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Effectiveness of a relaxation technique to decrease the memory and behavior problems of Alzheimer's patients

Stella Maris Verna

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EFFECTIVENESS OF A RELAXATION TECHNIQUE TO DECREASE THE MEMORY AND BEHAVIOR PROBLEMS OF ALZHEIMER'S PATIENTS

by

Stella Maris Verna

Dissertation Submitted in Partial Fulfillment of
the Requirement for the Degree of
Doctor of Philosophy
Psychology

Walden University
May 2001

DOCTOR OF PHILOSOPHY DISSERTATION

OF

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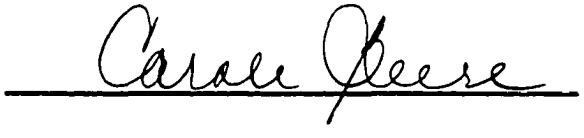
APPROVED:



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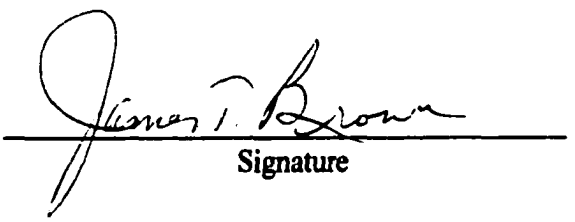

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Abstract

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Abstract

This study explored the effects of instruction in a relaxation technique on patients diagnosed with mild to moderate Alzheimer's disease (AD). The two-group pretest-posttest quasi-experimental design was implemented with 34 pairs of AD patients and caregivers in a group setting. It was hypothesized that treatment patients, compared with controls, would show (a) increased mental functioning, measured by their scores on the Annotated Mini-Mental State Examination (AMMSE) (Folstein, Folstein, & McHugh, 1975); and (b) decreased memory and behavior problems, measured by caregivers' scores on the memory and Behavior Problems Checklist (MBPC) (Zarit, Orr, & Zarit, 1985). Treatment subjects were instructed in a 5-week course (Benson, 1975, 1997), and controls followed normal activities. Results of *t*-tests and MANCOVA supported both research hypotheses. Treatment subjects showed significantly higher AMMSE gain scores on four of nine measures, and a significantly higher mean posttest score (treatment, $M = 24.00$; control, $M = 20.59$) ($F = 86.62$, $p < .01$). Treatment subjects showed significantly lower MBPC gain scores on 17 of 32 items, and a significantly lower mean posttest score (treatment, $M = 33.88$; control, $M = 51.94$) ($F = 75.98$, $p < .01$). Thus, results of this study showed that instruction in a relaxation technique can help mild to moderate AD sufferers to increase their mental functioning and decrease their memory and behavior problems.

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CHAPTER 1

INTRODUCTION TO THE STUDY

As longevity increases worldwide and the older population continues to grow, attendant medical, psychological, and socioeconomic problems increase concomitantly. Older adults have assumed an increasingly large proportion of the population. For example, in Japan and the United States, 13% of the population, as indicated by statistical methods with geometric progression, are over 65, and in the United Kingdom, this age group comprises about 17% (Steel, 1997). In developing countries such as Indonesia, Liberia, and Thailand, the older population is expected to quadruple in the next 25 years (Steel, 1997). In the United States the number of individuals age 60 and over will multiply 6 times from 1950 to 2025, and by 2050 it is estimated that those from 60 to 85 will comprise almost 25% of the total population (Chawla, 1993).

Worldwide, Alzheimer's disease (AD) afflicts an estimated 20 million older individuals. Among adults in the United States age 65 and over, Alzheimer's disease is the fourth leading cause of death. The afflicted include approximately 10% of those 65 and over, 19% of those 75 to 84, and 48% of those over 85 ("What Is Alzheimer's Disease?," 1996).

As of 2000, an estimated 4 million Americans will have AD (Perel, 1998). By 2050, an estimated 14 million Americans will contract AD unless significant breakthroughs take place

to prevent or slow this disease (Alzheimer's Association, 1999). As longevity and the number of older Americans increase rapidly in the coming years, AD will also increasingly affect them. This disease is now considered a major public health problem (Plaud, Moberg, & Ferraro, 1998). Although early onset may occur between ages 50 and 65, late onset, after 65, is much more common. AD now afflicts over 60% of those over 65 years of age (Morrison-Bogorad, 1997). As Wetle (1997) observed, aging and its associated problems will be one of the foremost issues of the 21st century.

AD is a degenerative disease in which the brain is grossly affected. The disease affects all aspects of an individual's functioning: cognitive, physical, neurological, and emotional. Especially common is the progressive decline of cognitive and memory functioning, including language use and visuospatial abilities (Richards & Hendrie, 1999). Disorientation, depression, suspiciousness, anxiety, stress, and apparently unprovoked angry outbursts commonly occur. According to the Diagnostic and Statistical Manual for Mental Disorders (American Psychiatric Association, 1994), survival rates average 8 to 10 years from onset, with a range of 1 to 20 years and progressive degeneration of all functions.

AD is a type of dementia, defined generically in the DSM-IV (1994) as "the development of multiple cognitive

deficits" from a medical condition, persistent effects of a substance, or combined physiological conditions (p. 133).

Of the 12 types of dementia specified in the DSM-IV (1994), AD is the most common, occurring in over 60% of all those with dementia. As Kaplan and Sadock (1996) reported in their text sypnosizing clinical psychiatric disorders, AD has been found to be higher in women than men, and for both groups, prevalence increases with age. In addition, these authors estimated that AD patients "occupy more than 50 percent of all the nursing home beds" (Kaplan & Sadock, 1996, p. 591).

Although the first description of AD appeared in medical literature in 1907, no prevention or cure has yet found. Nevertheless, promising scientific and medical research has been ongoing and intensive into the physiological causes, course of the disease, and palliative pharmacological treatments (Cutler & Sramek, 1996; Hollister & Gruber, 1996; Morrison-Bogorad, 1997; Richards & Hendrie, 1999).

Research on a vaccine for AD is promising but in the initial stages ("Scientists Announce Initial Results," 2000). Present treatments include medication and a range of nonpharmacological modes to help the individual maintain or regain memory and related mental functioning. Whether patients are at home with a caregiver or guardian, in nursing homes, assisted-living facilities, or adult day care

centers, treatments are directed toward helping afflicted adults cope with the cognitive deterioration, decline in self-esteem, and increases in behavior problems and emotional stresses that most often accompany this disease. However, to date, little research has explored such alternative approaches to traditional treatments for AD (Borkovec & Costello, 1993; Fugh-Berman, 1997). New approaches and research on their efficacy may give AD patients greater opportunities to resume or regain mental functioning, lessen their stress levels, and decrease their behavior problems.

Background of the Problem

In Dade County, Florida, the site of the research, it is estimated that 1 in 10 persons over 65 and almost half of those over 85 have AD (Agency for Health Care Administration, 1998). The Alzheimer's Association (1999) estimates that overall in this large county there are over 40,000 cases of AD. The toll is tremendous in suffering and cost, not only for those afflicted but also for family members and others who care for the AD patients (Ronch, 1996; Wuerst, Ericson, & Stern, 1994).

Both pharmacological and nonpharmacological treatments are prescribed for AD patients. However, pharmacological treatment is often contraindicated for behavior problems associated with AD in older adults. Side effects are numerous and potentially dangerous, such as dizziness,

blurred vision, confusion, and cardiovascular and central nervous system depressant effects. These side effects can add significantly to the difficulties of dementia (Suhr et al., 1999).

Nonpharmacological and psychosocial treatments are similar, whether delivered in facilities that include AD patients with a more general older population or specialized AD centers (Burnside, 1994). All activities are intended to encourage and promote the afflicted adult's socialization, mental functioning, emotional coping, and physical health. If the patients' responses are positive, family members and guardians also benefit with lower stress levels and increased communication with the AD relative, who again resembles the person they once knew (McCarty, 1996).

Facilities for AD patients offer nonpharmacological treatments that include many educational and recreational activities, such as reviews of current events, diverse games, field trips, hobby development, and cultural activities. The psychosocial treatments include reminiscence groups, theme-oriented groups, and music and art therapy (Duchesneau, 1994; Partners in Caregiving, 1995).

Such treatment modes fulfill many functions, primarily to keep the patients active, interested in their surroundings, and occupied for as long as possible. These modes also may help to give structure to the patients' daily routines, to recover lost socialization skills, and to limit

some of their disorientation (Aisen, Marin, & Davis, 1997). Despite prevalence of these treatment modes, little empirical research exists that measures the specific benefits of the typical activities or reduction in behavior problems (Burnside, 1994; Easkin, Glasgow, & Riley, 2000; Romaniuk & Romaniuk, 1981; Toseland, 1990). Most often, improvement is variable and deterioration is consistent (DSM-IV, 1994).

In light of these directions, other means of treatment have begun to be explored. As alternative practices encompassing both the body and mind have become more widely accepted in the treatment of many illnesses (Maier, Watkins, & Fleschner, 1994), mind/body techniques with Alzheimer's patients have been increasingly applied.

This trend is indicated as gerontological researchers have recognized the need for more innovative approaches concerning AD patients. Ader (1995) reported on current research in psychoneuroimmunology about the increasing links found between the activity of the brain and emotions and the physiological immune system. Cotrell and Schulz (1993) called for "identification of new variables, models of change, and hypothesis development" for the study of AD patients (p. 209). Kaplan and Sadock (1996) suggested that "brain-imaging techniques" may be useful in AD cases (p. 592). And Tarrant (1996) reported that recollection and guided imagery, a mind/body technique, positively affected

emotional and physical symptoms.

Mind/body applications, such as relaxation techniques, have proven to be effective when applied to various clinical conditions. These conditions include pain, anxiety, and agitated behavior. However, to date little research has explored alternative approaches to traditional treatment for AD (Brokovec & Costello, 1993; Fugh-Berman, 1997). Research with AD patients as subjects may be complicated by the degree of their mental deterioration (Danner, Beck, Heacock, & Modlin, 1993). It is often severe, and thus their guardians or caregivers, who are closest and most familiar with the patients, should be enlisted to observe, ascertain, and accurately report changes in the patients (Suhr, Anderson, & Tranel, 1999).

Notwithstanding the severity of AD, in research endeavors AD patients are often neglected or dismissed. In recommending that AD patients be considered viable resources for research, Cotrell and Schulz (1993) asserted a position generally contrary to the prevailing views.

Because cognitive deficits are central to AD, as these researchers pointed out, AD patients are rarely chosen as suitable subjects. Researchers have assumed that data collected from AD patients "is inherently unreliable and therefore not useful. This narrow view ignores the variability in the communicative abilities of individuals with dementia and reflects a very limited perspective on

research methods" (Cotrell & Schulz, 1993, p. 219).

This study, then, was built on the enlightened view of Cotrell and Schulz (1993). With the increasing acceptance by the medical community of alternative, complementary, nonpharmacological treatment, the researcher addressed the effects on AD patients of a course in a mind/body approach, specifically instruction in a relaxation technique.

Problem Statement

Alzheimer's patients suffer from many problems of mental deterioration and behavioral upsets. To date, despite the benefits of both pharmacological and traditional nonpharmacological treatments, these modalities have been found deficient in helping to relieve the symptoms of patients suffering from AD. Thus, the problem investigated in this study was to determine how individuals with AD respond to an alternative, complementary nonpharmacological treatment, specifically, group participation in a course in a relaxation technique.

Purpose of the Study

The purpose of this study, then, was twofold:

1. To add to the research with the AD population.
2. To ascertain the effectiveness of the selected intervention, specifically instruction in a relaxation technique in a group setting, for increasing mental functioning and decreasing memory and behavior problems in AD patients.

Significance of the Study

This study may benefit the AD patients and all those who care for them. Both Alzheimer's patients and their families suffer greatly from the debilitating effects of this progressive disease, whether it is in the mild or severe stage. In addition to medication, nonmedical means, specifically of a recreational, educational, and psychosocial nature, are widely used (Easter Seal Society of Dade County, 1998). Such activities help these patients remain oriented to reality and in possession of their memories and reasoning abilities for as long as possible.

However, this study, although implemented in group format, utilized the individuals' inner resources more directly than more conventional group activities. This approach has been suggested for patients (Kaplan & Sadock, 1996) but has been empirically investigated very little. As the medical community has begun to accept the effectiveness of mind/body techniques for a wide range of illnesses (Borysenko, 1988; Maier et al., 1994; Siegel, 1990; Simonton & Henson, 1992; Weil, 1995), the AD patient also deserves the possible benefits of these techniques.

Family members of these patients could also benefit, especially the caregivers. Many studies have documented tremendous stresses that caregivers suffer in dealing with their Alzheimer's relative (Brown, Sloman, Brown, & Mitchell, 1995; Teri, 1997). These stresses are often

interrelated and may affect caregivers in the emotional, physical, relational, and financial spheres (McCarty, 1996; Monahan, 1995; Sayles-Cross, 1993). A means of help such as the intervention successfully utilized with AD patients in this study may also result in easing the formidable demands and stresses on their caregivers.

Finally, successful outcomes from this study and implementation of the course could also aid the staff at facilities and institutions that treat Alzheimer's patients. These include nursing homes, assisted-living residences, and adult day care centers. With the addition of this course or similar instruction in relaxation techniques in a group setting, staff members would be able to incorporate this activity into the programs. Patients would then have the additional choice of this course, which could appeal to those who suffer from sleeping problems, depression, anxiety, and stress, and who may decline or resist more socially-oriented group activities.

In addition, for those facilities which offer caregiver support groups, it would be very beneficial to provide a course in this relaxation technique for this population. This approach would help caregivers manage their own stresses and also aid their understanding of the experiences of the AD relatives (Mace & Rabins, 1991). With such benefits in mind, the following research questions and hypotheses were generated.

Research Questions and Hypotheses

Research Question 1: Will Alzheimer's patients show measurable improvement in mental state, specifically orientation, registration, attention, recall, and language, after completing a course in a relaxation technique, compared to a control group?

Research Question 2: Will there be a measurable improvement, as rated by caregivers, in the memory and behavior problems of AD patients who are given a course in relaxation, compared to a control group?

The following research hypotheses, formulated from these research questions, were tested with the sample, instruments, intervention, and statistical procedures described in chapter 3.

Null Hypothesis 1: There is no statistically significant difference in the mental functioning of AD patients who participate in a course in a relaxation technique and the mental functioning of AD patients who do not participate in such a course, as measured by pretest and posttest scores on the Annotated Mini-Mental State Examination (AMMSE) (Folstein, Folstein, & McHugh, 1975) (Appendix A).

Research Hypothesis 1: AD patients who participate in a course in a relaxation technique will show a statistically significant increase in mental functioning, compared with AD patients who do not participate in such a course, as

measuredby patients' pretest and posttest mean scores on the AMMSE.

Null Hypothesis 2: There is no statistically significant difference in the memory and behavior problems of AD patients who participate in a course in a relaxation technique and AD patients who do not participate in such a course, as measured by caregivers' pretest and posttest scores on the Memory and Behavior Problems Checklist (MBPC) (Zarit, Orr, & Zarit, 1985) (Appendix B).

Research Hypothesis 2: AD patients who participate in a course in a relaxation technique will show a statistically significant decrease in memory and behavior problems, compared with AD patients who do not participate in such a course, as measured by caregivers' pretest and posttest mean scores on the MBPC.

The positive directionality of the research hypotheses is supported by a number of previous studies in similar nonpharmacological treatment with the general population. In these studies subjects were given relaxation therapy not only for medical reasons but also for cognitive and psychological conditions, such as recall problems, anxiety, and insomnia, which are common components of individuals with AD (e.g., Benson, 1997; Borovec & Costello, 1993; Suhr et al., 1999).

Rationale

The rationale for this study derives primarily from the

work of Benson (1975, 1985, 1997; Benson & Baim, 1998; Benson & Stuart, 1992). A physician, associate professor of medicine at the Harvard Medical School, and founding president of the Mind/Body Medical Institute in Boston, Benson developed the "Relaxation Response" (RR) over 20 years ago (Benson, 1975, p. 9). This is a simple technique, easily taught by an experienced instructor, that amalgamates Western and Eastern approaches (Benson, 1975, 1997).

Benson and Stuart (1992) described the process in the following way:

> When you elicit . . . the relaxation response, you turn your attention inward, concentrated in a repetitive focus such as breathing or a word or a prayer. Your body and your mind begin to quiet down. A state of physiological and mental rest ensues. (p. 46)

A major tenet underlying the RR and its benefits is the interrelationship of body and mind. The interrelationship is conceptualized as the biopsychosocial model of health, which many research studies have documented (Benson & Baim, 1998). This perspective was simply explained by Simonton and Henson (1992) as "Harmony--balance among the physical, mental and spiritual aspects of being" which apply "not only to the health of the individual's mind and body, but also to his or her relationships: with self, family, friends, community, planet, and universe" (p. 14).

One can reach such balance by recognition of the

mind's significant influence on beliefs, attitudes, emotions, and responses. Simonton and Henson (1992) asserted, "Beliefs influence emotions and, in doing so, influence health. . . . Ways of influencing beliefs, attitudes, and emotions can be taught and learned by using a variety of accessible and existing methods" (p. 14).

The relaxation response is one such method. Practice of the RR and associated techniques enhances an individual's quality of life in many spheres. With practice, benefits are experienced physically, emotionally, and mentally.

Simonton and Henson (1992), for example, described the effects of such techniques on the coauthor, a long-term cancer survivor. Benson (1997) reported that patients with hypertension over a 3-year period experienced significant decreases in blood pressure and needed fewer medications; cancer and AIDS patients had decreased symptoms and better adjustment to chemotherapy; and patients suffering from anxiety and depression had decreased affect. In addition, in other studies, individuals reported reduction of anxieties and fears, easing of stress and sleep problems, greater mental clarity, increased problem-solving abilities, and resurfacing of long-buried memories (Rickard, Collier, McCoy, & Crist, 1993; Sobel & Ornstein, 1996).

As such reports attest, mind/body techniques, including relaxation exercises, have been found to decrease depression and anxiety, increase mental clarity, lower stress, and

enable an individual to exercise increased control over behavior. With such benefits in evidence with a wide cross-section of the population, similar benefits may be gained with individuals who have Alzheimer's disease and suffer from similar symptoms, especially in the early stages. The present study sought to explore this possibility with Alzheimer's patients at two adult day care centers. Thus, the following definitions were used.

Definition of Terms

Adult day care center is a public or private facility that specializes in the care and supervision of older adults who may be ill, incapacitated, or well, or a combination. Centers generally provide transportation and some meals and snacks. Daily programs of varied activities are offered for participants, and sometimes for their family members (Cohen-Mansfield, Besansky, Watson, & Bernard, 1994). Both centers for this study specialize in Alzheimer's patients.

Alzheimer's patient is an individual, generally between ages 50 and 90, whom a physician has diagnosed with Alzheimer's disease or a related memory disorder. The patient progressively declines in many cognitive, emotional, and physical functions. Among these may be cognitive functioning; recall; language use, including reading and writing; motor activities; recognition of familiar people, environments, and objects; abilities to plan, organize, and abstract; and difficulties with daily self-care. In

addition, personality changes may include extreme suspiciousness, anger, depression, or delusions (DSM-IV, 1994; Mega, Cummings, Fiorello, & Gornbein, 1996; Teri, Logsdon, & Yesavage, 1997).

Attention and calculation is a component of the AMMSE (Appendix A), in which individuals are tested on their arithmetic and concentration abilities. Tests include successively subtracting a given number backwards from a total or spelling a word backwards.

Caregiver/guardian is the individual, as named in the center's records, who is the designated person responsible for the patient and with whom the patient resides. This person may be a family member, a close personal friend, or a court-appointed guardian (Brown et al., 1995; Monahan, 1995).

Language is a component of the AMMSE (Appendix A), in which individuals are tested on their ability to name objects, repeat a phrase, follow a three-stage command, read and write, and copy a design.

Relaxation techniques are methods of mental discipline to quiet and control one's own mind, based on ancient Eastern teachings (Benson, 1997). These are basic techniques which may be self-administered or guided by a therapist instructing aloud or in conjunction with an audiotape. They are easy to learn, involving "simply a process of focusing the mind on an object or activity" (Benson & Stuart, 1992,

p. 46). Specific variations may include the repetition of a single word, visualization of a pleasant scene, or focus on one's breathing. These techniques are taught widely to many populations for stress management, relaxation, and enhancement of physical and emotional health (Benson, 1997; Sobel & Ornstein, 1996).

Mental state is the level of mental functioning of an individual, assessed for this study by administration of the AMMSE (Appendix A). The AMMSE, comprised of five components, is a short questionnaire that determines an individual's orientation to present reality and abilities to remember, reason, and calculate simple arithmetical problems (Kaplan & Sadock, 1996).

Mild to moderate AD patients may appear to function normally much of the time. Since the disease is progressive, symptoms of cognitive deficits at early stages are not readily apparent. However, continuing cognitive decline takes place in the following areas: memory, language, and visuospatial functioning (American Psychiatric Association, 1994; Kaplan & Sadock, 1996).

The AAMSE was created in part to address the difficulty of diagnosis. The scoring range is from 0 to 30, with higher scores indicating higher mental functioning; non-AD adults generally score between 18 and 30. Scoring interpretations vary for mild to moderate AD sufferers: Katz (1998) and McDougall (1998) designated a score of 15, and LaFleshe and

Albert (1995) designated a score of 22. However, the originators of the AAMSE, Folstein et al. (1975), specified a score of 19 as the cutoff between any stage of AD and normal, with lower scores indicating later stages of AD. Based on this criterion, subjects for the present study were considered as mild to moderate AD patients if they scored 19 or above.

Orientation is a component of the AMMSE (Appendix A), in which individuals are tested on their recognition of the year, season, date, day, month, and their physical location, such as the state, county, town, hospital, and floor.

Problem behaviors are observable actions disruptive to the patient, caregiver, and others that indicate memory loss, emotional strains, or both. Problem behaviors may include forgetting where objects were placed, getting lost on familiar streets, or destroying property (McCarty, 1996), appearing sad or depressed, anxious or worried, irritable, angry or agitated (Suhr et al., 1999). For this study, problem behaviors were assessed by administration of the MBPC (Appendix B).

Recall is a component of the AMMSE (Appendix A), in which individuals are tested on their ability to remember previous conversation, as in repeating the names of three objects given to them in an earlier part of the mental state examination.

Registration is a component of the AMMSE (Appendix A), in which individuals are tested on their memory abilities for correct repetition of a series of objects named by the interviewer.

Relaxation response (RR) is a term that describes a self-induced eliciting of a measurable physical and mental state of relaxation, achieved by following specific instructions. The term was introduced by Benson (1975) in his translation of Eastern techniques to Westerners, to address chronic stress and its associated diseases, such as hypertension and atherosclerosis. The RR can be elicited by many techniques, such as yoga, autogenic training, progressive relaxation, and hypnosis (Benson, 1975; Benson & Stuart, 1992).

Assumptions of the Study

Several assumptions were made for this study. These were as follows:

1. Because subjects were drawn from AD adult day care centers, all patients were clinically diagnosed, as documented in their records, with symptoms of Alzheimer's type dementia, as specified by the DSM-IV (1994).

2. The Alzheimer's patients had not participated in a course in a relaxation technique since they began attending the centers.

3. The Alzheimer's patients attended the course willingly and participated as fully as they were able,

depending on their condition at the time.

4. Both patients and caregivers responded to the instruments as honestly and accurately as they could.

5. Caregivers were genuinely interested in helping their Alzheimer's relatives.

Limitations of the Study

Several limitations were inherent in this study. These concerned the Alzheimer's patients and their caregivers.

1. Both patients and caregivers constituted a convenience sample that was drawn from Alzheimer's day care centers in South Florida. Thus, results may not be generalizable to other groups of AD patients and their families in other caregiving situations or different geographical areas.

2. Patients and caregivers constituted a relatively small sample, 34 pairs. Although this was an adequate number for the statistical analysis (Rubin & Babbie, 1997), if there were dropouts, the number of actual participants could be too small for statistical significance.

3. Although most of the subjects were in the mild stage of AD, because of the nature and stage of the illness some patients' mental and physical capacities may have declined markedly at any point during the course. The study was designed with knowledge of this possibility, but if such a change were to occur, results could be affected.

4. Patients' attention spans may be intermittently

extremely short. This factor could bias results.

5. Caregivers' desires for their relatives to improve or to appear to improve may affect their responses. This "social desirability" factor (Rubin & Babbie, 1997, p. 162) must be recognized as a possibility in relation to the study results.

6. The implementation took place over 5 weeks, possibly too short a term for significant change. However, changes from practice of relaxation techniques have been documented in non-Alzheimer's patients for this length of time, as well as for shorter durations (Benson, 1997).

Summary

In this chapter, the background of the problem was discussed first, including the increasing longevity and numbers of older Americans, and thus the increased risk of more individuals contracting Alzheimer's disease. Statistics on AD worldwide and in the United States were reported, and the major symptoms of AD, a progressive, deteriorating illness, were described. The problem statement was then formulated: the present treatment modalities for AD patients include recreational, social, and educational activities as well as psychotropic drugs, which often have dangerous side effects.

The study's purposes were next enumerated: (a) to add to the research with the AD population, and (b) to ascertain the effectiveness of the proposed intervention, an

alternative, complementary treatment for increasing mental functioning and decreasing behavior problems in AD patients, specifically, participation in a course in a relaxation technique in a group setting.

The significance of the study was then discussed, in terms of benefit to several populations. The general improvement in the patients' condition could lead them to more satisfying and less debilitating lives and their caregivers' stresses could lessen because of the patients' improvement. Moreover, the staff of the centers could better aid both patients and caregivers through implementation of relaxation techniques as complementary therapy.

Next, two research questions and two null and research hypotheses were suggested. The first research hypothesis posited AD patients' measurable improvement in mental state after participation in a course in a relaxation technique, in comparison with a control group. The second research hypothesis posited AD patients' measurable decrease in memory and behavior problems after participation in a course in a relaxation technique, as observed by their caregivers, in comparison with a control group. The procedures described in chapter 3 were used to answer these research questions and test these research hypotheses.

Then, a rationale was developed which introduced the theoretical framework of the study. This discussion briefly surveyed the relaxation response, developed by Benson

(1975), and its effectiveness as reported in the literature related to the subject for over 20 years.

Finally, definitions of pertinent terms were given. Assumptions of the study concerning both patients and caregivers were enumerated, and limitations were noted.

It was the intent of this study to ascertain whether a course in a relaxation technique may help alleviate the mental and physical symptoms of adults with Alzheimer's disease. Mind/body applications, such as relaxation techniques, have been used with the general population for a variety of physical and emotional ills, with documented results. However, these techniques have been scarcely explored with AD patients.

The next chapter will review appropriate literature in relation to this study in several areas. These include an overview of AD and mind/body techniques, pharmacological treatments; nonpharmacological, complementary treatments such as relaxation techniques with the general population; and application of these techniques to AD patients.

CHAPTER 2

LITERATURE REVIEW

Introduction

This chapter is divided into five sections that review the literature pertinent to this study. The first section is an overview of Alzheimer's disease, including etiology, risk factors, symptoms, diagnosis and prognosis, current research, and pharmacological and nonpharmacological treatments. The second section surveys literature on the mind/body perspective, including psychoneuroimmunology. The third section describes the relaxation response, including procedures for eliciting it and studies with non-AD participants. The fourth section addresses research on relaxation techniques for physical and emotional illnesses with the general population. The final section discusses and critiques research on mind/body applications to AD patients and to caregivers.

