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MULTI-SENSORY STIMULATION ENVIRONMENTS FOR USE WITH DEMENTIA
PATIENTS: STAFF PERSPECTIVES ON REDUCTION OF AGITATION AND
NEGATIVE BEHAVIORS

A Thesis Presented

by

Megan Houston

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The Faculty of the Graduate College

of

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for the Degree of Master of Science
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Abstract

Background: Dementia is a degenerative neurological disorder that afflicts a growing proportion of the global population. Complementary alternative medicine (CAM) modalities are under investigation for their therapeutic value in the management of dementia.

Purpose: Nursing care of dementia sufferers can include managing agitation and negative behaviors; this study investigates staff appraisal of the Multi-Sensory Stimulation Environment (MSSE) as an intervention for these nursing challenges.

Methods: A purposive sample of nursing staff employed in residential care for dementia patients were recruited 10 weeks after the initiation of an open-access MSSE at the facility to complete a confidential self-administered questionnaire.

Results: 79% of potential participants returned completed surveys for a total sample of $n = 23$. 70% of survey respondents felt that residents were utilizing the MSSE “Somewhat Frequently” or “Very Frequently.” 77% of the staff felt the MSSE should continue in use at the facility or continue with some alterations. The sample suggested that the MSSE is helpful for mood, specifically anger, sadness, anxiety, and restlessness, but not for boredom. Higher-scoring items in favor of the MSSE intervention included confusion, perseverating, wandering, and interpersonal conflict.

Conclusion: Several components of agitation and negative behavior in the dementia population appear to be improved with the use of an MSSE according to this sample. Further research is needed to support the results of this sample and to explore more detailed recommendations regarding the use of MSSE in dementia care.

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Table of Contents

	Page
Acknowledgements.....	iii
List of Tables	viii
List of Figures	ix
Chapter 1: Introduction.....	1
1.1. Overview.....	1
1.1.1. Prevalence.....	2
1.1.2. Treatment	2
1.1.3. Agitation and negative behaviors	3
1.2. Explanation	4
1.2.1. MSSE described.....	5
1.2.2. Terminology	6
1.2.3. Research topics	6
1.2.4. Limitations of current research	7
1.3 Purpose	8
1.4. Conceptual Framework.....	9
1.4.1. Theory of goal attainment.....	9
1.4.2. Framework, assertions and assumptions.....	10
1.4.3. Connecting King to the MSSE	11
1.5. Objectives.....	12

Chapter 2: Review of the Literature	14
2.1. Literature Search.....	14
2.2. Popular Media.....	15
2.3. Scholarly Media.....	17
2.3.1. MSSE/Reminiscence amalgam.....	17
2.3.2. Prospective cohort study.....	18
2.3.3. Mixed methods study.....	19
2.3.4. Pilot study	21
2.3.5. Pilot follow up RCT: MSSE versus Reminiscence	21
2.3.6. RCT: MSSE versus Activity.....	23
2.3.7. Crossover cohorts: MSSE and Garden	24
2.3.8. Mixed methods crossover: MSSE and Garden.....	25
2.3.9. MSSE and antipsychotics	26
2.3.10. Quasi-experimental evaluative study.....	28
2.3.11. Case studies	29
2.3.12 Latest example RCT: MSSE versus activity.	29
2.3.13. Counterpoint	30
2.4. Nursing Staff Perspectives.....	31
2.4.1. Reports of positive outcomes and barriers.....	32
2.4.2. Feedback outside of this review	33
2.4.3. Argument for researching staff perspectives	34
Chapter 3: Methods.....	35
3.1. Research Design	35

3.1.1. Setting	35
3.1.2. Subjects and sampling strategy	36
3.1.3. Procedure	36
3.2. Measures	37
3.2.1. Instrument description	37
3.2.2. Content validity literature review	38
3.2.3. Agitation and negative behavior items	39
3.2.4. Expert panel	40
3.2.5. Readability	41
3.2.6. Reliability	41
3.2.7. Rejection of test-retest	41
3.2.8. Internal consistency	42
3.3. Data Analysis	42
Chapter 4: Results	44
4.1. Response Rates and Sample Characteristics	44
4.1.1. Age and gender	44
4.1.2. Expertise	44
4.1.3. Shift work	45
4.1.4. Relevant experience	47
4.2. Total Scores and Utilization	47
4.2.1. Total questionnaire results	47
4.2.2. Degree of utilization	49
4.3. Agitation and Negative Behaviors Results	51

4.3.1. Anxious/confused subscale.....	52
4.3.2. Perseverating subscale	52
4.3.3. Anger/conflict subscale	53
4.3.4. Psychotic and physical symptoms subscale.....	53
4.3.5. Lowest and highest scoring items for the agitation subscale.....	54
4.4. Overall Impression.....	54
4.4.1. Level of benefit subscale	56
4.4.2. Staff input	57
Chapter 5: Discussion	59
5.1. Findings	59
5.1.1. Reflections on study performance	59
5.1.2. Relationship to existing studies	60
5.1.3. Cost.....	61
5.2. Limitations.....	62
5.2.1. Sample characteristics	62
5.2.2. Novel instrument	63
5.2.3. Subjective approach.....	63
5.2.4. Indirect measurement of potential for patients.....	63
5.2.5 High level non-indicative data.....	64
5.2.6. Wide variability	64
5.2.7. Intervention interval.....	65
5.2.8 Potential sources of bias	66
5.3. Recommendations.....	66

5.4. Conclusions	68
Appendix A: MSSE-SAS.....	70
Appendix B: Optional Comments Submitted	81
References.....	84

List of Tables

Table	Page
Table 1: Demographic Characteristics of the Sample	46
Table 2: MSSE-SAS and Subscale Analysis	48

List of Figures

Figure	Page
Figure 1: Frequency of MSSE-SAS Total Scores	49
Figure 2: Frequency of Agitation Subscale Scores.....	52
Figure 3: Frequency of Responses Regarding Benefit	55
Figure 4: Vote to Maintain or Dismantle the MSSE	56

Chapter 1: Introduction

1.1. Overview

Dementia is a neurological disorder with various possible causes and varying intensities of manifestation. Given the prevalence of the condition, researchers are pursuing strategies both pharmacologically and non-pharmacologically oriented to aid patients, families and clinical personnel in achieving effective, appropriate, high-quality care. These research efforts are complicated by several factors including the difficult task of measuring effect and response in dementia patients, whose ability to communicate in a traditional manner is often severely affected by the disease. One way to supplement the research on various dementia care strategies is to assess the experiences of nursing caregivers involved in implementation of such interventions.

Dementia is an umbrella term referring to cognitive decline from degenerative and vascular causes resulting in significant functional and behavioral disturbance (Tampi, 2013). Dementia is “the leading cause of institutionalization of the elderly... [as] the capacity of performing the tasks of daily life is deteriorated” to the point that “when the diagnosis of dementia is given, the patient is no more able to function in social life [or] personal life” (Takeda, Tanaka, Okochi & Kazui, 2012, p.1-2). Morrissey (1997) references a concise definition written by the World Health Organization (WHO) in 1986: “Dementia has been defined as the global impairment of higher cortical functions, including memory, the capacity to solve the problems of day-to-day living, and a decline in the performance of learned perceptuo-motor skills, the correct use of social skills and control of emotional reactions, in the presence of

gross ‘clouding of consciousness’...irreversible and progressive” (p.38). Rate of decline varies among patients as do certain aspects of presentation; for example, some patients exhibit a “loss of personality, where the uniqueness of the patient’s personality is lost,” while others may demonstrate “accentuated” personality traits (Takeda et al., 2012, p.2).

1.1.1. Prevalence. Prevalence of dementia increases sharply in correlation with age from “approximately 1% at the age of 60 years and doubles every 5 years, to reach 30% to 50% by the age of 85” (Tampi, 2013, para. 2). Globally, “age-standardized prevalence for those aged ≥ 60 years varied in a narrow band, 5%-7% in most world regions,” a total of 35.6 million people affected worldwide in 2010, projected to reach 65.7 million in 2030, and 115.4 million in 2050 (Prince et al., 2013, p. 63). On a local scale the state of Vermont with a total population of about 625,000 has approximately 8500 “Medicare fee-for-service beneficiaries suffering from Alzheimer’s disease, related disorders or senile dementia” as of 2011; this number that has held relatively steady for the last 5 years (United States Census Bureau, 2013; United States Department of Health and Human Services National Health Statistics, 2013).

1.1.2. Treatment. The prevalence rates and the continually progressive nature of dementia create urgency for developing effective treatment, as institutional care requires significant public health resources as well as financial resources from families

and government budgets. Although pharmacological agents exist to slow disease progression, disease *modifying* agents have failed continuously. In the wake of these failures, health care struggles to provide adequate treatments to facilitate quality of life for dementia sufferers, a task that may involve different types of interventions due to the individualized nature of the condition. Therefore, *complementary and alternative medicine* (CAM) strategies continue to be investigated for treatment of dementia. CAM therapies may not only enhance dementia sufferer's positive daily experiences but also decrease the negative experiences, or perhaps lessen certain symptoms.

1.1.3. Agitation and negative behaviors. Among the “accentuated personality traits” mentioned above, agitation and negative behaviors including aggressive and perseverative types occur in up to 50% of advanced dementia patients and 36% of patients with newly manifested disease (Bidewell & Chang, 2011, p. 300). These traits often pose a difficult challenge for caregivers when a resident is not easily redirected. Koopmans, van der Molen, Raats and Ettema (2009) found that of a small sample of dementia patients “in the final phase” of the illness, several agitated mannerisms occurred at least weekly, including “general restlessness” in 18% and “cursing or verbal aggression” in 10% of cases (p. 28). Furthermore, Bidewell and Chang (2011) point out that “Effects of agitation extend beyond the individual in whom the condition manifests,” with agitation positively correlated with “emotional exhaustion among nurses,” and “agitated residents...cause behavioural [*sic*] problems for lucid

patients...with attendant safety and management complications” (p. 300). CAM therapies may decrease the need for restraints or pharmacological intervention with antipsychotics or benzodiazepines in patient with agitation or negative behaviors. At least one study suggests that this is a strong possibility. In a quasi-experimental three-group before and after study, the group with the most use of the *multi-sensory stimulation environment* (MSSE) room at three sessions weekly had reduced use of neuroleptic, antipsychotic, and hypnotic/sedative/anxiolytic medications after 4 weeks (Boyle, Bell & Pollock, 2003, p. 168). Both MSSE groups, the other having one or two sessions weekly, decreased use of psychotropic medications (Boyle et al., 2003, p. 168). Both restraints and psychoactive drugs are factors that can provoke paradoxical reactions and also preclude the development of delirium superimposed on dementia, states that subject the patient to increased safety and medical risks.

1.2. Explanation

The term multisensory stimulation environment (MSSE) refers to a CAM therapy in which early research has sparked an increasing interest for application with the dementia population. Initially developed in the 1970’s under the name of *Snoezelen* for use with autistic children, the application of MSSE with dementia patients is relatively new, used primarily over the last 10-15 years although preceded by some German studies in 1997 and English and Dutch studies in the early 1990’s (Takeda et al, 2012; Finnema, Droes, Ribbe & van Tilburg, 2000). Psychiatrist Dr. Modyn Leszcz (2011) explains “Multisensory stimulation is predicated on the principle that patients

with dementia suffer from sensory stimulation imbalance. They are considered either insufficiently able to engage the sensory stimuli of their environment or overwhelmed and unable to process it” (p.154). The MSSE provides an alternative sensory experience distinct from the usual caregiving environment.

1.2.1. MSSE described. The multi-sensory or Snoezelen environment is a “specially designed physical environment” that employs “visual, auditory, tactile and olfactory stimulation” to “affect the relaxation process...by placing fewer demands on intellectual capacities but capitalize on the residual sensorimotor capabilities of people with dementia” (Takeda et al., 2012, p. 5). The space provides sensory stimuli to patients in a setting that emphasizes engagement with evocative sensory elements such as fiber-optic lighting, music or sound effects, aromatherapy and tactile manipulatives. “Complex cognitive capacity is not required for participation...[it is] a humane, thoughtful exposure and engagement using a range of stimuli, including language, sound, visual, smell, texture, and touch” (Leszcz, 2011, p. 154). The setting departs from the typical atmosphere of both healthcare facilities and traditional home-like environments, constructs that may require more complex mental processing. Patients may then interact with the sensory stimuli with beneficial effects. The multi-sensory or Snoezelen modality “is an intervention that aims at: reducing maladaptive behaviors and increasing positive behaviors, promoting positive mood and affect, facilitating interaction and communication, and promoting a healthier caregiver-patient relationship, thereby reducing caregiver stress” (Leszcz, 2011, p. 154). The multi-

sensory or *Snoezelen* therapy may be resource to help patients experience a positive change when suffering from challenging emotional states such as agitation.

1.2.2. Terminology. The term *Snoezelen* is now trademarked, supporting a commercial industry specific to the *Snoezelen* label and the application of these same principles using the more generic terminology multi-sensory stimulation environment (MSSE) (Ward-Smith, Llanque & Curran, 2009, p.452). Consistent with previous research, MSSE and *Snoezelen* are treated as equivalent terms for the purposes of literature review; this paper will refer to multi-sensory stimulation environment (MSSE) in most contexts as other investigators have done to “avoid any confusion with the use of a trademarked product” (Ward-Smith et al., 2009, p.452).

