Chapter 13
Peer-Led Memory Training Programs to Support Brain Fitness

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Abstract Despite evidence supporting the effectiveness of cognitive enhancement interventions in older adults with age-related changes, few if any cognitive enhancement programs are available in the community that can be administered with ease and high quality, and reach a large number of persons. Just as peer-led programs are widely used to promote health awareness, health self-maintenance, and wellness, peers can promote memory awareness and education in community-residing older adults with mild age-related memory concerns. Overall, there has been a gap between the development of effective cognitive intervention programs to help offset the daily minor challenges associated with mild age-related memory loss, and convenient availability to the general population. Given this need, in association with the University of California, Los Angeles (UCLA) Longevity Center our group developed a unique 5-week, peer-led community education/intervention program to improve memory functioning in older adults. In this chapter, we detail the development and implementation, and present preliminary data regarding the effects on memory of this MTP program. We discuss the benefits and challenges associated with administering this kind of peer-led memory enhancement strategy. Given the many older adults experiencing age-related memory decline and the potential benefits of the intervention, the potential impact of peer-led memory training programs could be considerable.

Introduction

Successful aging has been defined as maintaining both cognitive and physical health throughout life (Rowe & Kahn, 1998). As people age, however, they often experience cognitive and physical challenges.

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The influence of age-related physical and cognitive decline on society is projected to grow as the proportion of the population older than age 60 years increases over the next decades. The mildest form of such cognitive decline known as age-associated memory impairment (AAMI) (Crook et al., 1986; Larrabee & Crook, 1994) is characterized by self-perception of memory loss and a standardized memory test score indicating a decline in objective memory performance compared with younger adults. In people 65 years of age or older, its estimated prevalence is 40% in the United States. The condition is often referred to as normal aging, and it tends to remain stable in most cases. However, as people continue to age, their risk increases for becoming more cognitively impaired and developing mild cognitive impairment (MCI) (Winblad et al., 2004), a condition defined by more severe memory deficits without functional impairments. Although MCI patients are able to continue to live independently, they show objective memory impairments similar to those seen in people with very mild Alzheimer's disease (AD). Approximately, 10% of people 65 years or older suffer from MCI, and nearly 15% of them develop AD each year. Cognitive problems in aging are of concern not only because they may predict the development of dementia but also because of their immediate impact on quality of life.

Some studies suggest that mentally stimulating activities may protect against age-related declines in cognition and lower the risk for dementia; however, definitive evidence proving a causal relationship between mental stimulation and lower dementia risk is lacking. Several lines of evidence indicate that learning and mental activities are associated with improved cognitive functioning and/or lower dementia risk. People with advanced education and professional accomplishments tend to have greater density of neuronal connections in brain areas involved in complex reasoning (Del Ser, Hachinskim, Merskey, & Munoz, 1999). Epidemiological studies indicate that increased frequency of engaging in everyday mental or leisure activities is associated with significantly reduced risk for developing dementia or cognitive decline (Akbaraly et al., 2009; Desai, Grossberg, & Chibnall, 2010; Fillit et al., 2002; Fritsch, Smyth, Debanne, Petot, & Friedland, 2005; Paillard-Borg, Fratiglioni, Winblad, & Wang, 2009; Verghese et al., 2003; Wilson, Barnes, & Bennett, 2003; Wilson et al., 2002). In randomized clinical trials, cognitive training improves memory, reasoning, and mental speed in persons with normal aging or mild memory declines (Ball et al., 2002; Cavallini, Pagnin, & Vecchi, 2003; Craik et al., 2007; O'Hara et al., 2007; Stuss et al., 2007; Valentijn et al., 2005; Verhaeghen, Marcoen, & Goossens, 1992; Willis et al., 2006). A major hurdle that most programs have not overcome is in transferring such cognitive gains to improvement in everyday memory challenges.