Two major criteria were applied for the selection of research reviewed. First, conceptual and empirical studies were preferred that were published no more than 5 years ago. The exceptions were foundational, survey, or "classical" works, such as the first report of the relaxation response by Benson in 1975. Second, studies were included from researchers who primarily espouse the traditional medical model. Nonmedical proponents of the alternative mind/body approach may employ less scientific rigor in research studies that may affect claims of effectiveness.

Alzheimer's Disease

Definition

Alzheimer's disease is a type of dementia, which is generically defined as an acquired impairment of memory and other cognitive abilities that adversely affect daily functioning (DSM-IV, 1994). AD, a progressive, neurodegenerative disease, is characterized by loss of function, shrinkage of brain matter, and degeneration of nerve cells in several areas of the brain.

AD affects parts of the brain that control thought, memory, and language ability; the result is cognitive impairment and behavioral and psychological changes. The disease leads to a loss of mental functions, such as learning and recall ability; affects motor coordination, resulting in the inability to perform the normal activities of daily living; and precipitates a host of other behavioral and psychological changes.

To date, no cure has been discovered for AD, and prognosis is generally poor. From onset, individuals may live anywhere from 1 to 20 years, with the average survival rate 8 to 11 years after onset (Kaplan & Sadock, 1996). The course of AD tends to be slowly progressive and the cognitive and behavioral symptoms make a substantial contribution to the disability of the disease.

However, recent pharmacological breakthroughs have appeared to slow the disease and provide relief of some

symptoms. In addition, a wide range of nonpharmacological treatments are being developed and studied (Alzheimer's Association, 1999, 2000; Richards & Hendrie, 1999). Intensified research into many modalities has been prompted by the alarming increase in the rate of AD among the older population.

Prevalence

Alzheimer's disease is a major health concern in the United States and globally. As indicated earlier, statistical methods with geometrical progression indicated that approximately 4 million Americans have AD (Perel, 1998). Additionally, 19 million have a family member with the disease, and 37 million know someone afflicted. AD is the most common form of dementia, comprising approximately 70% of all cases. Of those afflicted, 7 out of 10 live at home, and almost 75% of home care is provided by family and friends. In addition, half of all nursing home patients suffer from AD or a related disorder (Alzheimer's Association, 2000).

Incidence rates are estimated at 127 cases per 100,000 persons per year. Between 2% and 4% of the total population over age 65 have AD, and that prevalence increases with age, especially after 75. More women than men are afflicted, and possibly more Blacks than Whites, although this incidence varies by region and more research remains to be conducted (Alzheimer's Association, 1999; American Association of

Retired Persons, 1997; Cohen, 1993; DSM-IV, 1994; Plaud et al., 1998).

Costs for the treatment of AD are the third highest in the United States. As a whole the country spends at least $100 billion on AD, since neither Medicare nor private health insurance covers needed long-term care. Nursing home care averages $42,000 per year but can range to $75,000 (Alzheimer's Association, 2000; Cullum & Rosemberg, 1998; Meek, McKeithan, & Schumock, 1998).

Etiology

As the incidence of AD increases, scientific and medical studies into its causes have gained intensity. Today much is known about the physical causes of AD, although exact causes remain elusive. Nevertheless, recent research has determined that AD progression is associated with increases in two types of microscopic brain lesions, amyloid plaques and neurofibrillary tangles (Stege & Bosman, 1999). Studies on the brains of deceased adults from 51 to 88 revealed that the higher the distribution and density of these structures, the greater the likelihood and severity of AD (Morris & Price, 1999). Although these structures may be present in non-AD older individuals, the increased amounts and density determine presence of AD (Hayflick, 1996).

In addition, studies of the inflammatory processes of the brain, oxidative stress, and impaired energy metabolism have indicated that these abnormalities may be associated

with the significant cognitive impairment of AD (Alzheimer's Association, 1999, 2000; Redjems-Bennani et al., 1998). Further, genetic research has identified three genes that are involved in the development of early-onset AD in those under 60, and one gene associated with late-onset AD in those 60 and older (Blacker & Tanzi, 1998; Morrison-Bogorad, 1997). A significant new discovery of another gene, "BRI," has been isolated as a primary cause of a form of inherited AD common in Britain. This gene was shown to have affected 38 members of a family of over 300 that spanned nine generations (Vidal et al., 1999).

The preponderance of research has been conducted in physiology. However, research on psychosocial causes has shown that delirium and severe depression may be causes of AD in older adults. Both of these conditions may stem from physiological illnesses and insufficiencies (i.e., renal and thyroid abnormalities) as well as from medications (Richards & Hendrie, 1999).

Risk Factors

These psychophysiological conditions put older adults at risk for AD, as well as other factors. Genetic factors appear to be one such aspect, as discussed above. Presence of the gene apolipoprotein E-4 (APOE-4) appears especially predictive, although not everyone with this gene develops AD (Haan, Shemanski, Jagust, Manolio, & Kuller, 1999). As seen above, age and family history are also high risk factors.

Other risk factors include serious head injury, diabetes, atherosclerosis, circulation problems, and Down syndrome (Bernardo, 1999; Haan et al., 1999). As noted, delirium and severe depression in older adults have also been found.

Further research with almost 10,000 AD patients in nursing homes shows that those who have a greater risk of dying are males with diabetes or atherosclerosis who are malnourished (Gambassi et al., 1999). However, overall, females are at slightly greater risk than males (Cummings, Vinters, Cole, & Khachaturian, 1998). Dietary factors have also been found significant. Grant (in press) found that in subjects age 65 and over, higher fat and total caloric intake had the highest correlation with AD prevalence rates.

Socio-occupational factors have also been explored. Jorm et al. (1998) conducted a 3½-year longitudinal study in which 518 males 70 or over completed four cognitive tests, including the AMMSE. The researchers found that those at greatest risk for AD were men in "the realistic occupations, which include trade, technical and some service occupations" (p. 481). In addition, the greatest occupational difference appeared on the instrument measuring reading ability.

Intelligence may also be a risk component. Lower intelligence, which is associated with smaller brain size and less rapid nerve conduction than higher intelligence, has been associated with a higher risk of AD, independent of education effects (Cummings et al., 1998). Such findings

suggest further research is necessary in this provocative area for earlier diagnosis of possible symptoms and interventive measures.

Stages

There are generally three acknowledged stages of AD: mild, moderate, and severe. However, these may vary depending on the assessing health professional and the degree and kind of symptoms observed (Cummings et al., 1998). The DSM-IV (1994) indicates highly detailed criteria for AD with many predominant variations, but no specific criteria are designated for the different stages.

In their analysis of 62 deceased AD patients, Morris and Price (1999) were able to classify physiologically the stage of AD on the basis of the observable plaques and tangles in the brain. Of the total subjects, 39 had no signs of dementia, 15 were "mildly demented," and the remaining 8 were "severely demented" (p. 45).

Cognitively, an individual's stage of AD may be indicated by administration of the AMMSE, the most commonly used instrument for assessing cognitive function (Richards & Hendrie, 1999). As noted earlier, based on the validation studies of Folstein et al. (1975), the originators of the instrument, a score of 20 or less of a possible 30 is indicative of individuals with dementia. Later diagnoses have set scores below 15 as indicators of severe AD (Katz, 1998; McDougall, 1998).

Symptomatology

Severity of AD is indicated by more symptoms of greater intensity. The pervasiveness of AD leads to a variety of wide-ranging symptoms. They encompass functional, psychiatric, and behavioral impairments. Functionally, normal activities of daily life become more difficult, such as managing finances, shopping, cooking, and cleaning, as well as basic personal tasks, such as bathing, toileting, dressing, and feeding oneself. Forgetfulness increases and eventually lifelong partners and friends may not be recognized. Independent living gradually becomes harder as functional abilities decline (Mace & Rabins, 1991; Richards & Hendrie, 1999).

In addition to functional impairment, myriad psychiatric manifestations occur in almost all AD patients at some point. Behavioral manifestations are the most common symptoms, occurring in 90% of patients. These are the first to occur and are the most persistent. They may dismay close relatives and caregivers because of the apparent personality changes in the AD patients (Mace & Rabins, 1991; Naleppa, 1996).

Behavioral symptoms include dysphoria, euphoria, anxiety, stress, apathy, disinhibition (especially sexually), irritability, anger, aberrant motor behavior, hiding and hoarding objects, and agitation (Mega et al., 1996). Any of these behaviors may manifest in degrees,

depending on the AD stage. Mild agitation, for example, is not aggressive and may include moaning, crying, arguing, or pacing. Severe agitation, however, is highly aggressive and may pose risk of physical harm to the patient and others. Characteristic behaviors are screaming, kicking, throwing objects, injury to self, or scratching or hitting others (Goldsmith, 1998). Other symptoms include wandering, getting lost, insomnia and other sleep disturbances, aggression, and hyperphagia or abnormally high appetite (Hwang, Yang, Tsai, & Liu, 1997). After behavioral disturbance, psychosis is the second most common manifestation and includes delusions of paranoia, misidentification, and hallucinations. Depression is almost equally common, manifesting in about 86% of patients, although it is the least persistent (Richards & Hendrie, 1999).

Diagnosis

Whatever the symptoms manifested, diagnostic procedures and tools used are extensive. Today, diagnosis of probable AD is 85% to 90% accurate. There is no single or comprehensive diagnostic test or method; rather, physiological, cognitive, mental status (generally the AMMSE), neurologic, neuro-psychological, psychiatric, and neuroimaging examinations are recommended. These are performed especially to distinguish AD from normal aging-related memory loss and other conditions of dementia (Alzheimer's Association, 1999). In fact, in the DSM-IV

(1994), the delineation of AD is based on exclusionary criteria for other causes of dementia rather than inclusionary criteria. In addition, reliance on a single test may show "normal" results in a cognitive or neuropsychological examination because of extraneous factors; a sole test may not register early subtle changes in cognitive decline. Cullum and Rosenberg (1998) reported that in their multidisciplinary AD center, 14% of 673 consecutive patients with AD had AMMSE scores above 23, which is in the normal range.

Many physicians as well as other clinicians agree that the sequence and extent of diagnostic procedures should be extensive (e.g., Cullum & Rosenberg, 1998; Richards & Hendrie, 1999). The following sequence of procedures is recommended by Plaud et al. (1998): (a) complete patient history, including precondition of intellectual abilities and other functioning assessments; (b) systematic examination of mental state, including cognitive functions, appearance, mood, speech, thought content, and perceptual disturbances; (c) physical examination, including blood pressure, sight and hearing tests, and assessment of walking; (d) laboratory tests of blood, urine, and electrolytes, as well as liver and thyroid functioning; (e) radiological tests, including chest and skull x-rays and possibly a CT scan.

Once diagnosis is completed and stage and extent of AD

have been determined, treatments are prescribed. These may be pharmacological or nonpharmacological, and often both.

Pharmacological Treatments

Research in pharmacology is progressing rapidly on medications to palliate the symptoms and slow the deterioration brought on by AD. Many drugs are available for symptom reduction, such as psychotropic and antiinflammatory drugs, although none eradicates the disease. New experimental drugs are promising for regulating defective cell processes, protecting nerve cells in the brain from damage of AD, and repairing damaged nerve cells (Kumar, Sugaya, Saunders, & Mechanic, 1996). Donepezil hydrochloride (brand name Aricept) was the most recent drug approved by the Food and Drug specifically for AD (Alzheimer's Association, 1999).

Donepezil is a cholinesterase inhibitor, that is, a drug that enhances cholinergic neurotransmission of nerves in the brain. AD is partly a disorder of cholinergic functioning; this drug and other cholinesterase inhibitors, such as tacrine (brand name Cognex), may "represent the drug of choice for Alzheimer's disease treatment" (Giacobini & Michel, 1998, p. 232). These drugs have been shown to improve cognitive functioning, as well as psychiatric and behavioral symptoms, for up to 1 year over the first 3 years of clinical onset of AD (Richards & Hendrie, 1999).

Many other drugs that combat AD degenerative processes,

such as antioxidants, are in development and undergoing clinical trials (Schneider, 1998). A new experimental drug, memantine, was reported on in a study of 166 patients in six nursing homes and a psychiatric hospital (Experimental Drug, 1999). Patients were randomly selected for a treatment group to receive the drug or a control group to receive a placebo over 12 weeks. For patients who received the drug, functional independence improved by 73% compared with the control group's 45% improvement. The evaluations of the nursing staff, with a behavior rating scale, resulted in a 67.5% improvement for the treatment subjects compared with a 39.6% improvement in the control subjects (Experimental Drug, 1999).

Finally, a new, promising vaccine that prevents development of brain deposits associated with AD has been successfully tested in mice. Researchers speculate that the vaccine triggers the production of antibodies to destroy the molecules that precede the destructive brain deposits. Beginning protocols with humans have yielded encouraging results (Schenk, Barbour, Dunn, Gordon, & Grajeda, 1999; Scientists Announce Initial Results, 2000).

These breakthroughs are highly promising, and the variety of drugs for AD has become consistently greater. However, pharmacological treatments may be contraindicated for many AD patients. Side effects can be uncomfortable and often dangerous, such as nausea, headaches, abdominal

distress, and dizziness (Cotrell & Schulz, 1993; Suhr et al., 1999). Interactivity with medications taken for other conditions must be carefully monitored (Hollister & Gruber, 1996). In recognition of such factors, Richards and Hendrie (1999), a physician and psychiatrist, unequivocally asserted, "Nonpharmacological treatment approaches should be attempted first before pharmacological treatments" (p. 795).

Nonpharmacological Treatments

Parallel to the ongoing pharmacological research, studies have consistently been conducted on a variety of nonpharmacological modalities. These are not meant to replace but to complement traditional treatments. Many types of behavioral treatment have been the most prevalent; however, recent research, although preliminary, has also revealed encouraging results with several nonpharmacological substances (Cullum & Rosenberg, 1998).

Substances. Estrogen loss has been found to be a factor in propensity for AD. Males produce apparently sufficient amounts, with "lifelong sources of brain estrogen" from cerebral chemistry conversion of testosterone to estrogen (Cummings et al., 1998, p. 89). Thus, menopausal women are particularly at risk. In a study by Paganini-Hill and Henderson (1996) of 3,760 older women, the risk of AD was significantly reduced in those using estrogen compared with those not using it. The risks also decreased significantly with increasing dosage and duration of oral therapy.

Other nonpharmaceutical substances have been studied for effectiveness in delaying or ameliorating AD. Over 50 studies of the herb ginkgo biloba were examined by Oken, Storzbach, and Kaye (1998). Most of the studies did not clearly diagnose dementia and AD; nevertheless, modest positive results were reached after treatment groups received 3- to 6-month treatments of 120 mg to 240 mg of the herb daily. Of the 212 subjects in treatment and control groups, those in the treatment group showed a 3% increase in an objective measure of cognitive function in AD.

Further studies have shown positive results in delay or improvement of AD symptoms with Vitamin E and certain diets. Vitamin E, in doses of 2,000 IU daily, was shown to have beneficial effects in some cases of AD (Alzheimer's Association, 1999; Cullum & Rosenberg, 1998). Grant (in press) studied a population of adults 65 and older from 18 community samples in 11 countries. He found that individuals with diets high in fat and total calories had the highest correlations with AD prevalence. Diets low in fat and high in fish consumption reduced the prevalence of AD in European and North American countries.

Such studies offer promising results in prevention and treatment of AD for both younger and older individuals. Other nonpharmacological behavioral modalities also offer hope. These include recreational, educational, psycho-social, and other psychotherapeutic behavioral modalities.

Recreational and educational modalities. In both AD residential care and day care programs, planned and supervised recreational and educational activities are the most prevailing therapeutic modes. These are all designed to help the individual regain meaning, reestablish valued interpersonal relationships, bolster self-esteem and dignity, increase self-confidence, and provide success experiences (Cutler & Sramek, 1996; Mace, 1987). Activities may include group programs in current events, field trips, hobbies, arts, crafts, games, cooking, and mild exercise (Duchesneau, 1994). Educational activities may be especially recommended; Cummings et al. (1998) pointed out that higher levels of education and challenging occupations and activities are associated with lower risk of AD.

Other nonconventional modalities have been explored with positive results. For example, Whall et al. (1997) found that agitation and aggression in severe AD patients were mitigated by exposure to elements of the natural environment, such as bird songs, bird pictures, rustling leaves, and sounds of babbling brooks. In a similar population of severely demented patients, Wolfe and Herzberg (1996) used aromatherapy to help promote sleep in two subjects, a woman of 76 and a man of 88. Despite this small sample, results indicated that mean hours per week of sleep time increased for both individuals after aromatherapy was initiated.

Psychosocial modalities. Such unusual sensory treatments bear further investigation, as do a number of psychosocial modalities that are more widely employed with AD patients, especially in groups. Art therapy and pet therapy, which is gaining acceptance, may be helpful. Visits by school children to older normal and AD patients are not only enjoyable for both generations but may be salutary and intellectually stimulating for the older adults (Richards & Hendrie, 1999; Soler, 1998; Weston, 1998).

A particularly nonthreatening, enjoyable mode for AD patients is music therapy. As with the other therapies, the purpose of music therapy is to improve social interactions, facilitate relaxation and remembrance, alleviate depression, and enhance motor functions (Tomaino, 1994). Goddaer and Abraham (1994) conducted a 4-week study of 29 nursing home residents, ages 67 to 93, with severe cognitive deficits. Introduction of relaxing music showed that their physical and verbal agitated behaviors were reduced significantly. No reductions, however, were observed in aggressive or hiding and hoarding behaviors.

A longer study with music therapy, 12 weeks in duration, of 51 AD patients from five facilities, showed important outcomes for movement, rhythm, and singing activities. Among other findings, Gfeller and Hanson (1995) found that AD patients were most active in movement activities that did not require extensive verbal skills,

especially when the movement activities were challenging. These results have significant implications for the success of the present study in a relaxation technique, which involved moderately challenging movement and muscle relaxation.

Other forms of psychosocial treatment include reminiscence therapy and life review. These decrease isolation, increase socialization, and encourage AD patients to remember events, names, and places in their pasts (Duchesneau, 1994; Kelley, 1997; Weiss, 1989). In addition, relaxation techniques have gained greater attention and, for the most part, have proved viable in reducing symptoms and increasing cognitive functioning (McCurry, Logsdon, & Teri, 1996; Welden & Yesavage, 1982). In relation to both the general and AD population, research on the effects of relaxation techniques in physical and psychological illnesses are discussed at length later in this chapter.

Psychotherapeutic behavioral modalities. The many behavioral treatments have aided AD patients in most of the major symptomatological areas of AD, such as memory, language, and sexual disorders; agitation; anger and violence; irritability; distraction; wandering; sleep and eating disturbances; paranoia and misidentification; depression; and social isolation (Plaud et al., 1998). Insufficient research has been conducted, however, to ascertain the effectiveness of particular behavioral

approaches to individual symptoms or symptom groups (Plaud et al., 1998). Nevertheless, studies to date generally indicate positive results (Richards & Hendrie, 1999).

Depending on the stage of AD, psychodynamic therapy and other types of psychotherapy, such as emotion-oriented, supportive, and interpersonal, may be beneficial. With severe AD, however, one-to-one therapy that requires sustained concentration and focus may be contraindicated (Richards & Hendrie, 1998). However, as Plaud et al. (1998) observed, structured environments and specific, step-by-step instructions are vital, and therapy should "focus on specific behavioral, cognitive, functional, and emotional problems" (p. 284). In addition, therapy for caregivers is also often recommended, due to the tremendous stresses and the necessary "re-education" toward their loved one (Mace & Rabins, 1991; McCarty, 1996; Monahan, 1995).

A social learning behavior approach to treat agitation for AD patients and caregivers was conducted by Teri et al. (1998). With 41 pairs over 8 weeks and a total of 11 sessions, therapists helped caregivers identify and modify "target" behaviors and those associated with undesired agitation (p. 437). Education was also provided by means of videotapes and reading, as well by as practical examples of problem-solving. Although no objective measures were taken, results of four case studies indicated that this modality helped modify the AD patients' unwanted agitated behaviors.

Reality orientation therapy was also shown effective by Zanetti et al. (1995) with AD patients over an 8-month intervention. This mode emphasizes basic orientation information in verbal, visual, and written forms. The therapy was chosen especially to address AD patients' symptoms of delusions, paranoia, and misidentification. Compared with a matched control group, the treatment subjects showed a significant improvement in cognitive function, as measured by the AMMSE.

A related form of present-reality therapy, the cognitive-behavioral approach, has long been recommended for older adults, partly because it addresses current concerns in contrast to the traditional psychotherapeutic focus on the past (Cotrell & Schulz, 1993; DeRubeis & Beck, 1988). Few quantitative studies exist with AD patients and cognitive therapy. However, Robinson (1989) studied 48 older nondemented adults on self-reported worry and anxiety, two symptoms of AD. Two treatment groups and two control groups were formed for the 4-week intervention.

One treatment group was trained in cognitive restructuring, in which subjects were instructed to reevaluate realistically the situations that produced their anxiety and worry. The second treatment group was instructed in relaxation to respond to their worry images. On pre-, mid-, and posttest measures, the cognitive restructuring group showed the greatest reduction in anxiety and worry,

followed by the relaxation group. There was no change in the two control groups (Robinson, 1989). Such results are encouraging and indicate the need for further exploration of cognitive therapy for the AD population.

Results of the studies reviewed here also imply that AD patients may have greater cognitive and functional awareness than is generally assumed. As Cotrell and Schulz (1993) pointed out, because cognitive deficits are at the heart of AD, in the past researchers have often minimized AD patients' desire for challenge and abilities to respond cognitively. More current research has begun to show the flaws in this assumption.

This discussion of the major aspects of AD has reviewed its definition, prevalence, etiology, risk factors, stages, symptomatology, and diagnosis. AD is a debilitating and deteriorating disease that affects all aspects of the individual. The disease has no cure at the present time and its prevalence is quite widespread and increasing as the population ages. The many risk factors, stages, and the symptomatology of AD have been fairly well identified, and behavioral problems are by far the most common symptoms. The diagnosis of AD has become highly accurate (85% to 90%), and clinicians recommend a range of physical and psychological procedures to insure better diagnostic accuracy.

When AD is diagnosed, various treatments are then prescribed. As this review has shown, AD is treated by both

pharmacological and nonpharmacological methods. Medical research is progressing at a rapid rate, outcome research is highly encouraging, and the variety of drugs available is steadily increasing. Although side effects may range from the inconvenient to the dangerous, pharmacological treatment can help postpone and alleviate the incapacitating symptoms of the disease.

Ongoing research has been conducted as well with nonpharmacological treatments. Many nonmedical substances have shown promise in the treatment of AD symptoms, such as estrogen, ginkgo biloba, Vitamin E, and diets low in fat and high in fish consumption. Most widely utilized modalities in both residential and day care programs are recreational and educational group activities, such as arts and crafts, field trips, mild physical exercise, hobbies, current events, and word and number games. Recent research has shown the feasibility of other nonconventional modalities, such as exposure to nature and aromatherapy. Various psychosocial modalities, such as art therapy and music therapy, have also demonstrated beneficial results. Psychotherapeutic behavioral treatments have long helped AD patients to control the many symptoms of the disease. Studies have shown that psychodynamic and other types of psychotherapy may prove salutary in the early stages of AD. However, in the later stages, AD patients have been more responsive to modes of cognitive and reality therapy.

The present study was undertaken because of the researcher's conviction that AD patients desire to and are able to respond to focused instruction and challenging activities. Thus, the research investigated the effects of a nonpharmacological approach that is grounded in the mind/body approach. This intervention was relaxation training, and its effect was studied on the cognitive and behavioral functioning of patients with mild AD. The next section introduces the mind/body perspective.

The Mind/Body Perspective

Increasing Acceptance by the General and Medical Communities

Of the prolific literature on mind/body perspectives, much of which is popular (e.g., Siegel, 1990; Simonton & Henson, 1992; Weil, 1995), this review is selective. It reflects especially the work of researchers, primarily physicians trained in the medical model. Through research results, they have recognized the interrelatedness of the physical, mental, emotional, and social spheres of the human organism. This recognition has given rise to a new field of research which has been termed psychoneuroimmunology (PNI) (Maier et al., 1994).

From the early popularity of Cousins's (1979) Anatomy of an Illness, in which he chronicled his healing of a rare debilitating disease and attributed it to unusual methods, the mind/body approach to healing has captured both popular

and scientific interest. Research in this mode had preceded Cousins's account of his personal triumph; however, self-prescribed massive doses of Vitamin C and equal doses of laughter therapy, followed by his remission, led to renewed interest in research on the links among the mind, emotions, and body.

Physicians and psychological researchers have since studied these links more seriously. With increased research, nonpharmacological treatments as complementary or alternatives modes to medical treatments have continued to gain acceptance in both the general population and the medical community. For example, a national survey of trends in the use of alternative medicine showed that use has increased in the last decade. Eisenberg et al. (1998) surveyed 1,539 adults in 1991 and 2,055 adults in 1997. When results were compared, the researchers found that use of at least 1 of 16 alternative therapies increased from 33.8% to 42.1%, or from 60 million people to 83 million people. Of the 65% increase in the total number of therapies that were used, the largest increases observed were in herbal medicine, massage, megavitamins, and self-help groups.

Pertinent to the present study, there was a 47.3% increase in total visits to alternative therapy practitioners, largely because of increased visits for massage, chiropractic, self-help, energy healing, and relaxation therapy. Moreover, of those who used relaxation

techniques that elicited "the relaxation response," 75% reported using meditation (Eisenberg et al., 1998, p. 1572).

Alternative therapies have become more accepted in medical spheres as well. The National Institute of Health Office of Alternative Medicine identified over 300 different forms of alternative medicine. Under "Mind/Body Control" are listed, among others, sound/music therapy, guided imagery, yoga, relaxation, meditation, and humor therapy (Medical Adviser, 1995, p. 31).

A study was conducted by Burg and Stoller (1998) of physicians, other health professionals, and related faculty at six health science center schools in two universities. Findings revealed that, of the 764 respondents, more than half reported use of one or more types of alternative medicine. The highest personal use was for massage, 35%; relaxation techniques, 24%; dietary supplements, 23%; and chiropractic, 16%. Although this physician faculty reported significantly lower use of alternative therapies themselves, including relaxation therapy and imagery, they nevertheless were more likely to recommend these therapies to their patients, 62%, than to use them personally.

At a conference on spirituality in medicine, Benson (1975, 1997; Benson & Baim, 1998), founder of the Harvard Mind-Body Medical Institute and originator of the relaxation response, reported on a survey among 269 family physicians at the meeting. Four out of five believed medical students

should become acquainted with alternative modalities, and 9 out of 10 reported their patients had sought alternative help (Vedantam, 1996).

Other alternative or complementary techniques, such as relaxation, are also widely used today in a number of medical institutions (e.g., Courtelis Center, 1997; Elders Institute, 1999; Integrated Care, 1997; Miami Heart Institute, 1998). The director of the Center for Alternative Medicine and Longevity at the Miami Heart Institute observed that the program at this center provides "a bridge between alternative and conventional treatments" (Miami Heart Institute, 1998, p. 2).