1.2.3. Research topics. Research reflects a variety of interests in applying MSSE’s to the needs of the dementia population, including chronic pain; balance; activities of daily living; functional performance and occupational therapy performance outcomes; cognition; depression; apathy; quality of life; family members’ involvement in care; and even worship (Schofield & Davis, 2000; Klages, Zecevic, Orange & Hobson, 2011; Staal et al., 2007; Collier, McPherson, Ellis-Hill, Staal & Bucks, 2010; Letts et al., 2011; Ozdemir & Ademir, 2009; Lane-Brown & Tate, 2009; Mahboubinia et al., 2012; Wallace & Brown, 2004; Walters, 2007). At least one researcher has proposed a specific, detailed approach for the use of MSSEs based on his research, from passive to active, reinforcing behaviors by caregivers (Staal, 2012). Another area of significant research interest is the potential of MSSE’s as a non-pharmacological, CAM therapy for agitation and negative behaviors.

1.2.4. Limitations of current research. Although some studies report promising results applying MSSE to the dementia population, the research on the whole remains weak. This weakness is due in part due to the difficulty in assessing affect, effects and response in the dementia population, who sometimes lose the ability to convey emotions in a readily interpretable way. Additional research is needed to build the evidence base regarding positive effects of this CAM treatment (Takeda et al, 2012).

Another weakness in the MSSE literature is that many studies focus on a small number of participants. These small numbers may persist because patients requiring high levels of supervision tend to be housed on smaller units. Additionally, as a vulnerable population it can be difficult to obtain consent from the Durable Power of Attorney for Healthcare for each patient for the purpose of research studies. As a case in point, Wareing, Coleman and Baker (1999) reported that MSSEs decreased apathetic and inappropriate social behaviors and inspired interest in patients' surroundings -- certainly encouraging findings, yet their work included only four males with late stage dementia, making generalizability impossible. Several other similar articles with tiny, case-study type populations exist.

Many research teams have addressed limitations and called for additional study. In their review, Brodaty and Burns (2012) found only one level II RCT and it was without significant outcome. They ranked five other studies at III or below on their rating scale from I (highest quality) to IV (lowest quality), despite the fact that all

studies reported results favorable to the use of MSSEs (Brodaty & Burns, 2012). They characterize the evidence as “far from convincing, as the standard of research was generally low... [and] there is scant evidence of sustainability of effect once intervention ceases,” (Brodaty & Burns, 2012, p. 557). However, they caution that “A lack of quality research is not necessarily indicative of a lack of efficacy” (Brodaty & Burns, 2012, p. 557). While this last concept bears consideration, the fact remains that health care seeks to implement strategies backed by solid, well-conducted, ethical research.

1.3. Purpose

The aim of this research is to explore the views of nursing staff regarding the utilization of MSSE as part of the therapeutic milieu for residential dementia patients, specifically regarding agitation and negative behaviors. The views of nursing staff could either lend support or detract from it in terms of the efficacy of MSSEs, and staff perspectives are an untapped resource as nursing staff often know their patients extremely well. Staff members can often gauge emotional responses despite an apparent communication impairment from the patient, and unlike patients, staff can typically convey their thoughts and responses clearly. A confidential survey will serve as the vehicle to gauge nursing staff’s views regarding whether the MSSE is an effective intervention for residents displaying a variety of agitated or negative behaviors as defined in the survey items.

1.4. Conceptual Framework

This research on MSSE is grounded in the conceptual framework of nursing theorist Imogene King, whose work examines the nurse's role. Her concepts regarding nurses are generalizable to the caregiving staff on the dementia unit, not all of whom are credentialed nurses but who work in support of nursing functions and ideals.

King began her career as a diploma certified nurse in Missouri in 1945 (Sieloff, 2006). She worked as a staff nurse in a variety of clinical specialties, achieved her Bachelors of Science in Nursing in 1948, and launched her career as a nursing educator, much of which she spent at Loyola University, Ohio State, and the University of South Florida (Sieloff, 2006). She served on the Defense Advisory Committee on Women in the Services for the US Department of Defense and held numerous other memberships and delegate posts (Sieloff, 2006).

1.4.1. Theory of goal attainment. King first developed her interacting systems framework to describe “the organized wholes within which nurses are expected to function,” (King's own words) a framework employed by several universities and specialty nurse education programs (Sieloff, 2006). Within this framework King created the middle range theory of goal attainment to explain the interaction between nurse and patient, describing her theory as focused on “human transactions in different kinds of environments” (Sieloff, 2006). A number of researchers have applied King's work to a diverse array of nursing scenarios, including human immuno-deficiency virus (HIV) with psychosis, transition to menopause, child abuse in connection with alcohol dependence, chronic illness, family health, post-op recovery, adolescent health

promotion, patient satisfaction, and many others (Sieloff, 2006). This research on one facility's experience with an MSSE applies the theory of goal attainment to the interaction between nursing personnel and dementia patients. The survey tool assesses nursing staff's perspectives of "human transactions in different kinds of environments," as the MSSE exists within the dementia unit's residential, therapeutic milieu (Sieloff, 2006).

1.4.2. Framework, assertions and assumptions. King's interacting systems framework layers three systems over one another: the personal system comprised of individuals such as the patient or the nurse; the interpersonal system comprised of interactions between individuals, and the social system encompassing societal influences such as religion, education, health care systems, etc. (Sieloff, 2006). For King, the personal system includes "the concepts of body image, growth and development, perception, self, space, and time" and the interpersonal system requires consideration of "communication, interaction, role, stress, and transaction" (Sieloff, 2006). The major assumptions in the theory of goal attainment condense into four categories: nursing, person, health, and environment. Sieloff (2006) explains that *nursing* is "an interpersonal process of action, reaction, interaction, and transaction" (p. 292) centered on the state of health resulting from human interplay with their surroundings. *Person* for King refers to a unique being of intrinsic worth with distinct desires and priorities who is self-determining, both spiritual and calculating, who may select from a series of alternatives with some level of rationale, in most scenarios (Sieloff, 2006). "*Health* is a dynamic state in the life cycle; illness is an interference

in the life cycle...health ‘implies continuous adjustment to stress in the internal and external environment through optimum use of one’s resources to achieve maximum potential for daily living (King, 1981, p.5)’ (Sieloff, 2006, p. 292). In other words, *environment* significantly impacts the state of both health and life (Sieloff, 2006).

In addition, King describes eight theoretical assertions regarding the concepts of perceptual accuracy, interactions, transaction, goal attainment, satisfactions, nursing care, growth/development, role congruency, role conflict, stress, and communication (Sieloff, 2006, pp.292-293). These concepts form a web of relationships that require more in depth study to apply to nursing practice in a systematic fashion, such as in the design of novel nursing interventions to test.

1.4.3. Connecting King to the MSSE. King’s assumptions represent a complex and very respectful conception of humanity and of nursing. These assumptions value the patient and the nurse as autonomous, multidimensional, rational, and spiritual beings immersed in a dynamic environment requiring decision-making, and they respect the ability of impaired patients such as dementia patients, to make such decisions regarding interaction with the elements of their surroundings. The MSSE functions on the principle that dementia patients may potentially gain physical, emotional, spiritual, and perhaps other benefits from interaction with sensory stimuli around them. King’s theory considers environment as a critical aspect of the human experience, and couples this assertion with an emphasis on human interactions. Dementia patients may experience interactions with the nursing staff and with the

environment that lead to the aforementioned health adjustments and therefore, providers and caregivers may be able to facilitate dementia patients' health adjustments using the MSSE as a resource.

MSSE may be a valuable nursing intervention from King's perspective. Nursing as a discipline teaches caregivers to: assist dementia patients to maintain functional interactions with their environment as the disease process progresses; to apply a dynamic, interactive, interpersonal nursing process; to maximize resources around daily living; and to maneuver the interactions with environment into the best possible health advantage for dementia sufferers (Sieloff, 2006). The elements of MSSE offer a visual and environmental portal of opportunity for King's nursing process and assisting residents' in making the life and health adjustments (Sieloff, 2006). Since King highly values both the nursing role and the environment, the aim of this research is to assess nursing staff's perspective on detecting the perceived benefit, if any, of the MSSE in the residential dementia care setting for agitation and negative behaviors.

1.5. Objectives

The aims of the study are modeled on previous work published by Hope, Easby and Waterman (2004). The current objectives are:

1. To evaluate how staff perceive the usage of the MSSE by residents.
2. To evaluate how staff perceive the effects of the MSSE on residents' moods and emotional states, specifically to agitated and negatively affected states.
3. To evaluate whether staff perceive the MSSE as an asset to the overall

setting, to their work, and/or to residents independently, in terms of serving as an effective resource for agitation and negative behaviors.

4. To encourage staff input regarding optimizing use of the MSSE as an intervention targeted at agitation and negative behavior.

1.6. Significance

Multi-sensory stimulation is a CAM strategy that, according to previous studies, holds potential as a beneficial therapy for dementia patients with a variety of possible applications, including agitation and negative behaviors. However, previous research is largely based on observation of patient behavior with exposure to the MSSE, a process highly affected by observer interpretation, as well as by the altered or significantly decreased emotional expression common to the dementia population. Assessing the perspective of staff members after a minimum of 60 days of MSSE access on the dementia care unit capitalizes on the expressive and analytical ability of the personnel who have direct experience utilizing the MSSE as a strategic resource in their daily work. The input from staff could lend clarity and insight into the use of the MSSE with dementia patients displaying agitation or negative behavior, thereby benefitting the general care community in understanding the potential benefits or implications of the MSSE with this population.

Chapter 2: Review of the Literature

2.1. Literature Search

Several researchers have used a variety of designs and measurement tools in an attempt to establish a positive effect of MSSE on agitation and behaviors of dementia patients. This literature review includes studies extracted from the following databases: Ovid Medline, PubMed, CINAHL, PsycINFO, and Web of Science.

Keywords were selected to capture the pool of research on both Snoezelen and MSSE interventions, as these terms are nearly synonymous. For the purposes of this research the terms *Snoezelen* and “MSSE” are distinguished only by the fact that Snoezelen is a trademarked commercial brand while MSSE has no restrictions for use, and is employed in the literature as an alternative moniker for this intervention. The following keywords were used to conduct the search: “Snoezelen,” “multisensory stimulation,” “multi-sensory stimulation,” “multisensory environment” and “multi-sensory environment” combined with “dementia,” “Alzheimer,” or “Alzheimers.” Results were narrowed by limiting to research studies and journal articles published in the English language in 1990 or later.

The search resulted in 104 research studies, research reviews, study protocols, expert opinions, and casual informative pieces about Snoezelen or the aggregate MSSE terms for use with the dementia population. These items were reviewed either for analysis in this literature review or for contributing information in the introduction of the topic. All of the studies included in the analysis were conducted in residential care

facilities serving dementia patients, as opposed to inpatient psychiatric units or other patient populations. All of the studies implemented multi-sensory therapy in the form of a unique multi-sensory stimulation environment, that is, as a specific room, rather than by integrating multi-sensory equipment throughout the entire care setting or with other methods of implementation. Studies regarding related concepts such as gardens and reminiscence therapy were excluded unless contrasted and compared with an MSSE. Furthermore, the studies included in this review measure affective, emotional and quality of life indicators; studies exclusively measuring biological indicators such as chronic pain, balance, mobility, cognition, or performance on activities of daily living (ADLs) were excluded.

2.2. Popular Media

Although still considered a newer and complementary alternative therapy, *Snoezelen* and MSSE-type interventions have been utilized frequently and long enough to gain some representation in the non-academic media. Some nurses have championed MSSEs as a potential benefit to dementia patients. One registered nurse (RN) states the MSSE “has so many uses...It can motivate, relieve stress, help with anger management, and provide comfort and relaxation” in a piece written for the popular press about a facility in Pennsylvania, (Wood, 2008, para. 3). In this facility, it was nurses who suggested creating an MSSE to “add more meaning to residents’ lives,” finding that “It’s another way to interact with residents, not just direct care and activities of daily living” (2008, para. 18). Results of this facility’s intervention were published in 2011 by Robbins & Norton in *Long-Term Living* magazine. The Cohen-

Mansfield Agitation Inventory (CMAI) and the Adult Functional Adaptive Behavior Scale (AFABS) were employed to measure agitation and functional ability before and after 13 weeks of MSSE exposure at least once weekly for a minimum of 15 minutes (Robbins & Norton, 2011). This group found a clear reduction of agitation across the whole of the sample of 15 residents, as well as minor improvements on the AFABS, and improved behavior after every session for six residents plus improved behavior after more than half the sessions for 14 out of 15 (Robbins & Norton, 2011).

Similarly, another facility in Massachusetts created a dedicated MSSE room with a *Namaste Care* theme for dementia patients they felt were “doing nothing all day, and difficult to arouse or stimulate” (Lourde, 2007, p. 50). They anecdotally report positive results of “higher family satisfaction, improved census, improved quality of care, and enhanced staff morale” (Lourde, 2007, p. 50). Personnel recall a drastic improvement for a particular resident who was “very agitated, yelling a lot, and anxious. When we put her into the program, she became a totally different person. She calmed right down and was much more at ease with her environment” (Lourde, 2007, p.50). Qualitative details showcase well in popular media publications.

