

2012 Volume 20 Number 1

SENIORS HOUSING & CARE JOURNAL

2012



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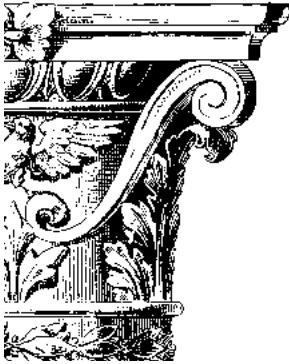
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Psychological Fitness for Older Adults: A Pilot Intervention

Jerome L. Short, PhD

ABSTRACT

The purpose of this pilot study was to evaluate a brief (three hours) psychological fitness intervention that taught and encouraged participants in a retirement community (ages 69 to 94) to practice eight daily psychological exercises. The intervention randomly assigned 96 participants to receive a program immediately or to a delayed-treatment control group. At a one-month posttest, the immediate intervention participants reported significant increases in optimism, decreases in anxiety, and marginally significant increases in perceived support compared to the control group. The results suggested the value of a brief intervention to enhance older adults' mental health, with the potential to reduce medical care costs.

INTRODUCTION

In recent years, there is increased interest in the prevention of psychological symptoms and promotion of psychological health among older adults. Brief interventions of only a few hours may provide psychological skills to enhance mood, increase health behaviors, encourage adaptive thinking, and contribute to satisfying relationships. These skills in turn may reduce the need for medical care and increase life satisfaction and longevity (Chiles, Lambert, & Hatch, 1999).

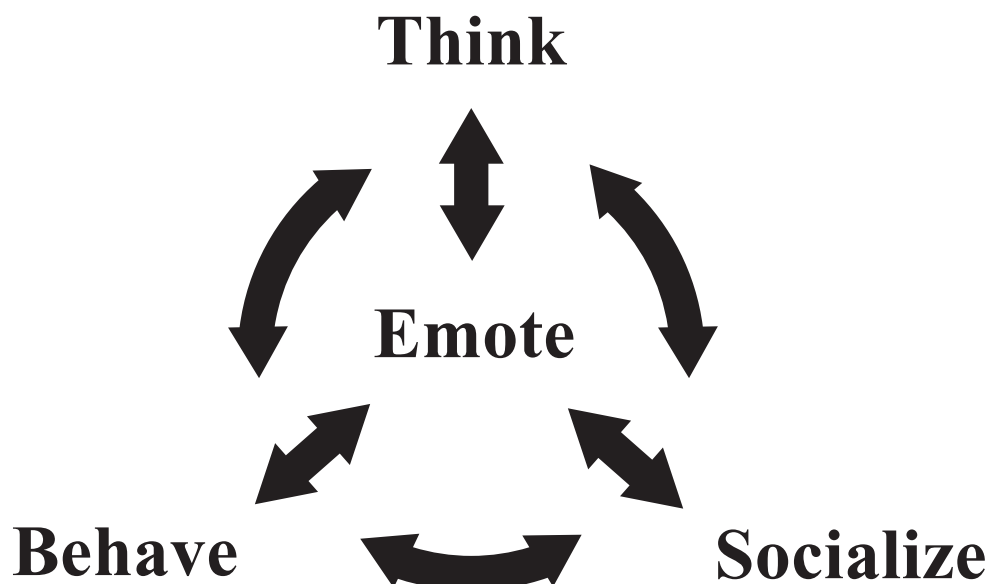
By 2050, the number of adults age 65 and older in the U.S. is expected to more than double from 40.2 million in 2010 to 88.5 million (U.S. Census Bureau Population Projections, 2008). Lifetime prevalence rates for the most common psychological disorders are 15.3% for anxiety disorders and 11.9% for mood disorders among adults above age 60 (Kessler et al., 2005), and 13.7% for Alzheimer's and other dementias

for adults above age 70 (Brookmeyer et al., 2011). Up to 20% of older adults experience significant anxiety symptoms that may not meet criteria for a specific anxiety disorder (Himmelfarb & Murrell, 1984). Among nursing home residents, 51.8% reported significant depressive symptoms in one study (Gaboda, Lucas, Siegel, Kalay, & Crystal, 2011). Depression in late life is related to more physical illness, self-neglect, suicide, and decreased physical, cognitive, and social functioning, which are associated with increased mortality (Blazer, 2009). The prevention of anxiety and mood disorders and increases in cognitive, behavioral, and social functioning are important targets for mental health interventions to increase the quality of life for older adults.

