ENVIRONMENTAL APPROACHES FOR CONTROLLING AGITATION IN OLDER ADULTS WITH DEMENTIA: A REVIEW

By

SHELLEY L. GEIL

A clinical research project submitted in partial fulfillment of the requirements for the degree of

MASTER OF NURSING

INTERCOLLEGIATE COLLEGE OF NURSING
WASHINGTON STATE UNIVERSITY VANCOUVER

May 2001
To the Faculty of Washington State University:

The members of the Committee appointed to examine the clinical research project of SHELLEY L. GEIL find it satisfactory and recommend that it be accepted.

Chair

[Signatures]
ACKNOWLEDGEMENT

First of all I would like to thank my husband Matt for his endless support, encouragement and undying devotion to my continuing education. Without him taking on so many additional tasks at home, I would not have been able to focus on school. To my children Dakota, Dallas, Madison and Dawson, their incredible patience as I spend too much time on homework. To my supportive family, especially my mother-in-law Jan who was dedicated to my children, when I couldn’t be, and always was there to listen; my parents who encouraged and supported me throughout, and my friends who continued to help me find the time for fun. Additionally, to Jesus Christ, my Lord, who without His guidance, grace and gift to me, I could have never completed this journey. Finally, my church family at Cherry Grove, who provided endless prayer, encouragement, and cheerleading, the past several years.

I also want to acknowledge the incredible support I received throughout this process from my employer Southwest Washington Medical Center. Chris Rosanski, Becky Hill, and my fellow teammates on Psychiatric Services II, I want to thank for continual encouragement and their wonderful ability to make it possible for me to continue working while attending school.

To my committee: Liz who spent hours reading my very rough drafts and gave me time and energy when I needed guidance, Pam who always had time to give a listening ear, and Renee who provided such valuable feedback and time to help me complete this paper.
ENVIRONMENTAL APPROACHES FOR CONTROLLING AGITATION IN OLDER ADULTS WITH DEMENTIA

Abstract

by Shelley L. Geil, M. N.
Intercollegiate College of Nursing
Washington State University Vancouver
May 2001

Chair: Elizabeth LeCuyer-Maus

Dementia is a mental disorder and a clinical syndrome whose essential feature is the development of cognitive deficits including memory impairment. The number of people in the United States aged 65 and older with dementia is expected to increase to almost three million by the year 2015. Psychiatric and behavioral disturbances represent a significant problem; these occur in up to 90% of patients with dementia at some point in the course of their illness.

Regulations under the 1987 Omnibus Budget Reconciliation Act (OBRA-87) limited the use of psychotropic medication use to control behavior, in residents of long-term care facilities requiring quantitative documentation of a trial of nonpharmacologic alternatives. This paper will review current literature on means of controlling agitation with nonpharmacologic alternatives, including environmental methods, such as use of stimulus including activities, colors and signposts, visual barriers, nursing milieu management, use of bright light treatment, individualized music, and simulated presence therapy.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>iii</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>iv</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vi</td>
</tr>
<tr>
<td>DEDICATION</td>
<td>vii</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Symptoms and Behaviors of Dementia</td>
<td>4</td>
</tr>
<tr>
<td>APPROACHES TO CONTROLLING AGITATION</td>
<td>6</td>
</tr>
<tr>
<td>Dementia and Stimulus Objects</td>
<td>6</td>
</tr>
<tr>
<td>Bright Light Treatment</td>
<td>8</td>
</tr>
<tr>
<td>Colors and Signposts</td>
<td>10</td>
</tr>
<tr>
<td>Visual Barriers</td>
<td>11</td>
</tr>
<tr>
<td>Nursing Milieu Management</td>
<td>12</td>
</tr>
<tr>
<td>Individualized Music</td>
<td>14</td>
</tr>
<tr>
<td>Classical versus Favorite Music</td>
<td>16</td>
</tr>
<tr>
<td>Environmental &quot;White Noise&quot;</td>
<td>18</td>
</tr>
<tr>
<td>Simulated Presence Therapy</td>
<td>21</td>
</tr>
<tr>
<td>DISCUSSION</td>
<td>25</td>
</tr>
<tr>
<td>Positive Outcomes</td>
<td>25</td>
</tr>
<tr>
<td>Limitation of Studies</td>
<td>26</td>
</tr>
<tr>
<td>Potential Implementation</td>
<td>29</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>35</td>
</tr>
</tbody>
</table>
LIST OF TABLES

1. Environmental Methods of Controlling Agitation in Older Adults with Dementia.32
Dedication

To my husband Matt,

and my children,

Dakota, Dallas, Madison and Dawson.
INTRODUCTION

Introduction

Dementia is a mental disorder and a clinical syndrome whose essential feature is the development of cognitive deficits including memory impairment (American Psychiatric Association, 2000). Of 32 million older Americans, about 4 million suffer from dementing disorders with upward to 11 million people diagnosed with dementia worldwide (Colenda, Streim, Greene, Meyers, Beckwith & Rabins, 1999; Farlow, 1999). There are multiple types of dementia; Alzheimer’s Disease and vascular dementias are the most common in the United States. Dementia of the Alzheimer’s type is the third most costly disease in the United States after heart disease and cancer. Alzheimer’s accounts for over $100 billion in yearly costs, most of which is paid out of pocket (Fillit, 1999; Penna & Rosenthal, 1998). The number of people in the United States aged 65 and older with Alzheimer’s disease and related disorders is expected to increase from approximately two million in 1995 to almost three million by the year 2015, and of these over 1.7 million would need active assistance in personal care (U.S. General Accounting Office, 1998). Current figures of over 1 million nursing home residents could reach 2 million before the middle of this century (Phan & Reifler, 1988). Approximately two thirds of nursing facility residents have dementing illnesses, about 80% of which are due to Alzheimer’s disease (Colenda et al., 1999).

As our population ages, the number of older Americans who are nursing facility residents increases. Subsequently, the prevalence of mental disorders, including dementia, in nursing facility populations will increase (Colenda et al., 1999). Dementia is clinically significant in nursing facilities because it causes symptomatic distress to
patients, complicates the course of other medical illnesses, interferes with and complicates nursing and medical care, increases disability, caregiver burden, nursing and other healthcare costs, and diminishes the quality of life of those who suffer from such disorders (Colenda et al.). Psychiatric and behavioral disturbances represent a significant problem for patients with dementia as well as for their caregivers and the entire healthcare system (Doraiswamy, 2000). Tariot (1996a) states that behavioral symptoms occur in up to 90% of patients with dementia at some point in the course of their illness. In addition to cognitive deficits, patients with dementia have a variety of behavioral and psychiatric signs and symptoms including bizarre delusions, suspiciousness, visual hallucinations, paranoia, depression, wandering, mania, abnormal sleep, pacing, agitation, violence, verbal outbursts, and other behaviors (Doraiswamy, 2000; Reisberg, Borenstein, Salob, Ferris, Franssen & Georgotas, 1987). Issues of control of behavioral symptomology are very important in the management and treatment of dementia (Reisberg et al.).