A Wisconsin facility has also implemented an MSSE and a self-designed charting program to evaluate its effects, stating that they use the MSSE for many purposes in dementia care, including “those who have patterns of agitation and anxious behaviors; those with limited responses,” (Bera, 2008, p.18). This group also finds that the MSSE provides “pleasurable experiences...the opportunity to attain happiness and

purpose, and to improve their quality of life. Residents have control because there are no rules” and because residents “actively engage...in activities that gently stimulate their senses throughout the day,” (Bera, 2008, p. 18). Wisconsin staff claim that the MSSE became “the key that had unlocked thoughts, personalities, and spirits,” (Bera, 2008, p.20). Stories like these no doubt inspire some facilities to consider the implementation of an MSSE to capitalize on such positive results, yet administrators and nursing professionals often base such decisions on scholarly grade materials such as research studies or commentary published in research journals.

2.3. Scholarly Media

2.3.1. MSSE/Reminiscence amalgam. Within the academic research, one group in Portugal adapted the MSSE concept to a reminiscence modality, blending the two interventions and creating “a typical beach environment” with elements designed to stimulate all five senses (Ligia, Joao, de Lurdes & Viviana, 2010, p.77). These stimuli were combined with cognitive stimuli to “provide moments of well-being, relaxation, comfort, satisfaction and happiness, joy” to a sample of 17 dementia patients assessed with both the Barthel Index and the Mini-Mental Status Exam (MMSE) (Ligia et al., 2010, p.77). The group reported several positive findings: “less apathetic behaviors;...significant improvement in the types of behavior and states of mind (e.g. happiness, environment awareness, spontaneous speech and level of activity);...able to remember past events and talked more coherently and spontaneously;...improved their interaction with surrounding environment, their communication, mood, well-being and relaxation” presumably measured by

observation (Ligia et al., 2010, p. 77). This project then combines the MSE concept with MacDonald's suggestion "to bring some normal experiences back" (MacDonald, 2002, p. 33). However, the study is of limited value for those interested in distinguishing the efficacy of MSSEs from the efficacy of reminiscence therapy.

2.3.2. Prospective cohort study. Milev et al., (2008) assessed 18 residential dementia patients using the Daily Observation Scale (DOS) and Clinical Global Impression Improvement Scale (CGI) to determine the effects of 12 weekly MSSE sessions of 30 minutes versus 12 weeks of three times weekly sessions of 30 minutes versus usual care. Measurement intervals were baseline, 4 weeks, 8 weeks, 12 weeks, and again at 12 weeks post intervention (Milev et al., 2008). Dr. Melyn Leszcz (2011), psychologist, asserts in her review that "significant improvements" were shown at 8 and 24 weeks for the DOS scores and 12 and 24 weeks for the CGI scores "suggesting a durable and protective effect from this form of intervention" (p.155). "It is important to sustain within the care environment a sense that humane, psychological, and psychosocial interventions can have positive and enduring impact in the care of this population," (Leszcz, 2011, p. 155). Furthermore, she speculates that "It may well be that this form of therapeutic action raises morale and hopefulness in caregivers as their work moves beyond that of custodial care alone...Indeed, improvement in staff morale and involvement may be an important mediator of therapeutic impact" (Leszcz, 2011, p. 155). However, it is important to consider the limitations of the Milev study. With a sample size of 18, the three treatment groups were not large enough to support sufficient power, and the measurement tool was not completed in a blinded

fashion (Milev et al., 2008). Additionally, the sample included all stages of dementia (Milev et al., 2008).

2.3.3. Mixed methods study. A 1998 study by a British researcher attempted aggressive data collection on 29 patients in a British facility over a period of 8 months using a seven part assessment packet comprised of both quantitative and qualitative measurement tools (Hope, 1998). Extreme care was reported in the training of staff members with detailed instructions provided concerning the use of equipment and structure of therapy sessions to avoid confounding by caregiver or therapeutic approach (Hope, 1998). Quantitative data included patient demographics; responses to individual pieces of MSSE equipment; responses during the session using the Interact tool, a scale developed specifically for assessing response to MSSEs; and pulse rate prior to and following each session (Hope, 1998).

The Interact rating scale showed a strong level of internal consistency with Cronbach's alpha at 0.825 (Hope, 1998). One of the few studies to evaluate singular pieces of MSSE equipment, 21 (47%) of 45 total sessions including 16 (55%) of (55%) the 29 participants recorded negative reactions (Hope, 1998). Yet 13 of the sessions were rated positively overall, leaving eight sessions (18%) of pervasively negative responses from eight different residents (28%) (Hope, 1998). Collectively, tactile equipment elicited the majority of negative responses (Hope, 1998). Raters recorded increases in happiness and contentment, and positive moods were demonstrated for at least a portion of the time in 80% of MSSE sessions (Hope, 1998). 25 of 45 sessions

(56%) recorded no negative activities, defined as wandering, restless, or aggressive (Hope, 1998). 16 of 45 sessions (36%) did record these behaviors but they decreased throughout the session in all cases and seven of them reported the activity had begun prior to entering the MSSE (Hope, 1998). However, in a related article of reflection about the project, Hope anecdotally noted that some ambulatory residents made the physical transition to the room more difficult for staff to manage (versus disabled, wheelchair-bound patients), and sometimes agitated residents did not want to stay in the MSSE once they arrived in it (Hope, 1997). Qualitative content analysis included staff notes about behaviors prior to and immediately following sessions, as well as overall effect on the patient; one important theme that emerged was the enhanced quality of staff-patient relationships (Hope, 1998).

A major drawback of this study is the relative infrequency of use of this intervention over the 8 month data collection: with 29 participants and 45 total visits, most patients visited the MSSE only once in those 48 weeks. Qualitative analysis revealed staff anxiety about incorrect use of the MSSE and about possibly provoking an adverse response from patients; these sentiments may perhaps also reflect that the strict guidelines provided during instruction may have inadvertently discouraged use of the MSSE. Additionally, the seven-piece intervention assessment may have seemed daunting, or too time-consuming, for staff to implement the intervention. The author notes that some members of staff may have lacked faith in the potential of the MSSE and therefore did not integrate it into their nursing care. Lastly, the unit hosts a significant number of student nurses, who may have been preoccupied by other

learning needs or possibly even pressured into avoiding use of the MSSE if nurses on staff did in fact discourage it.

2.3.4. Pilot study. A randomized controlled pilot study in Great Britain by Van Diepen et al., (2002) suggested both favorable and variable effects of MSSE on dementia patients. The study used sealed envelopes to randomize five subjects to eight MSSE sessions twice a week for up to 40 minutes, versus five controls to reminiscence therapy, another commonly accepted CAM dementia treatment, on the same frequency and duration (Van Diepen et al., 2002). MSSE intervention decreased agitation in dementia patients during and after therapy as assessed by the Cohen-Mansfield Agitation Inventory (CMAI) and Agitation Behavior Mapping Instrument (ABMI), results favoring the launch of a larger study (Van Diepen et al., 2002). However, measurements of heart rate indicated that the environment seemed stimulating to some patients and relaxing to others (Van Diepen et al., 2002).

2.3.5. Pilot follow up RCT: MSSE versus Reminiscence. The teams' subsequent 2004 randomized controlled cross-over trial (RCT) of twenty British dementia patients found no significant difference in reduction of heart rate or agitation between the two interventions, again using the CMAI and ABMI (Baillon et al., 2004). The team concluded in a second article that heart rate was not a suitable measure as accelerations or decelerations may reflect both a positive or negative response, another point highlighting the need for further research (Baillon et al., 2005). The authors inferred merely from observation of participants, a highly subjective finding, that

MSSE “may have a more positive effect than reminiscence,” yet “there was considerable variation in the way individuals responded to each intervention” so that while MSSE “may have a calming effect on some patients who are agitated...for other patients the interventions did not have a substantial effect” (Baillon et al., 2004, p. 1051). The team noted that any given patient seemed to respond to the MSSE differently on separate occasions (Baillon et al., 2005). In addition, the 16-subject subsample with severe dementia, as indicated by MSSE scores less than 10, seemed to respond better to MSSE than reminiscence (Baillon, et al., 2005).

Though the researchers had attempted to strengthen results with the cross-over design, removing any confounding due to baseline differences between treatment and control groups, the total number of sessions for each therapy was reduced to only three. It is therefore possible that variation between and within single subjects may have stabilized with greater exposure. Still, the researchers reported that the MSSE appeared more beneficial than reminiscence for certain items on the Interact rating scale, including “happiness, fear, relating to other people, attention to the environment, agitation, enjoyment and relaxation” (Baillon et al., 2005, p. 371). Although this research did not produce meaningful results for decreasing agitation and behaviors in dementia patients, the researchers asserted that MSSE “can at the very least, be an enjoyable and positive activity for people with dementia, and offers additional choice of an intervention that is appropriate for such patients” (Baillon et al., 2005, p. 372).

2.3.6. RCT: MSSE versus Activity. In the same approximate time frame another European group failed to demonstrate superior efficacy of MSSE versus activity therapy, another standard dementia care intervention (Baker et al., 2003). This team randomized patients to 8 sessions of up to 30 minutes, occurring twice weekly for 4 weeks, to evaluate the potential for MSSE in changing behavior, mood or cognition short- or long-term versus the control group, who were treated with an activity therapy such as “playing card games, looking at photographs, doing quizzes, etc.” for the same duration and frequency (Baker et al., 2003, p. 467). This multi-center trial across three European countries involved a robust number of 136 participants and strove to maintain consistency in the major components of each intervention and by providing a structured approach to all therapy sessions (Baker et al., 2003).

Despite the large size and thorough statistical analysis of the study data, one of the sites was a day center while the other two were residential, and different facilities utilized different measurement approaches effectively reducing the large sample size to small groups under one umbrella study assessments (Baker et al., 2003). Chung and Lai (2002) point out that the randomization process was compromised in this study and that some residents were randomized without first providing consent. Some of the assessments were delivered by the same individuals who delivered the MSSE intervention, introducing possible detection bias (Chung & Lai, 2002). Even more unfortunately, one of the sites did not complete all of the longer-term assessments, and blinding was not employed (Baker et al., 2003). This group did not find a significant

reduction in wandering behavior as measured by the wandering/restlessness item on the Interact scale (Baker et al., 2003). Bidewell and Chang (2011) assert that with “no advantage of multi-sensory stimulation over more modest control activities...if cheaper interventions are just as effective, dedicated Snoezelen rooms become harder to justify (p. 306). Interestingly, similar to Baillon and team, Baker’s group suggests that MSSE seemed more beneficial and enjoyable to their subjects with more severe dementia, citing a decrease in apathy in the results from the UK group (Baker et al., 2003).

2.3.7. Crossover cohorts: MSSE and Garden. Another study conducted in Australia in in 2004, the same approximate time frame as Baillon and Baker’s work, utilized an outdoor garden, essentially a different type of environment in contrast to MSSE (Cox, Burns & Savage, 2004). This study observed 24 long-term care dementia patients in three sessions of 16 minutes each in three different environments, the third being a traditional living room environment, for a total of nine sessions (Cox et al., 2004). The crossover within-subjects design specified that participants experience all sessions in all three environments with the same caregiver who rated response according to the Affect Rating Scale (ARS), a tool both reliable and valid for use with Alzheimers disease which is one of the main causes of dementia, and which demonstrated strong inter-rater reliability of 0.82 in this study (Cox et al., 2004).

This research failed to show definitive efficacy for reduced agitation and behaviors in these dementia patients (Cox et al., 2004). The researchers explain that the negative choices on the ARS, “anxiety, fear, or sadness,” were rarely recorded in any of the environments; therefore, they found it “not possible to comment on the

value of the *Snoezelen* room, the garden, or the living room...in terms of reducing agitation or negative affect” (Cox et al., 2004, p. 42). However, the MSSE significantly increased positive affect as measured by the ARS, especially one of pleasure, and since it also did not provoke negative affect, these results suggest that more research must be conducted to fully understand the potential of this intervention (Cox et al., 2004). The qualitative portion of this study, measuring responses of both caregivers and visitors to the MSSE, reports favorable reviews and confirms the positive affect findings; however, only six caregivers and six visitors participated in the interviews (Cox et al., 2004). The qualitative data in this study may be helpful for future researchers or for training caregivers in understanding in more detail how patients might respond to the MSSE intervention (Cox et al., 2004).

2.3.8. Mixed methods crossover: MSSE and Garden. Another more recent study of the year 2011 resembles the work of Cox et al., in that it also compared a garden activity to MSSE, was conducted in Australia and employed a within-subjects, repeated measure, mixed methods design (Anderson, Bird, MacPherson, McDonough, & Davis, 2011). Anderson and colleagues analyzed 12 dementia patients over 8 weeks by rating behavior before, during and after three sessions each of MSSE and garden therapy using just four categories for ease and clarity of statistical analysis, “disturbed/disengaged; neutral; engaged; very engaged,” (Anderson et al., 2011, p. 169). Despite their critical analysis of existing research, this team managed to collect only nine MSSE sessions and five garden sessions during the study, with only seven participants reaching the needed four sessions for analysis of covariance

(ANCOVA) to assess response to the intervention over time (Anderson et al., 2011). The research findings encourage further study in that “disturbed/disengaged” ratings fell from 28.21% prior to MSSE sessions to 10.1% afterwards (Anderson et al., 2011). Yet like others before them, the authors noted that both the MSSE and garden elicited positive effects and that participants responded variably to both interventions, that is, without predictability, findings that once again may have mediated with more exposure to the interventions (Anderson et al., 2011).

