classes also attended the additional eight sessions. In week one, the emphasis was on helping participants reduce their anxiety, using stress inoculation techniques such as deep breathing and relaxation. In week two, the focus was on how memory changes as people age. In week three, the focus was on factors affecting memory for people of all ages. And during week four, the focus was on using external strategies as memory improvement techniques.

Measures

Memory Performance Measure—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 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 = borderline; 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 (van Blaen, Westzaan, & Mulder, 1996). Prospective memory, or remembering to complete an action in the future without the direct assistance of someone else, was tested with three items from the RBMT: remembering to ask for a belonging, remembering to ask about an appointment, and remembering to deliver a message.

Memory Self-Efficacy Measure—The Memory Self-Efficacy Questionnaire (MSEQ), a Guttman scale consisting of 50 questions (Berry, West, & Dennehey, 1989), is a self-report tool consisting of multiple indices to obtain direct 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 both for the laboratory tasks, r (SEL) = .88, r (SEST) = .90, and for everyday tasks, r (SEL) = .74, r (SEST) = .78.

Affect Measure—The Center for Epidemiological Studies Scale (CES-D) contains four subscales: depressed affect, well-being, somatic symptoms, and interpersonal relations; however, a composite score is acceptable (Hertzog et al., 1990; Radloff & Teri, 1986). Scores may range from 0 to 60, with scores > 16 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.

Data collection occurred over 2 months. At the time of the first interview, the individual signed a consent form after the study was carefully explained and all questions were answered. A master's prepared gerontological nurse researcher administered the MMSE face-to-face, and study questionnaires were then administered to all subjects by master's-prepared nurse data collectors. Subjects were interviewed on a one-to-one basis in their rooms in privacy, and interviewers often stopped and returned after subjects rested. Subjects were allowed rest periods as needed. The interviews took approximately 60 to 120 minutes to complete. Individuals were tested twice, before and after the intervention. Time 2 interviews occurred within 1 month of the final intervention session.

RESULTS

Using a cutoff score of 16 on the CES-D, 43% of the sample scored in the depressed range and using a cutoff score of 23 on the MMSE, 57% scored in the cognitively impaired range. Seventeen individuals dropped out of the study and only 13 completed the posttest. Demographic and outcome variables were analyzed with ANOVA to compare those who completed the intervention with the dropouts. Those who dropped out did not differ from those who completed the study in age, cognition, depression, memory performance (profile and screening), or memory self-efficacy (Table 1). Among the 30 individuals in the group, class attendance was poor. Thirteen individuals attended at least two classes, but only two attended all eight classes. Posttest data were available for 13 subjects.

At posttest their total memory performance scores did not differ from their scores at pretest. However, an analysis of individual memory items yielded significant differences ($p \leq .05$) at posttest on delayed route, date, and immediate story recall (Table 2). Posttest scores on date ($M = 1.22_{E1}$, $M = .56_{E2}$) and delayed route ($M = 1.56_{E1}$, $M = .78_{E2}$) declined. There was an increase in immediate story recall ($M = .67_{E1}$, $M = 1.33_{E2}$). The group also made significant gains ($p \leq .0001$) in memory self-efficacy ($M_1 = 35.84$, $M_2 = 1.87$).

DISCUSSION

It was difficult to retain adequate numbers of individuals in the study. Even though the investigator and research assistants had lists of potential subjects who might benefit from the intervention, the staff paid no attention to their ideas about who should attend and often brought another resident who was not part of the study protocol. The investigator was informed that residents with memory problems were brought to the classes; thus, many of the group were not high-functioning individuals.

As mentioned earlier, many logistic and spatial aspects of the nursing facility were strong possibilities which might have produced the high dropout rates. The odd-shaped classroom (40 × 10 feet) was actually a sun porch and was awkward to accommodate the participants who arrived in wheelchairs. Those individuals who were late ended up in the rear, and were further from the speaker and the audiovisual materials. Along one side of the classroom was a wall of windows which allowed light to enter and fill the room. The light may have produced glare for the residents and interfered with their ability to pay attention and concentrate. Loud noises

from the neighboring television-viewing room were evident whenever the door was opened to let someone in the room. In addition, the timing of classes in late morning may have been in conflict with the morning care of the residents given by the nursing assistants.

A major difficulty in implementing the intervention was the mix of affective and cognitive levels of participants. As noted above, 43% of the sample were depressed and 57% were cognitively impaired. In pretesting subjects, interviewers often had to stop the testing due to subjects' mental and physical exhaustion or emotional distress, and offer to return at a later date if subjects wished to continue. This also partially explains the high dropout rate from pre- to posttest.

At both pre- and posttests the subjects had lower memory performance scores than the average scores of older adults reported in Cockburn and Smith's (1989) study from Great Britain (8.80), and McDougall's (2000) memory intervention study with elderly in assisted living (5.11). The significant decreases in scores at posttest on date and delayed route were unexpected and are difficult to explain. The significant increase in immediate story recall among subjects is an important finding since it indicates that subjects benefited from the memory training. A previous intervention study using cognitive-behavioral therapy in a nursing home over a 24-week period found a significant improvement on cognitive scores beginning 8 weeks after treatment initiation (Abraham, Neundorfer, & Currie, 1992). The intervention reported here provided significant outcomes after an individual attended an average of 4.6 memory classes, $SD = 3.62$. There is hope for improvement, as shown both here and in other memory improvement studies, and therefore studies must continue. However, interventions may need to be developed to meet the specific needs of individuals with depression and those with cognitive impairments.

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TABLE 1

Means and Standard Deviations of Variables

	(n = 13) COMPLETERS		(N = 17) DROPOUTS		p
	M	SD	M	SD	
Age	73.09	(7.61)	73.00	(17.54)	NS
Cognition	23.18	(3.71)	21.37	(4.89)	NS
Depression	13.18	(10.10)	12.10	(10.49)	NS
Memory Performance (SS)	3.64	3.44	1.94	2.05	NS
Memory Performance (SPS)	9.73	7.46	6.38	5.10	NS
Memory Self-Efficacy	35.24	(25.56)	27.20	(25.56)	NS

TABLE 2
Means and Standard Deviations of RBMT Memory Items—Two Groups

	(T1, n = 13) BASELINE		(T2, n = 13) POSTTEST		p
	M	SD	M	SD	
Name	.56	(.88)	1.11	(1.05)	NS
Picture Recognition	1.11	(.78)	1.44	(.88)	NS
Face Recognition	.78	(.83)	.78	(.83)	NS
Immediate Route	1.22	(.97)	.78	(.97)	NS
Delayed Route	1.56	(.73)	.78	(.97)	.04
Orientation	.56	(.53)	.56	(.53)	NS
Date	1.22	(.97)	.56	(.53)	.01
Immediate Story Recall	.67	(1.00)	1.33	(.86)	.05
Delayed Story Recall	.78	(.97)	1.22	(.83)	NS
Appointment	.89	(.60)	.78	(.83)	NS
Belonging	1.00	(.73)	.78	(.97)	NS
Message	.78	(.97)	.56	(.88)	NS

TABLE 3
Means and Standard Deviations of Memory Strategy and Confidence Variables at T1 and T2

	(T1, n = 13) BASELINE		(T2, n = 13) POSTTEST		p
	X	SD	X	SD	
Memory (Screen)	3.71	(3.12)	3.85	(3.58)	NS
Memory (Std. Profile)	10.02	(6.56)	9.69	(7.25)	NS
Memory Self-Efficacy	35.84	(22.64)	41.87	(28.33)	.0001