This article will review research on evidence-based mental health promotion techniques and interventions, describe a brief theoretically integrated psychological fitness intervention, present the results

Exhibit 1. BEST Model.

BEST Responses



of a pilot study for residents of a retirement community, and suggest directions for future research.

Psychological Fitness Model

Most people understand and follow the principle of performing physical exercises to enhance physical fitness. Similarly, people who do psychological exercises should enhance their psychological fitness. One can organize the evidence for effective psychological exercises with the acronym of BEST for behavioral, emotional, social, and thoughtful exercises. Furthermore, one can integrate these conceptual approaches in an interactive model that indicates that changes in any one of these four dimensions will affect the other three dimensions, as shown in **Exhibit 1**. These exercises and the integrative model are consistent with cognitive-behavioral (Beck, 1995; Jacobson, Martell, & Dimidjian, 2001), emotion-focused (Greenberg, 2002), and interpersonal (Klerman, 1984) therapies that are commonly used evidence-based treatments for reducing psychological symptoms and increasing mental health.

The next section describes two exercises for each of the four BEST dimensions: (1) behavioral activation; (2) daily health behaviors; (3) relaxation; (4) emotional processing and expression; (5) altruism; (6) social support; (7) gratitude; and (8) optimism.

Behavioral Exercises

Behavioral activation is the pursuit of enjoyable daily activities and rewarding experiences to reduce negative emotions and increase positive emotions through behavior change (Jacobson et al., 1996). A practical approach to behavioral activation is to increase the experience of rewards and pleasure that involve one's five senses of sight, hearing, smell, taste, and touch through daily activities, such as watching people, listening to music, smelling perfume, eating favorite foods, and hugging others. Several successful interventions have been reported. A single session intervention and two-week treatment interval for university students with moderate depression led to greater reductions in depression and increased

environmental reward at post-treatment relative to a no treatment control group (Gawrysiak, Nicholas, & Hopko, 2009). In addition, a five-session behavioral activation and therapeutic exposure intervention for participants with complicated bereavement led to significant improvement on structured interviews of symptoms of grief, post-traumatic stress disorder, and major depressive disorder, and self-report measures of depression, physical functioning, and social functioning, irrespective of how many days since a death occurred (Acierno et al., 2012). Another study of patients, 65 and older, with mild to moderate cognitive impairment in a geriatric psychiatric facility found that those randomly assigned to eight 30- to 60-minute behavioral activation sessions over four weeks experienced significant decreases in depression (Snarski et al., 2011). Older adults may need to consult with a physician about increased activity, especially if they experience any pain or discomfort.

Key daily health behaviors for older adults are nutritional eating, physical activity, and adequate sleep, and these behaviors appear to mediate the link between the personality trait of conscientiousness and lower mortality (Kern & Friedman, 2008). In a study of people 65 and older living in the community in Great Britain, the combination of moderate physical activity, consumption of fruits and vegetables, not smoking, and low to moderate alcohol consumption lowered the all-cause mortality rate by 58% over nine years (Hamer, Bates, & Mishra, 2011). Another study of older adults assessed physical activity and psychosocial variables at two and five years following a six-month randomized, controlled exercise trial. Older adults with higher levels of physical activity, more positive affect, and higher self-efficacy at Year 2 were more likely to continue to be active at Year 5 (McAuley et al., 2007). In a prospective study of 3,820 Spanish adults, representative of the non-institutionalized population 60 and older, those who slept eight hours or more had higher mortality within seven years as compared to those who slept seven or fewer hours, even when adjusted for health status (Mesas, López-García, León-Muñoz,

Guallar-Castillón, & Rodríguez-Artalejo, 2010). It is often helpful to provide current research evidence about nutritional eating, physical activity, and sleep to reassure older adults about the levels of each that relate to health and longevity.