Nevertheless, traditional medical practitioners and researchers have cautioned extensively about the use of alternative methods. Fontanarosa and Lundberg (1998) pointed out that many "alternative therapies have not been evaluated with rigorously conducted scientific tests of efficacy based on accepted rules of evidence" (p. 1618). Because of the growing national trend toward such therapies, and the "billions of dollars in health care" expended on them, these researchers advocated the highest scientific standards for both physicians who recommended such treatments and the patients entering into them (p. 1619).

The Mind/Body Linkage Explained

With such a caution in mind, medical and psychological

researchers have been understandably skeptical. However, research has been ongoing, especially concerning the immune response. This psychophysiological response is a major aspect of PNI; understanding of the response is vital in reduction of anxiety and stress in both the general population and AD patients.

To provide an overview of PNI for the general psychologist, Maier et al. (1994) reviewed the evidence and explained the linkages between the emotions and illnesses in both biological and psychological terms. They concluded that the immune system and the brain form a "bidirectional interacting set of processes, each regulating the other," and that psychological processes may influence this dual network and in turn be modulated by it (p. 1014). Although these authors recommended that more research should be conducted for conclusive evidence, they also foresaw the coming years as "an exciting time in PNI research"; this interdisciplinary field is evolving because of "the growing realization that systems cannot be understood in isolation" (p. 1015).

Research over the past 15 years in the emerging field of psychoneuroimmunology was reviewed by Ader (1995), who echoed Maier et al. (1994), cautioning that causal links have not been scientifically established. However, Ader (1995) acknowledged "a new appreciation of the interactions between behavioral, neural, endocrine, and immune processes.

. . . What have been considered separate 'systems' can be considered components of a single, integrated defense mechanism" (p. 6). Ader (1995) also called for more scientifically rigorous research in PNI to investigate the mind/body interrelationships and their clinical and therapeutic implications.

Such studies were cited and summarized by Benson and Baim (1998) concerning a range of illnesses and the associations with nonphysiological factors. Representative studies in the last decade include those on stress and headaches and shoulder, neck, and back pain; stress and vascular disorders; stress, anger, and social support and cardiovascular disease; anxiety and gastrointestinal disease; depression, stress, and immunological disorders such as rheumatoid arthritis, colds, and cancer.

This section has reviewed the mind/body perspective from the standpoint of its increasing acceptance by the general and medical communities. Popularized over 20 years ago, the mind/body viewpoint has gained research attention. As research has shown, alternative therapies have become widely accepted and are increasingly elected by the general public. The medical community also has become more cognizant and accepting of this perspective, although with understandable reservations and cautions to patients.

Nevertheless, as this section has pointed out, research has been ongoing in the relatively new field of PNI

exploring mind/body interconnections. With the heightening realization that the human biological, psychological, and intellectual systems cannot be separated, researchers recognize that scientific rigor must be strictly employed in PNI research. Especially with the relaxation response, many studies have been conducted in relation to physical illnesses. In the next sections, the relaxation response and research studies on its efficacy will be explored.

The Relaxation Response and Related Techniques: Description

The relaxation response is both an ancient and very current technique. In recent decades it has been rediscovered and applied to the physical and mental afflictions of Western culture. This section will describe the background, dynamics, and procedure for eliciting the relation response.

The relaxation response derives from the mental technique of quieting the mind and focusing on a single thought, object, or image (Benson, 1997). Relaxation began to gain acceptance in Western culture about 25 years ago. LeShan (1974) was one of the first to demystify this process from its Eastern origins and make it accessible to Westerners without the necessity of attending special locations or engaging in special rituals. Since then, Benson (1975, 1985; Benson & Baim, 1998; Benson & Stuart, 1994) has conducted research on, written about, and widely taught the

relaxation response and associated techniques for stress reduction and other Western ills (Benson & Baim, 1998, p. 3).

The relaxation response is a conscious method for an individual to relieve habitual stresses and experience renewal, physically and mentally. It is "natural and familiar," because it focuses on an object or activity, an act which one does normally throughout the day (Benson & Baim, 1998, p. 10).

The relaxation response is elicited primarily through two essential means, according to Benson and Baim (1998). These are (a) a mental device to focus the thoughts, and (b) an observing attitude toward passing thoughts, feelings, or sensations. The first may be a repetition of a word, phrase, prayer, or sound; or a focus on one's breathing. The second is an outlook, which could prove difficult to reach at first, of being unconcerned about how well one is doing, not blaming oneself for inevitable thoughts that could surface, and developing "an attitude of acceptance toward whatever happens in this process" (Benson & Baim, 1998, p. 11).

In this technique, one learns to recognize what Benson and Stuart (1992) called "the observing self" (p. 47). This is the part of one's mind which, for example, recognizes that a nightmare is just a dream, or a tragedy in a movie is not real life. With practice, this faculty becomes more conscious and strengthened. Thus, using "this subtle inner

skill" (Benson & Stuart, 1992, p. 48), one may be helped to control and reverse negative thoughts and behaviors.

A related aspect is "mindfulness," another technique for focusing the awareness (Benson & Baim, 1998, p. 7). In this technique, attention is focused on the experience of the present moment only. One does not allow the mind to become fragmented or turn to thoughts of the past or future. Rather, one keeps returning to the present, concentrating on its thoughts, experiences, emotions, and bodily sensations.

Mindfulness, although apparently simple, can be difficult to achieve with consistency. Most people are "preoccupied with thinking about the past or anticipating the future" (Sobel & Ornstein, 1996, p. 94). However, Sobel and Ornstein (1996) also appealed to Westerners by pointing out the commonality of mindfulness with one's concentration on any important task or project. As these authors observed, the 2,500-year-old Buddhist tradition called mindfulness "is thoroughly modern and relevant to our present day lives"; it does not conflict with any religious, existential, or scientific beliefs (p. 94).

This variation was particularly appropriate for use in the present study because, first, the practice may be applied to anything in one's experience, such as sitting, breathing, observing the room, listening to the relaxation audiotape playing. Second, the practice of mindfulness was highly applicable as a tool to help the subjects,

Alzheimer's patients. Because of its focus, this technique may help them regain orientation to present reality, reconnect with their present physical environment, and restore and reclaim some of their mental powers.

Another aspect of relaxation is the use of imagery and visualization, which often may be orally "guided" by the instructor. This technique is simply the imagining of a pleasant locale, as if viewing a painting or a movie. As Benson (1997) advised, "I often recommend that people recall some very soothing, beautiful place they have been to, maybe on a vacation, or maybe someplace comforting they remember from childhood" (p. 74). This technique was also highly appropriate to the AD patients in the present study. Their recalling of a pleasant environment was an aspect of reminiscence therapy, recommended by Weiss (1989) for older adults with memory disorders and dementing illnesses.

In addition, imagery of various types may increase calmness, foster a sense of security and protectedness, and relieve physical pain and emotional distress. For some, imagery may be a way to change behavior positively, and the technique has been taught and used in sports, business, and the dramatic arts (Benson & Stuart, 1992). Graphic images of various types were suggested by Sobel and Ornstein (1996) for use with many ills, including stress, heart disease, cancer, depression, and behavior change. For the subjects in this study, possible applications of this technique, in

addition to a beautiful natural setting, could help them visualize themselves performing activities, enjoying experiences, and feeling as well as they did before their illness.

Eliciting of the relaxation response and associated techniques is accomplished by simple procedures, to which older adults may respond well. Guidelines were given by Benson and Baim (1998, pp. 14-15) and are summarized below. These procedures were taken into account in the present study in planning and delivering the implementation. Especially for the AD patients, necessary adaptations, as suggested by the authors, were made.

1. When to practice: Early in the day is recommended, to set a positive tone; or before the midday meal; or before sleep. For older adults, after a meal may be best, so that hunger does not impede focus.

2. Where to practice: A quiet place is recommended, without disturbances of phone, other people, or noises. An attractive setting, possibly with plants or pleasant objects, enhances the experience. For older adults especially, a quiet, private room with closed door may increase the sense of security and safety.

3. Position during practice: A sitting position in a supportive, straight-backed chair is preferable. Other suggested positions are sitting or kneeling on the floor on a firm cushion for support. However, for the study subjects,

sitting on chairs with arms for additional support was the most comfortable seating arrangement.

4. Length of practice: The ideal time recommended for one session to elicit the relaxation response is 10 to 20 minutes, once or twice a day. For individuals practicing alone, adhering to the same time and frequency daily will enhance results. For the study subjects, the length of time and frequency of sessions were scheduled before the intervention, as described in the next chapter.

Practice of the relaxation response by the methods discussed will lead the practitioner to a quieter and more peaceful state. Whether this or other mind/body relaxation techniques are practiced, measurable relaxation of both mental and physical systems takes place.

As summarized in this section, the relaxation response is an easily learned, conscious mental technique for quieting the mind and relieving stress. This technique is elicited through nonforced concentration on a physical or mental device, such as the breath, a word, object, or image. To best elicit the relaxation response, guidelines are recommended, especially a quiet place, a comfortable position, and an undisturbed length of time, generally 10 to 20 minutes. This relaxation technique may also be naturally combined with mental visualization and imagery, and the physiological results are measurable. With this commonality in mind, the next section reviews empirical PNI research on

application of the relaxation response and associated techniques.

The Relaxation Response and Related Techniques: Research Studies

For AD patients, research on the relationship between PNI and the nonpharmacological techniques described is sparse. With the increasing exploration of many types of treatment, several recent studies will be reviewed later in this chapter. However, many studies have been carried out by both Benson and independent researchers on the relaxation response and its associated techniques in non-AD subjects.

Studies by Benson

Benson and his associates have conducted many studies throughout the years on the relaxation response and physiological effects. In his early studies on the effects of relaxation, Benson (1975) reported physiological results that reversed those associated with constant stress, especially the "fight-or-flight" syndrome. In this syndrome, metabolism, heart rate, blood pressure, breathing rate, and muscle tension all increase and can lead to such fatal illnesses as hypertension, heart attack, and stroke (Benson, 1975, p. 25). With subjects practicing the relaxation response, Benson (1975) charted a marked decrease of oxygen consumption, heart rate, and blood pressure during the relaxation response. Further, lactate levels, associated with anxiety, became lower; and alpha brain waves,

associated with relaxed states, increased in frequency and intensity.

Studies reported in Benson's (1997) work were severely criticized by two researchers. In 1997 Tessman and Tessman, a biologist and a physicist, pointed to four studies of Benson's in which the subjects' uses of relaxation methods were credited for decreases in nausea, infertility, postoperative arrhythmias, and susceptibility to extreme cold temperatures. For each study, Tessman and Tessman claimed that the data were misrepresented in terms of number of subjects and percentages, or that each benefit could be explained by other reasons or factors.

The first Benson (1997) study concerned the placebo effect on persistent nausea during pregnancy. It was claimed that pregnant women's nausea ceased completely when they were told they were being administered an antinausea drug but in fact were given a nausea-inducing drug. When Tessman and Tessman (1997) checked the original study, they found it involved only a single subject, hardly enough to generalize about results.

Benson's second study claimed that with matched controls, 36% of the women with infertility became pregnant after completing a relaxation program. Examining the original study, Tessman and Tessman (1997) found there was no matched control group and that some of the women had become pregnant before beginning the training

program. This fact made questionable the claim that 36% owed their pregnancies to meditation.

In the third study, Benson asserted that open-heart surgery patients had fewer postoperative arrhythmias if they had learned relaxation techniques. However, Tessman and Tessman (1997) reported that they found "no significant evidence of benefits" cited in the Benson study (p. 370).

The fourth study was rather a discussion by Benson alluding to the ability of Tibetan monks, who meditate regularly and extensively, to presumably control their bodily reactions. When they wrap themselves in wet, cold cotton sheets, they do not shiver, as would most people. These conditions were replicated by I. Tessman, who found that, in the 15-minute trial, he also did not shiver. He concluded that the wet cloth actually acted as an insulation to the body.

Commenting on these critiques, Emery (1997) observed the evident irony. A pioneer in alternative therapies such as Benson had repeatedly pointed out the low scientific standards in the field. However, it appeared that he himself misrepresented findings in a number of his own studies.

Given the high visibility of Benson's work and his ongoing programs, critiques such as these by Emery (1997) and Tessman and Tessman (1997) should not be dismissed or minimized. These critiques, similar to those by Burg and Stoller (1998), point to the need for sufficient samples,

validation, conscientious replication, and use of control groups in mind/body research. The critiques also underscore the requirement for the identification of and control for the many possible intervening variables.

Studies by Others

Nevertheless, despite apparent lapses in scientific rigor, Benson's (1975, 1985, 1997) works and those of other researchers in mind/body approaches have helped many to cope with both physical and psychological disorders. The range of populations is wide, from children to older adults. Representative studies will be reviewed next.

Children and young adults. Day and Sadek (1982), for example, studied Lebanese fifth-grade children for the effects of the relaxation response on anxiety levels. A total of 62 children (22 female, 40 male) were randomly divided into treatment and control groups. The treatment group practiced relaxation techniques for 10 minutes daily over 6 weeks; the control group was instructed in a reading activity.

Results showed that, on instruments for children of test anxiety and general anxiety, treatment group subjects scored lower than control subjects. However, at follow-up 3 weeks later, the treatment effects had disappeared. It is possible that practice sessions were too brief, especially given the extraordinary stresses of Middle Eastern children in times of war and social upheaval.

With an older and possibly more stable group of subjects, the physiological effects resulting from the application of the relaxation response were studied by researchers Huber and Gramer (1990). Forty university students, ages 19 to 25, received a relaxation training program of 6 weeks' duration. Four physical measures were taken before and after the training: frontal brain electromyographic activity, heart rate, skin resistance level, and finger temperature. As the authors stated, results showed that "contrary to the traditional view, the relaxation response does not seem to result in generalized and uniformly decreased sympathetic nervous system activity" (Hubert & Gramer, 1990, p. 104).

These results could be accounted for by many factors. They include quality of training, other preoccupations of the students, possible researcher bias, and the absence of control. Such reasons, admittedly, could be present in studies showing positive outcomes of use of the relaxation response. However, the nonsignificant results of Huber and Gramer (1990) point to the need for more careful and replicated studies on the RR with a wide range of subjects.

Range of adults. In a more controlled study, Paran, Amir, and Yaniv (1996) monitored outpatient hypertensive adult patients for physiological effects of relaxation. Twenty patients were given 10 sessions of biofeedback-assisted relaxation instruction and home practice. A control

group was given the routine medication only. Results of a mental arithmetic stress test immediately before and 6 months after the relaxation therapy indicated that treatment group patients had lower blood pressure and lower states of anxiety than the control group. They were also able to take lower dosages of drugs than the control group. In addition, statistically significant positive 6-month posttreatment effects were evident, in lowered blood pressure, heart rate, galvanic skin response, and skin temperature.

An initial and follow-up study utilizing relaxation techniques were conducted to ascertain immediate and long-term effects of an 8-week stress reduction program. Kabat-Zinn, Massion, and Kristeller (1992) studies 22 patients with generalized anxiety and panic disorder (mean age 26), referred from a psychiatric outpatient clinic. Before and during the intervention, both patients and therapists submitted quantitive anxiety and depression assessments weekly, and then monthly afterwards. Immediately after the program, 91% (20 patients) scored significantly lower on anxiety and depression. At 3-year follow-up, in which most of the patients were still practicing the relaxation techniques, of the 20 who sent in assessments, 90% (18 patients) showed continued improvement in their anxiety and depression scores (Miller, Fletcher, & Kabat-Zinn, 1995).

In another study with surgical patients, 24 adults were randomly assigned to an treatment or control group. For 5

days, the control group simply observed 20 minutes of quiet time, and the treatment group watched a 20-minute videotape on relaxation and guided imagery, very similar in verbal content to the present study's audiotape. Following surgery, subjects in the treatment group showed less anxiety than controls, as measured by their responses to an anxiety instrument (Holden-Kund, 1988).

Physiological distress was shown to be ameliorated in another study by Achtenberg, Kenner, and Casey (1989) utilizing 64 patients who suffered severe orthopedic trauma, such as gunshot wounds and crushed limbs. The subjects were divided into four groups and were administered audiotaped relaxation training similar to that used in the present study, relaxation plus biofeedback, quiet time only, and no additional intervention. After 5 weeks, patients in the two relaxation groups reported less discomfort and anxiety, and lower systolic blood pressure, than those in the other two groups.

The effects of relaxation training and hypnotherapy have been studied by researchers for over 10 years. Although these interventions are indeed similar in prompting the individual to access inner consciousness states, they are distinct in methods and focus. Hypnosis has been defined as a state of heightened focal concentration, in which a person is receptive to another's suggestions. It is a condition in which a person responds to appropriate suggestions by

experiencing alterations of perception, memory, or mood (Kaplan & Sadock, 1996).

Relaxation shares many of these attributes, especially if the relaxation is guided or induced by another, but relaxation, especially as pertinent to the present study, has the goal of instilling a sense of control in patients concerning their levels of anxiety and relaxation. Hypnosis may use many techniques, such as voice sounds or objects to focus on. A major mode of relaxation, utilized in the present study, is instruction in concentration on different muscle groups to release them progressively. This method is called progressive muscle relaxation (Benson & Baim, 1998; Kaplan & Sadock, 1996).

Humphreys (1984) reviewed literature on the efficacy of the relaxation response on somatic conditions such as hypertension, insomnia, and anxiety. These are all conditions often suffered by AD patients. His review revealed little difference in effects between the two methods; they were further related since relaxation training was found to induce hypnosis in some subjects. Moreover, both methods were found significantly more effective than those employed by a waking-state control group, primarily in control and relief of the physical conditions specified.

The psychological and immunological effects of relaxation training were also studied by Johnson, Walker, Heys, and Whiting (1996). A total of 24 healthy adults, ages

18 to 65, were assigned to a treatment group or control group. The treatment group subjects were delivered three weekly sessions of relaxation training. Several mental state tests were administered, and urine and blood samples were taken. Treatment group subjects showed improved scores on the mental state tests and decreased presence of physiological stressors (lymphocyte responsiveness and interleukin-1 secretion).

Although in these studies the total number of subjects was relatively small (62 to 20), results were consistent on various measures. In addition, treatment duration was also relatively short, from 5 days to 10 weeks, respectively. In both number of subjects and duration, these studies are similar to those in the proposed research, 34 subject pairs and 5 weeks of instruction in a relaxation technique. The results of the previous studies thus offer support for the positive research hypotheses of the present work.

The workplace. The relaxation response and progressive relaxation have also been used in the workplace for stress management. Maddi (1998) studied the effectiveness of hardiness training on the job in comparison with a relaxation/meditation condition, the relaxation response, and a placebo/social support control. A total of 54 managers in a utilities company were randomly divided into three groups, with all treatment conditions 1½ sessions weekly for 10 weeks. Results indicated that the hardiness condition was

more effective than the other two, although the relaxation condition was somewhat effective.

Maddi (1998) himself posited that hardiness training gave respondents a greater sense of control and commitment that they could then transfer to their jobs and home life, in contrast to relaxation training. With regard to these findings and the proposed study, the AD patients are at a stage beyond workplace considerations. Their greatest requirements seem to be the need to assuage anxieties, agitations, and related symptoms as a result of their condition and not outside forces. Thus, the chosen intervention appears appropriate.

In another workplace study, Bellarosa and Chen (1997) reported on assessments by 96 industrial stress management experts of six extensively used occupational stress management interventions: relaxation, physical fitness, cognitive restructuring, meditation, assertiveness training, and stress inoculation. Results of a comprehensive literature search by the researchers and a detailed questionnaire to respondents revealed that meditation and stress inoculation were evaluated overall as the least practical interventions, and relaxation as the most practical mode. This finding supports the choice of a relaxation technique as the treatment mode for the present study.

Special contexts. An additional and innovative support

for the present research is the recommendation of Rosenbluh (1984) for the relaxation response as an affective "prescription" for crisis and anxiety-producing situations (p. 23). As he pointed out, relaxation may effectively substitute for frequent drug use, which is nonproductive and does not aid coping behavior. A five-step prescription is described, which focuses on four factors: A mental device, such as focusing on an object; an open, passive attitude; muscle relaxation; and a serene and quiet environment.

This article, although descriptive rather than experimental, is nevertheless important to the present study for several reasons. First, AD patients often experience their illness and its deteriorative progression as crises, and they suffer high anxiety (Mega et al., 1996). Second, the four factors outlined will be parts of the intervention, with the mental audiotape as the device. Third, although drugs are often prescribed for AD symptoms, many patients have unpleasant side effects (Schneider, 1998). Thus, the context of crisis intervention is a valuable one in which to view the present training intervention with AD patients.

A second context for AD patients may be seen from a study involving guided imagery, an aspect of relaxation training. In a laboratory setting, Tarrant (1996) conducted a study with four subjects who were administered four treatment conditions: recollection of a passive outdoor recreational experience, recollection of an active

recreational experience, recollection of a past classroom examination, and present listening to a relaxation tape.

Results of self-reports showed that recollections of the outdoor recreational experience produced positive changes in both affect and reduction of physical symptoms. Tarrant (1996) suggested that these "may have potential for application as a therapeutic technique" (p. 7).

Although this study was limited by very few subjects and the fact that they were all college students (mean age 25.2 years), implications are nevertheless pertinent to the present study. Tarrant (1996) observed that recollections of outdoor recreational experiences, as a guided imagery technique, might have particular application to certain populations. He cited specifically "cases where the intent is to provide positive stimulation (for example, when dealing with depression or promoting cognitive competence, as in persons with Alzheimer's disease)" (para. 26).

This observation follows from Weiss's (1989) discussion of the therapeutic effects of reminiscence in helping subjects with memory loss to remember life experiences and events. Both this recommendation and Tarrant's (1996) study imply the appropriateness of the present study. The intervention of relaxation techniques with Alzheimer's patients seems especially timely in the current research context.

Nondemented older adults. Although studies with older

adults exclusively are more limited than with other populations, research has nevertheless been conducted over the last 25 years. In 1975, for example, Richard examined the case histories of seven patients, all over 65, for several aspects of relaxation therapy. These included its role and effects in patients with a severe physical illness, and its effects in development of neurotic states. The average duration of relaxation treatment was 6 months, concurrent with more usual treatments, such as psychotropic medication and physiotherapy. Patient perceptions of somatic changes during the course of relaxation treatment were emphasized. They reported feeling "more relaxed," "easier," "having less aches and pains," and feeling "less on edge all the time" (p. 714).

Richard (1975) recommended further research with older adults and relaxation techniques, and some later researchers explored the effects of relaxation techniques with this population. Kiecolt-Glaser, Glaser, and Willinger (1985) studied 45 older adults in independent living facilities for the relationship of immunity to relaxation training. Over a 4-week span, 15 patients received relaxation training 3 times weekly, 15 patients received social contact 3 times weekly, and 15 patients received no contact. At posttest, the social contact and no contact groups showed no physiological or psychological changes, but the relaxation group patients showed significant increase in "natural

killer cell" activity and reported feeling more relaxed (p. 40).

Studying anxiety in nondemented older adults, Yesavage, Rose, and Spiegel (1982) found that over a 12-week period memory in the subjects improved with relaxation training, and their anxiety levels decreased significantly. Older adults' anxiety complaints and relaxation treatment were also studied by Rickard, Scogin, and Keith (1994). In a longitudinal study with posttreatment and 1-year follow-up measures, they found that, though there were no statistically significant treatment effects at follow-up, the means for subjects' anxiety at follow-up were consistently lower than the original posttreatment means.

Particularly pertinent to the present study is research by Scogin, Rickard, Keith, Wilson, and McElreath (1992). They studied 54 adults, mean age 68, for the effects of relaxation training on high subjective anxiety. Subjects were divided into three groups: progressive relaxation training involving muscle tension-release cycles (PR); imaginal relaxation training, in which subjects were instructed to simply imagine relaxation (IR); and a control group. Both treatment groups participated in a four-session treatment. Pretest and posttest measures were administered to all three groups on anxiety, general psychiatric distress, and relaxation responses.

At posttreatment and 1-month follow-up, both treatment

group subjects (PR and IR) showed significant positive changes, as measured by scores on the psychiatric distress inventory, and a significant pre-post session effect for relaxation. Also, these subjects showed significantly progressive relaxation from session 1 through session 4. However, no significant decreases were revealed for anxiety. This outcome led the researchers to conclude that, because anxiety is often "stable and enduring," more relaxation training sessions may be called for to elicit decreased anxiety levels (p. 422).

This study had both strengths and weaknesses in comparison to the present work. The study was limited in two ways. First, although the number of subjects was greater, 54, in contrast to the present 34, the number of sessions was very small, 4 in contrast to the present 15. Second, the time for each session was not specified; for the present study each session was 30 minutes.

However, the Scogin et al. (1992) study has several applicable strengths. First, the researchers reported that their older adults found the treatment enjoyable and nonthreatening, as had older adults in former studies. As this was the case with normal older adults, informal feedback during the present study indicated that older adults with AD responded similarly. Second, the improved relaxation concerning subjects who only imagined the muscle tension-release cycles has important implications for the

present subjects. Some were physically unable to engage in actual progressive muscle relaxation, as instructed in the intervention audiotape; based on the Scogin et al. (1992) findings, nevertheless they apparently benefited from the present training.

This conjecture is based in part on the few studies available on the use of relaxation techniques with AD patients. These seem to confirm the positive effects of relaxation techniques with this population.

In the review of research studies on the relaxation response and related techniques, this section has demonstrated that many studies have been conducted, both questionable and more scientifically rigorous. The originator of the relaxation response, Benson (1975, 1985, 1997), and his colleagues have conducted numerous studies on the relaxation response and its effects on many physical and psychological conditions. However, some of these studies have been found wanting for adherence to the highest scientific research standards.

Other researchers have also studied the relaxation response with various populations. Results have generally been promising, although mixed. Relaxation training has helped improve somatic conditions such as hypertension, insomnia, anxiety, and stress levels, as well as scores on mental state tests. Studies in the workplace have shown that, in one case, relaxation training was not as effective

as hardiness training, but in another, relaxation was found the most efficacious of six interventions. In a laboratory setting, guided imagery of outdoor experiences was found highly effective in reducing physical and emotional symptoms of stress and depression. In research over the last 25 years with nondemented adults, subjects reported they were more relaxed, less anxious, and less distressed than before the training. More recently, a number of studies of relaxation training and other mind/body techniques have been undertaken with AD patients. The next section reviews this literature.

Alzheimer's Patients and Mind/Body Techniques

The scarcity of research on mind/body techniques may be attributable to the fact that treatment and research on the AD population have focused almost exclusively on aspects of pharmacological, behavioral, and environmental management. Study of subjects suffering from AD has also been mostly limited to caregivers, as Cotrell and Schulz (1993) observed, and sparse attention has been given to patients themselves. Based on the few studies with AD subjects located for the present study, this perspective seems to have changed little since Cotrell and Schulz's (1993) work.

Nevertheless, these researchers also pointed to several earlier studies of AD patients which bear on their suitability as subjects. Prior studies focused on AD patients' symptoms as adaptations or communication patterns. For example, a patient's recognition and perception of

cognitive distortions resulting from the disease may produce depression or behavioral agitations, in contrast to these symptoms resulting from the disease itself. Such studies, as Cotrell and Schulz (1993) observed, "stress the active role of the individual in shaping responses to AD as an illness" (p. 206). The present study also enlisted the AD patients in an active role.

