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Sundowning Behavior and Nonpharmacological Intervention

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Abstract

Dementia patients commonly experience sundowning behavior which includes the following symptoms: restlessness, agitation, aggression, anxiety, swearing and confusion (NIH, 2013). Bachman and Rabins (2005) claim that in the U.S., 13% of dementia patients who experience sundowning behavior live in nursing homes and 66% live in community dwellings. Disruptive behaviors can burden caregivers and eventually institutionalize clients. The etiology of sundowning behaviors is unknown and there may be multiple factors such as, unmet physiological, emotional and psychological needs (NIH, 2013). American Psychiatric Association (APA) guidelines (2014) for the treatment of dementia recommend the use of psychosocial interventions to improve and maintain cognition, mood, behavior and quality of life. A literature review of sundowning behavior was conducted and focused on non-pharmacological management of sundowning behavior. The review included the following databases: CINHAL, Cochrane, PubMed and PsyhInfo dating from 2005-present. The literature review illuminated the effective use of music-based interventions for people with dementia, sleep education programs with light therapy, and behavioral management approaches to target unmet needs. There is substantial evidence that supports the use of the non-pharmacological interventions to decrease disruptive behavior, improve sleep disturbances, and improve the well-being for people diagnosed with dementia.

Introduction

There has been considerable progress treating dementia since it was first diagnosed in 1906 by Dr. Alois Alzheimer (Alzheimer’s Association, 2017). Major milestones include identifying the pathophysiology of the disease process, the amyloid and tau protein, the development of drugs and various biomarkers for the diagnosis. However, management of
behavioral symptoms of dementia continues to be a challenge for clinicians and staff caregivers. Late afternoon and early evening is most difficult for people diagnosed with dementia. Sundowning is a common behavior in dementia with an incident rate of 25% (Alzheimer’s Association, 2006). Moreover, this behavioral syndrome causes the following effects: caregiver distress and ailment, emergency department use, increase in social costs and early institutionalization for those suffering from dementia.

Changes in sleep are common in people with dementia and up to 50% nap during the daytime (Andrews, 2017). Changes in sleep and circadian rhythms lead to nighttime awakening, increased daytime napping and agitation or “sundowning” behavior. Behavioral management of sundowning is complex and requires a variety of non-pharmacological approaches including physical, emotional and environmental interventions. There are studies that found light therapy in the morning is beneficial for people with sundowning behavior to improve sleep quality and increase feelings of calmness. One popular non-pharmacological intervention used is music-based therapy for managing sundowning behavior and agitation. Music therapy has been found to effectively enhance cognitive function, reduce agitation and improved quality of life for people with dementia (Matthews, 2015). It is essential for Psychiatric Mental Health Nurse Practitioners (PMH-NPs) to consider management of sundowning behavior from a wide-range of perspectives including the use holistic approaches such as: music-based therapy, sleep education with light therapy, and behavior intervention.

**Purpose**

The purpose of this literature review is to increase PMH-NPs knowledge of managing sundowning behavior using nonpharmacologic methods to improve the quality of life of clients and family members. There has been increasing attention and funding for research on dementia
and the management of sundowning behavior syndrome. In 2011, President Obama signed the National Alzheimer's Project Act (NAPA) into law to address the "Alzheimer's crisis,” including research, care and support (Alzheimer’s Association, 2017). However, there are still reports of the high usage of antipsychotic medications in nursing homes for managing symptoms of sundowning behavior (Khachiyants, Trinkle, Joon Son, & Kim, 2011).

It is important for clinicians, including PMH-NPs, to have knowledge about managing sundowning behavior both pharmacologically and non-pharmacologically. In addition, they must be knowledgeable about how sundowning affects clients’ quality of life including sleep, mood and behavior. One practical guide for the treatment of people with dementia encourages the use of psychosocial interventions, such as targeting behavior, emotion and cognition (Rabins et al., 2014). For example, educating staff in nursing homes about sleep hygiene has been found to be successful in reducing aggressive behavior among dementia clients.

The literature review in this independent study provides definitions of key terms such as dementia, sundowning behavior, neuropsychological syndrome (NPS), nonpharmacological interventions, bright light therapy, and caregiver. This paper will provide evidenced based knowledge for PMH-NPs to provide holistic care to dementia clients, thus, effectively managing and preventing sundowning behavior.

**Significance**

In the United States, the number of people affected by dementia has risen to 5.2 million. The occurrence of dementia is also on the rise internationally (Epidemiology, 2016). Due to the increasing number of aging populations in the U.S, more PMH-NP’s are working with dementia patients. PMH-NPs will need to provide care based on nonpharmacological interventions and use multidisciplinary approaches. The use of pharmacological interventions in nursing homes has
been common for managing sundowning behavior for dementia patients, despite the Federal Drug Administration (FDA) guidelines that clearly state a higher risk of mortality associated with the use of antipsychotic medications (Zagorski, 2015). The use of antipsychotic medications can also affect a patient’s quality of life negatively. The FDA guidelines claim that the use of psychosocial interventions has tremendous benefits for clients and families decreasing the rate of institutionalization and creating a better quality of life (Zagorski, 2015). It is important for PMH-NP’s to have accurate information available for utilizing the best evidenced-based practices in providing holistic care in prevention of sundowning behavior. In addition, evidence supports long-term management approaches for behavior problems in dementia and guidelines stress the need to address the underlying causes of sundowning behaviors through psychosocial interventions to prevent and manage the disease (APA, 2014).

**Theoretical Framework**

Ann Whall (2000) developed the Need-Driven Dementia Compromised Behavioral Model (NDCBM), which is a framework developed to study and understand behavior associated with dementia diseases. It is common to see disruptive behavior in individuals with dementia such as agitation, wandering and irritability, especially in the late part of disease process which is a source of great concern for caregivers. This model challenges and changes the common view of sundowning behavior as disruptive behavior to viewing it as a behavior that communicates the unmet needs of clients (Whall, 2000). The NDCBM identifies factors that cause sundowning behavior, such as physical or social environment for anxiety for which nurses could develop individually tailored interventions (Whall, 2000). For example, when individuals with dementia are transferred to nursing homes, they may become restless, anxious or depressed. Looking at this phenomena through the lens of the NDCBM would warrant different responses and solutions.
from nurses and caregivers. Nurses aim to provide holistic care and meet biopsychosocial needs of clients and this model recommends a focused assessment of “entire aspects” of the situation for care to be effective and comprehensive (Whall, 2000).

**Definitions**

*Dementia*: “Dementia is a neuropsychiatric syndrome characterized by cognitive decline and progressive deterioration of daily function, often associated with behavior disturbances” (Abraha et al., 2017, p.1).

*Sundowning behavior*: “Sundowning is a composite of behaviors, including travel behavior, loud vocalizations, wandering, maladaptive behaviors, and physical aggression” (Bachman & Peter, 2006, p. 500). This is a clinical syndrome of disruptive behavior worse in the afternoon and evenings among people diagnosed with dementia.

*Neuropsychiatric syndrome (NPS)*: is the same as sundowning behavior which includes the following behaviors: agitation, aggression, wandering, hallucination and delusion.

*Nonpharmacological intervention*: This is a treatment for behavior and psychiatric syndrome that directly aimed at decreasing behavior and psychiatric syndromes by indirectly working with caregivers and the environment or interventions directly targeting clients to decrease the behavior (Grand et al., 2011).

*Bright Light Therapy*: “it is treatment used for people who suffer from circadian rhythm sleep disorder” (Sleep Education, 2017). Our body’s internal clock regulates sleep and wake cycle.

*Caregiver*: “someone who is responsible for taking care of another person” (Collin English Dictionary, 2017).
Process

For this Independent Study (IS), the following databases were utilized: UND Library, Harley E. French Library of Health Science and the Chester Fritz Library for the literature review on management and prevention of sundowning behavior. The database search resulted in a total of 15 articles. Additionally, other articles were included related to sundowning behavior and nonpharmacological treatments along with APA guidelines for this assignment.