Emotional Exercises

Progressive relaxation is tensing and releasing different muscles to bring about greater physical comfort. One also can imagine enjoyable settings like a park or beach and make the images more vivid by thinking of the level of stimulation to the five senses of sight, hearing, smell, taste, and touch that elicit relaxation. In one study of older women ages 63 to 79, a group randomly assigned to practice relaxation and meditation significantly reduced their state and trait anxiety in comparison to a pseudo-relaxation control group (DeBerry, 1982). At a 10-week follow-up, those who continued to practice relaxation showed decreases in state anxiety, but those who stopped practice returned to their baseline levels of state anxiety. A study of women ages 65 to 75 found similar reductions in state anxiety with continued practice of relaxation and meditation (DeBerry, Davis, & Reinhard, 1989). Imaginal relaxation, where one imagines tensing and releasing muscles, appears to offer comparable benefits to progressive relaxation for reducing anxiety and may be preferred for older adults who experience pain when tensing muscles (Ayers, Sorrell, Thorp, & Wetherell, 2007). A meta-analysis of 19 studies showed that cognitive behavioral therapy for geriatric anxiety did not seem to add anything beyond relaxation training alone in reducing anxiety (Thorp et al., 2009). Older adults may benefit from relaxation activities several times during the day and especially before sleep.

Emotional processing is spending time identifying emotions and trying to understand their cause and meaning (Stanton, Kirk, Cameron, & Danoff-Burg, 2000). Women with breast cancer who coped through expressing emotions surrounding cancer had fewer medical appointments for cancer-related morbidities, enhanced physical health and vigor,

and decreased distress during the following three months compared to those low in emotional expression, controlling for age and other coping strategies (Stanton et al., 2000). College students who wrote or talked about their worst life experience for 15 minutes on three consecutive days reported higher levels of well-being and physical health compared to students who thought privately about the experience (Lyubomirsky, Sousa, & Dickerhoof, 2006). Another study found that adults who wrote three things that went well each day and their causes every night for one week had increased happiness and decreased depressive symptoms for six months (Seligman, Steen, Park, & Peterson, 2005). In an intervention for bereaved older adults ages 51 to 85, where they verbally disclosed their thoughts and feelings about the death of their spouse in four 20-minute sessions, participants reported significant reductions in hopelessness at one-month follow-up compared to a delayed treatment control group (Segal, Bogaards, Becker, & Chatman, 1999). For those who completed a one-year follow-up, the initial decrease in intrusive thoughts was maintained at one year. Total distress decreased from pretest and from post-treatment to one-year follow-up. Negative thoughts showed no changes across the initial three periods but significantly declined at one year. Moreover, decreases in negative cognitions were associated with decreases in depression, hopelessness, intrusive thoughts, and avoidance from pretest to one year (Segal, Chatman, Bogaards, & Becker, 2001).

Social Exercises

Altruism and volunteerism are associated with lower risk of mortality for adults above age 55 (Oman, Thoresen, & McMahan, 1999). Several experiments have attempted to understand whether frequency and variation of kind acts affects the volunteer's happiness. College students who performed five acts of kindness in one day reported more increases in happiness than those who did the acts over a week (Lyubomirsky, King, & Diener, 2005). Another study indicated that students who varied

their kind acts showed a greater increase in happiness as compared to a group who did the same kind acts (Lyubomirsky & Della Porta, 2010). In an experimental intervention with Japanese college students, their happiness increased by counting their own acts of kindness for one week. In addition, happy people became more kind and grateful through the counting kindnesses intervention (Otake, Shimai, Tanaka-Matsumi, Otsui, & Fredrickson, 2006). Among older adults, there are no experimental kindness interventions, but one study found that individuals with lower income systematically reported more benefits from volunteering. The researchers suggested that adequate training, ongoing support, and stipends contributed to personal benefits and can help with recruitment for volunteering (Morrow-Howell, Hong, & Tang, 2009).