Despite evidence supporting the effectiveness of cognitive enhancement interventions in older adults with age-related changes, few if any programs are available that can be administered with ease and high quality, and reach a large number of people in their own communities. Overall, there has been a gap between the development of effective cognitive intervention programs to help offset the daily minor challenges associated with mild age-related memory loss, and convenient availability to the general population. Given this need, in association with the University of California, Los Angeles (UCLA) Longevity Center our group developed a unique

5-week, peer-led community education/intervention program to improve memory functioning in older adults (Ercoli, Hedberg, & Johnson, 2006). This memory training peer (MTP) program includes memory improvement techniques, such as association and visual imagery, which other clinical trials have found to augment memory ability in older adults. This MTP program is innovative in that it trains lay volunteers to use a scripted, standardized curriculum to teach memory strategies to community-residing older adults; thus, the MTP program can be readily adopted in a variety of settings where seniors congregate. One of the most novel aspects of this program is its portability and ability to reach large numbers of older adults. Since its inception in 2003, more than 3,000 individuals have taken the course, which has been taught in seven US states (California, Iowa, Pennsylvania, Texas, Illinois, Florida, and Maryland) in a variety of venues (e.g., senior and community centers, hospitals and other healthcare provider organizations, and academic institutions). Approximately 500 volunteers have been trained to administer the program. In this chapter, we detail the development and implementation of this MTP program and discuss the benefits and challenges associated with administering this kind of peer-led memory enhancement strategy.

Development

Peer-led educational programs are implemented worldwide to promote adaptive health behaviors and wellness. They have been administered in developed and underdeveloped countries and to people of all ages and socioeconomic backgrounds (Alcock et al., 2009). There are several advantages to peers providing educational interventions. For instance, compared to non-peer health professionals, peer leaders may be more approachable, may have more credibility than health professionals, and often can relate better to the experiences and concerns of the participants (Gammonley & Luken, 2001; Nettles & Belton, 2010; Rogers, 1983). As examples, peer-led programs have targeted alcohol awareness, breast cancer awareness, sexual health, tobacco cessation, prevention of functional decline in older adults, successful aging, chronic mental illness self-management, and self-management of chronic physical diseases, such as diabetes and arthritis (Chodosh et al., 2005; Fabacher et al., 1994; Kim & Sarna, 2004; Kocken & Voorham, 1998; Lawn et al., 2007; Lorig et al., 1999; Maticka-Tyndale & Barnett, 2010).

While peer-led education programs have been widely disseminated for health self-management and raising awareness, memory function is one area that has received relatively little attention. Our main goal was to devise a portable, empirically based, and engaging entertaining memory training program that could raise awareness in older adults about memory health and train memory enhancement skills. We chose a peer-led education program model in order to increase accessibility to the community.

In developing the MTP program, we used approaches and content from research, educational, and popular resources. The intervention itself is modeled

after a multifactorial memory training program (Stigsdotter, 2000). Multifactorial memory training programs address both cognitive and noncognitive factors that contribute to memory function including (1) Education about memory; (2) Preliminary instruction in the basic elements of memory improvement strategies prior to the teaching of specific techniques (i.e., "pretraining"); (3) Instruction in specific memory strategies; (4) Home practice; (5) Discussion of noncognitive factors such as self-confidence, anxiety, and negative expectations; (6) Group-based training; and (7) Sessions of relatively brief duration. The UCLA MTP program includes all of those components.

The MTP program teaches specific techniques drawn from empirical studies that have demonstrated the effectiveness of memory training strategies in older adults with age-related cognitive changes (Cavallini et al., 2003; Craik et al., 2007; McCarthy, 1980; O'Hara et al., 2007; Stuss et al., 2007; Valentijn et al., 2005; Verhaeghen et al., 1992; Willis et al., 2006; Yesavage, 1983; Yesavage, Rose, & Bower, 1983). A meta-analysis of 33 memory training clinical trials of over 1,500 adults 60 years and over showed that gains due to use of memory training techniques are large – on average, effect sizes of 0.73-standardized difference, posttest mean minus pretest mean – compared to control (0.37) and placebo (0.38) conditions (Verhaeghen et al., 1992). Benefits from memory and other cognitive training interventions are robust, and may last from 6 months up to 5 years (Anschutz, Camp, Markley, & Kramer, 1987; O'Hara et al., 2007; Scogin & Bienias, 1988; Stigsdotter & Backman, 1993; Willis et al., 2006). Techniques and education material also were based upon a popular book about memory health and memory improvement techniques (Small, 2003).