Using CINAHL (Cumulative Index to Nursing Health and Allied Health Literature), a nursing specific database, to search terms like: “dementia and music” resulted 476 articles. Using filters, changing years, selecting peer review and English language resulted in 339 articles. There was one article on music therapy from RCT that was relevant and printed for review. Once the search terms were changed to: “music therapy AND dementia AND agitation” the search resulted in 49 articles and one article was printed for review.

In the Cochrane Review, the search term “music and dementia” resulted in 8 articles and one article was printed for review. While reviewing the Cochrane Review, the student also found several primary sources of RCT articles on music therapy and management of dementia. Using the school database, in the Chester Fritz Library, one article was printed on individual music therapy by using authors “Ming Hung Hsu.” A manual search using search term by authors name “ridder and music therapy and dementia” resulted in 183 articles and printed one articles on effects of individual music therapy for agitation in dementia, a randomized control trail.

Using PsyhInfo with search term “insomnia AND dementia AND bright light therapy” 30 articles were found, and two articles were printed on effects of light therapy for sleep in people diagnosed with dementia (a meta-analysis and RCT). Using the Chester Fritz Library,
manually searching “mcCurry sleep education dementia” resulted in 284 and one article was printed about evaluation of sleep education for people with dementia residing in Adult Family Homes.

One article from DynaMed Plus from EBSCO HEALTH, using the search term “dementia” was printed. Using the same articles systematic review resulted in links for primary articles in PubMed. Two articles were printed on non-pharmacological therapies in managing and preventing disruptive behavior in dementia. Manually searched terms by authors name “figueiro AND dementia” resulted in 26 articles and 1 article was printed about the effect of home-based light therapy for people diagnosed with dementia.

**Review of the Literature**

Dementia is a clinical syndrome with various causes and over time, a dementia client’s cognition, behavior, mood, social and emotional functions worsen. Per the Alzheimer’s Association, 1 in 3 seniors dies from Alzheimer’s or another type of dementia in the U.S. (Alzheimer’s Association, 2017). Pharmacological interventions have limited benefits and there is no cure for dementia. The 2014 APA guidelines for the treatment of dementia advocate the use of psychosocial interventions to improve and maintain cognition, mood, behavior and quality of life.

This literature review includes findings about non-pharmacological interventions for managing sundowning behavior, with the following recommended holistic approaches: the use of music-based intervention, sleep education programs with light therapy and behavioral interventions. In addition, this literature review includes current treatment methods and practice guidelines, and recommendations by the APA for managing dementia and behavior holistically.
Music Therapy

One of the most researched and reported non-pharmacological interventions for managing sundowning behavior is the use of music therapy. Music therapy includes both individual and group music therapy. For individual music therapy, therapists assess client’s abilities and experiences with music. Group music therapy allows for group interaction which benefits members from the combination of music and socialization. In active music therapy, clients play a musical instrument and sing. In passive music therapy, clients listen to music.

According to Ridder, Stige, Qvale & Gold (2017) agitation in the later stage of dementia causes significant distress to people with dementia and caregivers. In an experimental study done in Taiwan, patients above 65 years of age, diagnosed with dementia in nursing homes who have manifestations of agitation, participated in 30-minute individual music interventions, twice per week for six weeks (Lin, et al., 2010). There were 104 patients in the study, 52 in the experimental group and 52 in a control group by block randomization. The researchers used the Cohen-Mansfield Agitation Inventory (CMAI) to measure four categories: physically aggressive vs. nonaggressive and verbally aggressive vs. non-aggressive. The control group followed their routine activities. The researchers found a reduction in both physically and verbally aggressive behavior at the sixth session among all the participants (Lin et al., 2010). There was a statistically significant decrease in average score of agitated behavior in the intervention group when compared with the pretest at the 6th and 8th session follow up in the first month.

The intervention group scored 0.47 on average which lowered at the 6th session (P<0.001) and averaged 0.44 points lower in the intervention group compared to the pretest at the 8th session (P<0.001) and averaged a score of 0.47 lower when compared to the pretest at the first month follow up. This study highlighted that group music intervention can increase calmness,
relaxation and socialization in people with dementia. However, 58 patients (75.3%) were on antipsychotic medications, 41 patients were taking sedatives and 13 patients were on anticholinergic medications. Those variables influence the results of the study.

Another study by Raglio, Bellandi, Baiardi, Gionotti, Ubezio, Zannacchi, Granieri, Imbriani, & Stramba-Badiale (2015) evaluated the effects of music-based therapy for behavioral and psychological symptoms of persons with dementia. The study design was a randomized, controlled trial, conducted in nine cities in Italian care homes. There were 120 people diagnosed with dementia allocated into three treatment groups. Participants in the study were 65 years or older and diagnosed with dementia. Additionally, participants took the Mini-Mental State Exam (MMSE) and scored 18 or less. They also had a Neuropsychiatric Inventory (NPI) score of 18 or less; depression, agitation, anxiety or apathy NPI score of 6 or more, and were residents of the nursing home for more than 2 months. Exclusion criteria for this study were those with severe cardiovascular disease, respiratory and gastroenterology disease and had musical therapy treatment last year. Participants were randomized into three treatment groups: standard care with active music treatment, standard care plus listening to music, and standard care alone. Standard care plus active music treatment received 20 individualized 30-minute session, two times a week for 10 weeks. Groups listening to music therapy underwent 20 individualized, 30-minute sessions, twice a week for 10 weeks.

The study resulted in no substantial variations in behavior between the groups. All groups showed improvement in behavior, depression and quality of life. The NPI score fell by 28% in musical therapy, 12% in listening to music and 21% for the standard care group. Comparing this study to the Lin et al. (2010) group music intervention, which targeted only agitation and aggression, this study used music interventions and monitored not just a behavior,
but also depression and quality of life for people diagnosed with dementia. Depression is commonly diagnosed with dementia and this study can be considered important because music helps improve behavior and increases socialization. However, this study was conducted in nine Italian Nursing Homes, which followed structured interventions by a professional music therapist. Limitations of the study include difficulty implementing music therapy by caregivers who are community-dwelling people, because they lack skills of a professional music therapist.

In a study by Hsu, Flowerdew, Parker, Fachner & Odell-Miller (2015), researchers assessed the effectiveness of individualized music interventions to manage neuropsychiatric symptoms in dementia and their caregivers. The study included 17 care home residents and 10 staff randomized into an intervention group (music) and a standard care control group of both residents and staff. Results of the Hsu et al. (2015) study showed an increase in disruptive behaviors in the treatment group between 0 to 3 months before they started improving at 3 to 7 months. Overall, there was a significant difference between intervention and control groups for the level of disruptiveness and quality of life for residents. The significance of the study is the inclusion of staff caregivers into the study. Staff caregivers think musical interventions had a positive effect on residents, particularly mood and emotions. Staff caregivers also reported gaining more insight on residents, personal history, symptom cause and cognitive functioning. Music helped staff caregivers improve interaction techniques, helped them communicate better and improved the relationship with residents. The three studies by a Lin et al. (2010), Raglio et al., (2015) and Hsu et al., (2015) show that there is a trend that both group and individual music therapy helps improve behavior in individuals diagnosed with dementia.

Ridder et al., (2013) assessed the effectiveness of individual music therapy for agitation in people diagnosed with dementia and its effect on the use of psychotropic medication and well-
being of clients. This was a RCT study with 42 participants enrolled in a 14-week study. They assigned 21 to music therapy and 21 participants to standard care. Researchers measured agitation using the Cohen-Mansfield Agitation Inventory (CMAI) and quality of life Alzheimer’s Disease-Related Quality of Life (ADRQL). They also reviewed the use of psychotropic medications at baseline and at week 14. The study was completed in Norway and Denmark in 2010. Inclusive criteria included nursing homes with residents with severe dementia, diagnosis of dementia with symptoms of agitation. The majority of residents were female (69%), from Norway (76%), with an age ranging from 66-96 years-old.