The qualitative aspects of this study consisted of a free-form focus group conducted 8 weeks after the close of the intervention stage (Anderson et al., 2011). The recording was independently analyzed by two researchers, neither of whom was the interviewer, using grounded theory with inter-rater reliability of Cohen’s kappa = 0.92, which uncovered a theme of improved relationships between staff and patients as perceived by caregivers (Anderson et al., 2011). Of note, the researchers had allowed for as needed (PRN) use of the MSSE and garden interventions both during the study period and the 8 week post-study period, but no PRN sessions occurred in either time period, attributed to time and workload constraints by staff (Anderson et al., 2011). The qualitative findings therefore suggest that caregiver training and attitudes toward new interventions may affect utilization, among other factors. Overall, this study supports the need for future research, with promising but inconclusive, small scale data about the effects of MSSE on agitation and behavior in dementia patients.

2.3.9. MSSE and antipsychotics. An American study employed a placebo-controlled experimental design to measure incidence of psychotic behavior and use

of as-needed PRN antipsychotic medications using retrospective chart audit for Alzheimer's dementia patients (Ward-Smith, Llanque & Curran, 2009). The researchers tried to determine if sporadic use of an MSSE decreased agitated and psychotic behaviors as documented on patients' Psychotic Behavior Assessment Records (PBARs) and use of pharmacological intervention from patient medication records (Ward-Smith, Llanque & Curran, 2009). Strengths of this design include the fact that all sessions were conducted by one activities facilitator employed by the agency, minimizing confounding due to variances in staffing; additionally, the session facilitator was not one of the nurses charting patient behavior (Ward-Smith, Llanque & Curran, 2009). All sessions occurred between 1:00 p.m. and 3:00 p.m., minimizing confounding related to circadian rhythms; all participants were already prescribed antipsychotic medications administered at the same times each day, with no changes occurring during the study period (Ward-Smith, Llanque & Curran, 2009). A major weakness is that participants were not randomized; they were in fact deliberately care-planned to this intervention, with frequency and duration of sessions customized to each patient (Ward-Smith, Llanque & Curran, 2009).

Both the MSSE and control groups contained 10 patients; results were favorable in that there were decreased behaviors recorded on PBARs for all MSSE patients and zero use of PRN antipsychotic medication, while controls showed increased behaviors in all charted categories except one (Ward-Smith, Llanque & Curran, 2009). It is difficult to assess the significance of these results, as it is unclear whether the controls had increased behaviors because they lacked the MSSE intervention, or because

they were not already prescribed antipsychotic medications. Likewise, it is difficult to know whether the intervention group's positive responses to the MSSE in terms of behavior and PRN medications can be generalized to other patients because of the deliberate care-planning and customization of the MSSE to this group.

2.3.10. Quasi-experimental evaluative study. One outcomes-based pre- and post-assessment quality improvement study supported the use of MSSE as a preventative intervention for dementia residents with behavioral challenges in a nursing home (Minner, Hoffstetter, Casey & Jones, 2004). The nursing team tracked and trended behavioral incidents of residents and identified key times of day when residents were often predictably agitated; the MSSE room was utilized as a preventative, scheduled, intervention in this way over a one-year period, as well as for unscheduled use. Using the Comfort/Discomfort Scale with data collected on 19 residents and 324 MSSE visits, the mean number of positive behaviors increased from 3.7 before to 5.3 and 5.1 during and after MSSE intervention, while negative behaviors decreased from 2.1 prior to 0.9 and 0.8 during and after MSSE visits (Minner et al., 2004).

Using scale data as well as detailed notes maintained by one consistent facilitator, the nursing home declared this intervention successful in terms of not only reducing negative and increasing positive behaviors, but also in staff understanding of resident needs and improved collaboration and communication between various staff levels, with more input from nursing assistants (Minner et al., 2004). The report concludes that MSSE therapy “provides an enabling, a failure-free, and a stimulating and relaxing environment in which the resident with dementia is free to interact

without rules. It also provides an activity that presents the resident and caregiver as equals, allowing a bond of trust to develop that may carry over to interactions outside the room” (Minner, et al., 2004, p. 348).

2.3.11. Case studies. In addition to the studies cited above, an occupational therapist also commented on a bond of trust between caregiver and patient that seemed to continue after leaving the MSSE (Lape, 2008). This researcher, though not a nurse, found in her descriptive, quasi-experimental study that dementia patients had a decrease in negative behaviors in 50 out of 52 of the 30-minute sessions (Lape, 2008). The calming effects of the MSSE appeared to persist for as long as 4 hours post-intervention; unfortunately, the sample was comprised of just three dementia patients and therefore serves as a case study in this appraisal of the evidence (Lape, 2008). Another researcher tested MSSE on a similarly small, case-study sized sample of four women with dementia through observation, finding that “there was an overall positive mood/behavior change lasting 30 minutes after the end of the Snoezelen session for all patients...however, the benefits...showed no increase over the eight sessions indicating that the benefits of the Snoezelen sessions were not long-term” (Cornell, 2004, p. 1045).

2.3.12. Latest example RCT: MSSE versus Activity. This trial of March 2014, held at a facility in Spain, compares three groups stratified by dementia severity, then randomized to an MSSE versus activity group for two 30-minute sessions weekly for 16 weeks, versus controls (Maseda et al., 2014). Behavior, mood, cognitive, and functional impairment in basic *activities of daily living* (ADLs)) were measured at

baseline, 8 weeks, 16 weeks, and 8 weeks post intervention. The group found that the “physically nonaggressive behavior factor” improved significantly in the MSSE group versus activities (comprised of card games, taking quizzes, and looking at photographs), though not versus controls (Maseda et al., 2014, p. 4). Both the MSSE and activity groups “demonstrated behavior improvements and higher scores on the Cohen-Mansfield agitation inventory, verbal agitated behavior factor, and Neuropsychiatric Inventory-Nursing Home,” though not significantly different between each other (Maseda et al., 2014, p. 5). Mood scores improved but not to a statistically significant extent, worsening again at follow-up compared to intervention completion (Maseda et al., 2014).

As is the case in many long-term care facilities, the sample was largely female, with 90% being women, 70% widowed, 23.3 single (Maseda et al., 2014). Once again, the study finds support for MSSE but cautions: “One explanation is that the positive effect on the patients’ mood is determined by the one-to-one attention rather than the multisensory stimulation,” (Maseda et al., 2014, p 8). Retrospectively, the group finds that some of their measurement tools may not have assessed fine gradations of change in the dementia patient population and like others, these researchers ask for “future empirical studies with adequate designs and larger samples” (Maseda et al., 2014, p. 9).

2.3.13. Counterpoint. Upon further investigation into scholarly literature, it becomes evident that not everyone agrees with the concept of the MSSE for dementia care. A hospital charge nurse asserts that “care environments and practices have developed in a way that excludes people with dementia from the pleasurable

sensory experiences most of us enjoy every day,” asking, “rather than create a new environment to compensate for this deprivation, should we not try to bring some normal experiences back?” (MacDonald, 2002, p.33). Others caution that “in the absence of empirical research, nurses should be cautious about ‘new’ treatments which claim to enhance the life quality of older people with confusion” (Savage, 1996, p.20). Savage reminds us that the health care of the vulnerable dementia population must be designed with care. Thus, the need for further research is raised once again. “The current state of the evidence indicates that multisensory environments are useful but the evidence remains inconclusive. Practitioners working with such environments need clear standards and guidelines but these are dependent on a strong evidence base that does not currently exist. It is important that nurses, carers [*sic*], and therapists contribute to the generation of research-based evidence and the development of guidelines” (Thurtle & Wyatt, 1999, p. 440). Though these words were written in 1999, one could argue that the statements still reflect the current state of the literature on MSSEs, which is considered inadequate due to “ethical and methodological difficulties” (Thurtle & Wyatt, 1999, p. 440).

2.4. Nursing Staff Perspectives

Although MSSEs have been shown to have a positive influence on staff working with the learning disabled, there is little evidence on the effects of MSSEs on staff working with the dementia population (Hope & Waterman, 2004). Some researchers have asked for staff feedback that occasionally includes remarks about

agitation and negative behaviors, but is more generally oriented in most instances.

2.4.1. Staff education and focus group. Hope and Waterman (20004) explain that in the first phase of his research, staff reported that the MSSE in their facility was “underutilized” because it “had become ‘invisible’ to them and they tended to forget about its presence” (p. 556). After a series of educational sessions and further opportunity to use the MSSE with patients, the researcher conducted focus groups to reassess staff views of the program. These results indicated that the MSSE allowed staff to see their patients in a new way and with more depth as individuals; that the MSSE made staff feel empowered (“I felt that I was actually contributing to the patients’ welfare”); and that care given outside of the MSSE became richer as a result of the first two findings because relationships between residents and caregivers had been strengthened (Hope & Waterman, 2004, p. 557).

2.4.2. Reports of positive outcomes and barriers. Cox and Burns (2004) deliberately included staff perspectives in their research as a qualitative arm using person-to-person interviews with only six staff members. Major findings include a reluctance of residents to enter the MSSE independently and even to handle certain MSSE stimulation items at first; the utilization of the MSSE by staff as a resource for relaxation during a stressful day; positive indications of enjoyment from residents; and improved relationships with residents (Cox & Burns, 2004). A similar focus group from Anderson’s research identified lack of time and competing priorities as barriers to MSSE use, as their facility required staff to accompany residents into the

MSSE (Anderson et al., 2011). Anderson's group, like Hope & Waterman's staff, also reported improved relationships with residents and positive reactions from residents, although other staff members also reported discomfort with the concept of interacting with residents socially in the MSSE (Anderson et al., 2011; Hope & Waterman, 2004). Minner's outcome study echoed barriers regarding staffing levels but also better collaboration between nursing ranks in identifying opportunities for residents utilizing the MSSE (2004). Staff feedback from the work by Baillon and team had to do with variability in resident response to MSSE as discussed above (Baillon et al., 2005).

One of the few articles in the scholarly literature dedicated to staff perspectives does not apply to this review because the MSSE intervention was integrated into 24-hour care throughout the facility, not implemented as a distinct room (Van Weert et al., 2003). None-the-less caregivers in that study shared similar concerns such as lack of time, as well as similar benefits such as better team problem-solving among staff and improved relations with residents (Van Weert et al., 2003).

2.4.3. Feedback outside of this review. In an informal report of a MSSE intervention nurse Chris McKenzie (1995) reported that the "staff are enjoying the one-to-one therapeutic relationship with elderly mentally ill residents in a restful and stress-free situation" (p. 13). Morrissey (1997) references a study excluded from the formal portion of this review because it was published in German, not English: "Bloemhard (1992) proposed that Snoezelen helped to reduce staff burn-out, since it provides a pleasant way in which to work with severely impaired patients in

addition to dealing with basic nursing tasks such as incontinence, bathing and feeding...and to interact with patients who are severely impaired and may be no longer able to understand or respond verbally” (p. 39).

2.4.4. Argument for researching staff perspectives. As the literature suggests, there seems to be a growing enthusiasm for the use of MSSE in dementia among a small American and much wider international contingent of dementia care providers. Nevertheless the evidence base remains weak and incomplete. The large numbers of current and future dementia sufferers, and the agitation and behavior challenges this disorder is known to present, suggests an opportunity for CAM treatments warranting further investigation into MSSE intervention. Although a few studies have conducted focus groups or interpersonal interviews to gauge staff responses to MSSE interventions, there are no studies that focus on this question as a primary objective.

A dedicated inquiry into the perspectives of caregivers is warranted by the consistent, close contact and interaction between dementia patients and caregivers, the ease of communication from most caregivers, and the difficulty of assessing communications and responses from patients. In addition, a format in which caregivers can express their views anonymously had not been previously employed as studies had relied on focus groups and interviews, potentially inciting bias. Based on the preceding findings and the theory of King’s middle range theory of goal attainment, it was hypothesized that staff perceptions, anonymously assessed, would support the use of MSSE for agitation and negative behaviors among moderately-to-severely demented elderly patients in residential care.

Chapter 3: Methods

3.1. Research Design

This study employed an anonymous survey design to investigate staff perceptions of the effects of an open access MSSE on episodes of agitation and negative behaviors in elderly dementia patients. For the purposes of this study, the operational definition of the term “negative behaviors” encompasses restlessness; wandering; perseverating or evidence of such; yelling/screaming; attempts to leave the facility or verbalization of such; delusions or hallucinations; conflict with residents or staff; irritability or outbursts of anger; sadness or episodes of crying; fearfulness or anxiety; persistent comfort seeking; and episodic heightened confusion.

3.1.1. Setting. This research was conducted in an assisted living facility with a secure residential dementia care unit for elderly patients with moderate to severe dementia of various types, located in Vermont and hereafter referred to as the *dementia care unit* (DCU). The MSSE was a discrete room approximately 12' x 12' created by the facility in June 2014. The MSSE was located along a main hallway within the DCU and was open for easy access 24 hours daily as the door was removed from the doorframe. It contained a range of features for multisensory stimulation including visual, auditory, olfactory and tactile. The visual stimulation included handheld toys of colored bubbles and moving sand; simple abstract artwork; soft indirect lighting provided by floor lamps; and a deep forest green wall color different from the creamy yellow color of the rest of the unit. Auditory stimulation was provided by a sound machine playing a variety of sounds from nature such as waterfall and ocean waves.

Olfactory stimulation was provided by eucalyptus stalks. Tactile stimulation was provided by soft, furry fabric swatches on the arms of the overstuffed chair and sofa.