In addition to empirically supported methods for memory enhancement, the MTP program also incorporates basic principles of memory function, behavior modification, learning theory, and cognitive-behavioral approaches. The MTP program targets functions that are primarily subserved by the declarative memory system, which involves the conscious recollection of information, such as facts (semantic memory) and experienced events linked to time and place (episodic memory) (Tulving, 1983). Daily life examples of declarative memory include autobiographical information and remembering people, object placement (e.g., keys, purses, reading glasses), appointments, errands, shopping lists, and more. Forgetting in these daily life situations reflects the kinds of challenges experienced by older adults with minor memory difficulties (Craik & Rabinowitz, 1984; Hill, Backman, & Stigsdotter, 2000; Olofsson & Bäckman, 1996; Schai & Wills, 1991). Elements of behavior modification are incorporated into the program and in the training of the peer-trainers, who are taught the importance of *positive reinforcement* and *shaping*. Trainers reinforce correct or even partially correct execution of the memory strategies to gradually shape effective use and mastery of a technique. They provide encouragement, feedback, and praise to maintain the participants' motivation. The curriculum emphasizes *chaining and shaping* by breaking down a memory technique into steps and teaching each step sequentially to facilitate learning the complete technique. Finally, participants are encouraged to use *distributed practice* to space learning and practice trials over time in short sessions (Baddeley & Longman, 1978), rather than attempting to acquire the same information though "cramming." Home practice assignments are distributed weekly to reinforce learning.

From learning theory, *the levels of processing* approach (Craik & Lockhart, 1972) makes an important contribution to the MTP program. Levels of processing posits that memory is a function of the degree to which a new or to-be-learned piece of information is analyzed – the deeper and more meaningful the analysis, the better the stimulus is remembered. During learning, "deep" analysis that focuses on meaning is associated with higher levels of retention than "shallower" processing that focuses on physical or sensory aspects of a stimulus. Therefore, peer-trainers encourage deep analysis by having participants make associations to information in ways to make it more personally meaningful and distinctive, and help integrate that new information with a framework of preexisting knowledge that provides cues for later retrieval.

Finally, from cognitive-behavioral approaches, the MTP program includes exercises for *cognitive restructuring* to help shape more positive attitudes about memory and aging for participants. As described in Section "Specifics of the Curriculum," participants learn cognitive restructuring techniques to counter negative self-statements that may hinder learning the techniques.

Our group initially developed and piloted a multifactorial memory training intervention in older adults (Ercoli et al., 2005) that was instrumental in developing the MTP program. The pilot memory training program was a 7-week intervention taught by psychologists. We evaluated the pilot program in 63 older adults and found that the subjects who received training in associative memory enhancement techniques improved significantly on objective memory tests, with a medium effect size (ES = 0.63), compared to a health education control condition. We then shortened the pilot program to 5 weeks, which better accommodated participants' busy schedules. We also edited the pilot program to include techniques that were most easily taught in 15–20 min and added other educational material about lifestyle factors that affect memory (Small, 2003).

After shortening the curriculum, the final step was to manualize, script, and stage it so that trained peer volunteers could administer it. The manual includes everything that peer-trainers need. A professional educator developed the initial scripting, which was then revised extensively by a geriatric psychiatrist and psychologist. In developing the script, we paid special attention to terminology so that jargon and complexity were minimized. We also avoided the use of emotionally charged words that might increase the participants' anxiety. For example, the term "skill-builder" is used instead of "homework," and the word "memory check" is used instead of "memory quiz" or "test". The script also has a Flesch-Kinkaid Grade Level rating of 5.4; thus, the program is accessible to a broad range of reading-level abilities. Volunteers use the manual to present all of the material and examples, but they may adjust the discourse as needed to ensure that the participants fully understand the concepts and memory techniques.