Social support is one's subjective appraisal of connection to others and that others are available and adequate to help if needed. Perceived support has been associated consistently and strongly to good psychological health and low rates of psychological disorder (Barrera, 1986). Received social support is less important to psychological well-being in older adults unless it is provided by a spouse or sibling (Thomas, 2009). Compared to younger adults, older adults' relationships are more positive and satisfying, which may be attributable to others' tendencies to treat older adults more kindly, greater freedom to choose social partners in old age, and increased social expertise at reducing conflict in relationships (Luong, Charles, & Fingerman, 2011). One intervention randomly assigned lonely elderly women who lived alone to social support meetings or a control condition. At a follow-up, the support group was engaged more socially, less lonely, and had decreased blood pressure (Andersson, 1985). In a cognitive enhancement intervention for older adults, groups attended three sessions per week in their assisted living community for three months (Winningham & Pike, 2007). The sessions educated participants about the brain and memory and stimulated memory and cognitive activity. In addition, the activities facilitated social

interactions and social support. Participants worked cooperatively as they learned each other's names and memorized interesting information about each other (e.g., state of birth, favorite food item), associated childhood photos with participants, and worked on homework assignments together. After a three-month intervention, participants reported higher perceived social support and less loneliness than a control group. A way to increase perceived social support is to conduct psychological interventions in groups so that participants can converse with others and choose to interact outside the group sessions.

Thoughtful Exercises

Gratitude is an acknowledgement that one has received something of value from others. Gratitude reduces envy and resentment, leads to a focus on the benevolence of others, reduces materialistic strivings, boosts the retrieval of positive memories, and fosters trusting interactions with others (Emmons & Mishra, 2011). In one study where college students wrote and shared a gratitude letter, they experienced greater happiness up to one month later (Seligman, Steen, Park, & Peterson, 2005). Another study found that listing up to five things students were grateful for in a gratitude journal once per week led to greater happiness, unlike another condition of doing so three times per week (Lyubomirsky, Sheldon, & Schkade, 2005). A nationwide survey of retired adults ages 65 and older found that those who felt grateful were less likely to experience symptoms of depression (Krause, 2007). There are no reported gratitude interventions with older adults, but they hold promise for addressing anxiety, depression, grief, and caregiver burden by helping people focus on positive aspects of events that have been associated with loss (Hill, 2011).

Optimism refers to positive expectations of future events (Ferguson & Goodwin, 2010). Optimism is negatively associated with depression, anxiety, hostility, distress, and negative mood, and positively associated with psychological well-being, resilience to distress, satisfaction with life, positive

mood, and positive states of mind (Carver, Scheier, & Segerstrom, 2010; Scheier, Carver, & Bridges, 2001). In a study of adults age 65 to 94, optimism predicted both purpose in life and positive affect (Ferguson & Goodwin, 2010). In another study of older adults, optimism was positively related to life satisfaction and negatively related to depressive symptoms. Furthermore, optimism partially mediated the relationship of pain to life satisfaction (Ferreira & Sherman, 2007). One pilot intervention focused on enabling HIV-infected older adults to accurately appraise sources of stress, develop adaptive coping responses, including optimism, and access social support resources. The intervention increased participants' perceptions of social support, perceptions of social well-being, problem-solving, confrontive coping, and future optimism (Heckman et al., 2000). For older adults, the planning of daily and weekly enjoyable events and making reminders easily available may increase optimism.

Multiple Component Interventions

There have been previous multiple component interventions presented individually, online, or in groups. Moskowitz (2010) created a positive affect intervention named IRISS (intervention for those recently informed of their seropositive status) and delivered five one-on-one sessions to participants. A facilitator taught eight skills: (1) noting daily positive events; (2) capitalizing on or savoring positive events; (3) gratitude; (4) mindfulness; (5) positive reappraisal; (6) focusing on personal strengths; (7) goal setting; and (8) small acts of kindness. In a pilot study of 11 participants with HIV, she found a decrease of more than 40% in depression scores between the final intervention session and a four-week follow-up assessment, and an increase in positive affect scores of more than 20% between the start of the intervention and the week after the intervention ended.