At the time of inception, the facility provided a brief in-service to staff about the MSSE as an addition to the facility's established activities program. In-service covered the features of the MSSE and widely inclusive guidelines for use including pleasurable leisure opportunity, family visits, staff respite, or emotional consolation of a distressed resident.

3.1.2. Subjects and sampling strategy. A purposive sample of 20-35 staff members of the DCU were eligible for the study. This range was loosely estimated at the outset of the study, given that the facility employed a number of college student and per diem employees whose availability fluctuated. Inclusion criteria required the ability to read English and write survey responses, as well as active employment status in nursing or management/administration at the DCU at the time of survey administration. Exclusion criteria were comprised of the inability to read English or write survey responses, inactive employment status at the facility, or lack of consent. Response or participation rate among the target groups was estimated at 50% or better. All procedures complied with the current Health Insurance Portability and Accountability Act (HIPAA) recommendations.

3.1.3. Procedure. This research was pre-approved by the Institutional Review Board (IRB) at the University of Vermont Medical Center, formerly known as Fletcher Allen Health Care. DCU management provided written consent for research to be conducted at the facility as evidenced by a letter of attestation submitted to the IRB.

The survey process was initiated after the MSSE had been initiated for use in the DCU for approximately 10 weeks. Staff members meeting inclusion criteria were invited to complete the anonymous survey at the start or end of their regularly scheduled shift. An informative document approved by the IRB was be furnished to participants prior to the survey document. Staff were permitted to ask questions and to discuss the process with one another prior to beginning the survey. Completion and submission constituted consent for participation in the research study, clearly stated on the information sheet and on the survey (Appendix B). The first page of the survey collected brief demographic data from each participant; the remaining pages of the survey contained content area questions. The survey was deposited into a container upon completion to ensure anonymity of responses and the data was maintained off-site from the DCU facility by the PI. After collation of responses, aggregate results were provided to the DCU.

3.2. Measures

3.2.1. Instrument description. The survey tool was specifically created for this study by the PI. Other studies have frequently used qualitative methods for soliciting staff feedback on MSSEs, necessitating the original creation of a quantitative measurement tool for this study. It was entitled The Quiet Room Survey to reflect this particular sample's usual term for the MSSE in their setting; it is referred to in this document as the MSSE Staff Appraisal Survey (MSSE-SAS). The survey began with seven brief questions related to sample demographics that cover job title/type, employee age range and gender, length of time employed and status of employment

(i.e., full-time, etc.) typical shifts worked, and whether or not the employee had experience with a similar environment at another facility.

The survey contained 35 content questions designed to elicit a single answer. Responses are based on a Likert-style scale in which the options are listed in descending order from high positive to low negative with a neutral option in the middle, and an opt-out “don’t know” option at the end of the list to help ensure that questions may be unanswered but not entirely missed by the participant.

A subset of content is designed to elucidate how and often the MSSE is used, value of the MSSE for residents and staff, and to lend a minor degree of clarity to factors impacting care for residents of the DCU. Four questions assess the degree of use of the MSSE for all purposes (Items 1, 4-5, 10). Two questions assess whether the MSSE is perceived as a benefit to staff and residents (Items 33-34). One question assesses whether the employee believes the MSSE should remain in use or be dismantled (Items 35). This subset addresses the level of employee support for the MSSE to remain a part of the activities program at the facility.

3.2.2. Content validity literature review. The subject matter of the content questions is amalgamated from the prior studies presented in the literature review as a preliminary measure of content validity. The Likert response structure follows the example of the Interact scale, a tool with demonstrated reliability and validity when used with the dementia populations, created from scales used by Dutch researchers in evaluating Snoezelen environments (Hope, Easby & Waterman, 2004). Of the content

questions, two questions assess the estimated proportions of residents who appear to enjoy or dislike the MSSE (Items 2-3). Three questions address whether the MSSE is perceived as stimulating or quieting to residents, and if it has a general effect on their mood whether better or worse (Items 7, 8, 6 respectively). These concepts were also studied by Hope (1998) using the Interact scale and assessment of stimulation and discussed by Cox et al. (2004). One question assesses variability in resident response (Item 9) as discussed by Van Diepen et al., (2002). One question assesses perceived utility of the MSSE for residents in pain or physical discomfort, as these may be factors in the origin of agitation and negative behaviors (Item 19) Lape (2009). Similarly, one question assesses the MSSE's perceived utility for sleep issues (Items 20), measured by Maseda et al. (2014) and Hope (1998). One question asks the perceived likelihood of residents who are agitated or displaying negative behaviors to enter the MSSE whether alone or accompanied by others (Item 32); this question addresses findings by Hope (1998).

3.2.3. Agitation and negative behavior items. The various subscale questions assess agitation and negative behaviors directly. Three questions broadly assess for delusions and hallucinations, studied by Maseda et al. (2014) using the Neuropsychiatric Inventory-Nursing Home (NPI-NH) to screen characteristics of dementia including mood, for patients in residential care (Items 23-25). Three questions assess perseverating and related behaviors (Items 17, 26, 28); these questions were based on findings from behavior observation and focus groups by Anderson et al. (2011). Two questions address heightened confusion (Items 16, 27) (Baillon et al.,

2005). Three questions assess wandering and related activity (Items 18, 22); these are based on the Interact-During instrument used by Baker et al. (2003); case observations by Lape (2009); and behaviors studied by Ward-Smith et al. (2009). Five questions assess moods including sadness, anger, anxiety, general restlessness, and boredom (Items 11-15). These are modeled on the Interact-Short used by Baillon et al. (2005) that identifies mood categories of sad/tearful, fearful/anxious, perplexed, and bored. The Affect Rating Scale (ARS) used by Cox et al. (2004) identifies many of these same mood states. Many other studies included these categories as well such as Maseda et al. (2014); Lape (2009). Two questions assess interpersonal conflict (Items 21, 29) (Anderson et al., 2011). One question addresses resistance to care (Item 30). One question assesses yelling/shouting (Item 31), tracked by Ward-Smith et al. (2009) and other studies as well. The Cohen-Mansfield Agitation Inventory (CMAI), a reliable and validated tool that specifies agitation behaviors, was used by Baillon et al. (2004), Van Diepen et al. (2002), and Maseda et al. (2014) and influenced the content questions of MSSE-SAS through these works.

3.2.4. Expert panel. Once created, the MSSE rating scale was reviewed by an expert panel for face validity. This panel included an APRN with experience in geriatric care; an RN and Director of Nursing for a dementia care unit with decades of caregiving experience; a psychiatrist working in an elder care and memory loss facility; and an epidemiologist. Alterations were made based on recommendations and scope of research.

3.2.5. Readability. The survey tool was created in Microsoft Word and tested using this software's readability function. According to the program's parameters, documents intended for broad audiences of adults should minimize the use of passive sentences; should aim for a value above 60-70 on the Flesch Reading Ease index; and should aim for a U.S. reading grade level of 7th-8th grade. This scale had 12% passive sentences, a Flesch Reading Ease scale of 74.8, and a Flesch-Kincaid Grade Level of 5.9. A full copy of the scale is included in Appendix A.

3.2.6. Reliability. As previously noted, the survey questionnaire used in this study of staff perceptions is a novel tool developed by the PI. As such, it does not carry pre-established reliability. Of the three key facets of reliability, internal consistency was selected as the most important in this study. Equivalence measures were not employed because the data collection, tabulation and interpretation did not involve observational data or highly subjective processes such as data extraction or coding qualitative findings.

3.2.7. Rejection of test-retest. Although test-retest reliability could have been employed as a measure of stability, Polit and Beck (2012) warn that "attitudes, knowledge, perceptions, and so on can be modified by experiences between testings" (p. 333). When part of the sample pilot tests the data collection tool, responses can be "influenced by their memory of initial responses, regardless of the actual values the second day," resulting in "spuriously high reliability coefficients" (p.333). Additionally, "people may actually change *as a result of* the first administration" (italics theirs), or may "find the process boring on the second occasion" in which

“haphazard” responses could create “a spuriously low estimate of stability” (p. 333).

The number of eligible potential participants depended on the number of employees of the DCU per the eligibility criteria, a group known to be diminutive at the outset of the research study. Due to this low number, test-retest reliability was sacrificed because of the risk of contaminating the study data with responses tainted by second administration pitfalls as named above. As few as one or two surveys affected by any of these factors may have significantly altered the survey results.

3.2.8. Internal consistency. Given the exclusion of equivalence and test-retest reliability, internal consistency is the most significant measure of reliability for this survey tool. By design, most concepts tested within the questionnaire were covered by multiple items to lend accuracy to the assessment of staff perceptions around these concepts thereby enhancing reliability. Coefficient alpha, also known as Cronbach’s alpha, was calculated for certain items and subscales to gauge the ability of the survey questionnaire to measure certain attributes. The full questionnaire is analyzed in sections; Use (Items 1, 4, 5, 10, 32); Level of Benefit (Items 2, 3, 33, 34, 35); and Agitation and Negative Behaviors Subscale (Items 11-31). The latter is further divided into subscales: Psychotic and Physical Symptoms (Items 19, 20, 23, 24, 25); Anger/Conflict (Items 11, 21, 29, 30, 31); Anxious/Confused (Items 13, 14, 16, 18, 27); and Perseverating (Items 12, 17, 22, 26, 28). Alpha values are presented in Table 2.

3.3. Data Analysis

Descriptive statistics were employed to discuss characteristics of the sample of DCU staff such as gender, age range, job title, and other questions. As the survey

measures staff perceptions in a quantitative format, content questions were evaluated using univariate and bivariate descriptive statistics including means, percentages and contingency tables. Subgroup analysis was performed on some aspects of the data considering full-time versus part-time workers, day shift versus evening/overnight workers, and nurses versus licensed nurses assistants/resident care attendants (LNA/RCA) staff. Some elements were excluded from subgroup analysis: gender, as only one male returned the survey; term length, due to a high degree of homogeneity; age of respondent due to diminutive sample size; ethnicity was not assessed.

Inferential statistics were used to test differences in scores among subgroups of staff on the total scale and subscales using *t*-tests not assuming equal variances. Spearman's rho was calculated for respondent age versus total survey score. Item-total correlations were computed using SPSS statistics software to evaluate effects of item inclusion and deletion. Bar graphs, contingency tables and frequency distributions are used to clarify data using figures.

Chapter 4: Results

4.1. Response Rates and Sample Characteristics

Efforts at data collection were extremely successful. The survey questionnaire was administered to staff after the MSSE had been in use in the facility for a little over 10 weeks. The original pool of potential participants contained at least seven additional staff members who were unable to participate in data collection; six of these did not meet the criteria of active employment status and the seventh was not available to complete the survey during the data collection period. Of 29 staff members presented with the opportunity to participate, 23 returned a completed survey or 79%. However, one person answered “Don’t Know” to every survey item; therefore the survey was excluded from the sample. This brings the total number of surveys to 22 for a response rate of 75.8%, a rate that far exceeds typical survey research response rates.

4.1.1. Age and gender. Sample characteristics are summarized in Table 1. As anticipated, the sample was overwhelmingly female with 21 out of 22 participants or 95%, reflective of longstanding nursing workforce demographics. Within this sample 59% of participants were under the age of 40 years and 41% over; of those over 40 years the majority were between 50 and 59 years.

4.1.2. Expertise. By skill level, LNAs and RCAs comprised the majority of the sample at 73%. As clarification, LNAs hold a nursing license granted by the State Board of Nursing after completion of an approved educational course, whereas RCA is a term used to denote unlicensed nursing assistants who received their training from the facility itself. The facility employs only 5 nurses in the DCU, either Licensed

Practical Nurses (LPNs) or Registered Nurses (RNs); therefore all five eligible nurse survey participants returned the survey. This pattern reflects the supervisory and advanced care duties of the single nurse on each shift who oversees a team of LNAs and RCAs. Of note, only one participant designated him/herself in the “Management/Administration” category, although others were approached who could have identified with this subset. Of the 22 total participants, 12 staff or 55% reported full-time status, while six (27%) reported part-time status and four (18%) reported per diem status.

4.1.3. Shift work. The sample represented both day shift workers and evening shift workers fairly evenly, with 10 staff or 46% typically working day shifts and eight staff or 36% typically working evening shifts. Due to the fact that staffing needs are lower when residents are sleeping, only three (14%) of the sample called themselves overnight shift workers. Of the six (26%) staff who reported that their usual schedule was comprised of mixed shifts, three of these indicated that their usual shift is evening but they also work days; these were counted as evening/overnight staff. The fourth indicated his/her usual shift is days but also works evenings; this person was counted as a day shift worker.

Table 1: Demographic Characteristics of the Sample

Characteristic	<i>n</i> = 22	% of <i>n</i>
Gender		
Female	21	95%
Male	1	5%
Age (years)		
< 20	0	0%
20-29	6	27%
30-39	7	32%
40-49	2	9%
50-59	6	27%
60-69	1	5%
> 69	0	0%
Job Title		
LPN or RN	5	23%
LNA	7	32%
RCA	9	41%
Other	1	5%
Employment Status		
Full-time	12	55%
Part-time	6	27%
Per Diem	4	18%
Usual Shift		
Day	10	46%
Evening	8	36%
Overnight	3	14%
Mixed Shifts	6	27%
Employment (years)		
< 1	4	18%
1-2	10	46%
3-5	3	14%
> 5	3	14%
Didn't Answer	2	9%
Prior Work w/ MSSE		
Yes	3	14%
No	16	73%
Not Sure	2	9%
Didn't Answer	1	5%

Note. RN-Registered Nurse; LPN-Licensed Practical Nurse; LNA-Licensed Nursing Assistant; RCA-Resident Care Assistant. % are rounded.