Individuals in the intervention group received a minimum of 12 sessions of music therapy which lasted 33.8 minutes per session. Individual music therapy included listening to music, singing and dancing. The study found a slight increase in the agitation (CMAI) score (0.46) in standard care and agitation was decreased during music therapy (-2.96). A small effect size of 0.21 decrease in frequency of agitation in intervention group. The quality of life (ADRQL) decreased for standard care (-5.88) and increased during music therapy (10.42). The difference was not statistically significant (p=0.439). There were 15 (71%) participants in both the standard and music therapy groups were taking psychotropic medications. A total of 17 (40%) participants increased psychotropic use among standard care. Two (5%) participants in the music therapy group had reduction in use of psychotropic medications.

Although this study found positive responses to the music therapy with reduction in agitation in people with dementia compared to standard care, there was no increase in psychotropic use. Compared to studies by Lin et al. (2010), Raglio et al. (2015) and Hsu et al. (2015), this study found a decrease in psychotropic medications for two music therapy participants. The study is significant, since use of hypnotics and antipsychotics is common for
managing sundowning behavior in dementia patients in nursing homes and the risks associated with the use of psychotropic medications can includes death from adverse events. The Ridder et al. (2013) study also found improvement in the quality of life among intervention groups. The limitation of the study is that the sample size (n=42) is small and not generalizable. However, the study is important, because authors found no increase in psychotropic medications use among intervention groups and increase among participants in standard care.

In the Cochrane review, “Music-based therapeutic interventions for people with dementia” was assessed for the effectiveness of musical interventions for people diagnosed with dementia, measuring emotional well-being, behavior and social problems, mood disturbances and cognition at the end of 4 weeks of therapy (van der Steen, van Soest-Poortvliet, van der Wouden, Bruinsma, Scholten, & Vink, 2017). In the 17 studies evaluated in the Cochrane review (2017), there were no age restrictions for participants and review even included people less than 65 years old diagnosed with dementia. For behavioral agitation and aggression, researchers evaluated 12 studies with 515 participants, at the end of treatment effect. This study included 4 studies with 225 participants in the analysis at the end of long term treatment effect. They used the Cohens Mansfield Agitation Inventory, Neuropsychiatry Inventory (NPI) and BEHAVE-AD to count observed agitated behavior (van der Steen et al., 2017).

Researchers included both parallel and a cross over randomized control trial (RCT) for this study. Participants in the study were diagnosed with dementia per the Diagnostic and Statistical Manual (DSM IV) and/or International Classification of Diseases 10 (ICD). Participants were living in the community, hospitals or care homes and they were all diagnosed with dementia at various stages of disease severity. The difference in the Cochran review was that people diagnosed with dementia in the community and hospital settings were included,
unlike the previous four studies presented in this paper. The study review had heterogeneity of participants with various background, acutely sick in hospital and community dwelling.

Researchers found no evidence of an effect on agitation and aggression using music interventions at the end of treatment. However, the study did find that music-based therapy reduced depressive symptoms and music therapy would be beneficial since depression is commonly diagnosed with dementia. This supports how essential it is for PMH-NPs to assess for depression in people diagnosed with dementia and to treat them appropriately.

Both group and individual music therapy results in improved behavior, increased socializations and decreased depression for people with dementia (Lin et al., 2010; Raglio et al., 2015; Hsu et al., 2015; and Ridder et al., 2013). However, the Cochrane Review by van der Steen et al. (2013), which included 17 studies, found no evidence of effect on agitation and aggression, but that music therapy reduced depression in dementia patients. The results of the majority of the studies for this paper support that music therapy improves behavioral symptoms in people with dementia. Moreover, all four articles and Cochrane review (2013) found that music-based therapy is useful for reducing depressive symptoms in people with dementia. Music therapy causes no harm to any clients, rather it promotes socialization and helps patients to engage with other people.

**Light Therapy and Sleep Hygiene**

Khachiyants et al., (2011) claim that there are changes in circadian rhythms that may be associated with sundowning syndrome in patients with dementia (2011). For people with dementia, there are changes in sleep and wake cycles that can keep them awake at night and napping during the day time. The suprachiasmatic nucleus (SCN) and melatonin manage sleep. Disruption in circadian rhythm can be due to changes in SCN, seen in people diagnosed with
dementia and cause sundowning syndrome. Studies from this literature review supported the benefit of sleep hygiene for clients with dementia to improve sleep and decrease nighttime awakening.

Sleep issues are common in people diagnosed with Alzheimer’s and other dementias affecting 44% of community dwelling people (Salami, Lyketsos, & Rao, 2010). Studies have shown improvement in both duration and quality of sleep at nighttime using Bright Light Therapy (BLT). Lyketso, Lindell Veiel, Baker, & Steele (1999) conducted a study that involved 30 subjects, N=15 assigned to intervention and N=15 to control group. This was a randomized, controlled, crossover clinical trial, with morning BLT for the treatment of agitated behaviors in patients with dementia, residing in a chronic care setting. The control group received dim light.

The intervention group had significant improvement in sleep. The intervention group slept 6.4 hours a night at baseline, 7.6 at two weeks and 8.1 at four weeks. Sleep of patients in the control group didn’t improve significantly. However, no significant differences were found in mood and behavior with BLT. This study highlighted that the use of BLT or morning sunlight can be beneficial for people diagnosed with dementia for improving sleep. Limitations of this study may be whether researchers included the individuals who had issues with sleep for this study or not.

A study by McCurry et al. (2005) evaluated sleep education programs to improve sleep in dementia for people living in community dwellings with their caregivers. This was a randomize control trail (RCT) with 36 participants. The intervention group included caregivers (n=17) who received education on sleep hygiene and training on management of behavior. Patients were educated to walk daily and increase light exposure with lightbox therapy. The control group (n=19) received usual dementia education and caregiver support. The study measured sleep,
depression and behavior. Researchers measured sleep in patients at baseline, with a posttest at two-months and a six month follow up using Actillum wrist movement recorder. While the Lyketso et al. (1999) study focused only on effects of BLT for sleep and behavior, the study by McCurry et al. (2005) included sleep education along with light therapy for sleep and behavior.

The baseline scores revealed that there were no significant pretreatment group differences. At two-months (posttest), there was a significant (p<0.05) difference between the intervention and control group for patients’ time awake at night. The Nighttime Insomnia Treatment and Education for Alzheimer’s Disease (NITE-AD) group spent 36 minutes less time awake at night (32% reduction from baseline) and had fewer night time awakening (32% reduction from baseline) than the control group at six months follow up, NITE-AD also had significantly fewer awakenings per hour and awake less often. This study supports that management of sleep in people with Alzheimer’s Disease (AD) is essential for patients.

McCurry et al. (2005), noted that the study did not used polysomnography, a standard measure used diagnosing sleep disorders. In addition, some participants may have had undiagnosed sleep disorders. This study highlighted that patients with sleep disturbances in AD, can benefit from behavioral interventions, such as sleep hygiene education, walking and light exposure. Family and staff caregivers can be taught about sleep hygiene as alternative intervention for pharmacotherapy. Moreover, the study followed up at six-months and found participants wakening less and reduced awake time at night which is significant.

LaFazia, McCurry, Pike, Logsdon & Teri (2012) assessed the feasibility of sleep education in people with dementia in Adult Family Homes (AFH). The study involved 47 residents with dementia and comorbid sleep disorders. The study was a pilot randomized control trial (RCT) utilizing 37 AFH and 47 residents enrolled. The study was conducted from June
2006 and followed up in 2009. Residents were randomly assigned to the Sleep Education Program (SEP) N=31 and usual care with N=16. Participants ages ranged from 64 to 101 years-old and the majority were female, white and college educated. The Mini Mental State Exam (MMSE) average score was 8.1. All residents had one or more sleep problems. Twenty-five (45%) were prescribed sedation medication at bedtime. Exclusion criteria were preexisting diagnosis of primary sleep disorders or severe medical problems that kept them awake at night (pain, emphysema and incontinence).

The Sleep Education Program (SEP) was designed to educate staff caregivers to improve sleep in seniors with dementia and develop individualized sleep plans for each participant. Usual care control and/or control received routine medical care. The primary sleep outcome was measured using Micro-Mini Motion logger actigraphy worn on participants non-dominant wrist 1 week of sleep-wake activity measured each assessment. Actigraphy is commonly used and reliable tools to measure sleep-wake activities.