Historically, behavioral disturbances in elderly patients were treated with a variety of methods. Anxiolytic agents such as alcohol, chloral hydrate, and barbiturates were among the earliest treatment options. Benzodiazepines, beta-adrenergic blockers, antidepressants, and antipsychotic medication have replaced the earlier anxiolytic agents as the treatments of choice for agitation (Cohen-Mansfield & Billig, 1986). Psychotropic drugs, especially antipsychotic drugs and physical restraints, are the most common approaches to reducing agitation in nursing homes (Ballard & O'Brien, 1999; Landrevile, Bordes, Dicaire & Verreault, 1998). Unfortunately, there is limited research on the use of anti-psychotics for behavioral problems in dementia (Reisberg et al., 1987). Other
psychotropic drugs, such as benzodiazepines and antidepressants are also used to reduce agitated behaviors but there is little documented evidence to support their effectiveness (Schneider & Sobin, 1992). All of these medications have the potential for significant side effects that affect quality of life (Ballard & O'Brien, 1999; Beers, Ouslander, Fingold, Morgenstern, Reuben, Rogers, Zeffren & Beck, 1992). Some of these side effects are sedation, confusion, and orthostatic hypotension, which can lead to further loss of autonomy.

Many times medication has been prescribed inappropriately. Beers et al. (1992) found that more than 40% of nursing home residents have at least one inappropriate prescription. The inappropriately prescribed antipsychotics and restraint use received attention from the federal government. New regulations under the 1987 Omnibus Budget Reconciliation Act (OBRA-87), enforced beginning October 1, 1990, provided specific regulations for practitioners in prescribing psychotropic medication and use of restraints. OBRA-87 limits the use of psychotropic (antidepressants, anxiolytics, sedative-hypnotics and antipsychotics) medication in residents of long-term care facilities and protected residents from medically unnecessary physical or chemical restraints that were imposed for purposes of discipline or convenience (Gurvich, 2000). Additionally, using antipsychotic drugs to control undesirable behaviors in the absence of a legitimate psychiatric need results in loss of revenue for the nursing home, and the nursing home is held responsible for documentation justifying the use of psychoactive drugs (Kane & Garrard, 1994). OBRA-87 also required that for residents with behavioral problems, there must be quantitative documentation of the problem and a trial of nonpharmacologic alternatives (Shorr, Fought, & Ray, 1994).
Symptoms and Behaviors of Dementia

Primary psychiatric symptoms, including depression, psychosis, and cognitive impairment have been linked to more specific behavioral disturbances in dementia patients (Kunik, Graham, Snow-Turek, Molinari, Orengo, & Workman, 1998). Epidemiological studies have shown that there is a very high prevalence of psychiatric disorders in nursing facility residents (Colenda et al., 1999). One of these disorders, agitation, is not a diagnostic term but a group of symptoms, which can reflect either a psychiatric disorder, a mental illness, the adverse effects of various medications, or sensory/communication difficulties. Agitation has been defined as inappropriate verbal, vocal or motor activity that is not judged by an outside observer to result directly from the needs of the confused or agitated individual (Cohen-Mansfield & Billig, 1986). It may include behaviors such as aimless wandering, pacing, cursing, irritability, screaming, biting, and fighting (Billig, Cohen-Mansfield & Lipson, 1991). Billig et al. reported in their research that agitated patients received significantly more neurolupetic medication for agitation than non-agitated patients.

Agitation impairs quality of life for elderly people in the community, increases likelihood of their entering a nursing care facility, and increases their special needs within the facility (Cohen-Mansfield & Billig, 1986). Agitation or aggressive behavior can result in longer hospitalization, nursing home placement, physical restraint, and over-medication (Shah & Allen, 1999). Acute hospitals are forced to admit and retain patients with dementia who are refused admission to long-term care settings because of behavioral problems; emergency room visits are precipitated by these patients with behavioral emergencies; long-term care facilities gradually have replaced state
psychiatric hospitals as the major locus of care for these behaviorally complex patients (Tariot, 1996a).

In this problematic treatment climate, one must remember that agitation may be secondary to insecurity, frustration, fears, and/or misperceptions produced by impaired hearing, sight or an aphasia, and usually in people who are also cognitively impaired (Billig et al., 1991). Any treatment planning process must first include attempts to define the etiology of the agitated behavior with specific diagnostic efforts (Billig et al.). Many of the errors in current prescribing of psychotropic medications for nursing home patients occur when the physician mediates to eliminate a problem behavior rather than first diagnosing a specific disorder (Smith, 1990). Many researchers agree that it is crucial to identify reversible precipitants of behavioral and psychological symptoms of dementia, such as environmental and sensory triggers, and to use specific non-pharmacological treatment initially (Doraiswamy, 2000). A recent international consensus conference on behavioral and psychological signs and symptoms of dementia concluded that research is needed to develop and evaluate non-pharmacological interventions (Landreville et al., 1998). This paper will review current literature on means of controlling agitation through environmental methods, such as use of stimulus including activities, colors and signposts, visual barriers, nursing milieu management, use of bright light treatment, individualized music, and simulated presence therapy.

APPROACHES TO CONTROLLING AGITATION AND BEHAVIOR PROBLEMS

As Hinchliffe, Hyman, Blizard, & Livingston (1995) report, no single intervention in the management of behavioral difficulties would help in every situation. An initial step is to assess and adapt environmental factors that worsen the behavior, such as roommate
difficulties or an uncomfortable physical environment (Tariot, 1996b). Hamel, Gold, Andres, Reis, Dastoor, Grauer, & Bergman (1990) believe that aggression is usually triggered by an environmental stimulus.

There are multiple ways of manipulating the environment of a dementia patient to help control agitation. Many studies include a variety of activities as a method towards this end. One of the most debilitating consequences of dementia is the individual’s gradual loss of ability to perform activities that are rewarding and enjoyable. Care providers of all types recognize the need for meaningful activities for individuals with dementia. Tariot (1996) also recommends optimizing physical activity and social stimulation, and use of techniques such as validation, encouragement, support, reminiscence, and religious components. The following research studies will describe several potential environmental methods of decreasing agitation among demented persons.