4.1.4. Relevant experience. Survey participants were asked to write in the amount of time they had been employed at this facility. The whole group average was 2.57 years and the majority of the sample, 14 staff or 64% had worked there less than 2 years. Three staff (14%) had 3-5 year tenure and three staff had worked for the facility for over 5 years (14%). This question was left unanswered by two staff members (9%). Not surprisingly, 73% of the sample reported that they had never worked at a dementia care facility that had utilized an MSSE or similar concept. As discussed in the literature review, MSSEs require space, training and resources, and their use represents a relatively new concept in dementia care; therefore the sample has little prior experience as a group.

In summary, the majority of the sample of 22 participants was largely comprised of female nursing assistants under age 40 working day or evening shifts with less than 2 years' tenure at the facility and no prior experience working with an MSSE.

4.2. Total Scores and Utilization

4.2.1. Total questionnaire results. Data for the survey results can be found in Table 2. If all questions are scored as high as possible in favor of the MSSE, the maximum possible score is 175 points and the lowest possible score is 0. As a point of clarification, "Don't Know" responses were coded as zero and therefore neither adding nor detracting from findings, while "Strongly Disagree" responses were coded as 1. One survey was excluded on the basis that it had been scored "Don't Know" for all of the 35 items, essentially offering no assessment of the MSSE on any dimension. The

highest achieved rating was 148; the lowest rating was 35. The mean score for the full scale was 98.3; standard deviation of 36.64, showing high degree of variability in scores on this scale. Cronbach's alpha for the full scale was .948.

Table 2: MSSE-SAS and Subscale Analysis

Scale	Max Possible Points	Mean	<i>SD</i>	Min Value	Max Value	Cronbach's Alpha
Total Questionnaire	175	98.3	36.64	35	148	.948
Subscales:						
Utilization	25	14.9	6.35	0	24	.809
Agitation & Negative Behaviors	105	56.9	22.6	20	87	.915
Anger/Conflict	25	14.0	6.82	0	25	.801
Anxious/Confused	25	16.1	6.14	2	25	.821
Perseverating	25	14.1	6.53	6	24	.777
Psychotic & Physical Symptoms	25	10.1	6.16	0	25	.709
Level of Benefit	25	15.3	6.06	0	25	.769

Note. *SD* = standard deviation of the mean.

Scores are represented graphically in Figure 1. With this diminutive sample size, a dichotomous scheme is used in evaluating whether total survey scores are more positive than negative or vice versa. The midpoint is set at a score of 105. This point represents the value of all questions if they are scored at the midpoint or higher, that is at “Neither agree nor disagree” for 3 points; “Agree” for 4 points; or “Strongly Agree” for 5 points. Any question scored at this level indicates that the respondent does

not appear to disagree with the item. As the graph illustrates the bulk of total scores fall within 105-140, from a mildly to moderately positive assessment (all-inclusive of utilization, effectiveness for agitation and negative behaviors, and level of benefit overall) from 11 respondents or 50% of the sample. One respondent scored a strongly positive rating of 148, for a total of 12 staff of 55% in the positive range. Therefore 10 staff or 45% are within the negative range.

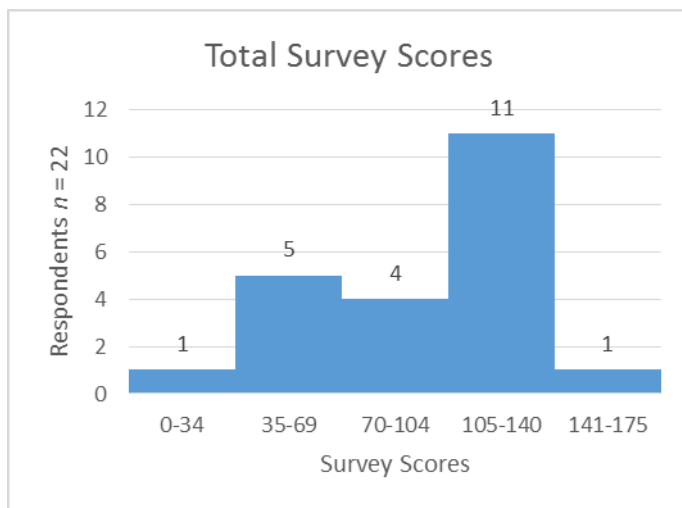


Figure 1: Frequency of the MSSE-SAS Total Scores

In subgroup analysis, full-time employees had higher MSSE scale scores than part-time/per diem employees at the 5% significance level ($p = 0.017$). The mean score for full-time employees was 115.3 versus the mean for part-time/per diem staff at 80.0. Spearman’s rho was .906 representing a positive correlation between respondent age and higher total scores on the MSSE questionnaire.

4.2.2. Degree of utilization. The first research objective was to evaluate how staff perceive residents’ utilization of the MSSE using a five item subscale. Of 25

possible points, utilization had a mean score of 14.9 and Cronbach's alpha of 0.809 as shown in Table 2. Item 1 inquired about an estimate of how many residents had been in the MSSE in increments of 25%; eight respondents or approximately 36% of the sample felt that at least half of the 16 residents had spent time in the MSSE. Another seven respondents or 32% felt that ¼ of the group, or about four residents had spent time in the MSSE; a third group of seven respondents replied "Don't Know." When asked in Item 5 about staff's frequency of use with residents for any purpose, 10 staff or 46% of the sample estimated use at "Very Frequently" or "Somewhat Frequently," while half as many, five staff or 23% estimated use at "Very Infrequently" or "Somewhat Infrequently." A majority of survey respondents felt that residents were both using the room independently (Item 4) and using it for leisure purposes (Item 10), as fully 16 respondents or approximately 73% of the sample indicated "Strongly Agree" or "Agree" for each of these queries. Specific to agitation and negative behaviors, 14 participants or about 64% of the sample felt that "residents who are agitated or in some sort of bad mood" are "very likely" or "somewhat likely" to enter independently or follow staff into the MSSE. In subgroup analysis, there were no statistically significant differences between nurse and LNA/RCA responses, nor between day and evening/overnight shifts. However, in two-tailed *t* testing not assuming equal variances, full-time employees were more likely to rate the use of the MSSE at a higher level than part-time/per diem employees ($p = 0.007$). The group mean for full-time employees was 18.3 versus 10.8 for part-time employees.

4.3. Agitation and Negative Behaviors Results

The second objective and the bulk of the survey were designed to evaluate how staff perceive the effects of the MSSE on residents' moods and emotional states, specifically to agitated and negatively affected states. To this end, 21 questions regarding agitation, sadness, anxiety, restlessness, wandering, pain, sleep disturbance, perseveration, and psychotic symptoms were included to investigate moods, behaviors, and contributing factors. Of the total sample 46% scored "Strongly Agree" or "Agree" on the combined item set, and a group of equal proportion scored "Neither" or "Don't Know."

Results of this subscale are portrayed graphically in Figure 2. Using a similar scenario to the total survey scores, a midpoint for the Agitation and Negative Behaviors subscale is calculated at 63, the point value if all 21 items of the subscale are scored at level three or higher ("Neither," "Agree," or "Strongly Agree"). As the graphic represents, nine of the respondents or 41% scored a mildly positive or higher response, while 13 or 59% scored mildly negative or worse. Cronbach's alpha was 0.915, yet with 105 maximum possible points the subscale mean was 56.9. Due to the diverse conceptual underpinnings, this scale was further analyzed as four distinct subscales: Anxious/Confused; Anger/Conflict; Perseverating; Psychotic & Physical Symptoms. In this parsed analysis, Item 15 for boredom was excluded as it did not clearly correlate with any of the four conceptual subscales. In subgroup analysis via *t* test, there were no statistically significant differences in response between groups among full-time versus

part-time/per diem, day shift versus evening/overnight, or nurse versus LNA/RCA for the Agitation and Negative Behavior subscale.

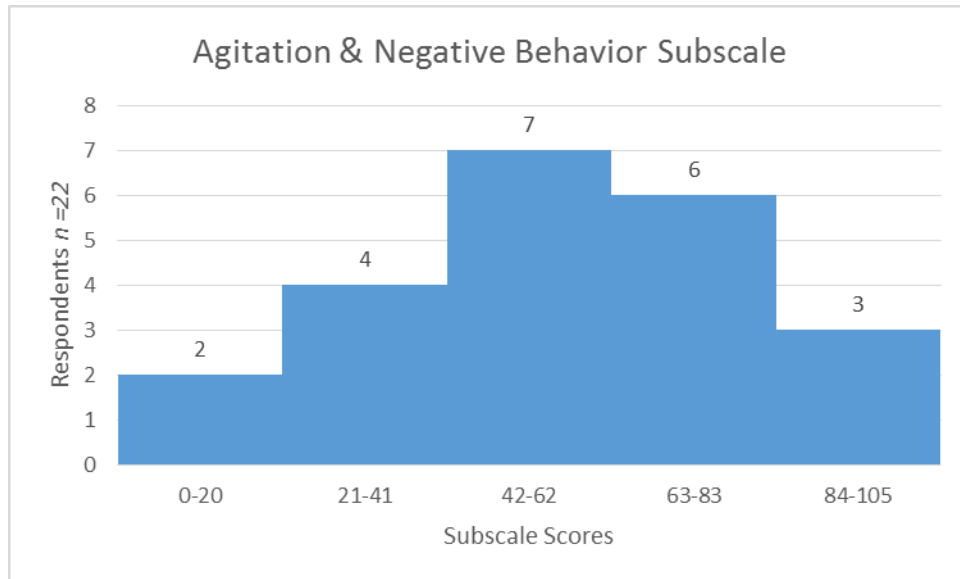


Figure 2: Frequency of Agitation Subscale Scores

4.3.1. Anxious/confused subscale. This subscale had the highest mean score of the four scales comprising Agitation and Negative Behaviors. Five items inquired as to effectiveness of the MSSE with residents who are “anxious, fearful or afraid” (Item 13); “restless or unable to relax” (Item 14); “feeling puzzled, perplexed or confused” (Item 16); “trying to leave the facility” (Item 18); or “unsure or don’t know where they are” (Item 27). The scale mean was 16.1 out of 25 possible points with Cronbach’s alpha of 0.821.

4.3.2. Perseverating subscale. This subscale inquired about sadness (Item 12);

“focus on one thought or question” repeatedly (Item 17); “pacing/walking compulsively” (Item 22); “pre-occupied by looking for objects or people” (Item 26); “following staff/clinging to staff” (Item 28). Of 25 maximum possible points, the scale had a mean of 14.1 and Cronbach’s alpha of 0.777.

4.3.3. Anger/conflict subscale. This subscale inquired as to effectiveness with residents who are “angry, mad, or irritated” (Item 11); “having conflict or arguing with another resident” (Item 21); “reacting poorly to a caregiver” (Item 29); “refusing care” (Item 30); and “yelling/shouting” (Item 31). The subscale’s mean was 14.0 with a maximum 25 possible points. Cronbach’s alpha was 0.801.

4.3.4. Psychotic and physical symptoms subscale. Pain and sleep disturbance were briefly assessed by one item each (Item 19 and Item 20 respectively), as these physical needs may play a role in agitation and negative behaviors for some dementia patients as discussed in the literature review. Seven staff or about 32% agreed that the MSSE may help with sleep disturbance and although five staff or 23% agreed that it may help with pain, an equal number disagreed. Descriptively, across the total group more participants indicated “don’t know” over any other response category for these two items, at eight or 36% (pain) and nine or 41% (sleep).

The pain and sleep items comprised the psychotic and physical symptoms subscale together with three items assessing visual and auditory hallucinations (Items 23 and 24) and delusions (Item 25). As the lowest scoring subscale, this collection of 25 possible points had a mean of 10.5 and the lowest reliability coefficient with Cronbach’s alpha at 0.709. There were no statistically significant differences in

subgroup analysis for this subscale. In item-total analysis conducted for this subscale using SPSS there were no items that raised alpha more than .002 above .915 for the total scale.

4.3.5. Lowest and highest scoring items for the agitation subscale. In addition to the item-total analysis in the above paragraph, Item 15 for boredom was also the low scorer in the descriptive sense. About 41% or nine members of the sample “Disagreed” or “Strongly Disagreed” that the MSSE is helpful for boredom; it was also a bottom scorer for LNA/RCA, full-time workers, and evening shift workers. The worst scoring item across all groups was boredom, while day shift and part-time/per diem categories had no outstanding low scorers, and the five nurses had only one item greater than 60% agreement for low score, “following staff/clinging to staff.”

Regarding top performing items, many of the survey respondents indicated the MSSE made a positive impact on mood in descriptive analysis. Between 15 and 18 respondents, or 65-78% felt that the MSSE was a positive intervention for each of four items on anger, sadness, anxiety, and restlessness. These four items were top scorers for the total sample, and for LNA/RCA, full-time employees, and evening shift workers. The anger item was the only score greater than 60% for the five nurses; anger and anxiety were top scorers for the day shift; anger and anxiety were top scores for the part-time/per diem group. Statistically, in item-total correlation analysis, there were no items that caused alpha to fall below .905 when deleted.

