On the environmental factors that alleviate relocation stress syndrome in residents of long-term care facilities

Amber Lois Williams

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On the Environmental Factors that Alleviate Relocation Stress Syndrome in Residents of Long-Term Care Facilities

by

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Thesis
Submitted to the Department of Technology
Eastern Michigan University
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MASTER OF SCIENCE
in
Interior Design

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Dedication

To my husband, for always encouraging me to go after my dreams and supporting me along the way. I couldn't have done this without you.
Abstract

This study intends to investigate the stress experienced by the elderly during the relocation process. Relocation stress syndrome occurs when a senior is moved from a familiar environment to an unfamiliar environment. The shock of the transition causes medical conditions to worsen, which can result in serious illness, possibly death.

“Moving to a nursing home entails a complete lifestyle change, the trauma of which is compounded when the patient is ill or in pain and the move is unanticipated” (Morse, 2000, p. 24AAA). I have researched reasons why seniors relocate to long-term care facilities in order to better understand the occurrence of relocation stress syndrome. By identifying environmental factors that can be modified to alleviate relocation stress syndrome, the risk should be lessened. Strategies such as encouraging independence and autonomy, providing privacy, maintaining lifestyle, increasing indoor environmental quality, and creating a healing environment will be examined.
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Introduction

Problem Statement, Background, Justification, and Significance

Over a period of nine months, twenty-five seniors were observed when involuntarily moved from a hospital or home into a nursing home. Their mortality rate was 24%. "An elder's ability to cope with relocation may be limited and may result in a syndrome" (Castle, 2001, p. 295). Between 36% and 55% of people age 65 and older can expect to spend at least some time in a facility before death, with the likelihood of admission increasing with advanced age (Kao, Travis, and Acton, 2004). “During any relocation, all individuals involved are at risk of developing [relocation stress] syndrome” (Mallick and Whipple, 2000, p. 98).

In 1992, the North American Nursing Diagnosis Association officially classified relocation stress syndrome as a nursing diagnosis. Relocation stress syndrome is defined as “physiologic and/or psychosocial disturbances as a result of transfer from one environment to another” (Morse, 2000, p. 24AAAA). It most frequently occurs in older adults shortly after moving from a private residence to a nursing home or assisted-living facility (Walker, Curry, and Hogstel, 2007). Relocation stress syndrome is characterized by both major and minor symptoms. Major symptoms occur 80% or more of the time. These include increased confusion, depression, anxiety, apprehension, powerlessness, anger, loneliness, and betrayal. Minor symptoms, such as affective disorders and physiological consequences, occur 50% to 70% of the time. Decreased life satisfaction, sense of devalued self, decline in mental status, gastrointestinal problems, sleep difficulties, social isolation, weight loss, fear, helplessness, hopelessness, suicidal thoughts, and paranoia characterize these problems. Other symptoms that may occur
include falls, mortality, morbidity, grief, reduced psychosocial functioning, and impaired social functioning (Kao et al., 2004).

Statistics show the average 75-year-old has at least three chronic conditions and consumes an average of five different prescription drugs (Bekhet, Zauszniewski, & Nakhla, 2009). These chronic conditions decrease the elder’s independence, quality of life, and functioning as well as interfere with their daily activities. Relocation stress syndrome may exacerbate these symptoms and impair functioning. Failure to identify psychosocial stress related to relocation can delay the diagnosis and treatment of physical and emotional illnesses among older adults (Walker et al., 2007).

Researchers have questioned why all seniors are not affected by relocation stress syndrome. They have come to the conclusion it depends on how the individual perceives stress. Stress has been described as “a non-specific response of the organism to threats or stressors” (McKinney and Melby, 2002, p. 152). When an older adult perceives a certain situation as a threat to their well-being, stress occurs. The perception of the threat is influenced by the person’s knowledge of the situation, values, beliefs, coping resources, and coping constraints (McKinney and Melby, 2002). All of these factors determine how the older adult will handle the stress. Environmental limitations, such as noise and lack of privacy, add to their tension. Understanding this process provides guidance on what factors may lead to relocation stress syndrome and how their symptoms should be addressed in order to prevent the occurrence.

Identification of the environmental factors associated with relocation stress and methods for reducing the effects of relocation stress syndrome will be useful for interior designers and architects when designing long-term care facilities. It will also be
important to the facility administrators and staffs so they can better ease the resident’s transition into their new home. These findings will also be of interest to the resident’s family, as well as fellow design faculty and students.