Dementia and Stimulus Objects

Mayer & Griffin (1990) performed a study designed to observe the dementia patient’s response to a variety of toys and stimulus objects and to determine the relative amount of interest displayed in such objects. Their subjects included male patients diagnosed with dementia who have displayed assaultiveness or extreme agitation which made it impossible for them to remain in their nursing homes. Five patients had Alzheimer’s Disease and four had alcohol dementia. In this study ten separate stimulus items were provided to the nine patients, one each day, over the course of a 2-week period, and repeated three months later with the Alzheimer’s disease patients. The items included a set of keys; small metal cars; a fabric book; a plush dog; a dressed doll; two
versions of a transformer toy, one simple and developed for ages 1 to 3, and one designed for school age children; and three versions of the busy box, a plastic toy designed for infants. Each patient was presented with a different object each day for a 10-minute period. During the 10-minute presentation period, the amount of time that the patient interacted with the toy was observed, timed, and noted.

Overall, the patients exhibited substantial interest in the toys and stimulus objects; turning knobs and dials and holding and manipulating metal and mechanical items tended to hold their attention. In comparing the two populations, the Alzheimer’s patient showed more interest in the busy boxes, although even these patients chose to play with these objects only 30 to 60 seconds at a time. Overall, patients also played with the objects viewed as less complicated, such as cars and objects designed for ages 1 to 3, for a longer period of time than with those designed for school age children.

Many of these patients displayed appreciation of the many stimulus objects and toys that were originally designed for children. It was suggested that these help the patient recall tasks performed during the more productive years and may be therapeutic, serving to create pleasant memories and improve self-esteem. Caution must be used in selecting appropriate toys, as many of the Alzheimer’s patients put items in their mouth.

Although this study was anecdotal only, the overall impression was that patients were calmer after engaging in exploration and they were more satisfied with this activity than they are with inactivity, and thus displayed less boredom and agitation. In selecting stimulus objects for this type of population, it is important to consider the amount of intervention that is required of nursing staff. For example, a small item that can easily be dropped can create a safety hazard for ambulating patients. It may be necessary to
demonstrate how the object works, using a calm, slow, and patient teaching technique, so the patient can fully explore the item. The authors conclude that by focusing efforts on environmental modification of stimulation levels, including using recreational toys, a degree of control can be provided over patients' behaviors.

**Bright Light Treatment**

Another environmental approach is the use of bright light treatment for behavioral and sleep disturbances in patients with Alzheimer's disease. Satlin, Voli cer, Ross, Herz, & Campbell (1992) performed such a study. Their theory was that evening bright light would improve sleep-wake patterns and reduce agitation in patients with Alzheimer's disease, specifically in clients who had severe sundowning. Sundowning is a syndrome of recurring confusion and increased agitation in the later afternoon or early evening; it is common among patients with Alzheimer's disease. Inappropriately timed rest and activities are characteristics of fragmented sleep-wake cycles and sundownings, the researchers suggest that these syndromes may be mediated by abnormalities of the circadian timekeeping system in Alzheimer's disease.

In this study, 10 in-patients on a dementia study unit were studied for three weeks. All met criteria for primary degenerative dementia and all were moderately to severely demented with their mean Mini-Mental State Examination score of 0.6 (SD=1.1) and their mean Activities of Daily Living (ADL) score was 5.3 (SD=0.8). The range of scores on the Mini-Mental State Examination is from 0 - 30, where 0-1= profoundly to severely demented. The possible range of the ADL is 0 – 6 with higher scores indicating increased impairment. Patients were identified as sundowners, defined as recurrent appearance or exacerbation of behavioral disturbances such as agitation, pacing, and restlessness,
yelling or shouting in the afternoon or evening. Patients also exhibited sleep disturbances characterized by frequent daytime napping and nighttime awakening.

Nurses performed daily ratings each shift for agitation and sleep-wakefulness disturbances on a 0-3 scale (0=none or minimal, 1=mild, 2=moderate, 3=severe). Higher scores for sleep-wake cycle disturbances represented more time awake during the night or more time asleep during the day or evening. Scores represented ratings for an 8-hour shift. Use of restraints and PRN medications were recorded for each shift. Medication changes were not permitted during the three weeks of the study. Locomotion activity was recorded for 48 hours at the conclusion of each study week using a portable piezoelectric activity monitor. Each evening of week two, patients received 2 hours of 1500-2000 lux light while seated in a gerichair facing the light box and restrained by a tray.

Nonparametric tests were used to compare the weekly summed ratings of individual clinical measures over the 3 weeks of the study, which included baseline, treatment and post treatment time periods. Relationships between baseline predictors, response, and treatment effects were analyzed using Pearson's correlation coefficients. Locomotion activities were analyzed for percent of activity for each daily shift.

Clinical ratings of sleep-wakefulness disturbance on the evening shift improved with light treatment in eight of the 10 patients (baseline m=6.2 (n=10); treatment m=3.0, post treatment m=2.3, p=0.03). This finding was supported by some of the objective measures obtained by the locomotion activity monitor, which showed a decrease during week 2 in nine of the patients. However, locomotion activity returned to baseline by week 3. Percent of nighttime activity occurring from 11 pm to 7 am decreased
significantly from baseline in nine patients. Overall the evening bright light pulses administered for a week to patients with Alzheimer’s disease who had sundowning behavior and sleep wake cycle disturbances were associated with significantly improved sleep-wake behavior during the evening, and a decline in the severity of sundowning during the post treatment week. Sleep-wake patterns improved and nighttime activity decreased.

Colors and Signposts

Hussian (1988) studied the use of stimuli such as colors and signposts to decrease problem behaviors in demented patients, in a study of five male demented patients from two long-term care institutions. An A- B1-A- B2 design was used, A being the observation period, and B the treatment phase, during which the target behaviors were measured by four different observers over eight hours each. Baseline was established by recording inappropriate behavior on a 30-point scale. During phase B1 verbal and/or physical prompts were given to the patient, including a bright yellow restroom door, a signpost consisting of a bright color with the patient’s name over the appropriate bed, tape on the floor in front of the nurse’s station, and other items. Prompts and special stimuli were not available during the return-to baseline phase A, and during phase B2 the special stimuli were re-affixed but no efforts were made to prompt attention. Inter-rater reliability of observations averaged 90%.

In this small study all five clients demonstrated a significant decrease in their problem behavior from baseline to B2, indicating that when the special stimuli were present without an immediate prompt, an improvement in orientation and stimulus-controlled responding occurred. The interventions in the study did not imply any obvious
source of contingent reinforcement for the desired behaviors, so the prompts and attention cues alone seemed effective interventions.