At 6 months, the control group had 24 minutes more awake time compared to the intervention group each night. The SEP had 8 hours of total sleep per night versus 8.4 hours for the usual care group at the baseline and 8.7 versus 8.5 hours in 1-month and finally, 9.6 versus 7.8 hours at the 6 months follow up. Total wake time at night for the SEP group was 2.8 hours versus 2.5 hours for the usual care control and at the baseline, 2.1 versus 2.4 hours at 1 month and finally, 1.9 versus 2.3 hours at 6-month follow up. All three studies found BLT and sleep education improvement of sleep at night and reduction of nap time during day in clients with dementia (Lyketso, et al. 1999; McCurry, et al. 2005; LaFazia, et al. 2013). LaFazia et al. (2012) study highlighted that creating a sleep schedule and modifying daytime activities had benefited the intervention group. Sleep problems in dementia are common, thus, it is essential for
providers to offer sleep education programs for individuals diagnosed with dementia and their
care givers.

McCurry et al. (2011) assessed the effectiveness of walking, light therapy, a combination
therapy of walking, light therapy and sleep education (Nighttime Insomnia Treatment and
Education in Alzheimer’s Disease; NITE-AD). The study design was randomized with a
controlled trial and assigned clients to one of the four treatment categories: walking, light
therapy, combination intervention (walking, light and sleep education) and a control group. The
study was conducted in Washington State, between November 2005 and March 2009. Inclusive
criteria were those with sleep problems of two or more times a week, diagnosis of dementia, no
visual impairment, able to walk and lived with caregivers. The majority of participants were
white, female and college educated.

Participants randomized in the walking, light therapy and the control group received three
1-hour, in-home training visits during weeks 1, 2 and 8, and had two telephone calls for weeks 4
and 6 to emphasize caregivers use of a daily journal. Groups randomized in combination NITE-
AD received six, 1-hour home visits during week four and two every other week. The walking
group walked for a minimum of 30 minutes a day. The BLT therapy group sat in front of a light
box for 1 to 2 hours before bedtime. The NITE-AD group received education on sleep hygiene
regarding routine bedtime and rise time, avoiding napping during day and identifying any
potential triggers that kept them awake at night. This group also had sessions of light therapy
and walking. The control group was provided usual care without training of caregiver and sleep
related homework.

Sleep wake activity was measured wearing an actigraphy by participants on their wrist.
All three intervention groups had less nighttime awakening compared to the control group.
Participants in the walking group had 33.1 minutes less of nighttime awakenings than the control group. The light therapy group had 39 less minutes of nighttime awakenings. The NITE-AD group had 39.8 less minutes of nighttime awakenings. There were no significant differences in total nighttime awake time among walking, light and NITE-AD. The studies by Lyketso et al. (1999), McCurry et al. (2005) and LaFazia et al. (2012) followed up at six months found less awakening at night, however, the study by McCurry et al. (2011), study found at the 6-month follow up for the intervention, the group couldn’t sustain improvement in sleep as adherence dropped 65.7% at week one and ultimately by 48.5 in the following 6 months. Future research should address behaviors that improve the adherence of interventions by working collaboratively with caregivers. Moreover, this study lacked heterogeneity which makes it difficult to generalize the study findings.

A study by Barrick et al. (2010) evaluated the effect of Bright Light Therapy (BLT) on agitation in people diagnosed with dementia residing in nursing homes. The study designed was an observational study conducted at two residential care settings: a 32-bed psychiatric hospital in North Carolina (NC) and a 24-bed unit in a dementia specific nursing home in Oregon (OR). Intervention groups received AM lighting, PM lighting, all day lighting and standard lighting for a 3-week period. Sixty-six residents with dementia participated in the study. Residents diagnosed with dementia were eligible for the study and the majority (68%) had severe cognitive impairment. Exclusive criteria were people with diabetic retinopathy, moderate to severe macular degeneration and absence of lens. Researchers included participants diagnosed with dementia from both the acute care setting and the community dwelling for this study.

Observation data on agitated behaviors was collected by trained research assistants who were blinded to the study. Staff caregivers rated agitation levels on 3 shifts using the Cohen-
Mansfield Agitation Inventory (CMAI). The light intensity in intervention group for AM, PM and all-day were higher compared to standard group (2535 lux North Carolina, 2638 lux Oregon vs 617 lux North Carolina, 591 lux Oregon). Average exposure to light in the AM was 2.64 hours and in the PM, was 2.87 hours and all day was 8.40 hours. Caregivers rated frequency of each behavior on 5-point scales (1 for “never” and 5 for “several times per hour”).

Observation of agitation levels found increases in all four categories as the day progressed with highest level of agitation in the PM between 4pm and 8pm (p=<0.001). Research also found agitation increased in those with mild/moderate dementia in the AM light compared to standard light (0.174 vs. 0.148; p=0.055). In North Carolina, self-reported agitation in the AM light was significantly higher compared to all day light (2.09 points; p=0.013). Staff caregivers working the evening shift reported higher agitation than day staff (3.49 points; p=0.021) and night shifts (3.63 points; p=0.036). The study concluded that BLT alone didn’t decrease agitation in dementia; this was supported by the CMAI score and reported by observation of staff caregivers. A limitation of this study was the use of the observational methods to measure the benefit of BLT on agitation. Strength of this study was the heterogeneity of participants with various severity of dementia, inclusion of both genders and various ethnicity.

A systematic review of the effects of light therapy on sleep problems included 53 studies with 1,154 participants (van Maanen, Anne Meijer, van der Heijden & Oort, 2015). The study search was conducted in November 2012. Inclusion criteria were those with sleep disorders. This review excluded light therapy to measure the effects of depression. They had four categories for the studies which included: circadian rhythm sleep disorders (CCRSD), insomnia, sleep problems related to Alzheimer’s Disease and other sleep problems. Researchers found
light therapy had significant effects on all type for sleep problems, including CRSD, insomnia, sleep problems in dementia and other sleep problems. However, there was no significant effect on early morning awakening. The largest effect size was CRSD (g=0.41) and insomnia symptoms (g=0.47). Light therapy for insomnia had positive effect with higher light intensity. Lyketso et al., (1999), McCurry et al. (2005), LaFazio et al. (2012), McCurry, et al. (2011) studies excluded participants diagnosed with insomnia, however, the study by van Maanen et al. (2015) measured the effects of BLT, including insomnia.

Effect size for CSRD was 3 out of 12 outcomes were significant and for insomnia 5 out of 13 outcomes were significant. Effect size were 5 out of 7 outcomes were significant for sleep problems in Alzheimer’s dementia and other sleep disorders 3 out of 9 outcomes were significant. For sleep related disorders in dementia, significant effect size was found among female participants. Researchers claimed a limitation for the review was that not all studies had diagnosed sleep disorders using ICD and/or diagnostic statistical manual (DSM). For sleep associated problems with dementia, females tended to have a greater response to light therapy. Therefore, it is important for providers to inquire about sleep problems in males as they tend to under report.

Ayalon, Gum, Feliciono, & Arean’s (2006) systematic review evaluated how Bright Light Therapy (BLT) effects Neuro Psychiatry Syndrome (NPS) behaviors in dementia. BLT showed a reduction in agitation and produced a calm effect on agitated people with dementia. The Agitated Behavioral Rating Scale (ABRS) was lower for those treated with BLT. The mean ABRS score with intervention was 9.71 and in a control group was 19.93; P<.001 (Ayalon, 2013). However, the effect of BLT did not last longer than one day after the intervention and
ABRS of this intervention group was 19.19 upon follow up. Future studies are needed to assess how BLT affects sleep as sleep is a major problem for people diagnosed of dementia.

**Behavioral Intervention**

Neuropsychiatric syndrome (NPS) is also known as sundowning behavior and includes the following behaviors: agitation, aggression, wandering, hallucination and delusion. Ayalon, Gum, Feliciono, & Arean (2006) claim that the recent systematic review by Sink and colleagues concluded pharmacological interventions managing NPS lacks evidence and support. Ayalon et al. (2006) also claimed that NPS is associated with staff and caregiver burnout, high turnover at work, high healthcare cost, early institutionalization and that finding alternative interventions to manage NPS is essential. Non-pharmacological interventions target unmet needs by controlling pain, increasing socialization, behavioral and environmental interventions.