One large-scale effort to improve adults' mental health is the Army's Comprehensive Soldier Fitness program for soldiers ages 18 and older (Seligman &

Fowler, 2011), which includes areas of emotional, social, family, and spiritual fitness. The Army presented the intervention to soldiers in online modules. An evaluation with nearly 10,000 soldiers showed small effect size ($d = .07$ to $.13$) increases in emotional fitness, adaptability, character, good coping, optimism, family fitness, family support, social fitness, friendship, and organizational trust for 18 to 24 year olds. There were increases in only emotional fitness, character, and friendship for those over age 24 compared to control groups (Lester, Harms, Herian, Krasikova, & Beal, 2011).

A test of an earlier version of the present study's three-hour group-based psychological fitness intervention with college students found that the randomly assigned intervention group participants reported significant increases in optimistic thinking, academic competence, positive body image, global self-esteem, and life satisfaction, and significant decreases in anxiety, depression, and anger symptoms compared to a control group (Short, 2006). Since there have been no similar interventions tested with older adults, the following study tested whether a psychological fitness intervention could contribute to older adults' mental health.

The psychological fitness intervention targeted members of a retirement community and included a focus on doing the eight exercises previously described. It was hypothesized that practice of behavioral, emotional, social, and thoughtful (BEST) exercises would decrease anxiety and depression and increase gratitude, optimism, perceived support, social life satisfaction, and amount and satisfaction of physical exercise and sleep for older adults.

METHOD

Participants

The participants included 96 residents of a retirement community (78% female) and their mean age was 81.6 (age range: 69 to 94). Nearly all residents were Caucasian (96%), and the majority (62%) was

unmarried, primarily due to spousal death (46% of the total sample). The education levels of participants were 6% less than high school, 32% high school graduates, 21% had some college, 21% were college graduates, and 20% had advanced degrees. There were no demographic differences between the intervention and control groups. They responded to flyers describing the study that they received in their mailboxes. There was no monetary compensation for participation. Nearly all the residents were able to walk to meeting rooms, except for five who used motorized wheelchairs. There was no information on their overall health status.

Instruments

Mini-Mental State.

Thirty items from the Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975) screened participants for cognitive impairment. Research has shown the measure is valid and reliable with “very old” (age 75+) adults (Hopp, Dixon, Grut, & Blackman, 1997). The scale was scored from 0 to 30.

Anxiety.

Ten items from the Symptom Checklist-90 (Derogatis, Lipman, & Covi, 1973) measured anxiety. This measure has assessed the mental health status of adults ages 60 to 88 (Scogin & Rohling, 1989). The items were scored from 1 (“not at all”) to 5 (“extremely”). Cronbach’s alpha was .91 for this study.

Depression.

Twenty items from the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) measured depression. The CES-D has screened for depression in a sample of older adults with an average age of 72 (Irwin, Artin, & Oxman, 1999). The items were scored from 1 (“less than one week”) to 4 (“five to seven days per week”). Cronbach’s alpha was .85 for this study.

Social Life Satisfaction.

Five items from the Extended Satisfaction with Life Scale (Allison, Alfonso, & Dunn, 1991), an adaptation of the commonly used Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) by inclusion of the word “social” in each item, measured satisfaction with social life. Older adults ages 65 to 95 have completed the SWLS (Roth, 2009). The items were scored from 1 (“strongly disagree”) to 5 (“strongly agree”). Cronbach’s alpha was .95 for this study.

Social Support Appraisals.

Twenty-three items from the Social Support Appraisals Scale (Vaux et al., 1986) measured perceived friend and family support. Older adults ages 65 to 95 have completed this scale (Roth, 2009). The items were scored from 1 (“strongly disagree”) to 4 (“strongly agree”). Cronbach’s alpha was .93 for this study.