**Visual Barriers**

Namazi, Rosner, & Calkins (1989) studied seven different visual barrier conditions to examine if any visual barrier could stop Alzheimer's residents from exiting from the unit, a common problem behavior. Participants were nine ambulatory residents on a 30-bed dementia unit. All participants were diagnosed with Alzheimer's dementia and two-thirds had additional co-morbid conditions, such as diabetes, mild seizure disorder, and hypertension. The tool included the Portable Mental Status Questionnaire, which was adapted for this study from the OARS Methodology, and the Mini-Mental State Examination. There was no variability on either scale and all participants scored between 0 and 1 on both scales.

The test was conducted using seven visual barriers. Although these barriers appeared to block exits, they did not prevent leaving the unit under emergency conditions. A two week collection of baseline data was considered condition 1; condition 2 consisted of strips of brown tape paralleling the door; condition 3 was strips of beige masking tape paralleling the door; condition 4 consisted of strips of black tape placed at a 45 degree angle from the wall up onto the door; condition 5 included a cloth matching the door color attached to the sides of the door and covering the doorknob; condition 6 was a second baseline condition with no barrier to examine the potential learning effects of prior barriers; condition 7 was a green patterned cloth in the same position as condition 5; condition 8 was the doorknob painted the same color as the door and finally condition 9 was a doorknob cover which allowed the knob to turn only with pressure applied. Staff
were instructed to document dates, times, and names of who set off the alarm, for 14 consecutive days for each of the conditions.

During the baseline data gathering period seven of nine participants exited with 43 exits. During conditions 2, 3, and 4, where optical illusions were applied with tape, the number of exits increased. Conditions 5 and 7, where a cloth concealed the doorknob, resulted in a reduction of exits to zero. Conditions 8 and 9, where the doorknob was masked by either paint or a cover, were less effective than concealment but more effective than the optical illusions.

The most effective barrier to exiting the unit was the doorknob completely concealed with a cloth panel. The authors note that there was no ongoing evaluation for potential change in each client's dementia, which may also explain behavior changes. However, staff reported no overt changes in functions during this period.

**Nursing Milieu Management**

Keatinge, Scarfe, Bellchambers, McGee, Oakham, Probert, Stewart, & Stokes (2000) studied the manifestation of agitation, measured the severity of agitation, and identified current nursing management practices and subsequent outcomes. The participatory action research method was used to identify issues relating to nursing practice and the work environment on nursing units. Unit staff decided the management of agitated behavior in the severely demented clients they serve was the priority. Ten residents participated in the study; however, to promote anonymity consent was sought from the caregivers or guardian of each of the residents on the unit.

The Buchanan Agitation Scale (BAS) was developed for use in this study, and contained language used by the nurses to describe agitated behavior in their clients. It
was first tested for reliability. A critical incident form was used by participant observers, as a component of the critical incident technique.

The actual study took place in three phases over ten months. Phase 1 was the initial period of observation, with the BAS and the critical incident form used by the nurse observers. Phase 2 included analysis and discussion of the results of phase 1, and identification and implementation over a one month period of one element found to have an impact on agitated behavior during phase one. Phase 3 was a repeat of phase 1 undertaken by the same nurse observers to evaluate the change identified and implemented in phase 2.

In analyzing the data from Phase 1, the information showed a relationship between agitation and time of day. In addition, agitation was found to consist of both aggressive and non-aggressive behavior, each triggered by a different factor. Four triggers were identified as giving rise to agitated behavior: physical or verbal nursing actions, another person, the physical environment, and no identifiable trigger. Three themes were identified in nursing practices as controlling the agitation. In cases involving aggression, nurses commonly withdrew the perceived trigger for the agitation. With non-aggressive type of agitated behavior, nurse practice involved either diversional activities or implementing a clinical decision to leave the resident alone.

Nurses were given feedback about the results of phase 1 and, as a group, identified one change in nursing practice to be implemented in phase 2. This involved a change from all residents being routinely toileted after meals to toileting being staggered to each resident's requirements. Phase 3 replicated the data collection technique used in phase 1.
The overall results showed the change in the toileting regimen had little impact on the frequency of agitation between phase 1 and phase 3; however, there appeared to be a reduction in the severity of the agitation. While 77% of episodes in phase 1 manifested as aggressive type agitation triggered by nurse action, this percentage had fallen to 63% in phase 3. In addition, there was a perceived reduction in the ratio of aggressive type to non-aggressive type behavior between phases (phase 1, 7:4 versus phase 3, 10:11).

Overall, the study determined that agitation in the demented elderly manifested as two distinct types of agitated behavior: aggressive and non-aggressive. There were also peak time periods of agitation that coincided with periods of increased interaction between nurses and residents, the majority of those interactions associated with activities of daily living. The change implemented in phase 2 did not affect the frequency of the episodes of agitated behavior but may have affected the severity.

**Individualized Music**

Gerdner & Swanson (1993) conducted a study on the effects of individualized music on confused and agitated elderly patients. They proposed that patients with dementia need their environmental conditions modified because of their declining cognitive and functional abilities and their increasing difficulty dealing with stress. They used the conceptual framework of the progressively lowered stress threshold model, which proposed that as stress levels increase, the patient's behavior becomes more dysfunctional and often catastrophic, and importantly, that stress can be reduced with modifications in the environment.

Five residents were selected from a health center. Inclusion criteria consisted of age: 70 – 99, and agitated behavior. Agitated behavior was defined by Cohen-Mansfield
and Billig (1986) as inappropriate verbal, vocal or motor activity that was judged by an outside observer not to result directly from needs of the confused or agitated individual. Subjects met criteria of mental confusion, defined as scores below 21 on the Mini Mental State Exam, the ability to hear music by audiocassette, and had given written consent. The Mini Mental State Exam was used to determine selection criteria for cognitive impairment. The Modified Hartsock Music Preference Questionnaire was completed by family members for identifying the resident's personal music preference. A modified Cohen-Mansfield Agitation Inventory (Cohen-Mansfield, 1986) was used as a measure of 29 agitated behaviors, which was the dependent variable. The tool had an interrater reliability of 97%.

Baseline data were collected for one week on each resident by observation and documentation using the Modified Cohen-Mansfield Agitation Inventory. During the second week, individually selected music was presented on an audiocassette player for a 30-minute period each day, while behavior of the patient was observed and documented. The patient's behavior was then observed and documented for another hour to determine the residual effects of the individualized music.

Music had played an important role in one resident's life, and this resident experienced the greatest reduction in agitated behavior during post intervention, with a baseline average of 17 agitated behaviors and a post intervention average of 11 agitated behaviors. The music was least effective in reducing agitated behavior in the resident who was unable to share what significance music played in her life. Her baseline averaged 19 behaviors, and her post intervention average was 17. The findings suggest the potential of individualized music as an alternative approach in the management of the
confused and agitated elderly patient who is confused and agitated.