In relation to patients' active roles, Cotrell and Schulz (1993) observed several deficiencies in AD research, especially the lack of studies focusing on the patient's perspective. These researchers emphasized the viable contributions that patients can often make in feedback, observations, and experiences. Finally, Cotrell and Schulz (1993) pointed to the need for studies of interventions with AD patients as subjects, to enhance their experiences, self-image, and overall well-being.

Later researchers recognized similar lacks and challenged dismissals of the AD patients themselves. For example, Buckwalter et al. (1995) observed, "elders with diminished levels of cognitive functioning are able to provide meaningful, consistent responses that illustrate individual expressions of self" (p. 14). Ronch (1996) pointed out that to view AD as only a disorder disrupting cognitive functioning is to ignore the vital role of AD patients' emotions.

As earlier studies also noted, emotional responses may

play significant cause-effect roles in AD patients' problematic behaviors. Researchers Lafleshe and Albert (1995) found that AD patients were similar to normal subjects in performing cognitive functions that required concept formation, cue-directed behavior, and attention. And Suhr et al. (1999) commented that the deficiency of psychological or behavioral interventions with AD patients "appears to stem, at least in part, from the belief that [their] memory impairment . . . precludes their learning new skills or behavioural repertoires" (p. 33). It is in light of such comments, and because of the dearth of other studies with AD patients themselves, that the present study was undertaken.

An early study by Welden and Yesavage (1982) of 48 psychiatric inpatients with AD or vascular dementia, ages 52 to 93, demonstrated that relaxation training attenuated their extreme agitation and anger outbursts, among other symptoms. Jarkovsky (1994) reported on relaxation training, as well as reality orientation and cognitive therapy, with psychiatric patients with both these types of dementia, and others with schizophrenia and paranoid psychosis. The 52 subjects, ages 64 to 88, were given all three modalities by trained staff from 1992 to 1994. Unfortunately, no quantitative measures were reported for any point in time during the intervention. Rather, Jarkovsky (1994) emphasized that the intervention goal was to stimulate the patients'

remaining mental and physical abilities and, as much as possible, promote their health and independence.

These are worthy goals, but for greater acceptance of such approaches, more empirical studies are needed (Cotrell & Schulz, 1993). It is interesting that relaxation intervention was used in a recent study with elderly caregivers, ages 61 to 72, of dementia patients. They were administered certain relaxation techniques, among other behavioral treatments, by McCurry et al. (1996). After a 6-week intervention, subjects showed improvement in sleep efficiency and hours of nightly sleep, and these were maintained at 3-month follow-up. However, this study was limited by a very small sample, four subjects, and no control.

Because caregivers of AD patients play such a central role, caregivers' participation is essential in objective measures of the patients' behavior (Alspaugh et al., 1999; Teri, 1997). The most recent and comprehensive study of AD patients and their caregivers with administration of relaxation techniques was conducted by Suhr et al. (1999). A total of 34 patients with mild to moderate AD and their caregivers, 17 pairs, were assigned to the treatment condition of progressive muscle relaxation (PMR) or a control group of imagery technique. All patients were living at home, similar to patients in the present study. Mean ages of patients were 76 and 74, respectively.

Prior to training, the AD patients were administered four instruments to assess their cognitive abilities of memory and verbal fluency, as well as an anxiety inventory. Caregivers completed three instruments: a researcher-designed AD behavior scale, a dementia severity scale, and the MBPC, the measure used in the present study.

Results comparing the treatment and control groups' pretest and posttest means supported the research hypotheses. Neither group showed a significant change in basic levels of dementia. However, the treatment group showed a significant decrease in both psychiatric symptomatology and behavior problems, compared to the control group. The treatment group also demonstrated improvement on the memory and verbal measures. Moreover, these results were sustained at a 2-month follow-up.

Despite the promising results of this study, limitations were present. Although patients were designated as mild to moderate AD sufferers, no measure was identified to substantiate this diagnosis. The present study used the AMMSE score pretraining as a diagnostic and exclusionary tool. In addition, in Suhr et al. (1999), neither the duration of the training nor time span of sessions for treatment and control groups were specified. The researchers stated that sessions were equated for both groups and "individually tailored"; however, no means or ranges of sessions were provided (p. 35).

Nevertheless, study strengths outweighed the weaknesses. The control conditions were well explained. Especially impressive was that the control treatment was also a palliative intervention, imaginal relaxation. In this regard, it is noteworthy that the Suhr et al. (1999) controls performed less well than the Scogin et al. (1992) subjects with similar imaginal relaxation techniques.

Another strength of the Suhr et al. (1999) study was the extensive use of instruments. These served to enhance the reliability of the study, demonstrating by correlation that the researchers were measuring what they set out to measure (Rubin & Babbie, 1997). A related strength, which enhanced validity, was the total number of subjects in both groups, who were similar in age and education. The present study also utilized 34 comparably matched subjects, the same number as in Suhr et al. (1999).

The outcomes of Suhr et al. (1999) indicate the potential effectiveness of relaxation training with AD patients for both cognitive and behavioral disturbances. As the researchers observed, relaxation training "has the potential to minimize catastrophic reactions and excess disability" for mild to moderate AD patients (Suhr et al., 1999, p. 40). Such training may help reduce caregiver stress levels and patients' needs for the administration of psychotropic medication. The present research should contribute additional validation for similar complementary

nonpharmacological treatment for both AD patients and their caregivers.

It is evident from this review of the sparse research on mind/body techniques with AD patients that past researchers judged them unable to participate satisfactorily in research studies. More recent views, however, have reversed this attitude, and researchers recognize the meaningful responses AD patients can provide, despite their cognitive deficits. The few studies in which AD patients were administered relaxation training showed amelioration of their agitation and insomnia. The most recent and extensive study to date, by Suhr et al. (1999), reported that the AD treatment group, compared with a control group, showed significantly reduced psychiatric symptoms and behavior problems, as well as improved memory and verbal functions. Based on these results, the researcher anticipated that development and use of such interventions would improve AD patients' quality of life, enhance their self-esteem, and reactivate their sense of independence and dignity.

Summary

Alzheimer's disease is a debilitating illness affecting the older population in greater numbers than ever before, and it is predicted to increase in the coming decades. There is presently no cure for AD; it is treated with specific drugs and supervised daily activities. In various group settings, the activities include self-care instruction,

as well as recreational, social, and educational programs to help patients retain or regain mental and physical faculties (Alzheimer's Association, 1999; Kaplan & Sadock, 1996).

In recent years, with increasing medical research to discover the causes and cures of AD, the new field of psychoneuroimmunology is emerging. In this discipline, medical scientists and psychologists have been investigating the integration of bodily systems and mental processes. Increasing evidence has been found for the interrelated effects of all systems of the human organism (Ader, 1995; Maier et al., 1994).

Clinical applications of such findings have been developed in many forms. One of these is mind/body techniques, which are utilized to address a range of physical and emotional maladies with many populations (Sobel & Ornstein, 1996). Among the most widely taught and used mind/body techniques are guided imagery and associated relaxation modes, specifically the relaxation response (Benson, 1975, 1997; Benson & Baim, 1998).

However, although such interventions and studies have been conducted with the general population, these techniques and outcome studies have been little applied to Alzheimer's patients, who could possibly benefit from them. Within the field of PNI, the mind/body techniques have been shown to enhance mental alertness, help individuals control behavior, and decrease stress and other negative emotions. These are

all aspects of AD with which patients struggle, as family members and professional caregivers attempt to help patients by various pharmacological and psychosocial methods (Richards & Hendrie, 1999).

The present study has added to the sparse research on a specific behavioral technique utilizing a PNI approach with AD patients. In this investigation, the researcher explored whether a nonpharmacological intervention, a course in relaxation training, increased the mental functioning and decreased the memory and behavior problems of Alzheimer's patients.

CHAPTER 3

METHOD

The problem explored in this study was chosen from the recognition that Alzheimer's patients suffer from many problems of mental deterioration and behavioral difficulties. To date, despite the benefits of both pharmacological and traditional nonpharmacological treatments, these modalities have been found deficient in helping to relieve the symptoms of patients suffering from AD. Therefore, as stated in chapter 1, the problem investigated in this study was how individuals with AD respond to an alternative, complementary nonpharmacological treatment, specifically, group participation in a course in a relaxation technique.

This study had a twofold purpose: (a) to add to the research with the AD population; and (b) to ascertain the effectiveness of the intervention, specifically a course in a relaxation technique in a group setting, for increasing mental functioning and decreasing memory and behavior problems in AD patients. Toward fulfillment of this purpose, two research questions and two research hypotheses were formulated.

Research Question 1: Will Alzheimer's patients show measurable improvement in mental state, specifically orientation, registration, attention, recall, and language, after completing a course in a relaxation technique, compared to a control group?

Research Question 2: Will there be a measurable improvement, as rated by caregivers, in the memory and behavior problems of AD patients who are given a course in relaxation, compared to a control group?

From these research questions, the following research hypotheses were formulated:

Null Hypothesis 1: There is no statistically significant difference in the mental functioning of AD patients who participate in a course in a relaxation technique and the mental functioning of AD patients who do not participate in such a course, as measured by pretest and posttest scores on the AMMSE (Folstein et al., 1975) (Appendix A).

Research Hypothesis 1: AD patients who participate in a course in a relaxation technique will show a statistically significant increase in mental functioning, compared with AD patients who do not participate in such a course, as measured by patients' pretest and posttest mean scores on the AMMSE.

Null Hypothesis 2: There is no statistically significant difference in the memory and behavior problems of AD patients who participate in a course in a relaxation technique and AD patients who do not participate in such a course, as measured by caregivers' pretest and posttest scores on the MBPC (Zarit et al., 1985) (Appendix B).

Research Hypothesis 2: AD patients who participate in a

course in a relaxation technique will show a statistically significant decrease in memory and behavior problems, compared with AD patients who do not participate in such a course, as measured by caregivers' pretest and posttest mean scores on the MBPC.

Design of the Study

To test the research hypotheses, this quasi-experimental study employed a nonequivalent groups pretest-posttest design. This design is similar to the true treatment pretest-posttest control group design except for lack of random assignment of subjects to treatment and control groups (McMillan & Schumacher, 1997). The groups, however, should be as equivalent as possible (Gay, 1996). Levin and Hinrichs (1995) noted that this design approximates "a true experiment in a naturalistic setting. . . . This often involves before-and-after observations centered around an event of interest" (p. 255).

In this study, the independent variable was the treatment, comprised of the treatment center's standard care plus the course. The dependent variables were patients' pretest and posttest scores on the AMMSE and caregivers' pretest and posttest scores on the MBPC.

Participants

Population and Sample

Participants for this study were drawn from the population of Alzheimer's patients in two adult day care

centers specializing in AD. The centers' patients come from the surrounding community and by referral from many sources. These include the Alzheimer's Association, memory disorder clinics, home health agencies and hospitals, area HMOs, local churches and synagogues, and present and past caregivers. Fees for attendance at the AD centers are based on a sliding scale.

A convenience sample of patients in the clinically diagnosed mild stage of AD was recruited. Patients with mild AD were chosen because at this stage they may be most helped to slow symptoms of the disease and because their cognitive functioning is still intact enough for attentive participation in the intervention (Plaud et al., 1998). In addition, this choice was based on research conducted with mildly impaired AD subjects and controls. In these studies, on tests measuring a cluster of cognitive abilities, although results indicated that AD patients scored lower than controls on memory and concurrent manipulation of information, both groups scored similarly in concept formation, cue-directed behavior, and attention (Lafleshe & Albert, 1995). These cognitive functions were required for treatment group patients in the present study.

As described in the criteria and procedure sections, to determine the subjects' stage of AD, 1 week before the intervention began, all subjects were administered the AAMSE as a pretest. Subjects participated on the basis of reaching

a score of at least 19, indicating mild to moderate AD.

Although the subjects constituted a convenience sample, an informal preliminary demographic survey revealed that they were nevertheless representative of the larger mild AD population. That is, in both the sample population and national incidence, there was a higher prevalence of females than males (Kaplan & Sadock, 1996). At the research centers, the gender distribution was found to be three times as many females as males. The age range of patients at the centers was from 50 to 90. This range is consistent with the national statistics for onset, although risk increases with age (Alzheimer's Association, 1998, 1999). At the research sites, all patients, 100%, lived at home and attended the centers for daytime activities. This percentage is higher than the 70% of AD patients nationwide who reside at home (Alzheimer's Association, 2000), and for study patients this characteristic was the least representative of the larger population.

In addition, despite variations in the centers chosen, both were similar to many such AD centers in terms of objectives, facilities, and activities. For example, the programs of the research sites included physical, recreational, educational, and social activities advocated or implemented in many day care centers nationwide (Burnside, 1994; Estes, 1993; Mace & Rabin, 1991; Partners in Caregiving, 1995).

Finally, the research centers had a diverse ethnic mix, including Black, Hispanic, and White patients. This mix generally reflects the ethnic diversity in the national population in adult day care centers for individuals with AD (American Association of Retired Persons, 1997; Cohen, 1993; Estes, 1993; Plaud et al., 1998).

Inclusion Criteria

For both the treatment and control groups, several criteria for inclusion were used, as follows:

1. Caregivers had to agree that the patient could participate, as indicated by the caregivers' return of the written consent (Letter and Informed Consent Form for Caregivers, Appendix D).

2. Patients had to reside with caregiver a minimum of 4 days per week to allow the caregiver ample opportunity to observe the patient in a daily setting for caregiver responses to the MBPC (Appendix B).

3. Patients had to have been admitted with a clinical diagnosis by a physician of "Dementia" or "Dementia of the Alzheimer's Type," per the DSM-IV (1994) diagnostic criteria (pp. 142-143).

4. Patients were required to have a minimum score of 19 on the AMMSE administered as a pretest. On the AMMSE, a possible perfect score is 30. Cutoff scores vary for determination of the different stages of AD, from mild to moderate. As noted above in the definitions section,

Folstein et al. (1975) specified a score of 19 or below to differentiate between any stage of AD and normal. Katz (1998) and McDougall (1998) used a score of 15 for mild to moderate subjects; and Lafleshe and Albert (1995) used a score of 22. Based on Folstein et al. (1975), the originators of the AMMSE, a score of 19 was chosen as the AMMSE criterion for this study.

5. Patients had to be able to understand and follow basic verbal instructions, as observed by staff members during the pilot study and practice sessions.

6. Patients needed the physical stability to sit comfortably in a chair, or their wheelchair, for at least 30 minutes, as reported by the patients themselves, caregivers, and staff in daily attendance. This time span was the length of one training session.

Sample Size

A total of 34 pairs of patients and caregivers were recruited, or 17 pairs per center. The patient population of Center 1 was 45 and that of Center 2 was 40. In discussing AD patients' participation in research studies, Cotrell and Schulz (1993) pointed out, "small sample sizes may be quite appropriate for the level of inquiry currently needed . . . especially if the goal is identification of new variables, models of change, and hypothesis development" (p. 209).

The total number of subjects was within the acceptable range of 30 for study validity (Gay, 1996). For experimental

research, Gay (1996) pointed out that "a minimum of 30 subjects per group is recommended" (p. 124). In research comparing groups, McMillan and Schumacher (1997) advocated "at least fifteen subjects in each group," noting that some experiments contain as few as 8 to 10 subjects (p. 176). Isaac and Michael (1995) discussed the merits of large versus small samples for experimental and quasi-experimental research. In favor of small samples, they observed, "Samples with Ns between 10 and 30 have many practical advantages," among which is that they are "large enough to test the null hypothesis" (p. 101).

Moreover, Isaac and Michael (1995) pointed out that a sample size greater than 30 is typically considered "large" (p. 101). In discussing the *t* test for significant difference between two sample means, which is the major statistical test used in this study, Isaac and Michael (1995) further noted that the *t* test is satisfactory for large samples and "particularly appropriate" for small samples, especially when the sample sizes are equal, as was the case in this study (p. 181).

With application of the multivariate analysis of variance (MANOVA), which was the other statistical test used, the nonrandomized sample could bias results. Nevertheless, the two group sizes were equal. With equal groups, according to Burns and Grove (1997), use of the *t* test and MANOVA "will increase power because the effect

size is maximized" (p. 311). The effect size is the extent of the presence of a phenomenon. In this study, the phenomenon was the effects on AD patients of a course in a relaxation technique. Further, multivariate analysis was illustrated by Levin and Hinrichs (1995) with 10 subjects in each group. The present study with independent groups had 17 subject pairs in each group. Finally, Herzog (1996) asserted, "MANOVA can be used with either independent- or nonindependent-treatment designs. . . . It is truly an all-purpose approach to the analysis of experimental data" (p. 233).

With these considerations in mind, one of the two centers was randomly chosen for the treatment group. On completion of the study, patients in the control group were offered participation in another session of the course in the relaxation technique.

Setting

The day care centers in Southeast Florida chosen for this study were matched as closely as possible for location, comparable facilities, age and gender distribution, diagnoses, and activities. Center 1 is a nonprofit institution under the auspices of a major charitable organization, and Center 2 is privately funded. In both centers, funding sources for patients include Medicaid, Alzheimer's Disease Initiative, and Community Care for the Elderly (Special Care for Special People, 1999). The

researcher had preliminary contact with the clinical directors of both centers. They offered their full cooperation in providing the necessary facilities and recruiting the required subjects for this study (Letter of Authorization from Clinical Director of AD Center 1, Appendix H; Letter of Authorization from Clinical Director of AD Center 2, Appendix I).

The following description is fairly typical of both centers, although the physical facilities differ somewhat. The centers are located in a major city. They have television and game rooms, as well as a training room, ample restrooms, and a large kitchen in which patients are encouraged to assist with meals. The administrative offices are located in each building.

The centers are painted in attractive colors and furnished with comfortable chairs and spacious tables. Several large bulletin boards with colorful announcements are prominently displayed for notices of activities and events. Activities are designed to encourage and maximize existing skills of patients and promote their self-esteem through stimulation of mental and physical abilities (Adult Day Health Care Program, 1998; Special Care for Special People, 1999).

Transportation is provided, and patients are picked up at their homes and brought back at day's end. Patients are served Monday through Friday, from 8:30 a.m. to 5:30 p.m.,

with two meals and a snack provided (Adult Day Health Care Program, 1998; Special Care for Special People, 1999).

A range of physical activities is offered (e.g., bowling, shuffleboard, dancing), some intellectual activities (e.g., word and number exercises, current events), and recreational activities (e.g., arts and crafts, gardening, field trips). A major goal of all activities is to prompt patients' memories, coordination, and reasoning skills (Adult Day Health Care Program, 1998; Special Care for Special People, 1999).

Both centers employ approximately eight staff members who have direct contact with patients: the clinical director, a senior companion, a licensed practical nurse, a social worker, a program assistant, two senior aides, and an adult education teacher. Additionally, the administrative supervisor, fiscal department staff, and medical records personnel are on the premises. Community volunteers also assist.

At both centers, in-service training programs have been developed for all employees and volunteers, and all employed staff have at least 3 years experience with Alzheimer's programs. The staff training and center resources and programs are designed to offer a protected environment to patients in which they can function in supervised, organized groups. The centers are equipped for handicapped access, special diets, and incontinence, as well as referrals to

agencies for other needs the patients could require.

Instruments and Materials

Four instruments were used to measure the dependent variables in this study. Two of these were administered to the patients and two were completed by their caregivers. Spanish translations were available for patients and caregivers who needed or requested them.

The Demographic Instruments

Description. Two demographic instruments were used, the Demographic Survey for Caregivers (Appendix E) and the Demographic Information Form for Patients (Appendix G). For both instruments, 10 items of basic demographic information are requested, such as gender, age, ethnic background, and marital status. In addition, several items were included for either patients or caregivers, specific to this study. For example, for patients, certain items concerned the assessment of their mental state and degree of physical mobility. This information was part of the information collected during each center's intake process. For caregivers, specific items of the instrument concerned their employment outside the home and the number of years they had been primary caregivers.

Reliability and validity. To enhance reliability, two of the demographic items were intentionally repeated for both the patients and the caregivers. These items are the relationship to caregiver/patient and the number of years

that the patient had been attending the center.

To promote validity, all demographic items were based on similar items used in previous studies involving dementia patients and their caregivers (e.g., Connell & Gallant, 1996; Monahan, 1995; Teri, 1997). The specialized items in the present instruments also paralleled individualized items in previous research, such as those in Suhr et al. (1999). The pilot study included administration of these demographic instruments for clarification and revision of any items participants found unclear or confusing. These revisions are reported in the section below describing the pilot study.

The Annotated Mini-Mental State Examination (AMMSE)

Description. The AMMSE (Folstein et al., 1975) (Appendix A) was administered to the patients at the two specified times during the study as pretests and posttests. A letter granting permission to reprint and use the AMMSE was received from the publisher (Appendix C). This instrument has been used extensively with both psychiatric and AD patients to ascertain their levels of cognitive functioning (e.g., Cullum & Rosenberg, 1998; Katz, 1998; Lafleshe & Albert, 1995, Plaud et al., 1998; Suhr et al., 1999). The AMMSE is a brief instrument that assesses cognitive functioning by quantitative measurement through various simple questions and tasks. These measure reality orientation, memory, arithmetic ability, reading, writing, visuospatial ability, and language (Kaplan & Sadock, 1996).

The 12 items are divided into five domains. These are: Orientation, Registration, Attention and Calculation, Recall, and Language. Examples include questions on the present year, date, and month; patients repeating words said by the researchers; reading and obeying a command; and copying a simple design (Folstein et al., 1975).

The AMMSE is administered in about 10 to 30 minutes, depending on the patient. Scoring is easily accomplished, with 1 to 5 points given for each question or task correctly performed. A maximum of 30 points is possible.

Reliability and validity. The AMMSE is one of the few standardized instruments with relatively high reliability (Kennedy, 1992; Zuckerman, 1994). This is evident from extensive reliability and validity studies carried out by Folstein et al. (1975) with two samples of patients. One sample had 69 patients and 63 control subjects, and the other had 137 patients. As Folstein et al. (1975) reported, the mean scores for patients with dementia, depression with cognitive impairment, uncomplicated affective disorder of depression, schizophrenia, and normals "agreed with the clinical opinion of the presence of cognitive difficulty" (p. 192). In addition, age-matched samples showed an identical dispersal of scores. Of a possible perfect score of 30, the mean score for normal older adults was 27.6; scores below 20 were reported for those with severe dementia and psychosis.

Concurrent validity was reported as very good by Folstein et al. (1975) for a group from their larger sample of 137. The Pearson correlations between the AMMSE scores of the sample and their verbal and performance IQs on the Wechsler Adult Intelligence Scale were 0.776 and 0.660, respectively.

Test-retest reliability for the AMMSE was reported by Folstein et al. (1975) for both 24 hours and 28 days. For two trials at 24 hours, the Pearson r remained high at 0.887 and 0.827, respectively, and there was no change in the scores. For 28-day trials with clinically stable, elderly, depressed, and demented patients, no significant difference was reported in the scores by the Pearson correlation and the Wilcoxon T test.

The Memory and Behavior Problems Checklist (MBPC)

Description. The MBPC (Zarit et al., 1985) (Appendix B) was administered to the caregivers at the two specified times during the study as pretests and posttests. A letter granting permission to reprint and use this instrument was received from the publisher (Appendix C). This instrument has been widely used in studies of AD patients and their caregivers (e.g., Alspaugh, et al., 1999; Goode, Haley, Roth, & Ford, 1998; Suhr et al., 1999; Teri, 1997). The MBPC was designed to determine the frequency with which a dementia patient engages in memory and behavior problems and to identify problems that especially upset family members or

caregivers. In its original form, the MBPC was intended to be administered twice to the family member, once for frequency and once for reactions. For present purposes, only the frequency portion was used.

The MBPC was given to caregivers by the researcher, who asked the questions and noted responses. The authors of the instrument specify that respondents should complete the checklist with professional assistance. Estimated time for administration is 20 to 30 minutes (Zarit et al., 1985).

The MBPC is comprised of 32 items, and these assess a range of patient behaviors, including present reality orientation, past and recent memory, initiative in engaging in activities, motor activity, and evidence of negative emotions. Sample items include "4. Mixing up past and present (e.g., thinking a deceased parent is alive)"; "17. Being constantly restless or agitated"; "25. Appears anxious or worried" (Zarit et al., 1985, pp. 78-79).

The MBPC is scored on a 7-point scale of frequency, from "(0) Never occurred" to "(5) Occurs daily or more often" to "(7) This problem would occur if the patient weren't supervised." The frequency choices include time frames of the past 3 months, once or twice in the past week, and three to six times in the past week. For scoring, a designation of (7) is scored as (5). The total possible range is from 0 to 160; higher scores indicating greater frequency and thus severity of memory and behavior problems.

Reliability and validity. Reliability, stability, and validity of the MBPC were reported by Zarit (1982) and Zarit et al. (1985) and reproduced by Fischer and Corcoran (1994). Reliability and stability were found to be fair; the Guttman split-half reliability was .65 and the test-retest correlation was .80 (Fischer & Corcoran, 1994, p. 347).

Concurrent validity was reported as good, with significant correlation of the MBPC and the AMMSE (Folstein et al., 1975), the mental functioning assessment instrument used in this study. There was a .76 ($p < .001$) correlation between caregivers' scores on the MBPC and patients' scores on the AMMSE (Zarit, Reever, & Bach-Peterson, 1980, p. 652). Thus, the MBPC is both valid and reliable. It measures what it is intended to measure and is related to other established tests measuring similar conditions and problems.

Course Materials

To implement the intervention, an audiotape was employed instructing the listener in a relaxation technique. The tape used was Guided Relaxation Response Exercise: Rest in Gratitude/Healing Light (Mind/Body Medical Institute, 1992). This tape was chosen because it was created by the originator of the relaxation response, Dr. H. Benson, and is used in his extensive programs at the Division of Behavioral Medicine of the Deaconess Hospital in Boston, MA (Audiotape Transcription, English: Guided Relaxation Response Exercise, Appendix J). Further, this tape is widely used in relaxation

training courses with participants of all ages and physical conditions (Benson, 1997; Benson & Stuart, 1992; Mind/Body Medical Institute, 1992).

On the audiotape, which is 19 minutes in length, guided relaxation and breath awareness instructions prompt the listener to engage in a gentle body scan, accompanied by a background of soft music and gentle ocean and nature sounds. In a soothing and restful way, a female voice prompts the listener to develop nonjudgemental, focused awareness of the breath and body, to relax, and to feel at ease, secure, and safe.

Additional materials included an audiotape recorder and a tabletop audio speaker for amplification of sound, which was found necessary so participants could hear without strain. An ample number of chairs for all participants was provided by the center.

Procedure

Announcement of the Study

Announcement of the study was made in several ways. The researcher posted notices on the bulletin boards of the treatment and control group centers and with met patients individually during center activities, when she informed them about the study. She also initially contacted caregivers by telephone. Patients were then informed of the study course and were asked if they would like to participate.

The Pilot Study

When 10 patients and their caregivers from Center 1, the randomly chosen center for the treatment group, agreed to participate, a pilot study was conducted 2 weeks before the full intervention. Reactions were observed of both patients and caregivers to the consent forms, demographic questionnaires, and instruments. These documents were the introductory Letter and Informed Consent Form for Caregivers (Appendix D), the Demographic Survey for Caregivers (Appendix E), the Informed Consent Form for Patients (Appendix F), the Demographic Information Form for Patients (Appendix G), and the measurement instruments, the AMMSE and MBPC.