Optimism.

Six items from the Life-Orientation Test – Revised version (Scheier, Carver, & Bridges, 1994) measured optimism. Older adults ages 65 to 94 have completed this scale (Ferguson & Goodwin, 2010). The items were scored from 1 (“strongly disagree”) to 5 (“strongly agree”). Cronbach’s alpha was .74 for this study.

Gratitude.

Six items from the Gratitude Questionnaire (McCullough, Emmons, & Tsang, 2002) measured gratitude. Older adults completed this measure in a large longitudinal study (Krause, 2009). The items were scored from 1 (“strongly disagree”) to 5 (“strongly agree”). Cronbach’s alpha was .79 for this study.

Amount and Satisfaction of Health Behaviors.

Four items were created for this study. Two items asked “How much do you exercise per week?” and “How much do you sleep per day on average?” The other two items asked about satisfaction with exercise and sleep on a 4-point scale: 0 (“not at all”); 1 (“somewhat”); 2 (“moderately”); and 3 (“very much”).

Procedure

A team of research assistants screened participants. In order to participate, the older adults had to achieve Mini-Mental State Examination scores greater than 24 (the mean score was 29 and did not differ by group). Three people did not meet the criteria and were referred to a social worker in the retirement community. One person's data were excluded from analyses after inconsistent reporting of age and education and multiple incorrect responses to the Mini-Mental State Examination. Half of the participants were randomly assigned to receive the intervention immediately after a pretest, and the other half served as a delayed treatment control group. They all completed a pretest at the time of the screening and then a posttest one month later after the immediate treatment group received the intervention for three weeks.

The intervention consisted of three hours (one hour per week for three weeks) of teaching, discussing, and practicing in small groups (five to 10 members) eight behavioral, emotional, social, and thoughtful exercises to improve psychological fitness according to handouts from a guidebook (Short, 2010). The content for the guidebook came from a review of effective psychotherapy techniques, prevention program components, and health promotion strategies with adults. The group leader (a licensed clinical psychologist) presented the BEST model and indicated that change in any one of the behave, emote, socialize, and think dimensions would affect the other three dimensions. The group members learned that behavioral activation and health behaviors contribute to pleasant emotions, optimistic thoughts, and friendly interactions. Members were encouraged to engage in behaviors that bring pleasure to each of the five senses of sight, hearing, smell, taste, and touch on a daily basis. They also received information and strategies to help maintain physical activity and restful sleep. Next, they learned progressive muscle and imaginal relaxation strategies and emotional processing and expression that should lead to optimistic thoughts, approach behaviors,

and friendly interactions. Emotional processing and expression was encouraged with a FLAME acronym (feel the sensations, label the emotions, analyze the pattern of the emotions, manage the emotions, and express the emotions). In addition, group members learned that kind behaviors and perceived support should lead to pleasant emotions, approach behaviors, and optimistic thoughts. Group members discussed enjoyable volunteer activities and ways to best ask for and offer help. Satisfying relationships were encouraged with a PECK acronym (perspective taking, empathy, communication, and kind behaviors). Participants learned that optimistic and grateful thoughts contribute to more pleasant emotions, approach behavior, and friendly interactions. They were encouraged to avoid jumping to negative conclusions and examine the evidence for negative thoughts. Group members also discussed what they were grateful for and reported on future positive events that they scheduled. They received folders with eight pages of descriptions of the BEST exercises and were encouraged to try them over the course of the week and discuss their experiences at the beginning of the next group meeting.