Classical versus Favorite Music

Casby & Holm (1994) examined the effect of classical music and favorite music on the disruptive vocalizations of long-term-care residents with dementia of the Alzheimer's type. In this study, three single-subject designs were used to assess disruptive vocalizations during three phases: no intervention, classical music and favorite music. The clients, from a long-term care facility, were randomly assigned to one of the three designs: ABCA (Subject 1), ACA (Subject 2) and ABA (Subject 3), where A = baseline, B = classical music, and C = favorite music. The subjects had dementia of the Alzheimer's type, and exhibited repetitive disruptive vocalization. A physician's diagnosis was required to establish dementia. The subjects were also required to have a history of disruptive vocalizations severe enough to interfere with their functional abilities or the functioning of the facility. Exclusion factors included history of disrobing, physical aggression, known hearing impairment or a hearing aid that would interfere with the headset. From five residents who met the criteria, three were chosen by nursing personnel because they were deemed the most disruptive. Consent and information regarding the subject's favorite relaxing music from the past was obtained from relatives or legal guardians of the patients.

Subject 1 received 4 days of classical music and 4 days of her favorite music. Subject 2 received her favorite music for 4 days, and subject 3 received only classical music for 4 days. Data were collected on each participant during the times of the day that the incidence of disruptive vocalization was the greatest according to nursing personnel. An event recording method of data collection was used, using 10-second intervals for a
total of 10 minutes for each of the three phases. A tally mark was recorded for each verbal outburst that occurred during each 10-second period. For each phase, data were collected during two 10-minute sessions for each day over 4 days for a total of 12 observation days for subjects two and three and 16 observation days for subject one.

The mean and the standard deviation for the number of verbal behaviors were calculated for each subject during each of the three phases. Bartlett's test was used to test for the degree of autocorrelation between data points in any phase across subjects. For each subject there was a decrease in the mean level of repetitive disruptive vocalizations during each of the intervention phases as compared to the mean level during the first baseline phase, and during the return to baseline phase there was no increase in the mean baseline level of verbal behavior. The authors feel that the information suggests that the presence of music decreased the frequency of repetitive disruptive vocalizations. The authors state that excessive variability in baseline data may indicate instability of the data and may limit the validity of conclusions about change in mean level. A stable pattern of baseline behavior was not established; however, there was a decrease in the amount of variability across the intervention phases for two of three subjects.

The authors believe that their results indicated that the presence of music did significantly decrease the number of repetitive disruptive vocalizations in two subjects diagnosed with dementia of the Alzheimer's type. The mean number of repetitive disruptive vocalizations decreased on three subjects as a group, when analyzed individually only two subjects had a significant decrease in their scores of repetitive disruptive vocalizations. Subject three did not have a significant decrease in the number of repetitive disruptive vocalizations; this may be because the music (classical only) was
not particularly relaxing to this subject. The researchers indicate that the importance of selecting music that correlates with the patient’s interest is important if intervention is to be effective. The ability to generalize to a larger population is limited and further research would benefit from a larger sample size and investigation of whether different methods of music delivery resulted in comparable results.

Environmental “White Noise”

Burgio, Scilley, Hardin, Hsu, & Yancey (1996) studied the impact of environmental "white noise" on verbally agitated nursing home residents. The definition of verbal agitation includes screaming, calling out, repetitive statements, and moaning. Their study was conducted in two nursing homes, one with 306 residents and the other with 232. The average nurse to resident ratio was similar in both nursing homes. Sixteen severely agitated subjects were chosen for the study, as measured by charge nurses given criteria defined by researchers. Fifteen of the sixteen subjects had participated in an earlier observational study of verbal agitation. All subjects were at least 65 years of age, and were expected to remain in the facility for at least three months. Residents with severe hearing impairment were excluded.

Observations of study participants occurred during a 10-day baseline phase. Each resident was observed for two continuous 15-minute intervals during 5-hour blocks of time, for a total of 2.5 hours of observation per resident. Following the baseline assessment, 16 residents were exposed to a functional analysis phase where researchers systematically introduced and withdrew audiotape stimuli played through a portable player with headphones. The audiotape stimuli consisted of 2 types of environmental “white noise” (mountain stream and gentle ocean sounds). Over this 10-day phase, each
Resident was targeted to receive a maximum of four trials with each of the two audio
tapes for a total of eight trials. A trial consisted of four sequential segments where one
therapist alternated audiotape on for 5 minutes and audiotape off for 5 minutes for a total
of twenty minutes continual observation. Researchers were required to be available so
the audiotape trials could be conducted in response to naturally occurring episodes of
verbal agitation. Thirteen residents completed this phase.

Most of the 13 residents displayed verbal agitation at a lower rate than predicted
by the charge nurses during the initial referral, so only one resident completed the set of
eight trials. Five received six trials, five received five trials, one received three, and one
received two trials. A second reason for residents not completing the maximum 8 trials
was refusal to wear the headphone during a trial. Nine residents were considered initial
responders, as defined as having reliably less verbal agitation occurring during the
audiotape "on" period of time as compared to the audiotape "off" timeframe. These nine
were entered into the intervention phase of the study. Residents were assigned to receive
the audiotape that produced the largest decrease in verbal agitation, as documented in the
functional analysis phase.

Nursing assistants were given a 2-day education providing rationale and
descriptions of the intervention. The nursing assistants were trained in the use of the
cassette player, when to use it with residents, as documented by a formal written program
for each resident, which included a definition of the resident's verbal agitation, a
description of each step in the intervention, and the proper volume setting for each
resident. The Mini-Mental State Exam, the Barthel Self-Care Rating Scale, the Cohen-
Mansfield Agitation Inventory, Survey of Disruptive Vocal Behavior, and a medication
tracking form were used to measure verbal agitation. A social validity item designed by researchers was also used to assess the nursing assistants’ impression of the intervention. This included having the resident’s primary nursing assistant rate the effectiveness of the intervention on a 1 to 5 scale with 1 indicating the resident was a lot worse, 5 a lot better, and 3 indicating no change.

The nursing assistant managed intervention observation schedule was identical to the baseline phase. A copy of the behavioral program was placed on the resident’s wall and in the medical chart. The tape players and audiotapes were distributed prior to the observation period and the nursing assistants were informed that the audiotapes were available for the assigned residents. The project manager and two research assistants completed observation. The observers were allowed to prompt the nursing assistants to use the audiotape intervention if the resident was not engaged in any activity that conflicted with the use of the intervention. There was no systematic prompting of the nursing assistants and that prompting was estimated to have occurred one to two times per shift. Nursing assistant performance of the intervention was not tracked nor were their consequences for performance or nonperformance of the intervention. During the nursing assistant managed intervention period, a total of 22.8 hours of observation were collected.