Given the barriers to mobility and expenses that some seniors face for transportation, an additional important step was to develop a portable program that could be presented in locations where seniors congregate. We therefore purposefully made the MTP program "low tech" using readily available and inexpensive materials (e.g., paper and pencil, handouts) and decided not to use expensive, technical, or less available methods for dissemination (e.g., computers and LCD projectors).

Specifics of the Curriculum

The MTP program includes specific memory enhancement strategies, often called "mnemonics" that involve the use of verbal associations, visual imagery, and organizational strategies to remember information relevant to daily life, such as book and movie titles, dates, pin-codes, phone numbers, addresses, a shopping or to-do list; and, faces and names. The curriculum is divided into five sessions; each session is structured in the same way and includes instruction in two to three mnemonic techniques, class examples, group- and pair-wise exercises, and assignment of the "skill-builder" home practice exercises, which are initially easy to facilitate participants' confidence and provide mastery experiences. Skill builders become increasingly challenging and include reviews of previous material. Skill builders are reviewed weekly to reinforce the concepts. Over half of each session is devoted to practicing techniques through exercises. Class exercises are interactive, instructive, and fun. We have found that participants very much enjoy partnering with a classmate for the exercises. A team of two trainers presents the program. They teach and model the memory enhancement techniques and help participants with in-class exercises. Trainers also acknowledge individual differences and praise effort as well as excellence. We have found that this positive approach, along with pairing classmates for exercises, encourages participation and makes people feel comfortable.

At the start of the course, each participant receives materials including a pencil and a folder for keeping blank paper and handouts. Course content for each week is outlined in Table 13.1. Following the model of multifactorial memory training programs, in the first session, trainers discuss the rationale for the course, the importance of practice and regular attendance, and the benefits of memory training and basic education on memory functions, such as how memories are formed and how memory abilities change with aging. Trainers also discuss noncognitive factors that also can interfere with optimal memory functioning. For example, participants learn about how to identify negative expectations and thoughts (e.g., "I'll never be able to do this.") and how to use basic cognitive restructuring techniques to promote more positive thinking. Participants also engage in self-exploratory exercises to discover if they are visual or auditory learners, which helps to raise their awareness and focus their practice to enhance abilities that they may use less. In the first session, participants also complete a self-report questionnaire about their memory complaints, as well as a memory check (i.e., quiz). Participants take two additional memory checks and another self-report questionnaire at subsequent sessions and track their complaints and memory check scores throughout the 5 weeks.

In the first session, following the educational component, the next step is "pretraining" or the introduction of basic memory enhancement concepts. Research has shown that pretraining in the basic techniques of association and imagery facilitates the learning of specific mnemonic techniques (Verhaeghen et al., 1992; Yesavage, 1983). Attention pretraining involves studying a photograph and recalling the details. Association pretraining involves forming associations or thinking of jingles for products and names. For visualization pretraining, trainers talk participants through guided imagery exercises.

Table 13.1 Peer-led memory training program content

Session	Techniques and topics	Other activities
1	Introduction/Course Rationale Education on Memory Function Learning Styles Assessment Countering Negative Thinking Pretraining: Association and Imagery	Distribute Course Materials Take Memory Check #1 Complete Subjective Memory Questionnaire #1 Assign Skill Builder #1
2	Chunking Method Look-Snap-Connect	Review Skill Builder #1 Assign Skill Builder #2
3	Sentence and Link Methods Remembering Faces and Names	Review Skill Builder #2 Take Memory Check #2 Assign Skill Builder #3
4	Remembering Numbers, Addresses, and Dates Expanding Vocabulary Versatility Training	Review Skill Builder #3 Assign Skill Builder #4
5	Organizational Strategies Other Factors Affecting Memory Staying Mentally Fit Review of Techniques	Take Memory Check #3 Complete Subjective Memory Questionnaire #2 Review Skill Builder #4 Complete Course Evaluation Collect Course Evaluation, Memory Check, and Subjective Memory Questionnaire Scores