4.4. Overall Impression

The third objective was to evaluate whether staff perceive the MSSE as an

asset to the overall setting, to their work, and/or to residents independently. Descriptive analysis considers Item 33 (benefit to residents), Item 34 (benefit to staff), and Item 35 (MSSE should remain or not). As Figure 3 shows, a majority of the staff felt the MSSE was a benefit to both staff and residents on some level. About 48% or 11 staff felt the MSSE was a major benefit to residents and nearly as many called it a major benefit to staff. However, eight staff or about 35% of the sample reported neutral answers, as in “neither a benefit nor a disadvantage” or “don’t know;” this group is only slightly smaller than the positive responders.

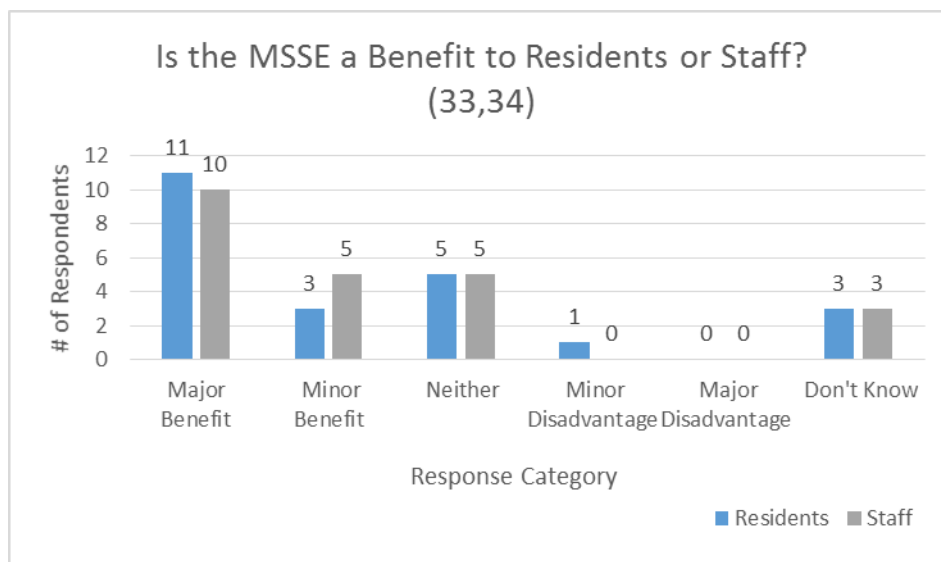


Figure 3: Frequency of Responses Regarding Benefit

The third item represented in Figure 4 asked participants to summarize their views in an executive decision about whether the MSSE should remain in operation on the unit or be dismantled or converted for a different purpose. A majority of 15

staff or about 65% of the sample indicated the MSSE should be continued on the DCU and an additional five or about 22% of the sample voted to continue it with some changes made; together these 20 staff members comprise 77% of the overall sample.

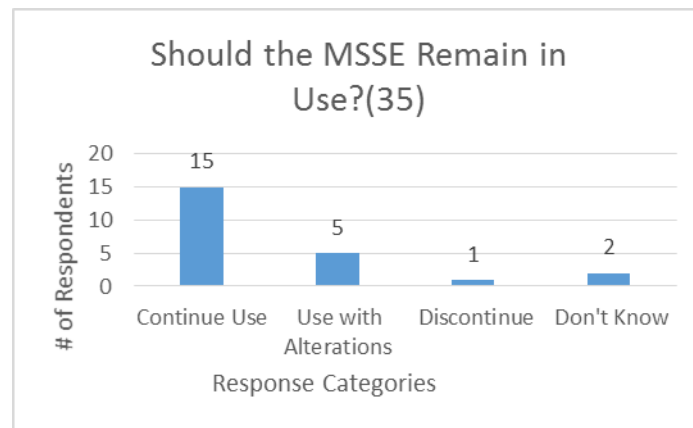


Figure 4: Vote to maintain or Dismantle the MSSE

4.4.1. Level of Benefit Subscale. In an effort to distinguish between feedback about the current level of utilization and the effectiveness of the MSSE for agitation and negative behaviors versus overall potential, five items comprised the level of benefit subscale. Items 2 and 3 asked for estimates of the number of residents who seemed to enjoy or disliked the MSSE out of the 16 living at the DCU. Items 33 and 34 asked respondents to classify the MSSE as a benefit or disadvantage for residents and for staff. Item 35 inquired as to whether the MSSE should continue to be utilized, continue but with changes made, or be discontinued. The subscale had a maximum possible rating of 25 points per respondent, a mean score of 15.3, and Cronbach's alpha of 0.769. In subgroup analysis, full-time employees were found to rate the Level of

Benefit higher than part-time/per diem employees ($p = 0.008$); the subscale mean was 18.4 for full-time and 11.5 for part-time/per diem. There was no statistically significant difference between day versus evening/overnight workers or nurses versus LNA/RCA.

4.4.2. Staff Input. The fourth objective was to encourage staff input regarding optimizing use of the MSSE as an intervention targeted at agitation and negative behavior. The survey questionnaire included an optional section for comments at the end of it; a complete list of comments is included in Appendix B. When asked to name the best thing about the MSSE, nine participants noted the sound effect machine, the color scheme, the relaxing or calming effect, and the change in environment. Conversely, the worst thing about the MSSE five participants noted that it was too dim or dark; that it was not used; that it still contained the fax machine for the DCU, and that it was too far from the common space.

The third question asked, “If I was in charge, this is what I would change,” to which eight participants indicated they would move the fax machine. Other responses were to add more lighting; encourage families to use it for visits or as a resource when visiting patients at the end of life; expose residents to the MSSE in a more structured way; and several noted they would deliberately incorporate it into the facility’s activities program. When asked how to improve the MSSE, six participants commented on adding satellite radio for calming music; adding activities that residents could engage without assistance; reinstalling the door; moving the location to a more centralized area; and increased staff training. At the close, a space labeled “Other Comments” prompted four participants to add further discussion largely concerning

the lighting and the level of use of the MSSE. These comments are represented verbatim in Appendix B.

Chapter 5: Discussion

5.1. Findings

The main outcomes of this study can be summarized in three main points. First, this study did not definitely assess whether staff felt the MSSE was being utilized frequently or regularly, as some items returned encouraging responses but others did not. Secondly, this study resulted in a mildly to moderately positive assessment of the MSSE on the overall scale considering use, agitation and negative behavior, and level of benefit; yet it resulted in only a mildly positive response to the effectiveness of the MSSE for agitation and negative behaviors. The MSSE was more strongly supported by full-time employees than other subgroups, and was felt to be more effective for anxiety type behaviors and less effective for psychotic symptoms and physical needs such as pain relief and sleep disturbance. Thirdly, this study suggested that although staff displayed a high amount of non-committal “Don’t Know” responses to agitation and negative behavior, it also responded overwhelmingly that the MSSE should remain in use at the DCU, perhaps with alterations. The majority of optional feedback comments address simple changes or issues that assume the MSSE will be maintained.

5.1.1. Reflections on study performance. There are many possible influences and factors that may inform the fact that the research did not more strongly support MSSE for agitation and negative behavior. Many of these are discussed in the Limitations section below. In addition, the methodology of the facility for implementing the MSSE may have impacted results. Staff were provided with a brief training in-service, but perhaps a more comprehensive training approach would

have encouraged higher utilization of the MSSE overall, thereby creating more opportunity for experiences that may have involved agitation and negative behavior. It is possible that if training had continued in small modules over the course of a few weeks, staff may have felt more comfortable in its use. Alternatively, if nurses and shift leaders had been trained from a leadership perspective in using the MSSE, care of residents over the course of a shift may have incorporated the MSSE more regularly and more deliberately for all purposes, including agitation. Another approach may have involved the scheduled activities program as a vehicle for encouraging utilization of the MSSE as multiple staff suggested in comments.

5.1.2. Relationship to existing studies. This study generally agrees with the existing research on this topic. The MSSE-SAS response, though not overwhelmingly supportive of the MSSE does successfully convey that many staff feel there is at least some benefit for residents experiencing agitation and negative behaviors. This finding agrees with the studies of resident observation and MSSE versus activity, reminiscence, or garden interventions that similarly suggested that MSSEs made a positive impact on agitation.

Regarding comparison to studies that specifically asked for staff feedback, this study was the first to employ a quantitative scale. The other researchers relied on interviews and focus groups, which communicated richly detailed but non-standardized evaluative statements. In comparison, this study also supports the MSSE, but without the emotionally inspiring statements from the other studies.

5.1.3. Cost. Important aspects of the MSSE intervention that often concern facility administrators is the cost of implementation, the use of space, and cost associated with the dedication of the space. In this particular DCU, the MSSE was created from a room approximately 12' x 12' and previously used as an office. The office space was moved to a separate, existing, non-residential space in the DCU and required the purchase of cubicle walls but did not require sacrifice of revenue-generating resident housing.

Preparation of the MSSE required payroll hours to clean out the office items, documents, and furnishings. Perhaps one of the larger components of the investment included the patching, priming, and painting of the walls. The maintenance team was also tapped for moving in the replacement furniture. The large furniture items included one short sofa, one armchair, two end tables, and one privacy screen; all of these items were obtained from stock furniture already owned by the facility, much of it donated by the families of previous residents. MSSE furnishings included artwork for the walls, handheld abstract manipulatives, a sound effect machine, soft fabric swatches, and dried eucalyptus. The total cost of these items was \$264.00. The facility would have incurred some degree of additional expenses if the fax machine, mentioned repeatedly in the optional feedback comment space, had been re-routed to another area. Regardless, it seems fair to posit that although companies specializing in MSSE and Snoezelen décor and equipment may charge several thousands of dollars to outfit an MSSE, a cost-conscious approach to creating the MSSE could limit the expense to

\$500-\$1,000 depending on the condition of the space to be converted. This is an unsought yet important finding of this study.

5.2. Limitations

5.2.1. Sample characteristics. The sample size was small, $n = 22$ and some of the inferential statistical calculations may be inappropriate for determining any significance, as the ratio of at least 10 subjects for each variable is desirable to make any generalizations (Munro, 2005). Several potential participants did not meet eligibility criteria at the time of data collection but had also not yet been replaced by new staffers. In addition, 64% of the sample had been employed at the DCU for 2 years or less. Although these numbers suggest a challenge for this facility in retaining staff members, it must be considered that the majority of the survey is comprised of LNAs and RCAs, which is often considered a stepping stone in the nursing profession to an advanced career level as LPN or RN. Staff members' prior experience employed at similar nursing care environments was not assessed; therefore some staff may have longer history of caregiving for dementia patients outside of this facility. A sample containing more nurses or more participants with longer stints of caregiving experience may have yielded more robust responses about the effectiveness of the MSSE. A larger sample may also have demonstrated more statistically significant differences between subgroups.

5.2.2. Lack of standardization. One limitation to this research is the lack of standardization regarding what an MSSE looks or feels like, how it is designed, how it is used, and how staff are trained to utilize it. Generalizability is limited because one

MSSE may look vastly different from another and have very different impacts at different DCU facilities.

5.2.3. Novel instrument. As detailed above, the MSSE-SAS was created expressly for this research by the PI. Although various strategies were deployed to enhance validity and reliability, this study represents the first application of this measurement tool and as such, issues with survey design were uncovered. For example, the response choice “don’t know” impacted the quality of responses by allowing participants to respond vaguely to a large number of items. Instruments that have already been deployed in multiple studies are often refined to eliminate problematic elements, and results produced can be evaluated in light of previous findings using the tool.

5.2.4. Subjective approach. This study design values staff opinions as highly important to evaluating the intervention; the successful use of the MSSE largely depends on whether or not staff believes the strategy is worthy of use with dementia patients. While staff perceptions are the primary interest, there is no objective data to inform the responses. Efforts to track traffic in the MSSE were not deployed due to privacy, adherence, and accuracy concerns, yet measurable indices such as this would have provided helpful context for survey results.

5.2.5. Indirect measurement of potential for patients. This study was intentionally designed to focus on staff perceptions of efficacy because staff are able to communicate reliably and there are few studies addressing staff feedback of this intervention. Although the design served its purpose, an additional component of

the research that could perhaps correlate this group of staff's experiences with an assessment of resident experiences may produce more definitive results.

5.2.6. High level non-indicative data. Each survey question allowed for a “don't know” answer choice at the close of the Likert scale. This choice was included to allow for an option if respondents felt uncertain about their true opinion of an item. It also helped to ensure that surveys could be completed more fully by letting respondents effectively state, ‘I intentionally skip this item,’ rather than leaving items blank and therefore introducing doubt as to whether the question had been missed. However, respondents chose the “don't know” answer selection much more than anticipated, as high as 30% or more in some cases. Although the response was coded as zero and therefore didn't impact the data, it drastically reduced the total number of meaningful responses in all subscales of the MSSE-SAS. As a result, the information is based on an even smaller pool of actual data than the small sample size already suggests.

5.2.7. Wide variability. Results demonstrate a wide discrepancy in responses as evidenced by standard deviation among mean scores. For example, the mean total MSSE-SAS score was 98.3, but the standard deviation was 36.64; the mean Agitation & Negative Behavior subscale was 56.9 and the standard deviation was 22.6. Though we are able to tabulate mean values, they are representative of cases that do not highly agree with one another because the standard deviation represents such a large proportion of the mean value. This variability may be improved by other factors

discussed here such as altering the response structure to exclude “don’t know” and lengthening the intervention period.