After a total of 75.15 hours of observation, the results suggest that the use of environmental "white noise" may be an effective treatment for reducing the frequency of verbal agitation in demented nursing home residents. Use of "white noise" was associated with a decrease in verbal agitation during both the researcher controlled functional analysis phase and during the on-unit, nursing assistant managed intervention.
Data analysis was performed using paired t-tests. Examination of the functional analysis phase data for the 13 residents indicated a significant decrease in the amount of verbal agitation exhibited when a "white noise" audiotape was on ($p < 0.001$).

The authors believe that when using a precise and reliable direct observation system, environmental "white noise" was associated with a decrease in verbal agitation. The conclusion is that environmental "white noise" may be an effective treatment for reducing the frequency of verbal agitation in demented nursing home residents.

Limitations of this study, as reported by the researchers, include a small sample size. It was felt that the sample size was not large enough to compare the efficacy of each of the environmental tapes. The authors believe that resident resistance, e.g. taking off headphones, and nursing assistant resistance to the intervention was a factor influencing audiotape use on the unit, as residents were observed using the audiotapes during 51% of the observational samples. The authors feel that replication is needed on a larger sample of residents with varying levels of agitation. This would allow investigation of resident characteristics, which may predict responsiveness to the intervention.

**Simulated Presence Therapy**

Woods & Ashley (1995) studied an approach on simulated presence therapy to manage problem behaviors in Alzheimer's patients. Feasibility studies occurred initially to determine what impact simulated presence therapy had on patients with dementia of the Alzheimer's type who manifested problem behaviors, and an additional feasibility study was used to identify criteria for the selection of patients who might benefit from this intervention.

The feasibility sample consisted of 27 residents from four nursing homes.
Residents were selected if they demonstrated a problem behavior (identified by nursing staff) and if they have a family member willing to participate. Consent was obtained from family members and legal guardians.

Initially an asset inventory was completed by the subject's family member that identified the patient's cherished memories and lifetime experiences, including best-loved people; important life events; family anecdotes; and favorite prayers, poems, hobbies and interests. Using this information, personalized simulated presence therapy tapes were made for each subject. Personalized simulated presence therapy tapes are composed of a family member's side of a telephone conversation and soundless space that corresponds to the patient's side of the conversation. All tapes were made by a trained simulated presence therapy communications expert. Each tape is approximately 15 minutes long.

Meetings were held with nursing staff for information purposes, planning, and training. Simulated presence therapy tapes were played for residents when they displayed a problem behavior as identified in the care plan. The three major types of problem behavior were social isolation (93% of the subjects), agitation (67% of the subjects) and verbal or physical aggressiveness (7% of the subjects). Of the 27 subjects, 22 showed positive response to simulated presence therapy. Twenty subjects showed positive response regardless of the behavior, two responded for the problem of social isolation but not for the problem of agitation, and five subjects did not show response.

Following this feasibility study, a pretest - posttest quasi-experimental design was used, in a pilot study, to examine the effect of planned use of the simulated presence therapy among patients with dementia of the Alzheimer's type. Nine residents from two units participated in the study; selection criteria were derived from the experience of the
feasibility study. Selection criteria included diagnosis with dementia of the Alzheimer's type and exhibition of one or more problem behaviors as identified by the nursing home staff and confirmed by researchers. Clients had to retain the capacity for verbal interaction and clients had to have a family member who was willing to participate in the project. The researchers controlled for cognitive impairment. As in the feasibility study, simulated presence therapy tapes were made and a target behavior and time when the behavior was likely to occur were identified for each subject based on chart review, discussion with nursing staff, and observation of the subject. Each resident received simulated presence therapy twice a day; the exact time varied with each subject according to the time when behavior problems were anticipated.

Using a standard target behavior form, observations of the subject behavior before and after the intervention were documented. The form provides space to document the observed behavior prior to the intervention, the precipitating factors of the behavior, and observed behaviors following the intervention. The Disruptive Behavior Rating Scale was used to classify problem behaviors into five categories: physical aggression, verbal aggression, agitation, wandering, and social isolation. Once behaviors were classified, pretest and posttest scores were derived. Two rating scales were used, one for the severity of behaviors considered disruptive and one for the severity of behaviors of affect. Scores on the disruptive scale ranged from 1 indicating behavioral problems were evident with severe symptoms, to 5, indicating that the behavioral problems were resolved.

Over the 2-month observation period, 425 total episodes of problem behaviors were documented; the most frequently manifested problem was social isolation. Verbal aggression accounted for 33% of the behaviors, agitation for 27%. An average of 47
episodes of problem behavior per resident were observed. Leaving a subject alone in a room accounted for the most frequent precipitant of problem behavior; initiating morning care and noise also accounted for problem behavior. Problem behavior improved with simulated presence therapy 91% of the time. In 7%, the behavior remained unchanged or worsened and 2% refused the intervention. Patients manifesting verbal aggression responded 91% of the time, those with agitation responded 96% of the time, and others with social isolation responded 89% of the time.

Of the total of 36 subjects from the feasibility and pilot study combined, 31 (86%) experienced improvement most of the time when simulated presence therapy was applied. The mean disruptive behavior score prior to simulated presence therapy was 1.75, and post intervention was 4.41 ($t = -9.11, p < 0.001$). Higher scores indicate less severe problems. There were several cases of residents having a reduction in medication usage as a result of the simulated presence therapy, one client had a reduction from 18 doses of anti-anxiety medication in the two months before initiation of simulated presence therapy to 2 doses in the 2 months of the treatment. Another client required haloperidol every night for episodes of screaming; however, when the simulated presence therapy was used for 1 hour each evening, the need for this medication was eliminated. Six participants who responded well initially to the simulated presence therapy have continued with the therapy for up to 9 months and in four cases the tapes have been used daily for over 2 years. The authors note limitations of these studies: including small sample sizes, lack of adequate controls, and the anecdotal nature of data collection, as well as unblinded basis of observation.
DISCUSSION

The results of this review indicate that there are several studies that evaluated methods of reducing agitation in older adults with dementia using environmental approaches. These options include using stimulus objects such as toys, bright light treatment, colors and signposts, visual barriers, changing nursing milieu management, music, use of environmental "white noise," and simulated presence therapy. The follow discussion will review the positive outcomes of these studies, as well as the limitations of this research.