Verbal feedback, comments, and suggestions were encouraged, especially "concerning directions, recording procedures, and specific items" (Gay, 1996, p. 258). For example, patients asked that the introductory letter be explained to them, as one said, "in regular English." With caregivers, for items 9 and 10 on the Demographic Survey for Caregivers, several said they had to look in their records for the number of years they had been the primary caregiver and the number of years their relative had been attending the center. To such feedback, the researcher gladly supplied colloquial English explanations and gave caregivers time to locate the pertinent information.

Difficulties or confusions were also noted, and

appropriate revisions were made. For example, in the Demographic Survey for Caregivers (Appendix E), item 5 concerning children originally stated "number of children." Several caregivers asked whether this meant number of children they had or number living at home; two volunteered that they had grown children who lived at home. Thus, the item was revised to read "Number of Children You Are Now Raising."

Additionally, in the Demographic Information Form for Patients (Appendix G), item 10 on patient's mobility originally had two subsections, "Normal" and "Assisted." Both patients and caregivers asked how to respond in situations in which the patient might need a steadying hand during periods of mild disorientation. Thus, clarification was provided with the revision to three subsections, "Walks independently," "Walks with help," "Confined to wheelchair."

When participants completed all items, their responses and comments were studied. The letters and demographic surveys were adjusted as described above. Because the two measurement instruments, the AMMSE and the MBPC, are standardized, no substantive changes were made. However, items to which pilot participants responded with questions or confusion were noted as needing explanation or further clarification. For example, for the AMMSE, four participants needed further explanation for the attention and calculation

instructions, and for the MBPC, two participants asked for clarification concerning types of activities for item 14, "Unable to start activities by themselves" (other than ADLs). The researcher was then prepared to explain or clarify these items with the full sample.

Pilot practice sessions. In addition, as part of the pilot study, the researcher conducted several practice sessions of the course for the pilot group patients (N = 10). Assisting staff observed patients' responses to the relaxation technique and a determination was made whether instructions or approaches should be altered to enhance their understanding and responses. In particular, the researcher spoke much more slowly than was normal for her, enunciating all words clearly. She also recognized that, for this population, additional time was necessary and assured participants they could take as much time as they needed. This reassurance was intended to increase their ease and lessen their possible nervousness. Practice sessions were conducted with all potential subjects to determine their ability to participate fully (see sample selection criteria above).

The pilot study yielded useful information about all participants' understanding of instructions and procedures and the need for revisions. The pilot study also ensured adequacy of the physical aspects of the training (e.g., patients' comfort, such as room temperature, quietness of

the environment, and adequate sound levels of the audiotape).

The pilot testing was also undertaken to address any other problem that could arise. One problem did emerge: After the first several practice sessions, some participants complained that the room was too cold. The center staff was notified, and arrangements were made for raising the temperature in the designated room for the remainder of the practice session and for the full intervention.

The Intervention

When 34 patients and their caregivers agreed to participate, excluding pilot study participants, the course in a relaxation technique was scheduled for the treatment group patients in the randomly assigned center. One week prior to the start of the course, appointments were scheduled for patients of treatment and control groups, so they could read and sign the Informed Consent Form for Patients (Appendix F), and complete the AMMSE (Appendix A) as a pretest. At the same time, the MBPC (Appendix B) and the demographic instruments were administered to caregivers of both groups.

The control group subjects did not participate in the course but followed their usual daily program. This program generally included recreational and educational activities described earlier, such as current events, arts and crafts, and mild exercises.

For the treatment group, the course was part of the daily activities. Nevertheless, a schedule of sessions by day and time was given individually to participants and their caregivers. The schedule was also posted on the bulletin board at the center's training room, and copies were given to the clinical director as well.

The course was conducted by the researcher and took place over 5 weeks, three times a week, for a total of 15 half-hour sessions. A shorter duration and more frequent sessions were chosen to enhance reinforcement and retention of learning, especially given the cognitive difficulties of AD patients (Cotrell & Schulz, 1993). The course weekly sessions were scheduled in a way that was at least 1 day but no more than 2 days between sessions, to further build on learning and enhance retention (Gay, 1996). The major activity of the course, after introductory remarks, was the patients listening to the audiotape in the relaxation technique.

Because of the ethnic composition of patients at both centers, each of the three weekly sessions was conducted in both English and Spanish by the researcher, who is bilingual. Prior to the first session, the preliminary instructions and a complete Spanish translation of the audiotape were made available (Audiotape Transcription, Spanish: Guided Relaxation Response Exercise, Appendix K; Affidavit by Professional Translator, Appendix L).

Each session took place twice. First, the researcher instructed the English-speaking patients as a group in the designated room, with the accompanying audiotape in English (Audiotape Transcription, English: Guided Relaxation Response Exercise, Appendix J). During this time, the Spanish-speaking patients were engaged in their normal center activities. Immediately thereafter, the researcher repeated the session in Spanish, with the Spanish audiotape, for the Spanish-speaking patients. During this time, the English-speaking patients were engaged in their normal center activities.

At the treatment group center, the course took place in the activity and training room. This is a private and quiet room with ample space and a door that can be securely closed. During the sessions, the door was kept closed, with a sign requesting no interruptions to ensure the patients' privacy and minimize disturbance from other activities or noises. Comfortable straight-backed chairs were arranged in a circle, spaced about a foot apart.

The course was taught by the researcher. Her qualifications for teaching it include 15 hours of training in mind/body medicine through the Harvard Medical School Department of Continuing Education (Certificate in Mind/Body Medicine, see Appendix M). Her qualifications also include personal training and practice of 24 years in a wide range of relaxation techniques. Additionally, she is a Licensed

Mental Health Counselor, certified by the State of Florida Department of Health, Board of Mental Health Counseling.

At the first session, patients were greeted, thanked for coming, and introduced to the "relaxation response" (Benson & Stuart, 1992, p. 48), which was taught as part of the session. The researcher gave participants a brief overview of what they would hear and be asked to do, and she encouraged their questions.

The researcher then gave minimal behavioral instructions: patients were to remain quiet and seated throughout the session. If they had a question, they were to raise their hands and not speak, and they would be approached individually. Before each session began, they were given the opportunity to visit the restrooms or obtain a drink of water. At each session, the researcher introduced and played the audiotape, with reminder instructions to participants. She used the same wording throughout each session for consistency.

To prepare for each session, participants were asked to sit comfortably in their chairs, with back and buttocks supported by the chair, arms resting on the chair arms or on their laps. They were be asked to listen to the tape and to follow its directions. Participants were also assured that there was no right or wrong way to respond, and that whatever they experienced was right for them.

Just before the tape was played, participants were

asked to take five deep breaths, and this deep breathing was first modeled by the researcher. They were reminded to breathe easily and naturally during the session. Further, they were instructed that, if they experienced any discomfort, they were to raise a hand and the researcher or staff assistant would aid them.

When the tape ended, the researcher gently reoriented the participants and answered any questions. They were then directed to exit the room and to continue with their regular center activities.

At the 15th session, appointments were scheduled for patients to complete the posttest AMMSE. In addition, the caregivers were contacted, and telephone appointments were scheduled for them to complete the posttest MBPC. The control group patients and caregivers were given these posttests during the same week as the treatment group.

Data Collection and Confidentiality

Individuals designated as the patients' primary caregivers were contacted by phone and given a brief explanation of the study and how it could help both patient and caregiver. The caregivers were asked if they would like to participate. If the caregivers assented, telephone appointments for completing the instruments were made, allowing enough time for the mailed packets to arrive.

All caregivers in both the treatment and control groups were mailed packets containing the Introduction by Clinical

Director (Appendix N), two copies of the Letter and Informed Consent Form for Caregivers (Appendix D), a stamped, self-addressed envelope for the return of one signed copy, and the Demographic Survey for Caregivers (Appendix D). The caregivers in the treatment group were additionally given the MBPC (Appendix B). In the Letter of Informed Consent Form, caregivers were instructed to keep their copies of all materials, except for the signed consent they mailed back, since they needed to refer to the materials again during data collection.

The data were collected by telephone. This method was chosen for the caregivers for several reasons. First, if responses had been requested by mail (except for the signed consent), the likelihood of sufficient and complete responses would have been relatively small (Gay, 1996). Second, a statement of introduction and procedure for the call was prepared to help insure uniformity of data collection. If caregivers were more comfortable in Spanish than English, the researcher spoke with them in Spanish.

The researcher also had professional Spanish translations produced of all materials to assure that both patients and caregivers understood the consent and all instruments and procedures. Eleven participants requested and were supplied with the Spanish versions.

After the foregoing materials were collected, and 2 weeks before the intervention, the pilot study was

conducted and all revisions made. The week before the first session of the course, patients in the treatment and control groups completed the AMMSE pretests. At that time, the researcher read aloud the Informed Consent Form for Patients (Appendix F), allowing time for questions and clarification. Caregivers completed the demographic instruments and MBPC pretests. After the intervention, in the last week of the course, the treatment and control group patients completed the AMMSE posttests, and caregivers completed the MBPC posttests. Although some dropouts were expected, there was none; all patients and caregivers participated throughout completion of the study. All instruments were collected by the researcher and scored.

To protect subjects' confidentiality and anonymity, all instruments were coded by number, with a key sheet of names compiled and accessible only to the researcher. After data collection, all data were stored in the researcher's private office in a locked file. The data were stored until the study was completed and results reported in the Winter of 2001. At that time, all data were destroyed by the researcher.

For anecdotal material included in the study concerning any subjects, details pertaining to their identities were disguised. On completion of the study, results were reported in group form only. Provision was made for the clinical director to receive copies of the dissertation on request.

Data Analysis

The data were analyzed by several means. After scoring, all data collected were entered into the computer for analysis (SASS/PC package). Both descriptive and inferential statistics were used. The sample was described using frequency distribution and summary statistics from the completed surveys for caregivers and patients (Appendixes E and G, respectively).

Descriptive statistics for both the AMMSE and the MBPC (Appendixes A and B) were also calculated. For each instrument, the ranges of scores was described, with summary statistics for both pretests and posttests of individual items to assess differences in behavior and of the total sample.

Inferential statistics were used to test the two research hypotheses. Two-tailed *t* tests were performed on the gain scores of each item in the AMMSE and the MBPC for both the treatment and control groups, in order to assess differences in each observed behavior. In addition, a multivariate analysis of variance (MANCOVA) was performed to test for differences between the two groups on the total scores of both tests. A multivariate procedure was selected for two reasons: because it was likely that the scores on the AMMSE and the MBPC would have a correlation other than zero, and the error rate would be inflated by performing two procedures instead of one (Herzog, 1996). In addition, a

multivariate procedure was chosen to help evaluate the reliability of the relationship between the independent variable and the dependent variables. The level of significance was set at $p \leq .05$ to avoid a Type II error, in which the null hypothesis is retained when it is false (Levin & Hinrichs, 1995).

CHAPTER 4

RESULTS

This chapter reports the results of the data analysis performed to test the two research hypotheses. First, demographic data for both AD patients and caregivers will be displayed and summarized. The results of the descriptive data analysis for both instruments then will be reported. These will be followed by reporting of results in relation to Research Hypotheses 1 and 2.

Description of the Sample

The total sample was comprised of 34 pairs of AD patients and their caregivers, 17 pairs in the treatment group and 17 pairs in the control group. Patients' demographic data were derived from completion of the Demographic Information Form for Patients (Appendix G). Caregivers' demographic information was derived from the completion of Demographic Survey for Caregivers (Appendix E).

Patients

Table 1 presents the frequency distributions of patients' demographic characteristics. As can be seen, there were more females than males in both the treatment (82%, $n = 14$) and control (76%, $n = 13$) groups. Most patients were between the ages of 70 and 79 (treatment, 70%, $n = 12$; control, 65%, $n = 11$), and approximately half were White (treatment, 41%, $n = 7$; control, 59%, $n = 10$). The majority of patients in the treatment group (47%, $n = 8$),

Table 1

Demographic Characteristics of Patients: Frequency Distributions

Variable	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
	n	%	n	%	n	%
Gender						
Male	3	18	4	24	7	21
Female	14	82	13	76	27	79
Age						
60-69	3	18	2	12	5	15
70-79	12	70	11	65	23	67
80-89	2	12	4	23	6	18
Ethnic Background						
African American	3	18	3	18	6	18
White	7	41	10	59	17	50
Hispanic	7	41	4	23	11	32

(table continues)

Table 1 (Continued)

	Group					
	Treatment		Control		Total	
	(n = 17)		(n = 17)		(n = 34)	
Variable	n	%	n	%	n	%
Marital Status						
Single	1	6	2	12	3	9
Married	8	47	6	35	14	41
Divorced/separated	2	12	2	12	4	12
Widowed	6	35	7	41	13	38
Education Grade School	12	70	11	65	23	68
High School	4	24	6	35	10	29
College	1	6	0	0	1	3
Relationship to Caregiver						
Mother	9	53	8	47	17	50
Father	2	12	3	18	5	15
Spouse	5	29	6	35	11	32
Other: Employer	1	6			1	3

(table continues)

Table 1 (Continued)

	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
Variable	n	%	n	%	n	%
Severity of Diagnosis						
Mild	15	88	16	94	31	91
Moderate	2	12	1	6	3	9
Assessment of Mental State at Intake						
High functioning	15	88	16	94	31	91
Moderate functioning	2	12	1	6	3	9
Number of Years Attending Center						
Under 1 year	3	18	3	18	6	18
1 year	12	70	14	82	26	75
2 years	2	12			2	6

(table continues)

Table 1 (Continued)

Variable	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
	n	%	n	%	n	%
Patient's Mobility						
Walks independently	14	82	15	88	29	85
Walks with help	2	12	2	12	4	12
Confined to wheelchair	1	6			1	3

Note. Percentages may exceed 100% because of rounding.

and a third in the control group were married (35%, n = 6). The majority of patients were mothers of the caregivers (treatment, 53%, n = 9; control, 47%, n = 8). Almost all patients were in the mild stage of AD (treatment, 88%, n = 15; control, 94%, n = 16) and were high functioning (treatment, 88%, n = 15; control, 94%, n = 16). Most of the treatment patients (70%, n = 12) had attended the center for 1 year, and most of the control patients (82%, n = 14) had attended the center for under 1 year. Finally, most of the patients in both groups walked independently (treatment, 82%, n = 14; control, 88%, n = 15).

To test whether any significant differences in the demographic variables existed between the patient treatment and control groups, a series of chi-square analyses was performed. The variables were those summarized in Table 1: gender, age, ethnic background, marital status, education, relationship to caregiver, severity of diagnosis, assessment at intake, number of years at center, and patient mobility. Chi-square analysis was chosen because all these variables were measured on a nominal scale (Herzog, 1996). The analyses resulted in no significant findings ($p < .05$), indicating that no significant differences existed between the patient treatment and control groups with regard to their demographic characteristics.

Caregivers

Table 2 presents the frequency distributions of the

Table 2

Demographic Characteristics of Caregivers: Frequency Distributions

	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
Variable	n	%	n	%	n	%
Gender						
Male	4	24	3	18	7	21
Female	13	76	14	82	27	79
Age						
40-49	7	41	6	35	13	38
50-59	4	24	3	18	7	21
60-69	4	24	5	29	9	26
70+	2	12	3	18	5	15
Ethnic Background						
African American	3	18	3	18	6	18
White	9	53	10	59	19	56
Hispanic	5	29	4	23	9	26

(table continues)

Table 2 (Continued)

Variable	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
	n	%	n	%	n	%
Marital Status						
Single	2	12	1	5	3	8
Married	10	58	12	71	22	65
Divorced/separated	3	18	3	19	6	18
Widowed	2	12	1	5	3	9
Number of Children Now Raising						
1 child	1	6			1	3
2 children	1	6	1	6	2	6
3 children	3	18	2	12	5	15
None	12	70	14	82	26	76
Education						
Grade School	4	24	2	12	6	18
High School	6	35	5	29	11	32
College	6	35	7	41	13	38
Graduate school	1	6	3	18	4	12

(table continues)

Table 2 (Continued)

Variable	Group: Treatment (n = 17) n	%	Control (n = 17) n	%	Total (n = 34) n	%
Relationship to Patient						
Daughter	10	59	10	59	20	59
Son	1	6	1	6	2	6
Spouse	5	29	6	35	11	32
Other: Employee	1	6			1	3
Employment Outside Home						
Work full-time	10	59	7	41	17	50
Work part-time	1	6	4	24	5	15
Do not work	6	35	6	35	12	35
Number of Years as Primary Caregiver						
Under 1 year	4	23	2	12	6	18
1-2 years	12	71	15	88	27	79
3-4 years	1	6			1	3

(table continues)

Table 2 (Continued)

Variable	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
	n	%	n	%	n	%
Number of Years Patient Attending Center						
Under 1 year	3	18	3	18	6	18
1 year	13	76	10	59	23	67
2 years	1	6	4	23	5	15

Note. Percentages may exceed 100% because of rounding.

caregivers' demographic characteristics. As can be seen, there were more females than males in both the treatment (76%, n = 13) and control (82%, n = 14) groups. Most caregivers were of two age groups, between 40 and 49 (treatment, 41%, n = 7; control, 35%, n = 6) and 60 and 69 (treatment, 24%, n = 4; control, 29%, n = 5), and approximately half were White (treatment, 53%, n = 7; control, 59%, n = 10). The majority of caregivers were married (treatment, 58%, n = 10; control, 71%, n = 12), and most were presently raising no children (treatment, 70%, n = 12; control, 82%, n = 14). The majority were also daughters of patients (treatment, 59%, n = 10; control, 59%, n = 10), and approximately a third were spouses (treatment, 29%, n = 5; control, 35%, n = 6). The majority also worked full-time (treatment, 59%, n = 10; control, 41%, n = 7). Most caregivers reported that the patient had attended the center for more than 1 year (treatment, 71%, n = 12; control, 59%, n = 10).

To test whether any significant differences in the demographic variables existed between the caregiver treatment and control groups, a series of chi-square analyses was performed. The variables were those summarized in Table 2: gender, age, ethnic background, marital status, number of children, education, relationship to patient, employment outside home, years as primary caregiver, and number of years patient attended the center. Similar to the

patient variables, chi-square analysis was chosen because all these variables were measured on a nominal scale (Herzog, 1996). The analyses resulted in no significant findings ($p < .05$), indicating that no significant differences existed between the caregiver treatment and control groups with regard to their demographic characteristics.

Descriptive Statistics: AMMSE

For patients' results on the AMMSE (Appendix A), Table 3 presents the pretest and posttest means, standard deviations, gain scores for all 11 items and for the total sample, and mean differences. Results are reported for each item within the five instrument domains, as defined earlier, Orientation, Registration, Attention and Calculation, Recall, and Language.

As Table 3 shows, for the treatment group, positive gain scores indicating an increased improvement in mental functioning from pretest to posttest were evident in four of the five domains. For Registration, the gain score was .24 and for Recall, .53. The Language domain showed gain scores in three items, Repeat a phrase, .59; and Read and obey instruction, .12. For the total instrument, a positive gain score of 1.53 was also evident. For the control group, no positive gain scores were evident in the individual domains or for the total instrument.

In summary, the total pretest mean for the treatment

Table 3

Patients' AMMSE Scores: Summary Statistics for Pretest, Posttest, and Gain Scores

	Group					
	Treatment		Control		Total	
	(n = 17)		(n = 17)		(n = 34)	
Item	M	SD	M	SD	M	SD
Orientation						
Time						
Pretest	3.18	.73	2.41	.51	2.79	.73
Posttest	3.12	.78	2.35	.61	2.74	.79
Gain score	-5.88E	.24	-5.88E	.24	-5.88E	.24
Mean difference		.00				
Place						
Pretest	3.00	.61	2.41	.51	2.71	.63
Posttest	3.00	.61	2.18	.53	2.59	.70
Gain score	.00	.00	- .24	.44	- .12	.33
Mean difference		.24				

(table continues)

Table 3 (Continued)

Item	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
	M	SD	M	SD	M	SD
Registration						
Pretest	2.65	.49	2.76	.44	2.71	.4
Posttest	2.88	.33	2.41	.62	2.65	.54
Gain score	.24*	.44	.35	.61	-5.88E	.60
Mean difference		.59				
Attention and Calculation						
Pretest	3.88	1.05	3.53	.87	3.71	.97
Posttest	3.94	.97	3.18	.64	3.56	.89
Gain score	5.88E	.24	- .35	.86	- .15	.66
Mean difference		.41				

(table continues)

Table 3 (Continued)

Item	Group: Treatment (n = 17) M	Treatment SD	Control (n = 17) M	Control SD	Total (n = 34) M	Total SD
Recall						
Pretest	2.18	.73	2.71	.69	2.44	.75
Posttest	2.71	.59	2.47	.72	2.59	.66
Gain score	.53*	.51	- .24	.44	.15	.61
Mean difference	.76					
Language						
Name pen/watch						
Pretest	1.94	.24	2.00	.00	1.97	.17
Posttest	1.94	.24	2.00	.00	1.97	.17
Gain score	.00	.00	.00	.00	.00	.00
Mean difference	.00					

(table continues)

Table 3 (Continued)

Item	Group: Treatment (n = 17) M	SD	Control (n = 17) M	SD	Total (n = 34) M	SD
Repeat a phrase						
Pretest	.41	.51	.94	.24	.68	.47
Posttest	1.00	.00	.94	.24	.97	.17
Gain score	.59*	.51	.00	.00	.29	.46
Mean difference	.59					
Follow a command						
Pretest	2.94	.24	2.41	.51	2.68	.47
Posttest	3.00	.00	2.29	.47	2.65	.49
Gain score	5.88E	.24	- .12	.33	-2.94E	.30
Mean difference	.18					
Read and obey instruction						
Pretest	.88	.33	1.00	.00	.94	.24
Posttest	1.00	.00	1.00	.00	1.00	.00
Gain score	.12*	.33	.00	.00	5.88E	.24
Mean difference	.12					

(table continues)

Table 3 (Continued)

Item	Group: Treatment (n = 17) M	Treatment SD	Control (n = 17) M	Control SD	Total (n = 34) M	Total SD
Write a sentence						
Pretest	.82	.39	1.00	.00	.91	.29
Posttest	.82	.39	1.00	.00	.91	.29
Gain score	.00	.00	.00	.00	.00	.00
Mean difference	.00					
Copy design						
Pretest	.59	.51	.82	.39	.71	.46
Posttest	.59	.51	.76	.44	.68	.47
Gain score	.00	.00	-5.88E	.24	-2.94E	.17
Mean difference	5.88E					
Total pretest	22.47	1.81	22.00	1.66	22.24	1.72
Total posttest	24.00	1.90	20.59	2.03	22.29	2.60
Total gain score	1.53*	.72	- 1.41	1.06	- 5.88E	1.74
Total pretest range:	19-25		19-25		19-25	
Total posttest range:	19-26		19-25		19-26	

Note: An asterisk (*) denotes positive change in gain score. Total possible range is 0-30.

group was 22.47 (SD 1.81), and for the control group 22.00 (SD 1.66). The total posttest mean for the treatment group was 24.00 (SD 1.90), and for the control group 20.59 (SD 2.03). The total gain score for the treatment group was 1.53 (SD .72) and for the control group -1.41 (SD 1.06).

Descriptive Statistics: MBPC

For caregivers' results on the MBPC (Appendix B), Table 4 presents the means, standard deviations, gain scores for 19 of the 32 items and for the total sample, and mean differences. Results for 13 of the 32 items were omitted because both the pretest and the posttest means and standard deviations for the treatment and control groups equalled zero. The omitted items were 6, 7, 8, 9, 11, 12, 16, 22, 27, 28, 29, 30, and 32. Results in Table 4 are reported for each of the other 19 items in consecutive order.

For discussion purposes, the 32 items may be classified into 10 categories by symptoms. These are Memory (items 1, 2, 3, 4, 5, 11, 12); Secretiveness (item 6); Orientation (items 7, 8, 9, 10, 13); Dependency (items 15, 16); Anxiety (items 17, 19, 23, 25); Depression (items 14, 18, 20, 24); Inappropriate public behavior (item 22); Combativeness and anger (items 21, 26, 27, 28, 29); Hallucination (item 30); and Other problems, which were Sleeping disturbances (items 31, 32).