Instruction in specific techniques continues in subsequent sessions. The categorization or "chunking" method, the easiest technique, is placed first in the curriculum to instill confidence and provide a successful experience for participants. Categorization involves breaking down or categorizing a list of items into smaller subgroups of items that have something in common. Words can be grouped under category headings, and the headings then act as cues to retrieve the items. Participants perform in-class exercises, one of which involves categorizing a list of 12 items into three groups – tools, sports equipment, and vegetables – and the use of category headings to cue their memories for the words. Look-Snap-Connect (Small, 2003) is an attention, visualization, and association technique, wherein multiple items can be visualized in a single scene or image. For instance, participants use Look-Snap-Connect to remember parking a car on level 3B in a parking structure. One way to do this is to form an image of three bumble bees hovering over a car. Participants learn the Sentence and Link methods; and how to remember names and faces. The Sentence and Link methods, respectively, involve creating sentences to remember short lists and creating stories to remember longer lists. Visualizing the sentences or stories is also helpful. For example, participants will create a sentence to remember three things on a to-do list: Buy a cooked chicken, bring flowers to a sick friend; RSVP to a nephew's wedding. A possible result would be "the chicken brought a bouquet of flowers to the wedding." Remembering faces and names requires first paying attention to a face, forming an association with a name or

changing the name slightly to sound like something familiar, and then linking the face and name using an image. This technique is based on McCarthy's (McCarthy, 1980) three-step method (1) identify a prominent facial feature, (2) change the name to sound familiar or meaningful, and then (3) associate the face and the transformed name using an image. Exercises focus on learning how to form associations to names (e.g., Terry sounds like merry) and how to pick out an outstanding facial feature to focus attention on a face (e.g., teeth), and link the face with the person's name using imagery (e.g., Terry has a merry smile). The face-name class exercises and skill builder exercises reflect ethnic diversity. For instance, we include photographs of Asian, African-American, and Caucasian individuals, and name association exercises provide tips for learning ethnic names (e.g., "Frank Soto," "Bob Castini").

Participants learn associations for remembering numbers and months. For example, the number 10 is associated with a dime; 747 is associated with a jet. The month of November can be associated with a Thanksgiving turkey. In one exercise, participants will remember a doctor appointment on November 5th. November can be associated with a turkey; the number 5 can be associated with a nickel, and participants can visualize a turkey with a nickel on its chest, wearing a stethoscope. Association and imagery can be applied to expand vocabulary. For instance, participants use association and imagery to learn the word "silage." Trainers will associate the word with a sound (e.g., "silage" as rhyming with "mileage"), meaning (animal feed made by fermenting grain in a silo), spelling (contains the word "silo"), and with an image (e.g., visualize cows eating grain near a silo). Versatility training involves being flexible in using techniques. Trainers lead exercises to interchange using sentences/stories, imagery, and Look-Snap-Connect to remember the same information. The topic of organizational strategies includes tips and class discussion for using practical memory aids, such as written and auditory reminders, and having special places for important things like keys. Participants learn about multiple factors affecting memory, including lifestyle and health-related variables, such as distraction, multitasking, stress, and anxiety. Participants apply the various memory techniques learned over the 5 weeks to new material as a final review. At the end of the course, trainers distribute a handout with resources (e.g., books, websites) where people can learn more about memory enhancement. Participants also are asked to complete an anonymous evaluation of the MTP program.

The MTP program manual includes information to help peer-trainers pace the class. For instance, the manual suggests how many participants the trainers should call on during an exercise or provides approximate time limits for exercises (e.g., "call on two participants" or "allow three minutes") to help keep the course on track and ensure adequate time to practice the various exercises. Possible examples and answers to class exercises are provided in italics to help trainers if participants need additional assistance or have questions about examples. The curriculum is paced at a rate comfortable for most adults over 60 years of age. Each trainer is fully self-contained for training in the community. They are equipped with a file with all materials needed to present the course.

Implementing the Program

Characteristics for MTP Program Participants

The MTP program targets people 60 years of age or older with mild, age-related memory concerns or changes. Patients with dementia will find the program too difficult and will become frustrated and generally unable to implement or learn the memory training strategies (Cahn-Weiner, Malloy, Rebok, & Ott, 2003; Yesavage, 1982). Memory training studies yielded mixed results for effectiveness in persons with MCI (Belleville, 2008; Rapp, Brenes, & Marsh, 2002; Unverzagt et al., 2007; Wenisch et al., 2007); therefore, some persons with MCI may not be optimal candidates for the program.