**Purpose and Objective of the Study**

The objective of this study is to collect data from various research findings to determine what environmental factors within long-term care facilities contribute to the occurrence of relocation stress syndrome. After identifying the environmental factors, methods and solutions can be developed to reduce the effects of relocation stress syndrome in future residents. Implementation of these solutions should improve poor health conditions in seniors and increase their quality of life.

**Hypothesis**

- The occurrence of relocation stress syndrome among seniors can be reduced through environments.
Review of Literature

Relocation

There are many reasons why an older adult may move from their home into a facility. Ideally, the move is planned, such as downsizing after retirement, but sometimes, the move is an unplanned response to illness or disability. The changes that accompany relocation are stressful (Walker et al., 2007). The experience involves the loss of their primary residence, in which they may have lived for over 40 years. They also may be forced to get rid of most of their personal belongings and move far away from friends and family. The abrupt transition to long-term care is a shock to body, mind, and spirit, which exacerbates existing medical conditions (Morse, 2000). A person’s struggle for independence and autonomy is a basic condition of the importance of their role in their new home.

Relocation controllability is the extent to which the residents choose and decide to move, which entails the degree of control they have over their destiny. Bekhet et al. (2009, p. 464) defines personal control as “the ability to manipulate some aspect of the environment.” If elders have little or no input into the decision-making process, they may feel depressed, hurt, abandoned, frustrated, or angry or as though they are being punished or discarded. They may react by resisting, making demands, withdrawing, or acting out against their family or facility staff members. The voluntary nature of the move is one of the most important correlates or determinates of a positive outcome. The ability to exercise choice, the ability to feel personal control and autonomy, and viewing relocation as voluntary, desirable, or important are critical variables in the process of adjustment. The perception of having a choice to move has been positively correlated
with psychological adjustment. A person's perception about choice to move and preparation for the move affect how well they adjust to their new surroundings and consequently their physical, emotional, and social well-being (Bekhet et al., 2009). The amount of psychological stress experienced by the relocated elder is influenced by the degree of change in the environment. Mikhail (1992, p. 36) explains, "Entering a nursing home in one's own community where a person may bring a favorite piece of furniture will be less stressful than a radical change." The sense of isolation and loss is intensified when forced to move away from long-established friendships and familiar places to live in another city or state to be near family members.

**Reasons for relocation.** In a 2009 study conducted by Bekhet, Zauszniewski, and Nakhla, three themes emerged to reflect reasons why an individual was relocating to a long-term care facility. These themes were labeled as pushing factors, pulling factors, and overlapping factors. Pushing factors are factors that push and press residents to move. These factors include one's personal health declining or their spouse's health declining, desire to be rid of daily responsibilities, lack of outside help, their current facility closing, and feelings of loneliness. If the individual perceives these factors as a positive reason for relocation, they can be reassuring during the process. Otherwise, if the reasons are recognized to be negative, adverse consequences such as relocation stress syndrome are likely to occur.

Pulling factors attract elders to relocate to a particular long-term care facility and are considered to be therapeutic. These factors include familiarity with the location and reputation of the facility, security, and joining friends. Pulling factors that make relocation voluntary and desirable are attachment to the community, joining friends and
neighbors, proximity to family, facility amenities, and the prospect or long-term care in the future. Quality, cost, and location were the most influential factors for both residents and family members in selecting a long-term care facility. Relocation to a new environment that is perceived as positive can result in beneficial outcomes.

Overlapping factors occur when an individual expresses both pushing and pulling factors as reasons for their move. For example, a person may cite reasons for relocating due to their own declining health (pushing factor) and also because of wanting to be with their friends (pulling factor). This could lead to conflicting feelings and reflect a sense of tension between the forces of pushing and pulling.

Although the senior may have been living at home before an acute illness or injury requiring hospitalization, 46% of nursing home residents are admitted directly from a hospital to a long-term care facility (Kao et al., 2004). In these situations, the move is just one piece in a string of stressful events. This contributes to the most severe psychological effects of relocation stress syndrome to occur immediately after the move. Seniors who do not want to be admitted to a long-term care facility have the most negative responses.