As Table 4 shows, negative gain scores, indicating a decrease in memory and behavior problems, were evident for

Table 4

Caregivers' MBPC Scores: Summary Statistics for Pretest, Posttest, and Gain Scores

	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
Item	M	SD	M	SD	M	SD
1. Repeating question						
Pretest	3.18	.39	3.25	.44	3.21	.41
Posttest	2.47	.94	3.59	.62	3.01	.97
Gain score	- .71*	.69	.35	.49	- .18	.80
Mean difference	-1.06					
2. Remembering recent events						
Pretest	3.06	.56	3.12	.60	3.09	.57
Posttest	2.35	1.17	3.82	.73	3.09	1.22
Gain score	- .71*	.85	.71	.47	-1.01E	.98
Mean difference	-1.41					

(table continues)

Table 4 (Continued)

Item	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
	M	SD	M	SD	M	SD
3. Remembering past events						
Pretest	2.82	1.13	3.24	.44	3.03	.87
Posttest	2.47	1.33	3.53	.51	3.00	1.13
Gain score	- .35*	.79	.29	.47	-2.94E	.72
Mean difference	- .65					
4. Mixing past, present						
Pretest	2.29	1.31	3.00	.00	2.65	.98
Posttest	2.29	1.31	3.29	.47	2.79	1.09
Gain score	.00	.00	.29	.47	.15	.36
Mean difference	- .29					
5. Losing, misplacing						
Pretest	3.00	.00	2.94	.56	2.97	.39
Posttest	2.53	.80	3.24	.66	2.88	.81
Gain score	- .47*	.80	.29	.59	-8.82E	.79
Mean difference	- .76					

(table continues)

Table 4 (Continued)

Item	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
	M	SD	M	SD	M	SD
10. Not recognizing familiar place						
Pretest	.71	1.31	1.59	1.54	1.15	1.48
Posttest	.59	1.33	2.35	1.41	1.47	1.62
Gain score	- .12*	.78	.76	1.20	.32	1.09
Mean difference	- .88					
13. Forgetting day						
Pretest	3.59	1.23	3.47	.80	3.53	1.02
Posttest	3.18	1.13	3.59	.80	3.38	.99
Gain score	- .41*	1.33	.12	.33	- .15	.99
Mean difference	- .53					
14. Unable to start activities by self						
Pretest	2.65	1.80	3.24	1.09	2.94	1.50
Posttest	2.12	1.54	3.82	.88	2.97	1.51
Gain score	- .53*	.62	.59	.80	-2.941E	.90
Mean difference	-1.12					

(table continues)

Table 4 (Continued)

Item	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
	M	SD	M	SD	M	SD
15. Unable to keep occupied by self						
Pretest	2.29	1.57	2.94	1.03	2.62	1.35
Posttest	2.12	1.62	3.41	.71	2.76	1.39
Gain score	- .18*	.53	.47	.62	.15	.66
Mean difference	- .65					
17. Constantly restless						
Pretest	.82	1.55	.35	1.00	.59	1.31
Posttest	.35	.79	1.53	1.55	2.74	1.48
Gain score	- .47*	.84	1.18	1.38	.35	1.43
Mean difference	-1.65					
18. Long periods inactive						
Pretest	2.65	1.66	2.82	1.33	2.74	1.48
Posttest	2.47	1.23	3.41	1.23	2.94	1.30
Gain score	- .18*	1.13	.58	.80	.21	1.04
Mean difference	- .76					

(table continues)

Table 4 (Continued)

Item	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
	M	SD	M	SD	M	SD
19. Constantly talkative						
Pretest	1.06	2.01	.82	1.47	.94	1.74
Posttest	.53	1.18	.82	1.59	.68	1.39
Gain score	- .53*	1.01	-1.06E	.87	.26	.96
Mean difference	- .53					
20. Little, no talking						
Pretest	2.65	1.66	2.59	1.50	2.62	1.56
Posttest	1.82	1.01	3.18	1.47	2.50	1.42
Gain score	- .82*	1.33	.59	.80	- .12	1.30
Mean difference	-1.41					
21. Suspicious, accusative						
Pretest	.29	.85	.29	.85	.29	.84
Posttest	.18	.73	.88	1.41	.53	1.16
Gain score	- .12*	.49	.59	1.18	.24	.96
Mean difference	- .71					

(table continues)

Table 4 (Continued)

Item	Group					
	Treatment (n = 17)		Control (n = 17)		Total (n = 34)	
	M	SD	M	SD	M	SD
23. Waking caregiver						
Pretest	2.29	1.61	1.76	1.39	2.03	1.51
Posttest	1.24	.90	2.12	1.65	1.68	1.39
Gain score	-1.06*	1.52	.35	.49	- .35	1.32
Mean difference	-1.41					
24. Sad, depressed						
Pretest	3.35	.79	3.18	1.01	3.26	.90
Posttest	2.59	.87	3.47	.80	3.03	.94
Gain score	- .76*	.97	.29	.59	- .24	.96
Mean difference	-1.06					
25. Anxious, worried						
Pretest	3.18	1.38	2.88	.99	3.03	1.19
Posttest	2.41	1.00	1.88	.93	2.65	.98
Gain score	- .76*	.90	1.78E	.50	- .38	.82
Mean difference	- .76					

(table continues)

Table 4 (Continued)

Item	Group: Treatment (n = 17) M	Treatment (n = 17) SD	Control (n = 17) M	Control (n = 17) SD	Total (n = 34) M	Total (n = 34) SD
26. Becomes angry						
Pretest	.82	1.59	.41	.94	.62	1.30
Posttest	.53	1.01	.53	1.18	.53	1.08
Gain score	-.29*	.59	.12	.33	-8.82E	.51
Mean difference	-.41					
31. Other: Sleeping disturbances						
Pretest	2.94	1.78	2.06	1.64	2.50	1.75
Posttest	1.65	1.22	2.47	1.97	2.06	1.67
Gain score	-1.29*	1.26	.41	.51	-.44	1.28
Mean difference	-1.71					
Total Pretest	43.65	4.06	43.94	3.36	43.79	3.67
Total Posttest	33.88	10.22	51.94	5.74	42.91	12.27
Total gain score	-9.76*	7.62	8.00	4.19	-.88	10.86
Total pretest range	33-52		36-49		33-52	
Total posttest range	19-54		37-60		19-60	

Note. An asterisk (*) denotes positive change in gain score. Possible range is 0-160.

the treatment group from pretest to posttest in 19 of the 32 items. The highest gain scores were for decreases in item 31, Sleeping disturbances, -1.29; item 23, Waking caregiver, -1.06; item 20, Little, no talking, -.82; item 24, Sad, depressed, -.76; item 25, Anxious, worried, -.76; item 1, Repeating question, -.71; and item 2, Remembering recent events, -.71. For the control group, no negative gain scores were evident; rather, all gain scores were positive (range .12 - 1.18), indicating that memory and behavior problems of control patients increased.

In summary, the total pretest mean for the treatment group was 43.65 (SD 4.06), and for the control group 43.94 (SD 3.36). The total posttest mean for the treatment group was 33.88 (SD 10.22), and for the control group 51.94 (SD 5.74). The total gain score for the treatment group was -9.76 (SD 7.62), and for the control group 8.00 (SD 4.19).

Research Hypothesis 1: AMMSE

Research Hypothesis 1 stated that AD patients who participate in a course in a relaxation technique will show a statistically significant increase in mental functioning, compared with AD patients who do not participate in such a course, as measured by pretest and posttest mean scores on the AMMSE.

To test this hypothesis, a series of *t*-tests for independent samples were performed on the gain scores for the items on the AMMSE. The gain scores were computed by

subtraction of the pretest score from the posttest score for each item, as shown in Table 3. Results of the *t*-tests are displayed in Table 5. It should be noted that of the 11 items assessed on the AMMSE, *t*-tests were performed on 9. This is because, as Table 3 shows, the mean scores for the pretests and posttests of both groups for Name Pen/Watch and Write a Sentence were zero. Therefore, a *t* value could not be computed for these items since the mean and standard deviation in each case was zero.

Table 5 shows that, in four of the nine items, the treatment group had a significantly higher mean score than the control group, indicating higher mental functioning. These items were Orientation, place, $t = 2.219$ ($p = .041$); Registration, $t = 3.244$ ($p = .003$); Recall, $t = 4.670$ ($p = .000$); and Repeat a phrase, $t = 4.781$ ($p = .000$). The *t* tests for the remaining five items did not show significant differences. No mean differences for any of the items were over 1 point (see Table 3).

Thus, as Table 5 shows, significant values resulted for the patient treatment group on four of the nine items, or 44% of the total items, on the AMMSE. These results indicate that the treatment group showed a statistically significant increase in mental functioning from pretest to posttest, compared to the control group, and for these items Research Hypothesis 1 was therefore supported.

Table 5

Differences in Patients' AMMSE Gain Scores: Treatment and Control Groups

Item	t value	df	p
Orientation			
Time	.000	32.000	1.000
Place	2.219	16.000	.041*
Registration	3.244	29.098	.003**
Attention and Calculation	1.896	18.519	.074
Recall	4.670	31.189	.000**
Language			
Repeat a phrase	4.781	16.000	.000**
Follow a command	1.769	32.000	.86
Read and obey instruction	1.461	16.000	.163
Copy design	1.000	16.000	.332

*p < .05. **p < .01.

Research Hypothesis 2: MBPC

Research Hypothesis 2 stated that AD patients who participate in a course in a relaxation technique will show a statistically significant decrease in memory and behavior problems, compared with AD patients who do not participate in such a course, as measured by caregivers' pretest and posttest mean scores on the MBPC.

To test this hypothesis, similar to the procedures for Research Hypothesis 1, first a series of two-tailed *t* tests for independent samples were performed on the gain scores for the items on the MBPC. The gain scores were computed by subtraction of the pretest score from the posttest score for each item, as shown in Table 4. Results of the *t* tests are displayed in Table 6. It should be noted that of the 32 items assessed on the MBPC, 13 (items 6, 7, 8, 9, 11, 12, 16, 22, 27, 28, 29, 30, and 32) yielded means and standard deviations equal to zero. Thus, these items were not appropriate for *t* test calculation. Table 6 displays the results for the remaining 19 items.

Table 6 shows that of the 19 items displayed from the total 32 items of the MBPC, for 17 items the treatment group had significantly lower mean scores than the control group, indicating fewer memory and behavioral problems. Only items 13, Forgetting day, and 19, Constantly talkative, did not evidence significant differences between the groups. Mean differences over 1 point were noted in the following items

Table 6

Differences in Caregivers' MBPC Gain Scores: Treatment and Control Groups

Item	t value	df	p
1. Repeating question	-5.169	32.000	.000**
2. Remembering recent events	-6.000	24.957	.000**
3. Remembering past events	-2.914	32.000	.006**
4. Mixing past, present	-2.582	16.000	.020**
5. Losing, misplacing	-3.176	32.000	.003**
10. Not recognizing familiar place	-2.540	27.490	.017**
13. Forgetting day	-1.597	18.000	.128
14. Unable to start activities by self	-4.558	32.000	.000**
15. Unable to keep occupied by self	-3.261	31.154	.003**
17. Constantly restless	-4.063	28.271	.000**
18. Long periods inactive	-2.280	32.000	.029**
19. Constantly talkative	-1.643	31.296	.110
20. Little, no talking	-3.748	32.000	.001**

(table continues)

Table 6 (Continued)

Item	t value	df	p
21. Suspicious, accusative	-2.288	21.293	.032**
23. Waking caregiver	-3.644	19.326	.002**
24. Sad, depressed	-3.849	26.354	.001**
25. Anxious, worried	-3.054	24.961	.005**
26. Becomes angry	-2.514	25.269	.019**
31. Other: Sleeping disturbances	-5.167	21.030	.000**

**p < .01.

(see Table 4): 1, Repeating question, -1.06; 2, Remembering recent events, -1.41; 14, Unable to start activities by self, -1.12; 17, Constantly restless, -1.65; 20, Little, no talking, -1.41; 23, Waking caregiver, -1.41; 24, Sad, depressed, -1.06; and 31, Other: Sleeping disturbances, -.1.71.

Thus, as Table 6 shows, significant values resulted for the caregiver treatment group on 17 of the 32 items, or 53% of the total items, on the MBPC. These results indicate that the patient treatment group showed a statistically significant decrease in memory and behavior problems from pretest to posttest, as reported by caregivers and compared to the control group. For these items Research Hypothesis 2 was therefore supported.

Research Hypotheses 1 and 2: Multivariate Analysis

To further test Research Hypotheses 1 and 2, a multivariate analysis of covariance (MANCOVA) was performed using the total AMMSE and MBPC posttest scores as dependent variables and the AMMSE and MBPC pretest scores as covariates. This procedure helped evaluate the reliability of the relationship between the independent variable, the intervention, and the dependent variables, the AMMSE and MBPC posttest scores. By means of this analysis, the posttest scores could be adjusted to take into account any initial differences in the pretest scores. In addition, the multivariate procedure avoided inflation of the error rate

which might result from performing two analyses rather than one.

The MANCOVA resulted in a Wilks's lambda value of .15, F = 81.68, hypothesis df = 2.00, error df = 29.00 ($p < .01$). This result indicates that there was a significant difference between the group vectors for the AMMSE and MBPC adjusted posttest scores. Between-subjects effects were calculated as a follow-up analysis to determine which of the dependent variables was responsible for the significant effect. Table 7 shows the results of the MANCOVA for these between-subjects effects.

It can be seen from Table 7 that both the AMMSE and MBPC posttests were involved in the overall significant multivariate finding. For the AMMSE posttest, the F value was 86.62 ($p < .01$). It may be concluded, then, that the treatment group had a significantly higher AMMSE mean posttest score (M = 24.00, SD 1.90) than the control group (M = 20.59, SD 2.03), indicating higher mental functioning.

For the MBPC posttest, the F value was 75.98 ($p < .01$). Thus, it may be concluded that the treatment group had a significantly lower mean MBPC posttest score (M = 33.88, SD 10.22) than the control group (M = 51.94, SD 5.74), indicating fewer memory and behavior problems.

Summary

To test Research Hypothesis 1, the t tests for independent samples resulted in four significant findings

Table 7

Results of MANCOVA for Between-Subjects Effects: AMMSE and MBPC Posttest Scores

Source	Dependent Variable: Total Posttest	Type III Sum of Squares	df	Mean square	F	p
Corrected Model	AMMSE	198.50	3	66.17	80.85	.000
	MBPC	4002.82	3	1334.28	41.36	.000
Intercept	AMMSE	.74	1	.74	.91	.348
	MBPC	6.30	1	6.31	.20	.662
Group	AMMSE	70.89	1	70.89	86.62	.000**
	MBPC	2451.52	1	2451.52	75.93	.000**
Error	AMMSE	24.55	30	.82		
	MBPC	967.91	30	32.26		
Total	AMMSE	17122.00	34			
	MBPC	67579.00	34			
Corrected Total	AMMSE	223.06	33			
	MBPC	4970.74	33			

**$p < .01$.

for the AMMSE in four of the five domains, in each case indicating a higher AMMSE gain score for the treatment group (Table 5) and denoting increased mental functioning. These significant findings were in the area of Orientation, Place; Registration; Recall; and Language, Repeat a Phrase. These results indicate that treatment group subjects at posttreatment were better able than control subjects to identify the state, county, city, center, and floor they were on at AMMSE administration (Orientation, Place). Treatment subjects were also better able to repeat three words at posttreatment after the researcher said them than control subjects (Registration). Further, treatment subjects were better able to recall the three words repeated at Registration (Recall). Finally, treatment subjects at posttreatment were better able to repeat a phrase given by the researcher than control subjects (Language, Repeat a Phrase).

To test Research Hypothesis 2, the t tests resulted in 17 significant t values (Table 6), 17 of the total 32 items. In each case, the treatment group showed significantly lower means, denoting decreased memory and behavior problems. The findings pertained to the following specific categories of problems: Memory (items 1, 2, 3, 4, 5); Orientation (item 10); Depression (items 14, 18, 20, 24); Dependency (item 15); Anxiety (items 17, 23, 25); Combativeness and Anger (items 21, 25); and Other: Sleeping Disturbances (item 31).

Finally, the multivariate analysis for further testing Research Hypotheses 1 and 2 resulted in significant differences between the treatment and control groups for the total AMMSE and MBPC posttest mean scores. The treatment group had a higher total AMMSE posttest mean score and a lower total MBPC posttest mean score than the control group (Table 7). These results further support the research hypotheses, indicating that after the course in a relaxation technique, the treatment group demonstrated increased mental functioning and decreased memory and behavior problems than the control group.

In the next chapter, results of this study will be discussed and conclusions will be offered. In addition, implications for AD patients and caregivers will be explored and recommendations for further research will be made.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Summary of the Study

This study investigated the effects of an alternative, complementary nonpharmacological intervention, a course in a relaxation technique, on patients diagnosed with mild to moderate AD. More specifically, the study sought to ascertain whether AD patients' mental functioning increased and memory and behavior problems decreased after exposure to this course, compared to a control group.

Results indicated that Research Hypothesis 1 was supported. Research Hypothesis 1 stated that AD patients who participate in a course in a relaxation technique will show a statistically significant increase in mental functioning, compared with AD patients who do not participate in such a course, as measured by patients' pretest and posttest mean scores on the AMMSE. Results indicated further that Research Hypothesis 2 was supported. Research Hypothesis 2 stated that AD patients who participate in a course in a relaxation technique will show a statistically significant decrease in memory and behavior problems, compared with AD patients who do not participate in such a course, as measured by caregivers' pretest and posttest mean scores on the MBPC.

This chapter first discusses these results in comparison to previous studies and draws several conclusions. Next, implications for AD patients and

caregivers are suggested. Then, implications for social change are discussed. Finally, based on the study results, recommendations for dissemination and further research are offered.

Conclusions

Demographic Components

Patients. Despite the limitations of a convenience sample, the treatment and control subjects in this study were well matched and were also generally representative of the national population of AD patients and their caregivers. The patients were similar to those in the national AD population in gender, age range, living status, and ethnicity (Alzheimer's Association, 1998, 1999; American Association of Retired Persons, 1997; Cohen, 1993; Kaplan & Sadock, 1996). As Table 1 shows, there were more females than males, about 4 to 1, similar to the national ratio. The age range was slightly above the national range of 50 to 90, with a preponderance of those in this study 70 to 79. In both groups, all patients lived at home, compared with approximately two thirds living at home nationally. Study patients were ethnically diverse, generally reflecting the national composition of predominantly White and Hispanic patients. Possibly not reflective of national composition (Cohen, 1993) was the low percentage of African Americans, under one fifth.

The patient population was similar to those in previous

studies of AD patients and relaxation training. In Welden and Yesavage's (1982) study, there were 2 females for every male, ages ranged from 52 to 93 years, and all were White. In Suhr et al. (1999), participants' gender and ethnic distributions were not supplied, but treatment subjects' mean age was 76 and control subjects mean age was 74, and all patients lived at home.

Caregivers. Caregivers in both the treatment and control groups were well matched and were also generally representative of the population in previous studies, especially with respect to gender, age, relationship to patients, and employment status. In the present study, as Table 2 shows, most caregivers were female, about 75%, and the most predominant age range was 40 to 49. The majority, 59%, were daughters of the patients and worked full time.

The subjects in McCurry et al. (1966) were 75% female. They were somewhat older than the present caregivers, between 61 and 72 years old, and 75% percent were daughters. A national survey of caregivers for all ill patients indicated similar characteristics to those in the present study: "Approximately 75% of caregivers were female; 40% were 49 or older, 55% were daughters, and 50% worked full-time." (Caregiving, 1997, p. 11).

Research Hypothesis 1: AMMSE

Research Hypothesis 1 stated that AD patients who participate in a course in a relaxation technique will show

a statistically significant increase in mental functioning, compared with AD patients who do not participate in such a course, as measured by patients' pretest and posttest mean scores on the AMMSE.

As Table 3 shows, results indicated that Alzheimer's patients in the treatment group showed measurable improvement in mental state in four of the five domains of the AMMSE for a total of nine items. These were Registration, Attention and Calculation, Recall, and two items in Language, Repeat a Phrase and Read and Obey Instruction. The control group showed no positive gains in any domain.

As Table 3 also shows, the scores of both groups changed before and after the course in a relaxation technique. Of a possible perfect score of 30.00 (Folstein et al., 1975), the total mean for the treatment group increased from 22.47 pretest to 24.00 posttest, whereas the total mean for the control group decreased from 22.00 pretest to 20.59 posttest. Combining the gains for all domains, the total gain score was positive for the treatment group, 1.53, compared with -1.41 for the control group. That is, the treatment group showed a measurable improvement in mental state after the course, and the control group showed a measurable decline in mental state.

Only on the domain of Orientation did the treatment group show no positive gain score, in which questions were

asked on time (current year, city, center name, and floor) (Appendix A). Although, as Table 1 shows, most patients were diagnosed with mild AD and assessed as high functioning at intake, the lack of a positive gain score in this domain may be attributed to the prevalence of disorientation as a primary symptom of AD (Cutler & Sramek, 1996; Richards & Hendrie, 1999). In addition, as noted in the study limitations, despite the diagnosis of mild AD, it was anticipated that patients' mental and physical capacities could decline during the course of the study. The lack of an Orientation gain may also be explainable by such decline.

As Table 5 illustrates, results of *t* tests on the gain scores for each item of the AMMSE showed that the treatment group had significantly higher mean scores than the control group on four of the nine items. These were Orientation, Place; Registration; Recall; and Language, Repeat a Phrase. That is, the treatment group showed statistically significant improvement in each of these domains after patients completed the course in a relaxation technique. In addition, as Table 7 shows, the multivariate analysis revealed that the total posttest mean for the treatment group was statistically significantly higher than that for the control group. That is, results indicated that AD patients who participated in a course in a relaxation technique showed a statistically significant increase in mental functioning, compared with AD patients who did not

participate in this course. Thus, Null Hypothesis 1 was rejected and Research Hypothesis 1 was accepted.

These results corroborate those of Suhr et al. (1999) in their similar study of 34 pairs of AD patients and caregivers. These researchers studied the results of training in progressive muscle relaxation, a component of the present study course in a relaxation technique. (Appendix J). With treatment and control groups comparable to those in the present study (each $\underline{n}$ = 17), Suhr et al. postulated that treatment subjects would show improved performances on measures of memory and verbal fluency and decreases in psychiatric and behavioral disturbances.

The researchers used measures that, like the AMMSE, similarly tested cognitive abilities for visual retention, oral word association, and category fluency. Their results showed a statistically significant difference from pretest to posttest for the treatment group on all three measures, and a significant difference only on oral word association for the control group. The present study therefore concurs with previous research concerning the measurable beneficial effects of relaxation techniques on the mental functioning of mild to moderate AD patients.

These findings are indeed dramatic and have many practical ramifications beyond research results. The significant improvement of treatment group participants in mental functioning indicates that instruction in a

relaxation technique stems or slows the debilitating cognitive effects of AD.

One of the most psychologically debilitating effects of the progressive nature of AD is on the self-esteem of patients. As they recognize that recall and attention span faculties are eroding, they also recognize that their independence is curtailed and they must become dependent on others for their daily activities (Richards & Hendrie, 1999). For these patients, such realizations often lead to loss of self-esteem, increasing depression, and even suicidal ideation (Katz, 1998; Mega et al., 1996).

However, as results of this study show, instruction in a relaxation technique offers new hope for mild to moderate AD patients. With incorporation of such a course in day care and residential programs, these patients may be able to regain more of their memories and the positive emotions associated with them (Zgola, 1987). Further, patients may be able to resume more of the independent activities to which they were accustomed. Such resumption in turn leads to a renewed sense of dignity and self-esteem (Plaud et al., 1998; Zgola, 1987). Certainly, then, patients' quality of life would improve, as would their relationships with their primary caregivers.

As is well-known, caregivers of AD patients suffer tremendous stresses, not the least of which is the frustration experienced from the patients' decreased mental

functioning (Mace & Rabins, 1991; McCarty, 1996). If a course in a relaxation technique were incorporated into AD treatment programs, it is likely that caregivers also would benefit significantly. Because patients would retain more information and resume more normal cognitive functioning, caregivers would then be able to interact more normally with them. This factor alone would contribute substantially to lowered stress levels for both.

Thus, AD centers should seriously consider the incorporation of a course in relaxation technique into their daily activities for patients. Such a course could undoubtedly help both patients and caregivers to improve their quality of life and interactions, and help them to recapture a measure of their relationship before the onset of the patient's AD.

Research Hypothesis 2: MBPC

Research Hypothesis 2 stated that AD patients who participate in a course in a relaxation technique will show a statistically significant decrease in memory and behavior problems, compared with AD patients who do not participate in such a course, as measured by caregivers' pretest and posttest mean scores on the MBPC.

As Table 4 shows, results showed that Alzheimer's patients in the treatment group showed measurable improvement as reported by caregivers on the MBPC. Negative gain scores resulted, indicating a decrease in memory and

behavior problems, on 19 of 32 items of the MBPC (highest decrease for item 31, Other: Sleeping Disturbances; lowest decrease for item 10, Not Recognizing Familiar Place). For 13 of the items, means and standard deviations for both groups equalled zero. The control group showed no negative gain scores on any of the 32 items. In addition, as Table 4 further shows, the total mean for the treatment group decreased from pretest to posttest, whereas the total mean for the control group increased from pretest to posttest. The treatment group has a negative total gain score, compared with a positive gain score for the control group.

These results suggest that the treatment group showed a decrease and the control group showed an increase in memory and behavior problems during the course. However, these results should be taken tentatively. Since, during the course, control subjects engaged in their regular center activities, no difference in their scores from pretest to posttest could be reasonably anticipated. However, as with Research Hypothesis 1, the limitation of the progressive nature of AD could have contributed to this outcome.

As Table 6 illustrates, results of *t* tests on the gain scores for each item of the MBPC showed that the treatment group had significantly higher mean scores than the control group on 17 of the 19 items in which means and standard deviations did not equal zero. In addition, the multivariate analysis revealed that the total posttest mean for the

treatment group was statistically significantly lower than that for the control group. That is, results indicated that AD patients who participated in a course in a relaxation technique showed a statistically significant decrease in memory and behavior problems, compared with AD patients who did not participate in this course. Thus, Null Hypothesis 2 was rejected and Research Hypothesis 2 was accepted.

It is interesting to note that in the Orientation category, patients' responses in the two groups to item 10, Not Recognizing Familiar Place, showed a statistically significant difference, but their response to item 13, Forgetting day, did not. These results partially support the treatment AD patients' lack of a positive gain score on the Orientation domain of the AMMSE.

The 17 items to which the two groups responded showed statistically significant differences were in the following memory and behavior categories, as noted in Chapter 4: Memory, items 1, 2, 3, 4, 5; Orientation, item 10; Depression, items 14, 18, 20, 24; Dependency, item 15; Anxiety, items 17, 23, 25; Combativeness and Anger, items 21, 25; and Other: Sleeping Disturbances, item 31. In the category of Memory, patients' responses showed the greatest decrease in problems with five items, followed by their responses in the Depression category with four items, and their responses in the Anxiety category with three. These categories reflect some of the most troublesome and

widespread symptoms of AD patients (Mace & Rabins, 1991; Plaud et al., 1998).

These results confirm previous research with older non-AD adults as well as those suffering from the disease. With non-AD subjects, Yesavage et al. (1982) found that after a 12-week course in relaxation training, anxiety levels significantly decreased. Rickard et al. (1994) studied non-AD adults for the effect of relaxation techniques on anxiety in a longitudinal design, with posttreatment and 1-year follow-up measures. Follow-up showed no statistically significant treatment effects, but subjects' means for anxiety at follow-up were lower than at posttreatment.

Scogin et al. (1992) studied the effects of four sessions of relaxation training on the anxiety of older non-AD adults. Findings revealed that the two treatment groups showed statistically significant session effects for relaxation, compared to a control group. However, contrary to the present study with AD patients, no significant decreases were found for anxiety. As the researchers observed, despite the partial positive results, there may have been too few sessions to significantly affect the subjects' anxiety. In comparison, the 15 sessions of the present study may have promoted statistically significant decreases in the subjects' anxiety.

The present study results also corroborate those of

Suhr et al. (1999) with treatment and control groups of mild to moderate AD patients. In addition to cognitive abilities, discussed above, these researchers studied the effects of progressive muscle relaxation on psychiatric symptoms and behavior problems. Like Scogin et al. (1992), Suhr et al. (1999) found no statistically significant difference from pretest to posttest for anxiety.

However, with administration by Suhr et al. (1999) of the MBPC, the caregiver measure also used in the present study, a statistically significant difference was found from pretest to posttest for the means of the treatment group: pretest 26.0 (*SD* 14.8), posttest 17.2 (*SD* 13.6) ($p < .001$). No statistical significance was found between the means for the control group: pretest 27.0 (*SD* 22.3), posttest 30.8 (*SD* 18.2). In the present study on this measure, as Table 7 shows, there was a statistically significant difference between the total posttest means for both groups, treatment, $M = 33.88$ (*SD* 10.22), control $M = 51.94$ (*SD* 5.74) ($f = 75.98$, $p < .01$).

The results of Suhr et al. (1999) and the present study are strikingly similar in several ways. First, both studies had the same number of mild to moderate AD subject pairs. Second, treatment and control groups were fairly well matched demographically. Third, the directions of decrease for the treatment group and increase for the control group are evident. Fourth, for both groups a significantly lower

mean score resulted for the treatment than control groups, indicating fewer memory and behavior problems.

It must also be noted that the mean MBPC scores obtained by the subjects in the present study were higher than the Suhr et al. (1999) study by 16 to 21 points, indicating that the subjects in the present study may have had comparatively more memory and behavior problems. The MBPC posttest mean obtained by the subjects in the present study, as well as a statistically significant difference in 53% of the negative gain scores (17 of the total 32 items), indicate that the subjects in the present study had decreases in memory and behavior problems. From this discussion, then, it can be seen that the present study supports previous research concerning the measurable beneficial effects of relaxation techniques on the memory and behavior problems of mild to moderate AD patients.