Participants typically can have a range of visual and auditory acuity for participation in the program. During screening, staff inform people who report sensory deficits that the MTP program requires reading and listening. Participants then make the choice whether or not to enroll. The material and environment in the course is sufficient for individuals with mild age-related hearing or visual deficits. For instance, most visual materials are printed in larger (size 14) font, and trainers are taught to present auditory information clearly and at a reasonable pace. Participants with sensory deficits are encouraged to position themselves closer to the trainers. At times, some participants with severe sensory deficits who started the course have self-selected out, mainly due to hearing difficulties.

Participants come from various sources in the community. Some respond to advertisements or learn of the MTP program through word of mouth. Others are relatives of patients from memory disorder clinics, or are patients who were originally referred for cognitive assessments who were found to have no significant memory impairment. MTP program staff do not perform cognitive screenings on potential participants. Instead, staff members inform interested callers that the MTP program is an educational course for persons with mild memory complaints. Addressing upfront that the MTP program is not a cognitive rehabilitation program for persons with brain injury, dementia or MCI has been generally effective in recruiting appropriate participants. In organizations that have different programs for people with varying degrees of cognitive ability, persons ineligible for the MTP program may be directed to a different course or activity. There have been occasions where persons with more severe cognitive impairment have taken the course, and in those cases, the individuals sometimes drop out, or may enjoy the course but not necessarily benefit from it. In the event that someone with more significant cognitive difficulties enrolls in the MTP program, peer-trainers will work individually with that person so the progress of other participants who are not cognitively impaired is not affected.

Recruitment, Training, and Retention of Peer-Trainers

As indicated in Table 13.2, there are several core factors relevant to the recruitment, training, and retention of successful peer-trainers for the MTP program. Trainers are initially recruited via newspaper advertisements and word of mouth. Potential trainers responding to the advertisements call administrative staff who then describe the MT program and the role of trainers in detail. Typically, after 15–25 potential volunteers are recruited, a psychologist with expertise in neuropsychology and aging conducts a 2-day training seminar to orient the volunteer memory trainers.

During the 2-day seminar, potential trainers learn about the rationale behind the program, memory systems, functions, and changes with age. Potential trainers learn the techniques and review the curriculum in detail. The psychologist models how to present the techniques, provides examples, and demonstrates class exercises using the manual. Each potential trainer then reads sections of the script aloud and role plays teaching portions of the course to the group. At the end of the training, the staff determines which potential trainees appear to be a good match for the program. Once the trainers are selected, they undergo further training and certification. New trainers are required to learn the script thoroughly and then return for mock presentations which are reviewed by peer and staff. Trainers that meet the standards of the Longevity Center at the mock presentations are then considered to be "certified". Those who do not meet the standards undergo additional training. New trainers are typically paired with and mentored by an

Table 13.2 Factors for successful recruitment, training, and retention of memory training peer (MTP) program trainers

Recruitment
Advertise in local papers, newsletters, word of mouth
Liaison with community groups
Recruit from MTP courses
Characteristics of successful MTP peer trainers
"People persons" with strong social and communication skills
Comfortable with public speaking
Confidence in and ability to understand and implement the mnemonic methods
Sensitive to diversity of participants
Quality control
Require peer-trainer applicants to take the MTP course
Conduct 2-day training seminar
Conduct certification of trainers, consisting of mock teaching of MTP material with peer-review/feedback
Experienced peer-trainers mentor new trainers
Retention of trainers
Meet needs of trainers for supplies and materials
Provide trainer appreciation days and continuing education
Require a minimum commitment to MTP program
Retain larger volunteer pool to prevent burn-out
Minimize time between recruitment and teaching first MTP course
Consider stipends for peer-trainers

experienced trainer for approximately two courses. The UCLA Longevity Center also collects anonymous reviews from participants at the end of each course, which are used to monitor quality of the training experiences. In addition, the Center holds trainer meetings twice yearly for continuing education on related or supplementary topics.