The three RCTs and 6 Single-Case Design (SCD) studies met the criteria of the American Psychiatry Association guidelines for review. One of the SCD’s studies was related to an unmet-needs intervention, 4 SCDs and 3 RCTs were studies of behavioral targeted intervention and 1 SCD study on environmentally oriented intervention. This systematic review included several aspects essential to resolving NPS and its association with unmet physiological, emotional, environmental and behavioral etiology.

Behavioral interventions focused on changing NPS by modifying the environment of the subjects. The four SCD studies that met the criteria for review studied the following: intervention including redirection, reward for prosocial attitudes and removal of triggers. All 4 SCD studies found reduction in NPS (disruptive behavior) by 80%. There was also a 50%-80% reduction in frequency for wandering and 100% reduction in aggression. A change in the environment situation can trigger behavioral issues in dementia patients (wandering and
agitation). This study found that modifying the environment, verbal redirection and reinforcement for positive behavior was found highly effective for reducing NPS.

**Current Treatment Methods**

Symptoms of sundowning behaviors like agitation, irritability, wandering and confusion, can result from unmet physiological or psychological needs and boredom. In a study by Cohen-Mansfield et al. (2012), the researchers conducted RCT targeting unmet needs of dementia clients, such as pain, loneliness, boredom and sensory deprivation. Researchers recruited 89 residents from six Nursing Homes (NHs) for the intervention groups and 36 participants for the control groups from five NH facilities around the U.S.

Researchers used Treatment Routes for Exploring Agitation (TREA) to identify individual’s agitated behavior. Nonpharmacological interventions, such as music, one-on-one socializations, respite video, art therapy and animal assisted therapy were used for the intervention groups. Researchers found a decrease in verbal and physical agitation and an increase in pleasure and interest in the intervention group. The strengths of the study included the use of RCT, how they recruited participants, including the inclusion and exclusion criteria and assessment measurement used to collect data (MMSE, NH charts and ADL.). However, research assistants were not blinded from the group implementing nonpharmacological interventions. The use of the TREA method can assist staff and family caregivers when identifying the underlying etiology and developing interventions tailored to individual clients.

Per the Alzheimer’s Association (2017), the cause of sundowning can be multifactorial (biopsychosocial) and include the following: changes in environment and caregivers, fatigue, increase in fear, difficulty communications and changes in vision and hearing. The Alzheimer’s Association (2017) recommended the following current treatment methods: monitoring for
comfort and meet physical needs, such as checking for pain, hunger, thirst, infection and toileting. These are basic nursing skills, including assistance with ADL and assessment for pain, which nurses perform at standard daily.

Thirty to sixty percent of people in late stage dementia experience pain and decreased cognition and capacity to communicate which puts them at higher risk of not receiving treatment or remaining untreated (Habiger, Flo, Achterberg, & Husebo, 2016). A study by Habiger et al., (2016) evaluated the effect of treating pain by using opioids for Neuropsychiatric Syndrome (NPS). Etiology of NPS can be multifactorial including changes in brain, unmet psychosocial needs and pain may be an important etiology. Habiger et al. (2016), conducted a secondary analysis of a clustered randomized control trial looking at efficacy for treating pain on NPS in advanced dementia in 18 NHs in Norway (2016). The study included 352 participants. They included clients with moderate to severe dementia as defined by DSM IV; MMSE score <20. Exclusion criteria were clients with advanced medical problems with six months or less expected to live, severe psychiatric disorders and NPI score of 8 or more for aggression.

Psychosis is common in individuals with dementia and pain is a risk factor (Habiger et al., 2016). The intervention group in Norway included 175 people and the control group had 177. During the intervention period, there were no changes in psychotic symptoms from baseline at 8 weeks. However, participants with one or more symptoms of psychosis at baseline showed a reduction in psychosis and delusion found in the intervention group when compared to the control group. For agitation, a decrease in agitation was found among the treatment group when compared to control group (Habiger et al., 2016). This study showed that treating pain improves delusion, hallucination and agitation in dementia when they presented with one psychotic symptoms at baseline. It is critical to state that pain medication doesn’t increase
prevalence of psychosis, delusion or hallucinations. The study highlighted essential information for clinicians to assess pain and treat it appropriately.

**Practice Guidelines and Recommendations**

Sundowning behaviors can be treated with multiple, non-pharmacological methods which target psychological, behavior and environmental factors. The APA guidelines of 2007 and 2014 support the use of psychosocial methods help to maintain or improve cognition, behavior and quality of life. The APA Guidelines (2014) have also encouraged integrating programs that support for people with dementia, which helps improve the well-being of both patients and caregivers to delay early institutionalization of people with dementia. APA Guidelines (2014) have also emphasized implementation of environmental measures, assessment of etiology for behavior and addressing these to meet possible unmet needs. This includes redirection and assurance to treat agitation. The APA, 2007 the practice guidelines for working with people diagnosed with Alzheimer’s and other dementia included the following: psychosocial interventions of targeting behavioral, emotional and cognitive aspects. Per the guidelines, behavioral interventions have shown benefits for lessening agitation and disruptive behavior (APA, 2014).

The 2014, APA practice guidelines recommend psychosocial interventions including: behavioral, emotional, stimulation and cognitive oriented interventions (Rabins et al., 2014). The interventions optimize cognitive, behavioral, affective and functional capacity of people with dementia. Behavioral intervention includes staff and caregiver education for reducing disruptive behavior. It also includes music therapy, home modification and participation in meaningful activities. Emotional interventions, such as support group services for persons with mild cognitive or early stage dementia, improves quality of life and mood. Cognitive oriented
interventions, including relaxation therapy in those in mild, major neurocognitive disorder dementias, may be moderately beneficial. Stimulated oriented therapy, such as music and physical activity can improve cognition and provide opportunities for socialization and reduce disruptive behavior and anxiety. The APA practice guideline of 2014 recommends a holistic approach, which includes emotional, behavioral and cognitive aspects for people diagnosed with dementia.

Results

The key findings of this paper will be synthesized and presented to peers and instructors using a power point presentation. Input of the literature review was received from mentors (professor) and Smart Thinking for the organization of this paper. This literature review included an in-depth review of non-pharmacological methods for managing sundowning behavior in dementia. Of fifteen articles reviewed, several articles included holistic aspects caring for people with dementia who are experiencing sundowning. There was a total of five music-based therapy, including one experimental, three RCT and one Cochrane Review. There was one study that focused on sleep hygiene, RCT and one Bright light therapy for behavior management which was RCT. In addition, four more studies on sleep: one pilot RCT compared intervention group which received sleep education vs usual care; one RCT study assessed effectiveness of walking, light therapy, combination therapy of walking, light therapy, and sleep education (Nighttime Insomnia Treatment and Education in Alzheimer’s Disease; NITE-AD); one observational study to evaluate effect of Bright Light Therapy (BLT) on agitation in people diagnosed with dementia in nursing home; and one meta-analysis, systemic review on effects of light therapy on sleep problems. There was one meta-analysis study focused on behavioral interventions of clients related to unmet needs of clients, such as physiological, emotional,
environmental and psychological. There was two RCT studies targeting unmet needs of clients, such as pain.

**Discussion and Implication for Nursing**

Sundowning is common in people diagnosed with dementia and the behavior affects clients sleep and mood. The use of pharmacological interventions has limited benefits and the use of non-pharmacological interventions is recommended by the APA (2014). It is essential for PMH-NPs to assess both the client and the caregivers to determine effective treatment options for dementia. The study of this literature review show a collaborative and holistic approach to more effective caregiving and management of sundowning in dementia patients. It is important for PMH-NPs and nurses to provide care humanly since there is no cure for dementia at present.