The corroboration of present study results with previous research is gratifying. However, more important for practical implementation and meaningful aid to AD patients and their families may be the actual significant decreases in patients' memory and behavior problems from instruction in a relaxation technique. As with increases in mental functioning, the decreases in these typical and enervating AD symptoms have widespread implications for improving AD patients' quality of life.

First, most present nonpharmacological treatments, such

as group activities, perform little more than a maintenance function (Burnside, 1994; Cummings et al., 1998). However, present study results show indisputable measurable evidence that improvement does take place. That is, symptoms such as memory loss, lack of orientation, depression, dependency, anxiety, combativeness and anger, and sleeping disturbances can be contained or actually decreased through a course in a relaxation technique.

Emergence and worsening of such symptoms have been thought inevitable by both the public and health care professionals (Kaplan & Sadock, 1996). However, the present study findings show unequivocally that these symptoms can be not only controlled but decreased.

Second, as symptoms decrease, the need for pharmacological application should also decrease. This has been an accepted mode for treatment of behavioral problems associated with AD, especially agitation, restlessness, angry outbursts, and insomnia (Zarit et al., 1985). As discussed earlier, side effects and interactions with other medications can be extremely dangerous (Hollister & Gruber, 1996; Kaplan & Sadock, 1996). Moreover, it is documented that, although drugs have temporary beneficial effects, continued use or increased dosages often exacerbates the problems (Zarit et al., 1985). With control of behavior problems by such nonpharmacological means as a relaxation technique, AD patients should require less or no medication.

This result alone would improve patients' quality of life.

Third, with decreased behavior problems, even more than with improved mental functioning, patients' daily lives would become much closer to their former, normal functioning. Because they would have greater control of their behavior, they would be able to perform and enjoy many more of life's activities than they had previously. As a result, their self-esteem and sense of dignity would return, as well as their ability to conduct their lives with more independence.

Fourth, for caregivers, too, the ramifications are dramatic. Caregivers suffer great stress in caring for AD patients and may manifest similar symptoms, such as depression, anxiety, sleep disturbances, and even suicidal thoughts (Brown et al., 1995; Zarit et al., 1985). Programs should therefore consider caregivers equally, since they are indispensable aids in the AD patients' care. At present in the two research site centers, as in most centers, caregivers are routinely taught to deal with patients' problem behavior by increasing their social support and learning the "stress-management model," in which they are provided information and instructed in a problem-solving process (Zarit et al., 1985, p. 128). However, this method is variable, at best, and often engenders frustration in both the patient and caregiver (Mace & Rabins, 1991).

With results of the present study, relaxation training

such as that implemented could be added to caregivers' education with teaching of the stress-management model. Such an addition would provide a supplementary and alternative modality to enable caregivers not only to cope more successfully with the patients behavior but, as important, to reduce the stresses in the caregivers own life.

Fifth, because of the significant study results, relaxation training techniques could also be taught to caregivers and other family members at family counseling sessions and support group meetings. Such techniques would help all members reduce their own stresses and thereby cope more positively with the AD family member. These programs could be extended to AD centers around the country and publicized. With reporting of their experiences, possibly through a website sponsored by the Alzheimer's Association or a given center, many caregivers could share their positive information and demonstrations of improved behavior. Such dissemination could indeed contribute to more acceptance nationwide of alternative, complementary modes of treatment as well as help deconstruct the prevalent belief that AD symptoms are irreversible.

Finally, all such programs would also aid health care professionals in interacting with AD patients and their families. Staff members often receive special training to calm and sooth patients with comforting words rather than drugs or restraints (Partners in Caregiving, 1995; Zarit et

al., 1985). With addition of a course in relaxation techniques, staff members, who also suffer much stress (Danner et al., 1993), would gain additional means to cope with their own stress, understand their AD patients, and respond to them more humanely and positively.

This study, it is hoped, will provide a beginning point for such important dissemination. In terms of immediate study objectives, the findings fulfill the two purposes stated. These were, first, to add to the body of research with the AD population; and second, to ascertain the effectiveness of the selected intervention, a course in a relaxation technique in a group setting, for increasing mental functioning and decreasing memory and behavior problems in AD patients. By fulfilling these purposes, the study also contributes to the sparse research on the application of alternative complementary therapeutic techniques to the AD population.

Implications for AD Patients and Caregivers

The older population in the United States is steadily and dramatically increasing. Currently, 12.5%, or 1 in 8 people in the United States, is 65 or older, and by 2025 experts estimate this number to increase to 18.4%, or 1 in 6. In Florida, the site of the present study, the percentages are higher: currently 18% and by 2025 an estimated 26.3% of the population will be 65 or older (U.S. Administration on Aging, 2000). Concomitantly, the incidence

of AD is expected to increase beyond the 4% of the total population estimated in the DSM-IV (1994) (Plaud et al., 1998). Frequent and accelerating medical breakthroughs continue to be highly promising (Alzheimer's Association, 2000; Scientists Announce Initial Results, 2000). However, until definite cures are found, the best strategy, as Plaud et al. (1998) pointed out, "is to actively assist patients, families, and caregivers with the long-term management of the problems associated with this disease" (p. 272).

It must be emphasized that most of the participants in the present study had mild AD. All were living at home, and most were high functioning and relatively independent. No studies have been conducted to date with AD patients in the severe stage who are cared for in institutions. As Suhr et al. (1999) observed of their mild to moderate population, "it is an open question" whether results are generalizable to AD patients in more advanced stages (p. 40).

Nevertheless, the results of this study show that management of mental functioning and memory and behavior problems can be facilitated in mild to moderate AD patients by a 5-week, 15-session course in a relaxation technique. Anecdotal patient feedback corroborated this conclusion. One remarked, "I feel so relaxed!" Another one said that after each session and for many hours she felt "like my old self again." And a third one stated she was sleeping better and experiencing less friction with her daughter-caregiver.

Based on these observations and the quantitative evidence, such a course could be implemented as part of adult AD center activities, as was the case in this study. The course could also be offered as part of programs in senior centers, community centers, churches, synagogues, and residential facilities that serve AD sufferers. Such courses would not only provide AD patients alternatives to other scheduled activities but could also increase their level of cognitive, psychosocial, and behavioral functioning.

In addition, caregivers could also benefit. With administration of a relaxation intervention with caregivers, McCurry et al. (1996) found improved sleep quality and duration at posttest and 3-month follow-up. In the present study, anecdotal feedback from caregivers indicated that, as they observed patients' improvement, especially in behavior problems, the caregivers themselves felt less stress. Observing the improvements in their relatives, several caregivers also expressed interest in taking the course. These comments were similar to those recorded by Suhr et al., (1999) of their caregiver subjects. Further, as one caregiver in the present study stated, "When I see that she's talking normally and not looking so depressed, I worry a lot less." Thus, a course in a relaxation technique could help alleviate caregivers' continuous and severe stresses (Sayles-Cross, 1993; Teri, 1997).

Caregivers other than relatives may also benefit from

this study. Staff members may wish to participate in the course to help alleviate their own daily stresses (Teri, 1997). In any case, for staff who care for these patients, positive results of the course, such as those shown, in improvement of AD problems could aid in the management of AD and provisions of patients' comfort.

Although the progression of AD will not be stemmed by a course in a relaxation technique, based on study results, this course is very likely to increase mental functioning and decrease memory and behavior problems of patients with mild to moderate AD. As patients improve, caregivers' stresses concurrently may decrease and staff may be able to provide care to which patients are more responsive. The present study has offered empirical evidence that such a course could help patients, primary caregivers, and health professionals in managing the problems of AD.

Implications for Social Change

Broader implications may also be drawn from this study. These apply to patients, caregivers, helping professionals, and the larger society. With the probability of escalating incidence of AD among the older population, the hypothesis tested in this study shows that an alternative, complementary mode of treatment such as application of relaxation techniques can be effectively used to help mild to moderate AD patients improve their cognitive and behavioral functioning. This outcome implies in turn a

better quality of life for these patients. Because of such results, it is also possible that close to normal mental functioning and behavior may be prolonged. These AD patients may regain or increase their independence and experience less social stigma because of their condition. Concurrently, despite their declining intellectual activity, they may live longer, become more productive, and experience more enjoyable lives.

For caregivers, quality of life may also be enhanced. It is well-recognized that primary caregivers, most often close relatives, are placed under tremendous stress and that their lives can change radically as a result of caring for their AD relative (Brown et al., 1995; Hollister & Gruber, 1990; Mace & Rabins, 1991; Tuokko, 1993). Zarit et al. (1985) named their seminal book The Hidden Victims of Alzheimer's Disease, referring to caregivers and patient families. Because the results of this study indicate that patients increase mental functioning and decrease behavior problems, as assessed by their primary caregivers, implementation of relaxation techniques could help decrease the burdens and stresses of caregivers (McCarty, 1996; Sayles-Cross, 1993; Teri, 1997; Zarit, 1982). Thus, caregivers may not only improve their quality of life, but also, through other pursuits and work outside the home (almost two thirds in the present study worked outside) may contribute more effectively to society.

For health professionals caring for AD patients in both day care and residential facilities, the degree of stress may be similar to that of caregivers. Because of the almost constant demands in the care of such patients, burnout is a widespread problem among helping professionals (Alzheimer's Association, 2000; Caregiving, 1997; Goode et al, 1996; Perel, 1998). Implementation of relaxation techniques may not only aid patient management, as noted in the previous section, but also contribute to professional caregivers' more consistent well-being. In turn, higher quality care may be rendered to more patients, those with and without AD. Thus, the overall quality of health care could be heightened in facilities and institutions for older adults.

With regard to the larger society, implications of the study results add support to what may be a pioneering perception of AD patients and contribute to reversing biases toward AD patients. As discussed at the beginning of this study, Cotrell and Schulz (1993) pointed out that AD patients are often neglected or dismissed as research participants. Their input is labeled "inherently unreliable" and they are all but dismissed as human beings (p. 219). It is little wonder that so many AD patients, especially in the early stages, suffer a dramatic decrease in self-esteem and feel "discarded" (Monahan, 1995, p. 65).

Thus, present results corroborate the view of AD patients as contributing, valuable individuals. Although

their capabilities may have diminished, they nevertheless retain many abilities and should not be disregarded or discarded because of their illness. Cotrell and Shulz (1993) wisely observe that the AD patient should be "viewed as a contributor whose perspective is essential to understanding the impact and course of the disease" (p. 210). The present researcher would extend this view. AD patients, despite their illness, deserve not to be stigmatized but rather to be viewed in the larger society as viable contributors, whatever their roles. The present study constitutes a step in effecting such desired social change.

Recommendations

Dissemination of Results

Based on the above implications, community service facilities and adult day care centers should be informed of the study results and applicability of the intervention to mild to moderate AD populations. Means for dissemination include presentations at professional conferences, such as those sponsored by the Alzheimer's Association or the National Family Caregivers Association. Results could also be disseminated through regional conferences, such as those in Southeast Florida sponsored by the Miami Area Geriatric Education Center (MAGEC) under the auspices of the University of Miami School of Medicine.

Additionally, this dissertation could be synopsized into one or more articles and submitted to professional

journals. More locally, because the South Florida area has a large population of older adults, local newspapers often report pertinent health-related findings. A condensation of the present study could be submitted to these newspapers for the purpose of informing the general public, patients, families, and AD health professionals of the benefits of relaxation techniques.

Finally, with dissemination of study results by such methods, the researcher could offer to teach the course in relaxation techniques to interested health professionals at various centers and facilities. With the researcher's present experience and previous training in mind/body medicine (Appendix M), she is prepared to offer instruction and consultation to those desiring to implement the course with AD patients and caregivers.

Further Research

In addition to dissemination of the present results, further research must be recommended to enhance the validity and reliability of the study and address several of the limitations. First, the population was a relatively small convenience sample. There were no dropouts, though anticipated in the summary of limitations, and the total sample of 34 was adequate for the statistical analyses (Rubin & Babbie, 1997). Nevertheless, the study should be replicated with larger, random samples of mild to moderate AD patients.

Second, participants were drawn from a single geographical location. Replication should encompass diverse geographical areas, such as eastern and western and urban and rural regions, with comparisons among subject populations.

Third, demographically the sample was generally representative of AD patients nationwide. However, African Americans represented the lowest proportion, 18% (Table 1). Some studies have found that in certain locations African Americans have a higher incidence of AD than Whites and Hispanics (Cohen, 1993; Naleppa, 1996). Thus, further research should incorporate a larger sample of this ethnic group for a more accurate and generalizable population of older adults with AD.

Fourth, results for the MBPC showed greater improvement than those for the Suhr et al. (1999) subjects on the MBPC. Because present study caregivers completed the MBPC, "social desirability" may have unduly influenced them (Rubin & Babbie, 1997, p. 162). To better control for this variable, the study should be replicated with the addition of a more neutral third party completing the MBPC, such as a day care center staff member or other relative instead of or in addition to the primary caregiver.

Fifth, the course duration was 5 weeks, shorter than some other studies with non-AD adults, such as the 12 weeks of Yesavage et al. (1982) and the 6 weeks of McCurrry et al.

(1996), but longer than the 4 weeks of Scogin et al. (1992). The present study's course of three sessions per week was also more frequent and possibly longer overall than the Suhr et al. (1999) once weekly sessions, which were "individually tailored" to patients' needs (p. 35).

In any case, further research should replicate the present study with a course equal in length and frequency, or longer, and include follow-up measures to test durability and retention of learning (Cotrell & Schulz, 1993; Gay, 1996). Follow-ups could be conducted at 3-, 6- and 12-month intervals, in conjunction with assessment of AD progression by such instruments as the Dementia Rating Scale (Clark & Ewbank, 1996).

Additional research could build on and extend the present study. Thus, sixth, because subjects in the present study and the Suhr et al. (1999) were predominantly mild AD sufferers, future studies could focus on patients diagnosed with moderate AD. Use of such a population would further test the efficacy of the present intervention.

Seventh, based on caregivers' responses, courses in relaxation techniques could be administered to both patients and caregivers simultaneously. Results could be compared with the present study for statistically significant improvement and interaction effects.

Eighth, the present intervention could be combined with other alternative, nonpharmacological therapies, such as

music therapy. Gfeller and Hanson (1995) found that AD patients at all levels of functioning (high, medium, and low) improved in physical, cognitive, and social functioning after 12 weeks of music therapy. At the University of Miami School of Medicine, a 4-week study exposing AD patients to music 5 times weekly for 40 minutes each session showed that patients became more active, experienced improved sleep, and cooperated better with medical staff than before the intervention (Music Soothing, 2000). Given these results and those of the present study, research combining music therapy with relation techniques could possibly yield significant improvement in AD patients' problem areas. However, matched controls should be in place to control for intervening variables.

Finally, future research could contribute more valid empirical evidence if follow-up studies included instruments of relaxation training effects, such as the "Relaxation Inventory" developed by Crist, Rickard, Prentice-Dunn, and Barker (1989, p. 716). This is a 45-item self-report assessing subjects' responses to physiological and cognitive tensions, and physical and emotional calmness. Use of such an instrument at pretest, posttest, and follow-up could assess levels of improvement in the typical problems of AD patients. Such an instrument would also evaluate patients' subjective feelings about their mental and emotional states, thus adding an important dimension to research in AD.

Administration of the Relaxation Inventory, as well as the other possibilities for future research suggested here, could build on Cotrell and Schulz's (1993) recommendation that AD patients be utilized as feasible subjects for research. The present study was an important step in this direction. Despite limitations, this study demonstrated that mild to moderate AD patients who completed a course in a relaxation technique showed increased mental functioning and decreased memory and behavior problems, compared with a control group.

Although this study has confirmed the viability of AD patients as subjects for research, more remains to be done. As Gfeller and Hanson (1995) urged in relation to patients with Alzheimer's disease, "health care teams must continue to offer a supportive environment [and] . . . purposeful activities . . . that are suitable for the functional level of the individual, across the entire continuum of decline" (p. 67). It is hoped that the present study has contributed to this worthy goal.

Further, AD patients in whatever environment, whether at home or at a center, deserve the same respect and dignity as any other patients. The findings of this study have shown that instruction in a relaxation technique has measurable positive effects in decreasing the symptoms of AD patients. Thus, dissemination of study results should help these AD patients, their caregivers, families, and health

professionals lessen the stresses and manage the effects of Alzheimer's disease in more positive and productive ways.

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APPENDIX A

The Annotated Mini-Mental State Examination (AMMSE)

CODE NUMBER: P_____

Date ___/___/___

ORIENTATION

___ What is the (year-1) (season-1)
(date-1) (month-1)? (5 Pts.)

___ Where are we (state-1) (country-1)
(city-1) (Center's name-1) (floor-1)? (5 Pts.)

REGISTRATION

___ Have patient repeat three words after you have said them (1 second to say each word). Give 1 point for each word repeated correctly. (3 Pts.)
Then repeat the words until patient learns all these words. Count trials and record: _____

ATTENTION AND CALCULATION

___ Serial 7s (begin at 100 and subtract backwards by 7). Stop after 5 answers. One point for each correct answer. (5 Pts.)
Alternatively, spell "earth" backwards. The score is the number of letters in correct order.

RECALL

___ Ask for the 3 words repeated above. One point for each correct word. (3 Pts.)

APPENDIX A (Continued)

LANGUAGE

___ Name a pen and watch. (2 Pts.)

___ Repeat "No ifs, and, or buts." (1 Pt.)

___ Follow a 3-stage command: "Take a paper in your right hand, fold it in half using both hands, and put it on the floor." (3 Pts.)

___ Read and obey the following:

"Close your eyes." (1 Pt.)

___ Write a sentence (on the back of this paper). (1 Pt.)

___ Copy design (on the next page). (1 Pt.)

___ TOTAL SCORE (30 Points Possible)

Assess Level of Consciousness:----------
(Along a continuum) Alert Drowsy Stupor Comatose

From: Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-Mental State," a practical method for grading the cognitive state of patients for the clinician. Journal of Psychiatric Research, 12(3), 189-198.

Note. Permission granted for use of the annotated version, per Appendix C. The test contents of this version are identical to the original.

APPENDIX B

The Memory and Behavior Problems Checklist (MBPC)

CODE NUMBER: C_____

Date ___/___/___

The following instructions will be given to the caregiver: "I am going to read you a list of common problems. Tell me if any of these problems have occurred during the past week. If so, how often have they occurred. If not, has this problem ever occurred?" The caregiver will be able to refer directly to the following frequency ratings.

Frequency ratings

0 = Never occurred.

1 = Occurred frequently in the past but not in the past three months.

2 = Has occurred recently, but not in the past week.

3 = Has occurred 1 or 2 times in the past week.

4 = Has occurred 3 to 6 times in the past week.

5 = Occurs daily or more often.

7 - This problem would occur if the patient weren't supervised.

Behaviors	Frequency
1. Asking the same question over and over again.	0 1 2 3 4 5 7
2. Trouble remembering recent events (e.g., items in the newspaper, on TV).	0 1 2 3 4 5 7
3. Trouble remembering significant events from the past.	0 1 2 3 4 5 7

APPENDIX B (Continued)

4. Mixing up past and present (e.g., thinking a deceased parent is alive).	0 1 2 3 4 5 7
5. Losing or misplacing things.	0 1 2 3 4 5 7
6. Hiding things.	0 1 2 3 4 5 7
7. Unable to find way about indoors.	0 1 2 3 4 5 7
8. Unable to find way about outdoors, for example, on familiar streets.	0 1 2 3 4 5 7
9. Wandering or getting lost.	0 1 2 3 4 5 7
10. Not recognizing a familiar place.	0 1 2 3 4 5 7
11. Not recognizing familiar people.	0 1 2 3 4 5 7
12. Not recognizing a familiar object.	0 1 2 3 4 5 7
13. Forgetting what day it is.	0 1 2 3 4 5 7
14. Unable to start activities by self (besides ADLs).	0 1 2 3 4 5 7
15. Unable to keep occupied or busy by self.	0 1 2 3 4 5 7
16. Follows you around.	0 1 2 3 4 5 7
17. Being constantly restless or agitated.	0 1 2 3 4 5 7
18. Spending long periods of time inactive.	0 1 2 3 4 5 7
19. Being constantly talkative.	0 1 2 3 4 5 7
20. Talking little or not at all.	0 1 2 3 4 5 7
21. Being suspicious or accusative.	0 1 2 3 4 5 7
22. Doing things in public that embarrass you.	0 1 2 3 4 5 7
23. Waking you up at night.	0 1 2 3 4 5 7
24. Appears sad or depressed.	0 1 2 3 4 5 7

APPENDIX B (Continued)

25. Appears anxious or worried.	0 1 2 3 4 5 7
26. Becomes angry.	0 1 2 3 4 5 7
27. Strikes out or tries to hit.	0 1 2 3 4 5 7
28. Destroying property.	0 1 2 3 4 5 7
29. Engaging in behavior that is potentially dangerous to others or self.	0 1 2 3 4 5 7
30. Seeing or hearing things that are not there (hallucinations or illusions).	0 1 2 3 4 5 7
31. Any other problems (specify):	0 1 2 3 4 5 7
32. Any other problems (specify):	0 1 2 3 4 5 7

From: Zarit, S. H., Orr, N. K., & Zarit, J. M. (1985). The hidden victims of Alzheimer's disease: Families under stress (pp. 78-79). New York: New York University Press.

APPENDIX C

Letters Requesting Permission to Use the Annotated Mini-Mental State Examination (AMMSE) and the Memory and Behavior Problems Checklist (MBPC) and Response Letters

Stella Maris Verna, M.S., LMHC
10555 SW 77th Court
Miami, FL 33156

December 15, 1999

Marshall F. Folstein
Department of Psychiatry and Behavioral Science
John Hopkins Hospital
Baltimore, MD 21205

Dear Dr. Folstein:

As a doctoral candidate at Walden University working on my dissertation, I am conducting a research study on the effects of a course in a relaxation technique on Alzheimer's patients. As part of this study, I would like to administer the Mini-Mental State Examination as both pretest and posttest.

Your permission is sought for reprinting and use of this instrument (copy enclosed for your reference). The pertinent information is as follows:

Mini-Mental State Examination (AMMSE)

Instrument originators: Folstein, M. F., Folstein, S. E., & McHugh, P. R.

APPENDIX C (Continued)

Article title: "Mini-Mental State" A practical method for grading the cognitive state of patients for the clinician

Journal: Journal of Psychiatric Research, 12, 189-198

Publication date: 1975

Please be assured that full credit to the original source will be given.

If you grant permission, please sign the form below in the space provided and return the form to me. A self-addressed stamped envelope is provided for your convenience. If permission of the original authors is needed, kindly provide their addresses. If specific credit to the authors is needed, please so indicate.

Final dissertation copies will be available upon request from Bell & Howell Information and Learning.

Your cooperation is very much appreciated.

Sincerely yours,

Stella Maris Verna, M.S., LMHC

Permission is hereby granted for reprinting and use of the material described above.

_____ _____

Signed: For M. F. Folstein Date

APPENDIX C (Continued)

Mailing Address: 31 St. James Avenue, Suite 1
Boston, Massachusetts 02116
(617)587-4215 (617)587-4201 Fax
www.minimental.com

April 10, 2000

Stella Maris Verna, M.S., LMH
10555 SW 77th Court
Miami, FL 33156

Fax: (305) 666-8232

Dear Ms. Verna:

Re: ***Stella Maris Verna* ("the Licensee") *requests permission to use the MMSE for use in her dissertation as a doctoral candidate at Walden University* ("the proposed use").**

Thank you for your interest in the Mini Mental State Exam (MMSE). "The copyright in the Mini Mental State Examination is wholly owned by the MiniMental LLC, a Massachusetts limited liability company."

We are now offering an annotated version and would be pleased to grant you permission to reproduce copies of the Annotated Mini Mental State Exam (AMMSE) (***Exhibit A***) to be used as an educational vehicle. ***Permission is being granted for use of the AMMSE in your dissertation as a doctoral candidate at Walden University involved with the research study you are conducting on the effects of a course in meditation and relaxation techniques on Alzheimer's patients. Researchers must be advised that for clinical use of the MMSE, permission must be obtained from Mini Mental LLC.*** If you are interested in using the Mini Mental State Exam, the administrative fee for issuance of the license granting permission to use the MMSE is $85.00 (eighty-five US dollars). Please remit your check, along with the executed license agreement to the following address. Upon receipt of your signed version of our license and payment of the administrative fee, we will return an officially executed agreement to you allowing the use of the MMSE.

MiniMental LLC
31 St. James Avenue, Suite 1
Boston, Massachusetts 02116
Fax: (617) 587-4201

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In addition, we can also make available to you a laminated card to be used as a reference for the clinician. The Mini Mental State Exam card (a plastic card for easy lab coat insertion) includes a copy of the MMSE on one side, and a list of score norms by age and education level on the back. These cards can be ordered directly through our MiniMental office for a fee of $10.00 USD per card.

Sincerely yours,

John Gonsalves, Jr., Administrator

Enclosures

APPENDIX C (Continued)

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This license agreement (the "Agreement"), dated as of *April 10, 2000*, is entered into by MiniMental LLC ("MMLLC"), a Massachusetts limited liability company having a principal place of business at 31 St. James Avenue, Suite 1, Boston, Massachusetts 02116 and *Stella Maris Verna, M.S., LMHC* ("Licensee"), with an organization with a principal address at *10555 SW 77th Court, Miami, FL 33156.*

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MiniMental LLC

By: _____

John Gonsalves, Jr.
Administrator

LICENSEE

By: Stella Maris V., LMHC

Name: Stella Maris Verna, M.S., LMHC
Title: Principal Investigator

APPENDIX C (Continued)

Stella Maris Verna, M.S., LMHC

10555 SW 77th Court

Miami, FL 33156

December 15, 1999

Permissions Department

Free Press

1230 Avenue of the Americas

New York, NY 10020

To Whom It May Concern:

As a doctoral candidate at Walden University working on my dissertation, I am conducting a research study on the effects of a course in a relaxation technique on Alzheimer's patients. As part of this study, I would like to administer the Memory and Behavior Problems Checklist (MBPC) to the patients' caregivers as both pretest and posttest.

Your permission is sought for reprinting and use of this instrument (copy enclosed for your reference). The pertinent information is as follows:

Memory and Behavior Problems Checklist (MBPC)

Instrument originators: Zarit, S. H., Orr, N. K., & Zarit, J.

Book: Measures for clinical practice: A sourcebook, Volume 1

APPENDIX C (Continued)

Authors: Fischer, J., & Corcoran, K.

Publication date: 1994, second edition

Pages: 348-350

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Sincerely yours,

Stella Maris Verna, M.S., LMHC

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_____ _____

Signed: For Free Press Date

APPENDIX C (Continued)

Stella Maris Verna, M.S., LMHC
10555 SW 77th Court
Miami, FL 33156

April 7, 2000

Ms. Despina Gimbel
Rights & Permissions Manager
New York University Press
70 Washington Square South
New York, NY 10012

Dear Ms. Gimbel:

As a doctoral candidate at Walden University working on my dissertation, I am conducting a research study on the effects of a course in meditation and relaxation techniques on Alzheimer's patients. As part of this study, I would like to administer the Memory and Behavior Problems Checklist (MBPC) to the patients' caregivers as both pretest and posttest.