The Longevity Center has recruited volunteer trainers from all walks of life and of all ages (20s to 80s). Successful trainers usually have strong social skills, relate well to peers, and are comfortable with public speaking. They also have confidence in their ability to learn and use the memory techniques. Successful trainers are dedicated to fostering an understanding of the techniques, are sensitive to individual differences in learning ability and style. They are also sensitive to the diversity of participants with respect to age, gender, culture, ethnicity and race, sexual orientation, socio-economic status, and disability. Many of the trainers have backgrounds in education, business, or social work, but the most important quality is being a "people person." Many trainers have had a family member with dementia, which led to their interest in age-related memory loss and memory training.

National and Local Venues

The MTP program has been administered locally in the Greater Los Angeles area and nationally. Locally, the program is presented at UCLA or hosted by venues that provide activities or services for older adults, such as senior centers, churches, synagogues, adult education and cultural centers, and museums. The local venues pay a fee to cover program expenses. Venues are responsible for recruiting participants, and then the peer-trainers from UCLA present the course at the venue. The MTP program has also been licensed to venues who then independently host the program for an entire year in a designated geographical catchment area. The licensees receive the manual and templates for administrative and promotional materials. Licensees are responsible for recruiting their own peer-trainers and participants and for providing all supportive functions and materials for the program. Licensees have included nonprofit healthcare organizations, memory disorders clinics, senior centers, and businesses. The MPT program psychologist from UCLA travels to the licensee site and trains their peer-trainers in the same 2-day seminar used for training local peer volunteers. Organizations that license the program are required to present it in its current form; however, adjustments can be made depending on the community of participants. For instance, the MTP program has been licensed to a Japanese-American nonprofit healthcare provider and also to a healthcare organization that provides outreach services to Latinos and Native Americans, and the peer-trainers can make adjustments as needed so that the program is culturally sensitive and relevant.

Requirements for Administration

Peer-led memory programs have the potential to reach a considerable number of people in the community. Like other peer-led programs, especially those administered

by nonprofit organizations, the limitations or barriers to wide dissemination include staffing, funding, and level of community interest. Administrative activities include advertising the MTP course, screening participants, recruiting, training, and supporting the peer-trainers. The most labor intensive aspects of the MTP program involve managing incoming phone calls after advertisements are placed for either courses or organizing training sessions for new peer-trainers. Identifying new venues to host the course is an ongoing task. Typically, having two to three venues lined up in advance is needed to maintain a steady stream of course offerings.

One challenge common to many volunteer-based programs is the recruitment and maintenance of the volunteers. For the MTP program, we have had many dedicated peer-trainers volunteer for several years. Trainers are recruited through advertisements, word of mouth, and the courses themselves. It is helpful to have peer-trainers commit to presenting three courses per year to reduce volunteer turnover. The time between recruitment of new peer-trainers and their first training venue should be minimized to maintain motivation. In addition, holding periodic trainer appreciation days or continued education is valuable for keeping volunteer peer-trainers involved. In Los Angeles, we maintain an active roster of 35 volunteer peer-trainers. Other organizations have used a combination of volunteer peer-trainers or permanent organization staff. In other self-management peer-led courses (Lorig et al., 1999), peer-trainers sometimes receive stipends.

Course frequency depends upon community interest, venue staffing, and available resources. In Los Angeles, with two part-time staff and an all-volunteer peer-trainer roster, over a 3-year period (2007 through 2009) the program was presented at 61 venues (approximately 20 per year) and reached 1,235 participants (an average of 412 persons each year).

The funding of the MTP program varies. Foundation funding from philanthropic organizations focusing on older adult health, wellness, and other issues is one avenue. Individual donors or self-supported mechanisms such as annual fund raisers are also mechanisms for funding. Venues may be charged a fee to cover expenses for staff time and materials.

In rural locations, a central venue, such as a large senior center, may offer the MTP program for a wide geographical catchment area (e.g., multiple counties), recruit peer-trainers from those areas and then offer the program in the areas where the peer-trainers live to cover a wide area. Some venues have opted to partner with other organizations that act as satellite sites so the MTP program can be held at several locations within a geographical region. In large metropolitan areas, having peer-trainers travel to communities is advantageous for circumventing barriers to access, such as mobility, traffic, insufficient transportation, or travel costs.