Music is an effective non-pharmacological intervention for managing and preventing sundowning behavior in dementia. The majority of music intervention studies in the literature review had positive findings and showed reduction of aggressive behaviors in people with dementia. Four of the five studies found that music interventions, for both group and individual, reduced aggressive behavior when compared with controlled groups. One study found that music therapy helps reduce verbal and physical aggression in dementia. Another study found it improves calmness, relaxation and socialization. Moreover, it decreases depression and improves quality of life. The fifth study, the Cochrane review was inconclusive and reported music intervention did not reduce aggressive behavior in dementia. However, all the studies on music therapy for this literature review found that music therapy helps reduce depression in people with dementia. PMH-NPs must assess all clients diagnosed with dementia for depression and may consider music therapy as a treatment option for depression. Moreover, group and
individual music therapy can promote interaction with other people in preventing boredom and loneliness, thus improving well-being.

Sleep problems in dementia are common with nighttime awakening and napping during the day time. Studies in this literature review supported that sleep education and light therapy have been effective with improving sleep and decreasing nighttime awakening. One of reason for early institutionalization is due to sundowning behaviors with nighttime awakening and agitated behaviors. Studies highlighted the importance of including sleep education that targeted routine and avoidance of daytime napping. Walking and daylight exposure also benefit both physiologic (cardiovascular and neurogenesis) and sleep.

The common behavior problems of wandering, agitation and aggression in those suffering from dementia can be related to environmental changes and unmet needs. The literature review revealed that behavioral interventions are recommended. For example, knowing that the underlying causes of behavior are things such as pain, thirst or boredom. Caregivers can use behavioral and environmental interventions before pharmaceutical interventions. Educating caretakers to look for the trigger of behaviors can lead to effective behavioral interventions. Interventions recommended are simple measures to prevent boredom and loneliness by engaging individuals in activities they enjoy, while this may be time consuming, it improves the quality of life for the individual with dementia.

Current treatment methods used for dementia and sundowning behavior use both pharmacological and non-pharmacological interventions. Pharmacological interventions have a moderate effect controlling agitated behavior common in sundowning behavior and are used commonly in nursing homes. Antipsychotics are commonly utilized to decrease agitated behaviors. Unfortunately, these pose potential risks including, at worst, death. It is essential for
PMH-NPs to know the risks associated with antipsychotic use and the strict regulations involved with their use. APA guidelines (October 2014) recommended using nonpharmacological interventions as first measures, which include psychosocial methods and support programs for patients. This encourages all organizations, including nursing homes to use nonpharmacological interventions over pharmacological interventions. Researchers also found treatment of pain decreases agitation, psychosis and hallucinations. It is essential for PMH-NPS to assess for pain in people with dementia and treat them appropriately.

Unfortunately, there is no cure for dementia and the related sundowning behaviors. PMH-NPs can advocate for an increase in funding for research on the disease and management of the related behaviors. Recent studies reported that the cost of caring for Alzheimer’s Disease and other dementia is greater than caring for cancer and heart disease (Reid, 2015). Per the Alzheimer’s Association (2017) dementia is the sixth leading causes of death in U.S. and it is expected that more people will be diagnosed in coming years due to an increasing aging population. Hopefully, treatment can be developed to slow the disease process like other chronic diseases have, such as diabetes, hypertension and AIDS. Over many decades there has been tremendous improvement in the knowledge of and diagnosis of dementia, however, more funding is required from the government and private organizations for researchers and for scientists to research novel treatments for managing dementia and behavior symptoms. Nurses are in perfect position to lead research and treatment efforts on those with dementia and related behaviors.

**Summary**

We have made significant improvement in diagnosing dementia, but there is no cure for dementia. Sundowning behavior is common in dementia and it causes significant stress to
patients, families and staff caregivers. With the increasing aging population in U.S., PMH-NPs will be working with the dementia population more and more. Pharmacological management using second generation antipsychotics has moderate effects in managing sundowning behavior, however, there is FDA black box warning with substantial risk of death related to cardiovascular and stroke. APA guidelines (October 2014) recommend the use of non-pharmacological methods to manage sundowning behavior, such as psychosocial measures and support services have been shown to be beneficial to clients.

This literature review found non-pharmacological intervention improve disruptive behavior, sleep disturbances and quality of life people diagnosed with dementia. For example, music interventions improve behavior, increase socializations and reduce depression in people with dementia. Moreover, one study found the use of music therapy had positive effects preventing the use of antipsychotics in individual with dementia in nursing homes. Literature review on bright light therapy and sleep education helped improve sleep quality and quantity, decreased day time napping, however, there are no changes in clients’ behavior. Sleep problems, depression, social isolation and behavior problems are common people with dementia. PMH-NPs can recommend to their clients with sundowning behavior a variety of intervention. Music therapy and bright light intervention along with sleep hygiene can improve behavior, sleep and quality of life. Most importantly, nurses should increase awareness of policy makers funding for researchers to improve treatment and management of dementia. The disease is stressful to patients, caregivers and costly for the United States health care system. We need resources to find interventions preventing the progression of the disease and to managing behavior symptoms more effectively.
Appendix

Sundowning Behavior in Dementia Patients and Non-pharmacological Interventions

Migmar Wangchuk
University of North Dakota
Dementia: Background information

- Dementia was first diagnosed in 1906 by Dr. Alois Alzheimer (Alzheimer’s Association, 2017)
- Dementia is a syndrome with group of symptoms which has many causes
- Characteristic symptoms of dementia are difficulties with memory, language, problem solving and cognitive skills that impairs daily function
- 5.5 million American people are living with Alzheimer’s Dementia (AD)
- Cost of caring for AD or other dementia patients is $259 billion annually
- AD is the sixth leading of death

What is sundowning?

- Sundowning is common behavior in dementia with an incident rate of 25% (Alzheimer’s Association, 2006).
- Sundowning/behavioral syndrome causes caregiver distress and ailment, emergency department use, increase in social costs and early institutionalization for those suffering from dementia.
- In the United States, 70%-81% w/dementia are living in the community
- Management of sundowning behavior from a wide-range of perspectives, music based therapy, sleep education with light therapy, and behavior intervention
Purpose

- To increase PMH-NPs knowledge managing sundowning behavior using nonpharmacologic methods:
  - Music based therapy
  - Sleep Education and Bright Light Therapy
  - Behavioral Interventions
- To provide PMH-NPs knowledge about how sundowning affects the patients and the resources available for managing sundowning behavior:
- Encourage use of psychosocial interventions targeting behavior, emotion and cognition (Rabins et al., 2014).
- Provide evidenced based knowledge for PMH-NPs to provide holistic care to dementia clients for effectively managing and preventing sundowning behavior.
- Provide definitions of key terms such as dementia, sundowning behavior, neuropsychiatric syndrome (NPS), nonpharmacological interventions, caregivers and bright light therapy.

Significance

- In the United States, the number of people affected by dementia has risen to 5.5 million.
- Dementia is the sixth leading cause of death in the U.S.
- Sundowning behavior is common and it affects both clients and caregivers.
- APA guidelines have stressed the need to address the underlying causes of sundowning behaviors.
- Pharmacological interventions in nursing homes has been common for managing sundowning behavior for dementia patients, despite the Federal Drug Administration (FDA) guidelines that clearly state a higher risk of mortality.
- PMH-NPs should provide care based on nonpharmacological interventions and use multidisciplinary approaches for early diagnosis of disease, care planning and referral to treatment team.
- PMH-NPs must base their care in a holistic, interdisciplinary approaches that focus on the improvement of the quality of life for clients by using nonpharmacological methods.
Theoretical Framework

- Ann Whall (2000) developed the Need-Driven Dementia Compromised Behavior Model (NDCBM).
- Framework was developed to study and understand behavior associated with dementia diseases.
- This model challenges and changes the common view of sundowning behavior as disruptive behavior to viewing it as a behavior that communicates unmet needs.
- NDCBM identifies factors that cause sundowning behavior, such as physical or social environment for anxiety.
- The model recommends a focused assessment of “entire aspects” of the situation for care to be effective and comprehensive (Whall, 2000).
- PMH-NPs must include an assessment of sundowning behavior and create a humane intervention based on holistic care to improve the quality of life for clients as well as family members.
Definitions

- **Dementia**: “Dementia is a neuropsychiatric syndrome characterized by cognitive decline and progressive deterioration of daily function, often associated with behavior disturbances” (Abraha et al., 2017, p.1).