RESULTS

Mean score differences on the measures for the immediate intervention group and the delayed treatment control group were tested with repeated measures analyses of variance with two levels of the time variable (Time 1 and Time 2 scores) and two levels of the group variable (immediate intervention and delayed treatment control groups). There was one main effect of group on sleep satisfaction ($F[1, 94] = 7.32, p < .01$), with the intervention group reporting more sleep satisfaction than the control group. There were no main effects for time. The interactions of time and group variables provided evidence of effects due to the intervention and are displayed in **Exhibit 2**. Older adults who participated in the intervention reported increases in optimism ($p < .05$) and reductions in anxiety ($p < .05$), and the

control group reported no change. There also was a marginally significant decrease in perceived support ($p < .08$) for the control group as compared to the intervention group (who maintained their perceived support). There were no significant groups by treatment interactions in social life satisfaction, gratitude, amount of sleep or exercise, sleep or exercise satisfaction, or depressive symptoms. The partial eta-squared effect sizes are analogous to explained variance (Cohen, 1992) and were .053 for optimism, .048 for anxiety, and .034 for perceived support. Both groups reported means of approximately 4.5 hours of weekly physical exercise and 7.5 hours of daily sleeping that did not change from pretest to posttest one month later. The

intervention group members' mean reported use of the altruistic and volunteerism exercises was 4.5 days per week; the thinking exercises of optimism and gratitude was 4.0 days per week; the emotional processing, expression, and relaxation exercises was 2.8 days per week; and the behavioral activation exercises was 1.3 days per week at the posttest.

DISCUSSION AND CONCLUSION

The results indicated the value of a brief psychological fitness intervention to increase optimism and reduce anxiety for older adults. There also was a marginally significant increase in perceived support for intervention participants. The results

Exhibit 2. Mean Comparisons Between Intervention and Control Groups of Older Adults ($n = 96$).

Variable	Intervention Group ($n = 46$)		Control Group ($n = 50$)		Time by Group Interaction		Partial eta squared
	Pretest	Posttest	Pretest	Posttest	<i>F</i>	<i>p</i>	
Optimism (SD)	3.87 (.82)	4.11 (.79)	4.05 (.68)	4.01 (.77)	5.19	.025	.053
Gratitude	4.61 (.62)	4.65 (.53)	4.63 (.50)	4.55 (.77)	0.81	.370	.009
Perceived Support	3.42 (.49)	3.43 (.48)	3.46 (.43)	3.36 (.50)	3.25	.075	.034
Social Life Satisfaction	3.39 (1.38)	3.70 (1.20)	3.53 (1.02)	3.53 (1.02)	2.61	.110	.028
Sleep Satisfaction	2.14 (.86)	2.37 (.73)	1.83 (.88)	1.83 (.88)	2.11	.150	.024
Exercise Satisfaction	1.93 (.99)	2.12 (.93)	1.80 (1.03)	1.85 (.84)	1.08	.302	.012
Anxiety	1.42 (.44)	1.31 (.30)	1.43 (.57)	1.46 (.58)	4.55	.036	.048
Depression	1.40 (.43)	1.40 (.37)	1.50 (.55)	1.51 (.55)	0.00	.970	.000

are similar to a psychological fitness intervention for college students that found that a three-hour intervention increased optimism and reduced anxiety (Short, 2006). One difference between the intervention results of the two studies is that the current intervention did not significantly decrease depressive symptoms. This may be due to the relatively low levels of depressive symptoms reported by the participants, the brevity of the intervention, or the persistence of depressive symptoms. Behavioral activation to reduce depressive symptoms may be more effective when there is evidence that people have decreased their physical activity. A single session behavioral activation intervention for university students with moderate depression led to reduced depression and increased environmental reward (Gawrysiak et al., 2009). There was no evidence that participants changed their physical behaviors in this study. Most participants reported moderate levels of daily exercise and moderate satisfaction. They may not have viewed additional physical activity as a primary goal for themselves.

Several exercises may have contributed to reductions in anxiety. Optimism and perceived support, which significantly or marginally increased among the intervention participants, have contributed to reduced anxiety in previous research (Barrera, 1986; Carver et al., 2010). In addition, the participants learned and practiced relaxation, emotional processing, and emotional expression techniques known to reduce anxiety (DeBerry et al., 1989; Stanton et al., 2000). A limitation in this study is the lack of pretest measures of the use of relaxation, emotional processing, and emotional expression. One should measure these exercises at multiple times in future tests of this intervention.