5.2.8. Intervention interval. The time between creating and assessing the MSSE may have been too short to produce truly informed responses. The MSSE was initiated in late spring 2014 open for use as a new feature of the DCU in June; the evaluative MSSE-SAS was circulated in September 2014. The 10 week period did allow opportunity for utilization of the MSSE by all shifts and by all staff members, including per diem employees. However, agitated and negative behaviors were perhaps not exhibited by residents every time a given staff member worked a shift, and it must be considered that each employee only works a portion of each week. To illustrate this point, Item 1 inquired about overall use in terms of how many residents had been in the MSSE. In this sample, 35% answered “don’t know,” suggesting they didn’t have enough experience to feel comfortable making an estimation; this substantial group may represent per diem employees who work infrequently and/or overnight shift workers who work when most residents are asleep. Although the number of residents who had spent time in the MSSE was estimated to be low, scores for Item 4, the degree to which residents used the MSSE and Item 5, for staff using the MSSE with residents scored more positively, and over half of respondents indicated that agitated residents would use, or could be led to using the MSSE (Item 32). A longer period from initiation of the MSSE to time of data collection would allow greater level of experience prior to rating the intervention’s efficacy; it also may have reduced the proportion of “don’t know” responses for the survey overall, thereby strengthening the data as staff

members felt comfortable committing to an opinion.

5.2.9. Potential sources of bias. In the selection bias category, this research sustained a type of loss to follow-up. The DCU experienced a high rate of employee turnover during the 10 week introduction of the MSSE. If the 75% response rate had held for the seven employees unable to participate, five additional surveys would have been completed, augmenting the sample size by 18-23% over its actual size of 22. Membership bias may also have impacted the results, as the sample was heavily skewed toward LNAs/RCAs and females. Reporting bias occurs when research participants under- or over-report for any reason. In this study, factors affecting ability to recall experiences with MSSE at the time of survey completion could have affected responses, or perhaps some participants did not wish to record negative responses and recorded “don’t know” instead.

5.3. Recommendations

Several alterations in design and scope may increase the quality of data and better evaluate the potential of the MSSE for easing agitation and negative behaviors. One simple strategy would be to lengthen the period of intervention. A multi-center scope could increase sample size and diversity of characteristics, perhaps with the inclusion of more nurses versus nursing assistants; it may also factor in diversity of MSSE design and use guidelines. A preliminary study might develop an MSSE protocol for specifying sensory elements, writing institutional level policies for utilization and developing staff training modules. These topics were named in the optional comments in this study and if addressed systematically, could help to

establish and grow the use of MSSEs in dementia care, creating more opportunities to evaluate efficacy. A longitudinal case-control study could track multiple outcomes between facilities that have an MSSE feature versus those that do not. A research design incorporating both objective and subjective data, as well as different perspectives on efficacy such as from family members and patients as well would provide a more complete view on whether staff members' assessment of efficacy is supported by other findings. Although some studies in the literature review incorporated some of these principles, small sample sizes often limit significance of the findings.

5.4 Significance to Theory and Nurse Practitioner Practice

In its completion, this research represents an application of Imogene King's nursing theory to nursing practice and to nurse practitioner-led nursing interventions. This study may serve to guide future researchers to investigate the impact of environment on patients, nursing staff, and nursing care. In addition, the MSSE-SAS tool may be used or adapted in further research examining the use of MSSEs in care of dementia patients.

This study demonstrates several competencies required for Advanced Practice Nursing, as listed below (National Organization of Nurse Practitioner Faculties, 2012, p.2-4):

1. Scientific Foundation Competencies: "Develops new practice approaches based on the integration of research, theory, and practice knowledge."

2. Leadership Competencies: “Advances practice through the development and implementation of innovations in incorporating principles of change.”
3. Quality Competencies: “Uses best available evidence to continuously improve quality of clinical practice.”
4. Practice Inquiry Competencies: “Provides leadership in the translation of new knowledge into practice.”
5. Health Delivery System Competencies: “Analyzes organizational structure, functions and resources to improve the delivery of care.”
6. Ethics Competencies: “Integrates ethical principles in decision making.”

The assessment of staff appraisal of efficacy of a trial intervention integrates these competencies regarding the improvement of nursing care based on evidence, ethics, and strong leadership.

5.5 Conclusions

MSSEs are one example of a non-pharmacological intervention that may help ease symptoms of agitation and negative behavior in patients with dementia. There are many factors that make this intervention difficult to evaluate, such as the vulnerability of dementia patients as a population; the investment of time, space, and staff training; concerns for proper use; variability in implementation. This study captured a mild to moderately positive review of the MSSE for agitation and negative behaviors and an enthusiastic response to this intervention for broader purposes. Additional research could clarify the potential benefit and specify best practice guidelines for

implementation. The growing prevalence of dementia in the United States and global populations necessitates continued innovation in care of these patients.

Appendix A

The Multi-Sensory Stimulation Room Staff Appraisal Survey

*By filling out and returning this survey, you are giving permission for your opinions to be used anonymously in a UVM research study.
See the Information Sheet for further details.*

1. The shift/time of day I usually work on the dementia care unit is (Choose the shift that you work most often):

Days Evenings Overnights

2. IF you frequently work more than one shift, please check one of the following combinations. *Please make sure you have also answered question 1 to show which shift you work more than any other.*

Both Days and Evenings Both Evenings and Overnights Both Overnights and Days

Some of All Three Shifts: Days, Evenings, and Overnights Does Not Apply To Me

3. My status is: Full-time Part-time Per Diem Not Sure

4. My job is (Check one; if you have two roles you may check both):

Nurse LNA RCA Activities Personnel Management/Administrator
 Other

5. Length of time I have worked here: _____

6. I have worked at another facility for dementia care that uses something similar to the Quiet Room: Yes No Not Sure

7. Please check the category that represents your age:

____ Less than 20 years old
____ 20-29 years old
____ 30-39 years old
____ 40-49 years old
____ 50-59 years old
____ 60-69 years old
____ More than 69 years old

8. Please check the category that represents your gender:

____ Male Female

Please choose ONE answer to each question.

1. The number of residents who have spent time in the Quiet Room is:
 All or almost all of the residents
 About $\frac{3}{4}$ of them (12 residents)
 About half of them (8 residents)
 About $\frac{1}{4}$ of them (4 residents)
 None or almost none of the residents
 Don't know

2. The number of residents who seem to enjoy being in the Quiet Room is:
 All or almost all of the residents
 About $\frac{3}{4}$ of them (12 residents)
 About half of them (8 residents)
 About $\frac{1}{4}$ of them (4 residents)
 None or almost none of the residents
 Don't know

3. The number of residents who seem to actively dislike being in the Quiet Room is:
 All or almost all of the residents
 About $\frac{3}{4}$ of them (12 residents)
 About half of them (8 residents)
 About $\frac{1}{4}$ of them (4 residents)
 None or almost none of the residents
 Don't know

4. Some of the residents enter the Quiet Room on their own, without being directed by staff or visitors.
 Strongly agree
 Agree
 Neither agree nor disagree
 Disagree
 Strongly disagree
 Don't know

Please choose ONE answer to each question.

5. For both leisure and problem-solving purposes, staff seem to be using the Quiet Room as a tool in caring for residents:
- Very frequently
 - Somewhat frequently
 - Neither frequently or infrequently
 - Somewhat infrequently
 - Very infrequently
 - Don't know
6. After spending time in the Quiet Room, residents' moods:
- Often improve or get better
 - Sometimes improve or get better

 - Sometimes get better, sometimes get worse, about half and half
 - Usually stay the same/no change

 - Sometimes get worse
 - Often get worse

 - Don't know
7. During or after time in the Quiet Room, some of the residents seem to become more lively, more energetic or more engaged in their surroundings
- Strongly agree
 - Agree
 - Neither agree nor disagree
 - Disagree
 - Strongly disagree
 - Don't know

Please choose ONE answer to each question.

8. During or after time in the Quiet Room, some of the residents seem to become calm, quiet or more detached from their surroundings.

Strongly agree
 Agree
 Neither agree nor disagree
 Disagree
 Strongly disagree
 Don't know

9. Individual residents respond differently to the Quiet Room at different times, sometimes in a positive way and sometimes in a negative way.

Strongly agree
 Agree
 Neither agree nor disagree
 Disagree
 Strongly disagree
 Don't know

10. The Quiet Room is sometimes used by residents as a leisure room or place to 'hang out,' alone or with other people.

Strongly agree
 Agree
 Neither agree nor disagree
 Disagree
 Strongly disagree
 Don't know

The Quiet Room is sometimes helpful for residents who seem to be...

11. Angry, mad or irritated:

Strongly agree
 Agree
 Neither agree nor disagree
 Disagree
 Strongly disagree
 Don't know

Please choose ONE answer to each question.

12. Sad, tearful, or depressed:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

13. Anxious, fearful or afraid:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

The Quiet Room is sometimes helpful for residents who seem to be...

14. Restless or unable to relax:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

15. Bored:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

Please choose ONE answer to each question.

The Quiet Room is sometimes helpful for residents who seem to be...

16. Feeling puzzled, perplexed or confused:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

17. Focused on one thought or question over and over:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

18. Trying to leave the facility or 'go home:'

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

19. In pain or discomfort:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

Please choose ONE answer to each question.

The Quiet Room is sometimes helpful for residents who seem to be...

20. Having trouble sleeping:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

21. Having conflict or arguing with another resident:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

22. Pacing/walking compulsively:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

23. Experiencing beliefs that are not true:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

Please choose ONE answer to each question.

The Quiet Room is sometimes helpful for residents who seem to be...

24. Seeing things that other people can't see:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

25. Hearing things that other people can't hear:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

26. Pre-occupied by looking for objects or people:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

27. Unsure or don't know where they are:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

Please choose ONE answer to each question.

The Quiet Room is sometimes helpful for residents who seem to be...

28. Following staff/clinging to staff:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

29. Reacting poorly to a caregiver:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

30. Refusing care:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

31. Yelling/shouting:

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

Please choose ONE answer to each question.

32. Residents who are agitated or in some sort of bad mood are:

- Very likely to enter or follow staff into the Quiet Room
- Somewhat likely to enter or follow staff into the Quiet Room
- Neither likely or unlikely to enter or follow staff into the Quiet Room
- Somewhat unlikely to enter or follow staff into the Quiet Room
- Very unlikely to enter or follow staff into the Quiet Room
- Don't know

33. For residents, the Quiet Room on this unit is:

- A major benefit
- A minor benefit
- Neither a benefit nor a disadvantage (neutral)
- A minor disadvantage
- A major disadvantage
- Don't know

34. For staff, the Quiet Room on this unit is:

- A major benefit in doing daily job duties
- A minor benefit in doing daily job duties
- Neither a benefit nor a disadvantage (neutral)
- A minor disadvantage in doing daily job duties
- A major disadvantage in doing daily job duties
- Don't know

35. At this facility, the Quiet Room should:

- Continue to be in use
- Continue to be in use but with some changes
- Not be used; turn the space into something else
- Don't know

END OF SURVEY

(continue to next page for optional comments)

OPTIONAL: You are not required to complete this section, but if you would like to provide more feedback please feel free. Please write on the back of this page if you need more space.

- a. The best thing about the Quiet Room is:
- b. The thing I dislike the most about the Quiet Room is:
- c. If I was in charge, this is what I would change about the Quiet Room:
- d. The Quiet Room could be improved by:

Other Comments:

Appendix B

Optional Comments Submitted

a. The best thing about the Quiet Room is:

“It is a great change of environment”

“Very welcoming, color is soothing”

“Feels like a living room”

“The sound machine”

“Offers a quiet, private setting where residents continue to be stimulated by textures, smells, and sounds that are calming”

“Change in atmosphere”

“Helping residents to calm down without medicine”

“It is relaxing for residents”

“Color & low lighting”

b. The thing I dislike most about the Quiet Room is:

“It is not used”

“Too dark”

“It is away from the common space- not always comfortable leaving people unattended”

“The room itself is dim but the bright light from hallway shines in”

“Having the fax machine in there”

c. If I was in charge, this is what I would change about the Quiet Room:

“Have residents enter and be routinely used so they could become more familiar with it”

“More lighting”

“I would incorporate it into activities, so that residents are normalized to the space & would be more apt to use it”

“More activities that could be used to engage/distract resident”

“I would like to see the Quiet Room be opened to family members to use in situations where their visit may not have gone well or as a place to have some privacy when a loved one has died or is actively dying (I would like to see family members using it with residents as well when needed but feel that it could also benefit them privately)”

“More activities maybe”

“Never to use it a place to punish residents”

“Put the fax in a different area”

d. The Quiet Room could be improved by:

“More central location to other activity spaces”

“Training staff in its use so it would actually get used!”

“Removing all things that are not a specific part of the room (i.e. copying machine).”

“Activities that residents could engage in themselves without an activities leader to occupy them without being in a group setting.”

“A door”

“Having a recliner and satellite radio for "calming music" if the resident chooses”

e. Other Comments:

“The Quiet Rom is darker than other environments. It seems like residents w/ dementia are disinclined to or less likely to enter dark areas...turning on/off lights is often a technique used to help guide residents to a given destination. I have never seen the Quiet Room used, either spontaneously or as part of a planned activity. Therefore, I don't know how it affects the mood /behavior of residents.”

“For the residents I have brought into the Quiet Room it has proved very effective in changing their mood or redirecting them, but it’s hard to generalize some of these statements because I have not brought all residents into the Quiet Room”

“The best thing about the Quiet Room is feels warming when entering the room, gives a place to feel good about yourself.”

“The Quiet Room could be improved by encouraging more residents to use it.”

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