Memory Improvement Results from the Program

At three points during the 5-week course (the first, third, and fifth sessions), participants in the MTP program take a memory quiz or memory check, which assesses their ability to learn and remember ten words. The purpose of these

memory checks is for participants to observe their progress and gain confidence. To determine if participants are seeing progress, the Longevity Center collected anonymous memory check results on a voluntary basis from participants. We randomly selected a subsample of memory checks from 145 participants and conducted paired *t*-tests to assess whether performance improved from baseline to the two follow-up assessments. Participants recalled a significantly greater number of words at both follow-up memory checks (session 3, mean [SD] = 8.1 [2.3]; session 5 = 8.3 [2.0]) compared to baseline (5.8 [2.3]), and the effect size from baseline to follow-up was large (ES = 1.17). The ES from session 1 to session 3 (1.10) was larger than the ES from Session 3 to the final session (0.10). The second and third memory checks allowed more time than the baseline memory check (2 vs. 1 min) so that participants had more time to apply the new techniques they learned. Because the length of time is longer for retests, we cannot determine if these results indicate objective improvement, easier test conditions at follow-ups, or both.

The UCLA Longevity Center also tracks participant satisfaction with the MTP program based upon feedback from the peer-trainers and participants. Participants are asked to complete an anonymous evaluation at the end of each 5-week course. Those responses are tallied and reviewed periodically to continuously assess the effectiveness of the program and make necessary changes, adjustments, or revisions to the curriculum or program administration. Participants are asked to complete an anonymous evaluation at the end of the 5 weeks. In the Los Angeles area, from 2007 to 2009, about 61% of the participants completed evaluations. Of those, 95% reported that the information learned in the course helped them improve their memory, while 4% were neutral regarding any program benefit, and 1% disagreed that the program was helpful. Overall, 95% of respondents felt the program was a good investment of their time.

Future Plans

Program Revisions

The Longevity Center staff updates and revises the program on a regular basis. Revisions may include the addition of new material or mnemonic techniques, new topics for education, and adjustments to examples and exercises. In addition to participant feedback from the survey, the volunteer trainers provide ongoing feedback based on their experiences teaching the course, and formal trainer meetings are held to solicit their opinions and then integrate their feedback into subsequent revisions. We recently developed a shorter peer-led MTP program that includes periodic refresher sessions (i.e. "booster sessions"). The course contains new material in addition to many of the tried and true methods presented in the original MTP program. Both programs are now available through the Longevity Center.

Translation and Development of Culturally Specific Programs

Because many non-native English speakers do not have access to memory training, additional efforts could focus on versions of MTP program translated into other languages and developed for other cultures. Currently, translation of the program into Mandarin is underway, as the program has been licensed in Taiwan. Other goals include translation into Spanish language for outreach to the Latino community.

Research

Our preliminary results suggest that the MTP program may improve objective memory test performance; hence, one goal would be to test the effects of the MTP program empirically. Although the memory training strategies in the program are empirically based, we know of no studies that have assessed the effectiveness of peer-led memory training programs. Additional research is needed that demonstrates the effectiveness of memory training in encouraging participants to use memory techniques outside of the classroom so that the program lessons transfer to everyday activities and improve the frequent memory challenges facing people as they age.

Conclusion

Despite evidence supporting the effectiveness of cognitive enhancement interventions in older adults with age-related changes, few if any programs are available in the community that can be administered with ease and high quality, as well as reach a large number of persons. Even cognitive intervention programs that have been effective are not necessarily conveniently available to the general population. Just as peer-led programs have been developed and widely used to promote health awareness, health self-maintenance, and wellness, peers can promote memory awareness and education in community-residing older adults with mild age-related memory concerns. Peer-led memory enhancement and education programs, such as the one developed by the UCLA Longevity Center can make memory education accessible and affordable for a large number of people. Given the many older adults experiencing age-related memory decline and the potential benefits of the intervention, the potential impact of peer-led memory training programs could be considerable.

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