- **Sundowning Behavior**: “Sundowning is a composite of behaviors, including travel behavior, loud vocalizations, wandering, maladaptive behaviors, and physical aggression” (Bachman & Peter, 2006, p.500). This is a clinical syndrome of disruptive behavior which is worse in the afternoon and evenings among people diagnosed with dementia.

- **Neuropsychiatric Syndrome (NPS)**: is the same as sundowning behavior which includes the following behaviors: agitation, aggression, wandering, hallucination and delusion.

Definitions Continued...

- **Nonpharmacological Intervention**: This is a treatment for behavior and psychiatric syndrome that directly aimed at decreasing behavior and psychiatric syndromes by indirectly working with caregivers and the environment or interventions directly targeting clients to decrease the behavior (Grand et al., 2011).

- **Bright Light Therapy**: “its treatment used for people who suffer from circadian rhythm sleep disorder” (Sleep Education, 2017). Our body’s internal clock regulates sleep and wake cycle.

- **Caregiver**: “someone who is responsible for taking care of another person” (Collin English Dictionary, 2017).
Methods

- Databases: CINAHL, Cochrane Review, Chester Fritz Library, Medline, EBSCO HEALTH, PubMed
- Search terms:
  - CINAHL- “dementia and music” “music therapy AND dementia AND agitation”
  - Cochrane Review- “music and dementia”
  - Chester Fritz Science- “Ming Hung Huil” “music and music therapy and dementia” “McCurry sleep education dementia”
  - DreamMed- “dementia”
  - PsyhInfo- “Insomnia AND dementia AND bright light therapy”
- Manually searched using title and name of author for primary source.
- Limiters: peer reviewed, 2005-present, English.

Search Results

- Total: 15 articles reviewed for literature review.
- Music based therapy: Five articles reviewed with one experimental, one Cochrane review and three RCT.
- Sleep hygiene and bright light therapy: Seven articles reviewed with four RCT on sleep hygiene and bright light therapy, and one pilot study. Two systematic review on bright light therapy.
- Behavioral intervention: Three articles reviewed with one meta-analysis and two RCT targeting unmet physiological and emotional needs.
Literature Review: Non-pharmacological Intervention

1. Music Based Therapy
2. Sleep Education and Bright Light Therapy
3. Behavioral Intervention
Music Based Therapy

Effects Of Group Music Therapy For Agitation In Patients With Dementia
(Lin et al., 2010)

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<tr>
<th>Design</th>
<th>Settings</th>
<th>Outcome/results</th>
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<tbody>
<tr>
<td>Experimental study, N=104 patients</td>
<td>Study conducted in Taiwan, nursing homes</td>
<td>- Intervention group scored 0.47 on average which lowered at the 6th session (P&lt;0.001) and averaged 0.44 points lower in the intervention group compared to the control group at the 8th session (P&lt;0.001)</td>
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<tr>
<td>Block randomizations</td>
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<td>- Decreased in agitated behavior in experimental group, reduction in physical and verbally aggressive behavior</td>
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<td>N=52 experimental, N=52 in control groups</td>
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<tr>
<td>Intervention group, 30 minutes individual music intervention, 2xweek for 6 weeks</td>
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<td>Control group followed routine activities</td>
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### Active Music Therapy vs. Individualized Listening to Music

(Raglio et al., 2015)

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<tbody>
<tr>
<td>RCT, N=120</td>
<td>9 Italian Care Home</td>
<td>All three groups improvement in behavior, depression, and quality of life.</td>
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<td>Randomized to 3 groups:</td>
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<td>Neuropsychiatric Inventory scores fell by 28% in musical therapy, 12% in listening to music and 21% for the standard care group.</td>
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<tr>
<td>standard care plus</td>
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<tr>
<td>active MT (SCMT);</td>
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<tr>
<td>standard care plus</td>
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<tr>
<td>Listening to music (SCLM); standard care alone.</td>
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<tr>
<td>Standard care plus active music treatment: 20 individualized 30-minute session, 2x week for 10 weeks.</td>
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<tr>
<td>Groups listening to music therapy: 20 individualized 30-minute session, 2x week for 10 weeks.</td>
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### Individual Music Therapy to Manage Neuropsychiatry Syndrome

(Hsu, et al., 2015)

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<tr>
<td>17 care home residents and 10 staff randomized into an intervention group (music) and standard care control group. Evaluated effectiveness of individualized music interventions to manage neuropsychiatric symptoms.</td>
<td>Study took place between February and September 2013 in two care homes in the UK.</td>
<td>Increase in disruptive behaviors in the treatment group between 0 to 3 months before started improving at 3 to 7 months. Music helps staff caregivers improve interaction techniques; helps them communicate better and improves the relationship with residents.</td>
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## Individual Music Therapy For Agitation In People With Dementia And Effects On The Use Of Psychotropic Medication
*(Ridder et al., 2013)*

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<th>Design</th>
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<td>RCT, N=42 participants enrolled in a 14-week study. N=21 music therapy and N=21 standard care. 12 session of music therapy lasted 33.8 minutes per session.</td>
<td>Explore effects of individual music therapy clients w/dementia in NH; study was completed in Norway and Denmark in 2010.</td>
<td>-1.7 (40%) participants increased in psychotropic use vs standard care. -2 (5%) participants in music therapy had reduction in use of psychotropic medications. Increase in the agitation (CMAI) score, slightly (0.46) in standard care and agitation was decreased during music therapy (-2.96).</td>
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Cochrane Review Music-based Therapeutic Interventions For Agitation In Dementia (van der Steen et al., 2017)

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<th>Design</th>
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<th>Outcomes/results</th>
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<tr>
<td>RCT</td>
<td>Diverse settings, community, hospital, and/or nursing home.</td>
<td>No evidence of an effect on agitation and aggression using music interventions at the end of treatment, but the study found music based therapy reduces depressive symptoms.</td>
</tr>
<tr>
<td>Evaluated N=17 studies total Behavioral agitation and aggression, N=12 studies w/515 participants Included 4 studies with 225 participants in the analysis</td>
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Review Of Music Therapy Intervention

- Both group and individual music therapy improved behavior, increased socializations and decreased depression for people with dementia.
- Cochrane Review by Van der Steen et. al (2013) which included 17 studies, found no evidence of effect on agitation and aggression.
- Cochrane Review found that music-based therapy is useful in reducing depressive symptoms in people with dementia.
Sleep Hygiene and Bright Light Therapy

Sleep Issues in Dementia

- Affects 44% of community dwelling people with dementia.
- Changes in circadian rhythms associated with sundowning syndrome.
- Suprachiasmatic nucleus (SCN) and melatonin manage sleep.
- Disruption in circadian rhythm can be due to changes in SCN.
- Studies that found light therapy in morning is beneficial for people with sundowning behavior to improve sleep quality and increase feelings of calmness.
- Many studies have shown improvement in both duration and quality of sleep at nighttime using Bright Light Therapy.
Effects Of BLT For Agitated Patients In Dementia In Long Term Care
(Lyketso, et al., 1999)

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<tr>
<td>RCT, N=30 residents</td>
<td>Chronic care settings (long term care), Copper Ridge, Utah.</td>
<td>Intervention group slept 6.4 hours night baseline (week 0), 7.6 hours 2 weeks, and 8.1 hours 4 weeks. No significant changes in mood and behavior with BLT.</td>
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### Sleep Education Programs For Dementia Patients Community Dwelling And Their Family Caregivers
*(McCurry et al., 2005)*

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<tr>
<td>RCT, N=36</td>
<td>Community dwelling individual with dementia and their caregiver, Washington State.</td>
<td>The Nighttime Insomnia Treatment and Education for Alzheimer’s Disease (NITE-AD) group spent 36 minutes less time awake at night (32% reduction from baseline). NITE-AD had significantly fewer awakenings per hour and awake less often. Six - months follow up found participants waking less at night.</td>
</tr>
<tr>
<td>Intervention group included caregivers (n=17); Control group (n=19). Intervention: sleep hygiene education; walk daily; day light exposure. Control: general dementia education and caregiver support. Measured sleep, depression and behavior.</td>
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### Sleep Education Programs (SEP) For Improving Sleep In Adult Family Home
*(LaFazio, et al., 2012)*