Your permission is sought for reprinting and use of this instrument (copy enclosed for your reference). The pertinent information is as follows:

Memory and Behavior Problems Checklist (MBPC)
Instrument originators: Zarit, S. H., Orr, N. K., & Zarit, J.
Book: Measures for clinical practice: A sourcebook, Volume 1

APPENDIX C (Continued)

Publisher: New York University Press

Authors: Fischer, J., & Corcoran, K.

Publication date: 1994, second edition

Pages: 348-350

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Final dissertation copies will be available upon request from Bell & Howell Information and Learning.

Your cooperation is very much appreciated.

Sincerely yours,

Stella Maris Verna, M.S., LMHC

Stella Maris D., LMHC

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Despina Gimbel 4/12/00

Signed: For NYU Press Date

APPENDIX D

Letter and Informed Consent Form for Caregivers

Stella Maris Verna, M.S., LMHC

c/o Adult Day Care Center

(305) 645-1508

Dear Caregiver:

I am writing to you about a study I am conducting on the effectiveness of relaxation techniques for Alzheimer's patients. This study is part of my doctoral dissertation research at Walden University.

Part of this study will be a course in these techniques to help patients like your relative feel better, and to help ease your burdens as caregiver. The course will be given at the Adult Day Care Center. If results are positive, the course could become a regular part of the Center's activities.

I would very much like to include your relative and you as participants in this study.

The clinical director has kindly agreed to let me contact you about this course, as you see from the enclosed letter. The course may help Alzheimer's patients to deal better with the behavior problems, emotional stresses, and frustrations of their condition.

There will be two groups participating in this study. One of the groups will receive the course in a relaxation technique. This course will be given during the

APPENDIX D (Continued)

Center's regular daily activities. The course will take place three times a week for about a half hour each session, for a total of five weeks.
will give the sessions in both English and Spanish.

Just before the first week and just after the fifth week, I will help your relative complete a short questionnaire about mental capacities. At these same points in time, I will ask you to complete with me, by phone, a short questionnaire about your background and another about your observations of your relative's behavior. These should take about 20 to 30 minutes to complete.

All information that both you and your relative give will be completely confidential. Both your identities will be protected, and I will keep the information collected in a locked file in my office, available only to me. In any written reports, neither you nor your relative will be identified.

The participation of both of you is completely voluntary and your choice will not in any way affect the care, activities, or services available to your relative at the Center. You and your relative may withdraw at any time, without any negative consequences in relation to the Center. There are no foreseeable risks or harm to either of you.

I will be telephoning you shortly to ask for your decision and to complete with me the forms you have

APPENDIX D (Continued)

received. When we speak, I will ask you to sign one copy of this letter and mail it back to me in the stamped, self-addressed envelope enclosed.

Please keep this packet of materials because we will be speaking about it on the phone again if you agree to participate.

In the meantime, if you have any questions or concerns, please feel free to contact me at (305) 654-1508.

Thank you so much. I would like to help in making your job easier as caregiver and your relative's life happier.

Sincerely,

Stella Maris Verna, M.S., LMHC
Researcher

I have read this letter this letter and understand this informed consent form. I give permission now for my relative to participate, and I also agree to participate.

_____ _____

Signature of Caregiver Date

APPENDIX E

Demographic Survey for Caregivers

CODE NUMBER: C_____

Date ___/___/___

Directions: For each item, please check the choice that is correct for you.

1. Your Gender

   1. ___ Male

   2. ___ Female

2. Your Age

   1. ___ 20-29 2. ___ 30-39 3. ___ 40-49

   4. ___ 50-59 5. ___ 60-69 6. ___ 70+

3. Your Ethnic Background

   1. ___ African American 2. ___ Asian

   3. ___ White 4. ___ Haitian

   5. ___ Hispanic 6. ___ Jamaican

   7. _____ Other: Please specify

4. Your Marital Status

   1. ___ Single 2. ___ Married

   3. ___ Divorced or separated 4. __ Widowed

5. Number of Children You Are Now Raising

   1. ___ 1 child 2. ___ 2 children

   3. ___ 3 children 4. ___ 4+ children

   5. ___ None

6. Education You Have Completed

   1. ___ Grade school 2. ___ High school

   3. ___ College 4. ___ Graduate school

APPENDIX E (Continued)

7. Your Relationship to Patient

1. ___ Daughter 2. ___ Son 3. ___ Spouse

4. _____ Other: Please specify

8. Your Employment Outside the Home

1. ___ Work full-time 2. ___ Work part-time

3. ___ Do not work

9. Number of Years You Have Been the Primary Caregiver*

1. ___ Under 1 year. 2. ___ 1-2 years

3. ___ 3-4 years 4. ___ 5-6 years

5. ___ 7-8 years 6. ___ 9-10 years

7. ___ 11-12 years 8. ___ 13+ years

10. Number of Years Patient Has Been Attending the Center

1. ___ Under 1 year 2. ___ 1 year

3. ___ 2 years 4. ___ 3 years

5. ___ 4 years 6. ___ 5 years

7. ___ 6 years 8. ___ 7 years

9. ___ 8+ years

* To the nearest year.

APPENDIX F

Informed Consent Form for Patients

As a regular patient at the Adult Day Care Center, I agree to participate in a study on relaxation techniques at the Center.

I understand that this study will be conducted by Stella Maris Verna, M.S., LMHC, a Ph. D. candidate at Walden University, as part of her dissertation research.

I am aware that the purpose of this study is to determine the effects of relaxation techniques on patients with Alzheimer's and related memory disorders. Benefits could include my feeling better and coping more easily with my problems. Results of the study could also be used by this Center and other programs to help their patients in the same way.

My participation is completely voluntary and I may decide not to attend the course at any time, with no harm to me, my family, or my participation in other Center activities.

I also understand that my participation, care, and any services I require at the Center will not be affected in any way. No risks or harm are foreseen for me or my family.

I have been assured that all information I give will be kept strictly confidential, and that outside the Center my participation will not be known. All records will be kept in a locked file available only to the researcher. In any report, I will not be identified.

APPENDIX F (Continued)

I understand that I could be selected to attend Mrs. Verna's sessions three times a week for about half an hour each, for five weeks. I will be given instructions and will follow them to the best of my ability. With Mrs. Verna's help, just before the first week and just after the fifth week, I will be asked to answer several questions and do several tasks.

For any questions or concerns, I understand I may speak with Mrs. Verna in person or by phone at (305) 654-1508.

I have read and understand this informed consent form, and I agree to participate.

_____ _____

Signature of Patient Date

APPENDIX G

Demographic Information Form for Patients

CODE NUMBER: _____

Date ___/___/___

(This information will be supplied from Center records and completed for each patient by the researcher.)

1. Gender

   1. ___ Male 2. ___ Female

2. Age

   1. ___ 50-59 2. ___ 60-69 3. ___ 70-79

   4. ___ 80-89 5. ___ 90+

3. Ethnic Background

   1. ___ African American 2. ___ Asian

   3. ___ White 4. ___ Haitian

   5. ___ Hispanic 6. ___ Jamaican

   7. _____ Other: Please specify

4. Marital Status

   1. ___ Single 2. ___ Married

   3. ___ Divorced or Separated 4. ___ Widowed

5. Education Completed

   1. ___ Grade school 2. ___ High school

   3. ___ College 4. ___ Graduate school

6. Relationship to Caregiver

   1. ___ Mother 2. ___ Father 3. ___ Spouse

   4. _____ Other: Please specify

7. Severity of Diagnosis of Alzheimer's disease

   1. ___ Mild 2. ___ Moderate 3. ___ Severe

APPENDIX G (Continued)

8. Assessment of Mental State at Intake

1. ___ High functioning 2. ___ Moderate functioning

3. ___ Low functioning

9. Number of Years Patient Has Been Attending Center*

1. ___ Under 1 year 2. ___ 1 year

3. ___ 2 years 4. ___ 3 years

5. ___ 4 years 6. ___ 5 years

7. ___ 6 years 8. ___ 7 years

9. ___ 8+ years

10. Patient's Mobility

1. ___ Walks independently

2. ___ Walks with help

3. ___ Confined to wheelchair

*To the nearest year.

APPENDIX H

Letter of Authorization from Clinical Director of AD Center 1

Easter Seals of Dade County, Inc.
1475 N.W. 14th Avenue
Miami, Florida 33125
(305) 325-0470 / Fax (305) 325-0578

Creating solutions, changing lives

June 17, 1998

Dr. V. Wayne Leaver
Chairperson, Dissertation Supervisory Committee
Walden University
4025 Sandlewood Lane #4
Fort Myers, FL 33907

Dear Dr. Leaver:

I am glad to authorize Stella Maris Verna to conduct training in Alternative Therapies such as relaxation and guided imagery with our patients in the Adult Day Health Care Program.

I understand this work will be used as part of her dissertation research.

Sincerely,

Dr. Angela Aroçena
Clinical Director
Adult Day Health Care Program
Easter Seal Society of Dade County, Inc.

APPENDIX I

Letter of Authorization from Clinical Director

of AD Center 2

DOUGLAS GARDENS
GUMENICK ALZHEIMER'S RESPITE CENTER

Miami Jewish Home & Hospital for the Aged at Douglas Gardens

September 20, 1999

Dr. V. Wayne Leaver
Chairperson, Dissertation Supervisory Committee
Walden University - Office of Administration -
24311 Walden Center Drive
Bonita Springs, FL 34134

Dr. Leaver:

I gladly authorize Stella Verna, MS, MFT, LMHC, to conduct training in Complementary Therapies such as relaxation techniques with our patients at the Center.

I am informed that Mrs. Verna is a Licensed Mental Health Counselor, licensed by the State of Florida Department of Health, Board of Mental Health Counseling. She is also trained in Mind/Body Medicine by the Harvard Medical School, Department of Continuing Education.

I understand Mrs. Verna is presently enrolled in the Professional Psychology Program and her work will be part of her dissertation project.

Sincerely,

Richard Vivian, M.Div.

Richard Vivian, B.A., M.Div.
Program Coordinator
Gumenick Alzheimer's Respite Center
Program sponsored by Alliance for Aging, Inc.
and the Department of Elder Affairs

Douglas Gardens Gumenick Alzheimer's Respite Center
1733 Northeast 162nd Street, North Miami Beach, FL 33162

APPENDIX J

Audiotape Transcription, English:

Guided Relaxation Response Exercise

Make yourself comfortable.
Stretch a little and close your eyes.
Begin by noticing your breath as it comes in
through your nostrils,
down past your throat,
fill into your lungs.
Feel the coolness of the air,
as it comes in with every in-breath
and how it is warmed a little by your body,
with every exhale.
Now, notice the gentle rise and fall of your body
as you breathe in and breathe out.
With every in-breath you are bringing in the relaxation,
and with every out-breath
you are letting go of any tension.
With every in-breath you are bringing in
the peace and the quiet,
and with every out-breath
you are letting go more and more.
Feeling safe.
Feeling quiet.
Feeling more and more relaxed.
Now, just imagine that your breath is like a light.
A beautiful healing light.

APPENDIX J (Continued)

The color of a southern sea in a bright sunny day.
The color of the Mediterranean or the South Pacific.
A sparkling deep turquoise.
A healing light.
And beginning in the crown of your head,
I want you to just imagine
that as your breath comes in
you are bringing in
this beautiful healing turquoise light
that is flowing down into your body.
And, wherever it flows
it pushes out and replaces the tension.
Now, just imagine that this essence of relaxation
is flowing over the crown of your head
and into every pore in your scalp.
Bathing every cell,
every muscle,
in this healing light.
And it feels gentle and soothing.
Just the right temperature.
Slightly cool if you are hot.
Slightly warm if you are cold.
Imagine that this light
is sliding down over your forehead,
down the back of your head,

APPENDIX J (Continued)

around your ears,
over your eyebrows
and in the small muscles around your eyes
and mouth,
and nose.
And this healing light is
healing your whole head.
And is helping you to relax even more.
And is bathing every one of your cells.
Bringing in the relaxation,
as it gently pushes out any tension.
And now, your whole head
and your whole face
can feel even more relaxed.
Now, work that healing light
on down into your neck,
into your throat,
and down each and every one of your vertebrae
all the way down to your spine.
And that it begins to push out
any of the tension that is in your back,
and in those muscles in your back,
all the way down to the very small of your back
and into your bottom.
And let yourself relax even more.

APPENDIX J (Continued)

And be held in this healing light.

As it goes down and soothes every cell,

and all your muscles.

And now, into your shoulders.

The healing light comes down into your shoulders,

into your arms,

your upper arms,

down into your elbows,

forearms,

wrists,

top of the hands,

palm of the hands,

all of your fingers.

Just letting the tension fly out of your fingers.

So that now your head,

and your neck,

and your throat,

your whole back,

your shoulders,

your arms,

are filled with this healing light.

More relaxed.

More comfortable.

And now let the light come down into your chest,

and fill your lungs.

APPENDIX J (Continued)

And bathe all the cells,

bones and muscles in that healing light in your chest.

And let the light come in and surround your heart.

Bring the light into your heart.

The area of your body where you hold your courage,

and your compassion.

And let the healing light just bathe that muscle.

And let it relax.

Let it be quiet.

And appreciate this healing light

as it bathes your whole heart

and chest.

Just imagine this light coming now from your heart

and filling up your whole torso,

all your internal organs,

bathing your abdomen.

And now down into your pelvic area

and your bottom.

Let yourself feel the release

as the healing light pushes out

and flows down.

Pushes out any tension.

Feel the difference between the area that was tense

and the area that is relaxed.

Notice the difference

APPENDIX J (Continued)

that this healing light has made.
Now allow yourself to just imagine
that the light is coming down into your thighs,
into all of the muscles and cells,
and bones of your thighs.
Bathing in the healing light.
Allowing the tension to flow out and down.
As the healing light
fills those areas of your body,
down into your knees,
top of the knees,
back of the knees.
Allowing the tension just to flow out.
And now imagine the light
coming down into your calves.
Bathing your calves in this healing light
that just flows and pushes the tension out
and leaves your body relaxed,
quiet, and in a place of healing.
Now down into your ankles,
top of the feet,
bottom of the feet,
all of your toes.
Just imagine that all the tension
simply flows out

APPENDIX J (Continued)

of the bottom of your feet.
And your whole body
is clear of tension.
And you are completely filled
with this beautiful, turquoise,
aquamarine light,
that leaves you rested.
Feeling quiet and safe.
Bathing in this healing light.
Feeling the quiet of your breath.
And the gentle rise and fall of your body.
As you are just quiet
and allow yourself to be immersed in this healing light.
Relaxed.
Safe.
And quiet.
So, be quiet now for a time.
And just allow yourself
to take in these feelings
and this healing.
In just a little while,
it will be time to bring your attention back.
I want you to just focus your attention
on your body now.
Feeling the gentle rise and fall

APPENDIX J (Continued)

of the quietness of your breath.
And your body has been able to be quiet,
comfortable,
relaxed,
as it is bathed in the healing light.
And allow yourself
to remember this.
And know that you can come back anytime
to this image of your whole body.
More relaxed.
With your mind focused.
Very gently,
begin to notice your body in the chair.
Feel your body and how relaxed it is.
And how much good you have done for it
over the past few minutes.
And remember that you can keep this feeling with you.
Relaxed body.
Focused mind.
And you can use your breath as a reminder.
Gently, bring your awareness now
to that feeling of your breath.
Deep in your breath,
begin to stretch a little,
waking up your body.

APPENDIX J (Continued)

Gently bringing your attention back into the room.

Moving slowly at first.

And when you are ready to open your eyes,

open them gently.

Take your time.

And feel refreshed

and fully awake.

So, when you are ready,

open your eyes. When you are ready.

APPENDIX K

Audiotape Transcription, Spanish:

Guided Relaxation Response Exercise

Póngase cómodo.

Estírese un poco y cierre los ojos.

Comience poniendo su atención en la respiración,

como entra por su nariz,

como pasa a través de su garganta,

y llena sus pulmones.

Sienta el frío del aire

cuando entra con cada respiración,

y como su cuerpo

lo entibia levemente al exhalar.

Ahora preste atención a como su cuerpo

sube y baja levemente

cuando usted inhala y exhala.

Cada vez que usted inhala, se relaja

y cada vez que exhala, se relaja.

Con cada inhalación usted trae paz

y tranquilidad a su cuerpo.

Y con cada exhalación

usted se siente más y más suelto.

Se siente protegido.

Se siente calmado.

Se siente más y más relajado.

Ahora imagínese que su respiración es como una luz.

Una hermosa luz curativa.

APPENDIX K (Continued)

Del color del mar y del radiante sol.

Del color del Mediterráneo y del Pacífico Sur.

Un brillante y profundo turquesa.

Una luz curativa.

Ahora quiero que usted se imagine que

cada vez que usted toma aire,

esta hermosa y curativa luz turquesa

entra por el centro de su cabeza

y se desliza a lo largo de su cuerpo.

Y por donde quiera que pasa

purifica,

y elimina todas las tensiones.

Ahora imagínese

que este fluido de relajación

se desliza por toda su cabeza

y penetra

en cada uno de los poros de su cuero cabelludo.

Bañando cada célula,

cada músculo,

en esta luz curativa.

Y se siente tan suave y tranquilizante.

A la temperatura precisa.

Lo refresca si siente calor.

Lo calienta si siente frío.

Imagínese que esta luz

APPENDIX K (Continued)

se desliza sobre su frente,
por detrás de su cabeza,
alrededor de sus oídos,
sobre sus cejas
y en los pequeños músculos que rodean sus ojos,
y la boca,
y la nariz.
Y esta luz curativa
está bañando toda su cabeza.
Y le está ayudando a relajarse aun más.
Y está bañando cada una de sus células.
Brindándole relajación
mientras suavemente elimina cualquier tensión.
Y ahora toda su cabeza
y toda su cara.
Se siente aun más relajado.
Ahora va a llevar esta luz curativa
a su cuello,
adentro de la garganta
y va pasando por cada una de sus vértebras
y a lo largo de toda su espina dorsal.
Y comienza a eliminar
todas las tensiones de su espalda,
hasta el rinconcito más pequeño de su espalda,
hasta llegar al final.

APPENDIX K (Continued)

Permítase relajarse aun más.

Y ser sostenido en esta luz curativa,

mientras de desliza y suaviza cada célula,

y todos sus músculos.

Y ahora penetra en sus hombros.

La luz curativa baja hacia sus hombros,

adentro de los brazos,

por los codos,

hasta el antebrazo,

las muñecas,

sobre las manos,

la palma de sus manos,

todos los dedos.

Permita que toda la tensión

salga a través de sus dedos.

Ahora toda su cabeza,

su cuello,

su garganta,

toda su espalda,

sus hombros,

y sus brazos están llenos de esta luz curativa.

Se siente más relajado.

Más cómodo.

Y ahora permita que la luz baje hasta su pecho,

y llene sus pulmones.

APPENDIX K (Continued)

Y bañe todas las células, huesos y músculos
en esa luz curativa que tiene en su pecho.
Y deje que la luz llegue y envuelva su corazón.
Lleve la luz a su corazón.
El área del cuerpo donde usted guarda su coraje
y su compasión.
Y simplemente deje que la luz curativa bañe este músculo,
y déjelo que se relaje.
Déjelo que se quede tranquilo.
Y contemple esta luz curativa
que baña su corazón entero,
y su pecho.
Simplemente imagine ahora
esta luz saliendo de su corazón
y llenando todo su pecho,
todos sus órganos internos,
bañando su abdomen,
bajando hasta la zona pélvica,
y hasta sus glúteos.
Permítase sentir el relajamiento
mientras la curativa luz se despeja
y se desplaza
eliminando cualquier tensión.
Sienta la diferencia entre el área que estaba tensa
y el área que está relajada.

APPENDIX K (Continued)

Note la diferencia
que esta luz curativa ha producido.
Ahora permítase simplemente imaginar que
la luz está bajando hasta adentro de sus muslos.
Adentro de todos los músculos y células
y los huesos de sus muslos.
Bañándose todo en esta luz curativa.
Permitiendo que todas las tensiones desaparezcan
mientras que la luz curativa
llena esas partes de su cuerpo
hasta adentro de sus rodillas,
sobre las rodillas,
detrás de las rodillas.
haciendo que la tensión simplemente desaparezca.
Y ahora imagine la luz
bajando hasta adentro de sus pantorrillas.
Bañando sus pantorrillas en esta luz curativa
que simplemente se desliza y elimina la tensión,
y deja su cuerpo relajado,
tranquilo,
y en un estado sano.
Ahora baja adentro de sus tobillos,
sobre los pies,
debajo de los pies,
por todos los dedos de los pies.

APPENDIX K (Continued)

Simplemente imagine que toda la tensión
de la planta de sus pies
simplemente desaparece.
Y todo su cuerpo
esta libre de toda tensión.
Y usted está completamente lleno
de esta hermosa luz turquesa,
esta luz aguamarina
que lo deja completamente descansado.
Sintiéndose tranquilo y seguro.
Bañándose en esta luz curativa.
Sintiendo la tranquilidad de su respiración
Y el suave movimiento que su cuerpo realiza al respirar.
Mientras simplemente se descansa
y se deja sumergir
en esta luz curativa.
Relajado.
Seguro.
Y tranquilo.
Permanezca tranquilo por un momento,
y simplemente permítase
absorber esta sensación
y esta curación.
Dentro de un momento
regresará a un estado de atención.

APPENDIX K (Continued)

Pero mientras tanto le pido
que mantenga su atención enfocada en su cuerpo.
Sintiendo el suave sube y baja
de la quietud de su respiración.
Su cuerpo se ha tranquilizado.
Se siente cómodo.
Relajado.
Mientras se baña en esta luz curativa,
permítase recordar esto.
Y sepa que puede regresar, en cualquier momento,
a esta imagen de su cuerpo entero.
Más relajado.
Con su mente enfocada.
Suavemente, comience a sentir su cuerpo en la silla.
Sienta su cuerpo y lo relajado que se encuentra.
Y cuanto bien ha hecho por él
durante estos pocos minutos.
Y recuerde que puede mantener esta sensación en usted.
Cuerpo relajado.
Mente enfocada.
Y usted puede usar su respiración como recordatorio.
Suavemente, ponga de nuevo su atención
en esta sensación del respirar.
Profundamente enfocado en su respiración,
comience a estirarse suavemente, despertando su cuerpo.

APPENDIX K (Continued)

Suavemente regrese su atención de nuevo al salón.

Moviéndose lentamente al principio.

Y cuando esté listo para abrir los ojos,

ábralos lentamente.

Tómese el tiempo que necesite.

Y siéntase renovado y completamente despierto.

Entonces, cuando esté listo,

abra sus ojo. Cuando esté listo.

APPENDIX L

Affidavit by Professional Translator

AFFIDAVIT

STATE OF FLORIDA)
: ss
COUNTY OF DADE)

Before me this day personally appeared RAFAEL G. ZUAZO who, being by me first duly sworn, deposes and says:

1. That he is fluent in both the English and Spanish languages and that he has translated the document described below:

Audiotape Transcription:

"Guided Relaxation Response Exercise"

2. That said translation from English into Spanish is true and correct to the best of his knowledge and belief.

3. That he has successfully completed the following required courses at Miami Dade Community College, for which he has been awarded the corresponding translator's certificate:

Introduction to Translation
Introduction to Oral Interpretation
Advanced and Legal Translation Skills
Legal Interpretation Skills

4. That he is a member in good standing of the American Translators Association.

5. That he has been a professional translator since 1992.

FURTHER AFFIANT SAYETH NOT.

RAFAEL G. ZUAZO

SUBSCRIBED AND SWORN TO before me at Miami, Dade County, Florida on this 29 day of July, 1998.

NOTARY PUBLIC
State of Florida at Large

My commission expires:

OFFICIAL NOTARY SEAL
FLEURETTE M SEQUEIRA
NOTARY PUBLIC STATE OF FLORIDA
COMMISSION NO. CC467321
MY COMMISSION EXP. JUNE 21,1999

APPENDIX M

Certificate in Mind/Body Medicine

HARVARD MEDICAL SCHOOL

DEPARTMENT OF CONTINUING EDUCATION

BOSTON, MASSACHUSETTS

THIS IS TO CERTIFY THAT

Stella M. Verna

was enrolled in the Department of Continuing Education of Harvard Medical School for the course entitled

Mind/Body Medicine (Marco Island, FL)

February 23 - 27, 1998

Harvard Medical School is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor continuing medical education for physicians.

Harvard Medical School designates this educational activity for a maximum of **15** *hours in category 1 credit towards the AMA Physician's Recognition Award. Each physician should claim only those hours or credit that he/she actually spent in the educational activity.*

Faculty Dean For Continuing Education

APPENDIX N

Introduction by Clinical Director

Alzheimer's Day Care Center

Dade County

Miami, FL

Date _____

Dear Caregiver:

To continue to improve the care of our patients, and especially your relative, I am writing to you to tell you about a new development at the Center.

As Director of this Alzheimer's Day Care Center, I feel a special and personal commitment for finding new and effective ways of caring for our participants.

Therefore, I am glad to tell you of an exciting course that will be offered at our Center, in which your relative may participate. This course will be led by Stella Maris Verna, MS, LMHC, who is a Licensed Mental Health Counselor and doctoral candidate in Professional Health Psychology at a major university. She will be giving this course for our participants as part of her doctoral research.

It is a 5-week training course in a relaxation technique, which should help your relative feel better daily and to decrease memory, behavior, and emotional problems. There is no extra charge for the course and it will be conducted at the Center during regular activity times.

This letter will introduce you to Mrs. Verna, whom I have known for several months. She is a fine woman,

APPENDIX N (Continued)

bilingual in Spanish and English, and a dedicated professional who really cares about our patients and wants to help make their lives better and help lessen your stresses as a devoted caregiver.

With this letter in enclosed more information that explains the course. Mrs. Verna will be telephoning you shortly to ask for your participation, which is essential, and for your permission so your relative may participate. Of course, if you have any questions, we will be very glad to answer them.

Please help us to help your relative cope better with Alzheimer's disease so that both of you may enjoy life and each other more. Thank you.

Sincerely,

_____

Clinical Director
Alzheimer's Day Care Center

CURRICULUM VITAE

Stella Maris Verna
10805 S.W. 77th Court
Miami, FL 33156
Home Phone (305) 666-8232
Office Phone (305) 662-9889
Email: sverna@springmail.com

University
Walden University
Program
Professional Psychology
Specialization
Health Psychology

License
Licensed by the Florida Board for Mental Health Counseling, 1998

Degrees
Ph.D. candidate in Professional Psychology, Health Psychology Specialization, Walden University, Minneapolis, MN.
Master of Science in Marriage and Family Therapy, St. Thomas University, Miami, FL, 1994.
Bachelor in Arts, Art Teacher, National Conservatory of Art, Buenos Aires, Argentina, 1973.

Present Position
Director, Center for Child and Family Counseling, Miami, FL.

Past Positions
Team Leader and Clinical Therapist, The Children Psychiatric Center, Miami, FL; Primary Clinical Therapist, Residential Adolescent Addiction Program, The Village South, Miami, FL; Domestic Violence Specialist, Metro-Dade Department of Justice, Family and Victim Services, Miami, FL; Founder and Coordinator of Shelter Program, Divine United Organization, Buenos Aires, Argentina.

Scholarly and Professional Specialization
Health psychology; mental illnesses; psychological assessment; diagnosis; treatment planning; child and family counseling; play therapy; domestic violence and addiction treatment counseling; elderly and aging; multicultural issues.