Seniors who relocate to a long-term care facility are generally dependent on others for three or more of their basic activities of daily living. These activities include bathing, dressing, toileting, transferring, continence, and feeding. The senior may also have significant cognitive deficits and/or lack adequate social support to provide care in a home-based or community-based setting. The senior may also have experienced a recent hospital stay for a serious illness that required extended care after their discharge (Kao et al., 2004). Relocation can be especially difficult for individuals whose relocation was
prompted by a change in cognitive functioning or physical health. This often causes their health and emotional problems to worsen.

**Phases of relocation.** As described by Kao, Travis, and Acton (2004), there are three main phases of relocation: pre-institutionalization, transition, and post-institutionalization. During the initial phase of relocation, pre-institutionalization, seniors and/or their families begin selection of the long-term care facility where they will be relocating. Planning for legal and financial needs as well as deciding what to do with the older adult’s house and belongings also occurs during this phase. The need to sell a home and dispose of personal belongings can add elements of personal loss and grief to the stress equation (Kao et al., 2004). Similarly, legal decisions such as advance directives and power of attorney designations can stimulate feelings of depression and powerlessness. Family members may also be coping with feelings of stress and guilt due to placing a loved one in a facility. Due to these major life decisions, tension may begin to build during this phase, lasting up to two weeks after relocation. This is when the first symptoms of relocation stress syndrome may be exhibited. Older adults may begin to feel helpless and powerless over their situation, which could lead to withdrawal and depression. Death is rare but can occur within days of being transferred to their new home.

It is during the first three months, or transition phase, that the effects of relocation stress syndrome are most intense. At this time, the senior is feeling even more helpless, vulnerable, and sometimes abandoned by their loved ones. The symptoms range from minor transitional difficulties to a full emotional crisis. These symptoms can last up to three months (Kao et al., 2004). Among seniors who were involuntarily admitted to the
facility, negative responses of anger and a sense of injustice are very common. Negativitiy is directed toward staff members for not acknowledging their former social roles in their communities and families. This is a reminder of their loss of social status and independence.

The final phase, post-institutionalization, involves long-term resolution and lasts up to one year. During this time, either a health realignment or illness occurs. How well the individual is doing depends on their perception of how much control they have over their lives. This loss of control will sustain their anger and fuel conflicts regarding their level of care. For this reason, it is especially important to point out areas in which the senior can maintain control over their daily lives, especially for those who were involuntarily admitted. While the senior is seeking a sense of control over their new environment, they are beginning to establish a new identity in their environment while remaining connected to family and friends. This process is more difficult for seniors with cognitive impairment. The entire relocation process may not be clear due to their inconsistent memory, reasoning, and judgment (Kao et al., 2004). Extra steps should be taken to accommodate these seniors. Way-finding methods, such as clear signage, should be used to help the seniors become familiar with their surroundings and give them confidence to become independent.

**Types of relocation.** According to Castle (2001), the elderly may experience four types of relocation: interinstitutional, intrainstitutional, residential, and residential or institutional. Interinstitutional relocation occurs when the senior is moved from one institution to another. This includes transfers to and from hospitals, psychiatric facilities, board and care homes, rehabilitation facilities, and continuing care retirement
communities. Interinstitutional moves can occur for several reasons. Mainly, they are caused by facilities needing to relocate or merge with other providers. Due to the current health system in the United States, nursing home closures are becoming more common (Castle, 2001). If a facility does not pass inspection and therefore loses their certification or licensure, the residents will be relocated to another facility that is better equipped to take care of them.

Movement within a facility from one room or area to another is intraninstitutional relocation. Studies show approximately 8% of residents per year may be moved within a facility (Castle, 2001). Residents may be moved within a facility because of consolidation of areas, remodeling, changes in level of care, roommate issues, or change in financial status. Castle (2001) explains that intranstitutional relocation may be no less disturbing than relocation to another facility. "Rooms may constitute the equivalent of homes...and become places imbued with meanings and significances equivalent to those that evolved in their former community residences" (Castle, 2001, p.304).

Residential relocation takes place when the individual moves from one residence to another. Not a lot of research has been conducted in this area. However, research suggests other studies focusing on effects of relocation can be applied since the older adult is still being moved to an unfamiliar environment (Castle, 2001).