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<tr>
<td>RCT with 37 APH, N=47 residents with dementia and comorbid sleep disorders SEP N=31 and usual care N=16 SEP educate staff caregivers to improve sleep in seniors with dementia and individualized sleep plans for residents. Usual care groups receive routine medical care.</td>
<td>Adult Family Homes (APH), Washington State.</td>
<td>-Total wake time at night for the SEP group was 2.8 hours vs. 2.5 hours for the usual care group at baseline; 2.1 vs. 2.4 hours at one month; 1.9 vs. 2.3 hours at 6-month follow up. -6 months, control group 24 minutes more awake time compared to the intervention group at each night.</td>
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### Walking, Light Therapy, A Combination Therapy Of Walking, Light Therapy And Sleep Education On Sleep

*(McCurry et al. 2011)*

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<th>Design</th>
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<th>Outcomes/results</th>
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<tr>
<td>- RCT, four treatment categories: walking, light therapy, combination intervention (walking, light and sleep education), and control group. -Walking, light therapy, control group received three 1-hour in-home training and two telephone calls to emphasize caregivers use of daily journal. Combination therapy, NITE-AD received six, 1-hour home visit.</td>
<td>Community dwelling individuals w/dementia. Study was conducted in Washington State, between November 2005 and March 2009.</td>
<td>- Walking groups had 33.1 minutes fewer nighttime awakenings than the control group. Light therapy with 39 fewer minutes and NITE-AD with 39.8 fewer minutes. -6-month follow up, intervention group couldn’t sustain improvement in sleep.</td>
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### Bright Light Therapy (BLT) Effects On Agitation Patients With Dementia In Nursing Homes

*(Barrick et al., 2010)*

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<tr>
<td>N=66 residents w/dementia Observational study Intervention groups received AM lighting, PM lighting, all day lighting and standard lighting for 3-week period.</td>
<td>Two residential care settings: a 32-bed psychiatric hospital in North Carolina (NC) and a 24-bed unit in a dementia specific nursing home in Oregon (OR).</td>
<td>Light exposure in the AM 2.64 hours; PM 2.87 hours; all day 8.40 hours. BLT alone didn’t improve agitation in dementia. Highest agitation PM between 4pm-8pm (p&lt;0.001).</td>
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Systemic Review On Effects Of Light Therapy On Sleep Problems (van Maanen, et al., 2015)

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<th>Design</th>
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<th>Outcomes/results</th>
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</table>
| Meta analysis               | Meta analysis w/53 studies around the world; settings not included. | - Effect size for CSRD was 3 out of 12 outcomes significant and for insomnia 5 out of 13 outcomes.  
- Effect size were 5 out of 7 outcomes were significant for sleep problems in Alzheimer's dementia and other sleep disorders. 3 out of 9 were significant.  
- Largest effect size was CRSD (g=0.41) and insomnia symptoms (g=0.47).  
- Light therapy effective treating sleep problems. |
Bright Light Therapy (BLT) Effects Neuro Psychiatry Syndrome (NPS) Behavior In Dementia
(Ayalon, Gum, Feliciano, & Arean, 2006)

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<thead>
<tr>
<th>Design</th>
<th>Settings</th>
<th>Outcomes/results</th>
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</thead>
<tbody>
<tr>
<td>Systematic review</td>
<td>Various settings: Home, adult day care, NH, skilled nursing facility.</td>
<td>The Agitated Behavioral Rating Scale (ABRS) was lower for those treated with BLT. ABRS score in intervention was 9.71 and in control group was 19.93, P &lt; 0.001. Effect of BLT did not last longer than one day after the intervention and ABRS in intervention group was 19.19 upon follow up.</td>
</tr>
<tr>
<td>The three RCTs and 6 Single-Case Design (SCD) studies Intervention BLT.</td>
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Behavioral Problems in Dementia

- Agitation and aggression is common in dementia.
- Agitation and aggression affects both patients and caregivers.
Behavioral Effects Neuro Psychiatry Syndrome (NPS) Behavior In Patients with Dementia
(Ayalon et al., 2006)

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<tbody>
<tr>
<td>Systematic review</td>
<td></td>
<td>Reduction in NPS by 80%; 50%-80% reduction in wandering</td>
</tr>
<tr>
<td>The three RCTs and 6 Single-Case Design (SCD) studies</td>
<td></td>
<td>frequency; 100% reduction in aggression.</td>
</tr>
<tr>
<td>-Behavioral interventions focused on changing NPS by modifying the environment</td>
<td></td>
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<td>-Redirection, reward for prosocial attitudes and removal of triggers.</td>
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Current Treatment Method

- Sundowning is common with dementia patients.
- Prevalence rate of sundowning 2.4-66% individuals diagnosed with AD (Khachiyants, Trinkle, Son, & Kim (2011).
- Etiology of sundowning multiple factors, physiological, psychological and emotional factors.

Changes In Sleep and Wake Cycle

- Changes in circadian rhythms that may be associated with sundowning syndrome in patients with dementia.
- Changes in sleep and wake cycles can keep them awake at night and napping during the day time.
- Suprachiasmatic nucleus (SCN) and melatonin manages sleep.
- Disruption in circadian rhythm can be due to changes in SCN.
- Studies from this literature review supported the notion that sleep hygiene benefit clients, improves sleep and decreases nighttime awakening.
**Unmet Physiological And Psychological Needs**  
*(Cohen-Mansfield et al., 2012)*

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| RCT             | Nursing Homes' (NHs) around the U.S.           | - Decreased in verbal and physical agitation and an increase in pleasure and interest in the intervention group.  
|                 |                                               | - TREAT method can assist staff and family caregivers identify underlying etiology and develop intervention. |

**Pain In Patients with Dementia**  
*(Habiger et al., 2016)*

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| RCT, N=352      | NPS in advanced dementia in 18 NHs in Norway. | Participants with one or more symptoms of psychosis at baseline showed a reduction in psychosis and delusion in the intervention group when compared to the control group.  
| Intervention N=175 people and control N=177 |                                               | - Decreased in agitation was found among the treatment group when compared to control group. |
|                 | Treating pain by using opioids for Neuropsychiatric Syndrome (NPS). |                                               |
APA Practice Guidelines

- The APA guidelines 2007 and 2014 found evidence that the use of psychosocial method helps improve cognition, behavior and quality of life.
- Emphasized implementation of environmental measures, assessment of etiology for behavior and addressing to meet unmet needs.
- The APA practice guideline of 2014 recommendation has a holistic approach, which includes emotion, behavior and cognitive aspects.
- Behavioral intervention includes staff and caregiver education for reducing disruptive behavior. It also includes music therapy, home modification and participation in meaningful activities.
- Emotional interventions, such as support group services for persons with mild early stage dementia, improves quality of life and mood.
- Cognitive oriented interventions, including relaxation therapy in those in mild/major neurocognitive disorder dementia is moderately beneficial.
- Stimulated oriented therapy, such as music and physical activity improves cognition and provide opportunities for socialization and reduce disruptive behavior and anxiety.
Discussion, Recommendations and Future Research

- **Recommendations:**
  - Music based therapy, sleep education, bright light therapy and behavioral interventions decrease agitation in patients with dementia and improve sleep quality and quantity.
  - Non-pharmacological interventions increase socialization and decrease the use of antipsychotic medications.
  - PMH-NPs and nurses can provide care humanly since there is no cure for dementia at present.
  - APA guidelines (October 2014) recommended using nonpharmacological interventions as first measures, which include psychosocial methods and support programs for patients.

Future Research

- There is no cure for dementia and the related behaviors.
- Dementia is the sixth leading cause of death in U.S. and it is expected that more people will be diagnosed in coming years due to an increasing aging population.
- PMH-NPs can advocate for an increase in funding for research on the disease and management of the related behaviors.
- Nurses are in a perfect position to lead research and treatment efforts.
References


References

Thank You
References