The fitness intervention contributed to increased optimism like previous research (Short, 2006) has shown. Enhanced optimism may have the potential to reduce medical care costs. For example, independent of depression, patients with high levels of optimism were less likely to experience rehospitalization by eight months after coronary artery bypass

graft surgery (Tindle et al., 2012). The intervention did not significantly affect gratitude. The entire sample had high ratings of gratitude (means of approximately 4.6 on a 5-point scale) at pretest, and there was not much room for improvement. Some research with adolescents has suggested that gratitude interventions may have limited benefits for those high in gratitude (Froh, Sefick, & Emmons, 2008). Perhaps older adults in settings with fewer resources and fewer support staff might have lower ratings of gratitude and more room for improvement.

The group-based intervention and discussions of family and friend relationships may have contributed to marginally significant increases in intervention members' perceived support. A group-based intervention is more cost-effective than an individual-based intervention but not as cost-effective as an online intervention; however, a group intervention may appeal to some people more than an online intervention. The opportunity to ask questions and receive prompt feedback may contribute to quicker learning and mastery of the presented skills. Group meetings provide an event for members to look forward to, an opportunity for physical activity to walk to the meeting room, the presence of group members to communicate with, and a chance to hear new perspectives.

The fitness intervention consisted of multiple exercises, and there was evidence of improvement on emotional, social, and thoughtful dimensions. The effect sizes for the outcome measures were in the small to medium range (partial eta-squared = .034 for perceived support, .048 for anxiety, and .053 for optimism; .01 is considered small and .06 is considered medium; Cohen, 1992) and were larger than the significant effect sizes reported for the Army's Comprehensive Soldier Fitness program for soldiers (Lester et al., 2011). The Army's program had Cohen's *d* effect sizes of .13 or less (.2 is considered small and .5 is considered medium; Cohen, 1992). Some researchers have suggested that successful interventions should match the person to the exercise since different exercises may work better for different

people (Lyubomirsky, King, & Diener, 2005). A variety of exercises and skills give people alternatives if they are not sufficiently effective or become harder to implement. The knowledge of multiple exercises and freedom to choose particular exercises may help with completion of them. In an online study where adult participants were encouraged to engage in six psychology exercises, individuals who had a high preference for an exercise were more likely to complete the exercise (Schueller, 2010). Recent research also suggests other types of beneficial exercises for interventions, such as savoring, capitalizing, mindfulness, and focusing on personal strengths (Moskowitz, 2010).

Future studies should include longitudinal follow-ups of the intervention, component analysis of the different aspects of the intervention, and daily experience sampling to determine immediate impact of specific exercises on mood, behaviors, and social interactions. There should be further efforts to refine the intervention by focusing on the most effective psychological exercises and greater use of technology to teach, monitor, and provide feedback on progress toward improved mental health.

This brief, structured, group psychological fitness intervention may be an economical way to enhance mental health for older adults in a variety of settings. Chiles, Lambert, and Hatch (1999) conducted a meta-analysis of 91 studies published between 1967 and 1997 that included patient groups undergoing surgery, patients with a history of health care system overuse, and patients receiving treatment for psychological disorders. Overall, cost savings due to psychological interventions were in the range of 20% to 30% across studies, and 90% of studies reported evidence of cost offset.

Although the program was conducted by a psychologist, that is probably not essential for program success. One could evaluate different types of leaders and styles of program presentation in the future. In addition, family and other caregivers to older adults also may benefit from these techniques and could model the use of them for others. Brief psychological

interventions hold promise for wider implementation through innovative programs and use of technology and may prove beneficial for greater numbers of older adults in the future.

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ACKNOWLEDGEMENTS

This research was conducted with assistance from The Erickson Foundation. The author thanks John Parrish, PhD (Executive Director, The Erickson Foundation), Shirley Metzger, LCSW (The Erickson Foundation), Barbara Pilgram, MA (The Erickson Foundation), and Diane Wagner, MA (George Mason University) for their assistance in planning and carrying out this study. The author is also grateful to the residents of the retirement community who participated in this study.

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