Positive Outcomes

In the study performed by Mayer & Griffin (1990), where dementia patients were presented a variety of stimulus objects over a two week period of time, there was the impression that the patients were calmer after engaging in the exploration of a stimulus object rather than inactivity. Satlin, Volicer, Ross, Herz, & Campbell (1992) researched the use of evening bright light to improve sleep-wake patterns and reduce agitation in patients with Alzheimer's disease. Their findings included an improved sleep-wake cycle and decreased severity of sundowning symptoms in this population. Hussian (1988), in a study evaluating the use of stimuli such as colors and signposts, reported that 100% of subjects had a significant decrease in problem behavior from baseline to the post-intervention evaluation period. Namazi, Rosner, & Calkins (1989) found that using a cloth barrier decreased the number of exits by Alzheimer's patients to zero from a baseline of 43 exits. Keatinge, Scarfe, Bellchambers, McGee, Oakham, Probert, Stewart, & Stokes (2000) studied nursing practice as a method of controlling agitation in demented patients. Their results did not show a decrease in the frequency of agitated
behavior; however, results did indicate a decrease in the severity of aggression. Simulated presence therapy was able to decrease social isolation, agitation, and verbal and physical aggression in a study by Woods & Ashley (1995). In this study, several residents, had a decrease in the amount of PRN medication needed to control behavior during the study period.

The use of auditory cues as a method of controlling agitation was researched in several reviewed studies. Music, as one method, was studied in Gerdner & Sawson (1993) and Casby & Holm (1994). Both of these studies indicated that if music is recognized as important in a resident’s life, and if favorite type of music can be identified, there is a decrease in agitated behavior or repetitive disruptive vocalizations. Similarly, the use of environmental “white noise” was shown to decrease verbal agitation in residents studied by Burgio, Scilley, Hardin, Hsu, & Yancey (1996). Burgio et al. (1996) reported that using a functional analysis phase to identify probable responders allowed staff to focus attention on residents most likely to benefit from the intervention.

Limitations of Studies

A major problem for all of these studies was their very small sample size. The largest sample size was ten, which decreases the ability to generalize the results to a broader population. Another potential problem is the general lack of separate, randomized control groups to compare the effects of the interventions on levels of agitation. The internal validity of the studies would increase with the addition of a separate control group. The studies conducted by Mayer & Griffin (1990); Satlin, Volicer, Ross, Herz, & Campbell (1992); and Hussian (1988) had no control group. The remaining studies including Namazi, Rosner, Calkins (1989); Keatinge, Scarfe,
Bellchambers, McGee, Oakham, Probert, Stewart, & Stokes (2000); Gerdner & Swanson (1993); Burgio, Scilley, Hardin, Hsu, & Yancey (1996); Casby & Holm (1994) and Woods & Ashley (1995) used the study subjects as their own control. Unblinded bias of observation is also a potential problem. In the studies performed by Burgio, Scilley, Hardin, Hsu, & Yancey (1996); Satlin, Volicer, Ross, Herz, & Campbell (1992); Hussian (1988); Namazi, Rosner, & Calkins (1989); Keatinge, Scarfe, Bellchambers, McGee, Oakham, Probert, Stewart, & Stokes (2000); Woods & Ashley (1995); Casby & Holm (1994); and Gerdner & Swanson (1993), staff were not blinded to the subjects receiving the intervention and this knowledge could decrease the validity of these studies.

Another potential problem concerns the methods of sample selection. Several studies used staff reports of patients with increased agitation as a method of subject selection. Satlin, Volicer, Ross, Herz, & Campbell (1992) used subjects who met criteria for a diagnosis of primary degenerative dementia. These subjects were identified as sundowners by nursing staff. Casby & Holm (1994) used subjects with a history of repetitive disruptive vocalizations that were severe enough, according to nursing staff, to interfere with their functional abilities. In the study performed by Gerdner & Swanson (1993), one subject, identified by nursing staff, as having a history of agitation, exhibited minimal numbers of agitated behaviors during the baseline assessment. Using staff report of agitation or sundowning can be unreliable as it is subjective and different staff may interpret the criteria differently. Subjects may not display target behaviors during the study period; this adds to the difficulty with the research design and increases the difficulty with interpreting the results.

A related problem is deciding on the time to measure target behaviors. When
researchers are relying on staff reports of time of day of increased agitation, this information again may be subjective and thus may not be reliable. In the study performed by Mayer & Griffin (1990), the goal was to study the patient population in the morning; however, this time period was not controlled. An observation period in which target behaviors are measured over a more specific or more extended period would yield improvement, and ultimately improve the reliability of the results of the research. In the study performed by Casby & Holm (1994), the data were collected during the time of day that nursing personnel indicated that the incidence of disruptive vocalization was the greatest. However, this time was not validated objectively and no pattern of behavior of disruptive vocalization was investigated or established in each subject before the introduction of the intervention. Keatinge, Scarfe, Bellchambers, McGee, Oakham, Probert, Stewart, & Stokes (2000) identify a limitation of their study to include that using staff as participant observers during the observation and documentation phase resulted in documentation occurring at various intervals. Additionally, in the study performed by Gerdner & Swanson (1993), there was initial direct patient observation and documentation of agitated behavior to identify peak levels. However, initial observation only occurred during the same one and one-half hour time period over one week. This limited observation data limits the data collected and potentially misidentifies peak periods of agitation. The researchers suggest that in future studies the patterning of behavior be further assessed in order to achieve optimum effects of the intervention.

Having a specific, reliable tool to measure target behavior with interrater reliability and validity is also important. In the study performed by Satlin, Volicer, Ross, Herz, & Campbell (1992), the daily rating performed by nurses on each shift was not
assessed for validity or reliability. Similarly, in the study performed by Woods & Ashley (1995), the target behavior form used by nursing staff to classify behaviors was not assessed for interrater reliability, thus potentially decreasing the validity of the data. In the study performed by Mayer & Griffin (1990), the researchers did not objectively measure changes in agitation of the dementia patients, but used anecdotal information, making it difficult to evaluate the significance in the decrease of agitation.

Staff compliance and/or ability to participate with the intervention has been cited in at least one study as a potential contributor to a less than optimal amount of data. Burgio, Scilley, Hardin, Hsu, & Yancey (1996) identified staff noncompliance with the intervention protocol as affecting the use of the intervention within their study.

Mayer & Griffin (1990) noted that fluctuating levels of attention, arousal, and medication effects could impact a patient's behavior, thus potentially changing the measurement of response. In the studies performed by Mayer & Griffin (1990) and Casby & Holm (1994), they did not control for medication changes, which could decrease the reliability of their data. By not controlling for some of these variations, it is difficult to evaluate the impact an intervention has on agitation of a dementia patient. Replication is necessary in each of these studies to increase the ability to generalize the results, both to a larger population group and to a variety of dementia clients. Additional research, with specific controls, is also needed to more fully evaluate elements of environmental control over agitated behavior.

Potential Implementation

The numbers of clients diagnosed with dementia is growing. Currently, it is estimated that upward to 11 million people are diagnosed with dementia worldwide.
Dementia accounts for over $100 billion in yearly costs, most is paid out of pocket by consumers (Penn & Rosenthal, 1998). OBRA-87, implemented in October 1990, regulates practitioners prescribing psychotropic medication and use of restraints, both of which were used previously as primary methods of controlling agitation within the demented population. OBRA-87 also required documentation of the specific problem and a trial of nonpharmacologic alternatives (Shorr, Fought, & Ray, 1994).

In order to be successfully implemented, interventions must be simple, easy to use, and compatible within a busy practice environment. If the intervention is one that staff will not or are unable to implement, the benefit of the intervention is lost. In this era of managed care and financial responsibility, cost of implementation must also be considered. Within this paper, there have been several studies reviewed that offer options available to nursing staff for nonpharmacologic treatment methods of controlling agitation. While all of these studies have limitations, and replications are needed, several of these reviewed studies used low cost, easily accessible interventions, that are within the nursing scope of practice to implement. The interventions included a variety of toys appropriate for the patients, signposts, boundary tape in a variety of colors, cloth covering doorknob section, paint, doorknob cover, tape players with headsets and a variety of music selections. Most of these items are inexpensive and common items within a home or nursing home, and the interventions are easily instigated. In addition, they seem safe, with little likelihood of harm to patients when used with good clinical judgement.

Although all studies have limitations, the investigation by Namazi, Rosner, & Calkins (1989) and Hussian (1988) may already demonstrate potential for implementation. The use of colors, signposts, and visual barriers significantly changed
target behavior in dementia clients. Although these studies need replication to confirm their results, the studies showed a statistically and clinically significant decrease in target behavior with simple interventions that are easily implemented by nursing personnel. It is hoped that with these cautions in mind, some of these interventions reviewed may prove useful to practicing nurses currently working with patients with dementia and agitation. It is also hoped that further study will enable nurses to even more confidently select interventions for their patients in the future.
<table>
<thead>
<tr>
<th>Study</th>
<th>Subjects</th>
<th>Format</th>
<th>Assessment Tool</th>
<th>Results</th>
</tr>
</thead>
</table>
| Mayer & Griffin (1990)| n=9      | 10 separate stimulus over two-week period repeated 3 months later | Measured amount of time interaction occurred with stimulus | Substantial interest in toys and stimulus objects Increased interaction possibly decreases agitation and combative
<p>|                       | no control|                                             |                                                  |                                                                         |
| Satlin, Volicer, Ross, Herz, Campbell (1992) | n=10 | Daily rating for agitation by nurses 2 hr of 1500-2000 lux light week 2 | MMSE Locomotor Activity using piezoelectric electric monitor Agitation Monitors | Rating of sleep-wakefulness improved in 8 of 10. Mean score of all 10 declining Nighttime activity decreased in 9 |
|                       | no control|                                             |                                                  |                                                                         |
| Namazi, Rosner, Calkins (1989) | n=9 | 7 visual barriers 2 baseline | Documentation of exits by time, date and names for 14 consecutive days for each test condition | No barrier (baseline): 43 exits Brown tape on floor: 54 exits Masking tape on floor: 52 exits Black tape on floor and door base: 52 exits Beige cloth hiding knob: 0 exits No Barrier (control): 22 exits Pattern cloth-hiding knob: 0 exits Beige painted knob: 14 exits Restricted knob cover: 7 exits |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>Subjects</th>
<th>Format</th>
<th>Assessment Tool</th>
<th>Results</th>
</tr>
</thead>
</table>
| Keatinge, Scarfe, Bellchambers, McGee, Oakham, Probert, Stewart, Stokes (2000) | n=10 own control | Three Phases  
  Phase 1: Observation  
  Phase 2: Analysis and implementation  
  Phase 3: Observation | Buchanan Agitation Scale Critical Incident Form | Four triggers increase agitated behavior:  
  1. Nurse action either physical or verbal,  
  2. Unknown particular trigger  
  3. Another person  
  4. Physical environment  
  Little change in number of episodes of agitation  
  Decrease in ratio of aggressive to non-aggressive type |
| Gerdner & Swanson (1993)                  | n=5 own control | Observation over 2 weeks | MMSE  
  Modified Hartsock Music Preference Questionnaire  
  Modified Cohen-Mansfield Agitation Inventory | Greatest reduction in agitation in a resident where music played an important part of her life. Music was least effective in one resident unable to share significance music played in her life |
| Burgio, Scilley, Hardin, Hsu, Yancey (1996) | n=16 own control | Observation  
  Baseline: 10 days  
  Analysis: 10 days  
  Staff training: 2 days  
  Intervention: 10 days | MMSE  
  Barthel Self-Care Rating scale  
  Cohen-Mansfield Agitation Inventory, Survey of Disruptive Vocal Behavior Social Validity Items | Use of environmental "white noise" may be an effective treatment for reducing the frequency of verbal agitation in demented nursing home residents. |
<table>
<thead>
<tr>
<th>Study</th>
<th>Subjects</th>
<th>Format</th>
<th>Assessment Tool</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casby &amp; Holm (1994)</td>
<td>n=3</td>
<td>Single Subject</td>
<td>Number of disruptive</td>
<td>Change in the mean level of repetitive vocalization across phases</td>
</tr>
<tr>
<td></td>
<td>own control</td>
<td>A-B-A (Subject 3)</td>
<td>vocalization</td>
<td>disruptive vocalization refers to average rate of response</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A-C-A (Subject 2)</td>
<td></td>
<td>Average decrease in level of verbal behavior during intervention phases</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A-B-C-A (Subject 1)</td>
<td></td>
<td>Return to baseline phase - no increase in mean level of verbal behavior</td>
</tr>
<tr>
<td>Woods &amp; Ashley (1995)</td>
<td>n=27</td>
<td>Observation</td>
<td>Recorded response to</td>
<td>Behavior significantly improved following simulated presence therapy</td>
</tr>
<tr>
<td></td>
<td>feasibility study</td>
<td>Pretest/posttest</td>
<td>to treatment</td>
<td>86% improved in behavior when simulated presence therapy applied</td>
</tr>
<tr>
<td></td>
<td>n=9</td>
<td>quasi-experimental design</td>
<td></td>
<td>Decreased use of medication</td>
</tr>
</tbody>
</table>
References