Last, residential or institutional relocation refers to a move from a residence to an institution or vice versa. "The most stressful move is from the home to an institution" (Castle, 2001, p. 327). As previously discussed, there are several reasons for a senior to be moved from a residence into an institution. Ideally, the move is planned and viewed as a positive change.
Reactions to relocation. How well older adults react to their move is related to the importance of independence and autonomy to the individual at the time of the relocation. Seniors who experience relocation stress syndrome comprise two distinct categories: resigned resisters and forceful resisters (Manion and Rantz, 1995). Resigned resisters experience brief episodes of withdrawal, crying, and sadness to profound expressions of helplessness and hopelessness. They are more often women, and they exhibit behavior typically associated with reactive depression or dysthymia. Forceful resisters exhibit anger and distrust. They may be uncooperative, aggressive, and physically or verbally abusive. They are more often men and their behaviors mimic residual or agitated depression. The amount of control new residents experience, as well as the degree of support of the family in the decision-making process, can help the process become less unpleasant. Preparation before the move, when possible, also makes the experience more positive (Kao et al., 2004).

In a study conducted by Manion and Rantz (1995), special attention was given to residents who displayed evidence of anxiety and depression and had unstable physical/medical conditions after their move into a facility. These patients were moved to similar rooms, with the exception of the residents who had a higher risk level due to their health who were not moved at all. The mortality rate for the residents dropped to a level of 0.037%, which was lower than the overall facility rate of 0.046%. The facility now assesses each resident according to physical deterioration/depression criteria before relocating them. After implementing this practice, mortality rates were reported to have decreased from a high of 0.25% to 0.02%.
Individuals have different methods of coping. “Coping is regarded as a function of personal and/or environmental characteristics for the purpose of regulating emotions” (Kao et al., 2004, p. 14). The two most common approaches to coping are the interactionist and the transactionist models. Both the interactionist and transactionist models emphasize the ways of perceiving and thinking about one’s relationship with the environment. When coping with a situation, a person is attempting to regulate his or her emotions. The interactionist model assumes that a person will always assess and respond to situations in the same way. Conversely, the transactionist model views a person’s perceptions as constantly changing. This model most accurately pertains to the issues that arise for seniors in long-term care facilities. This is a more effective coping strategy. In this model, coping is considered a process that changes over time and with different situations in order to solve problems and stabilize emotions. It is important for the individual to use the transactionist method of coping in order to successfully transition throughout all stages of relocation, especially if there are cognitive issues involved since their perceptions of reality are constantly changing. It is important for facility staff to monitor residents while adapting to their new environment for any signs or symptoms of relocation stress syndrome (Kao et al., 2004).

Alternative Solutions for Long-Term Care Facilities

Environmental gerontology. Environmental gerontology aims to understand, explain, and optimize the interaction between older adults and their environment. It deals with varieties of housing arrangements for the elderly; the nature and effect of home modifications; the range of facilities for institutional care; the role of neighborhoods and community settings; and rural and urban socio-physical contexts. As a person ages and
his or her cognitive and physical abilities decline, the demands from the environment increase. This results in the need to compensate with environmental adjustments to reduce the environmental stress or to adapt to new conditions to avoid negative outcomes (Schwarz, 2012). Environmental gerontologists strive to predict which setting is going to best fit the needs and abilities of an older individual. Their theory is that place matters, and "it is better, more enjoyable, easier, and less adaptationally costly to grow old in some places than in others" (Golant, 2003, p. 638).

Looking at the way an elderly people use their environment is indicative to whether or not their surroundings are meeting their needs. Environmental gerontologists look at the complex time and space interactions between the older person and their environment to understand the meaning their environment gives to them. If they have been living in a place for a substantial amount of time, they most likely have strong emotional, symbolic, material, and social meanings tied to their homes and have developed an attachment to them. One theory explains that this attachment, or place tie, makes the senior feel more in control, secure, and have positive self-esteem. "Place attachment is not a state but a process that continues throughout life" (Golant, 2003, p. 639). Removing seniors from locations they have formed attachments to helps to explain why they may suffer from relocation stress syndrome. Bringing possessions with them to the facility where they are relocating keeps some of this attachment intact and helps to boost self-esteem (Golant, 2003).

It is important to understand that a group of individuals are not all the same. Each senior has an important life trajectory, which will differentiate one from another. Past life experiences and outcomes will determine how they emotionally respond to change
and are able to adapt to new surroundings. Even though a group of seniors may all view their new home in a facility as “bad,” they recognize that they are coming to this same conclusion from different starting points. This also means the seniors are going to perceive potential risks differently than an interior designer planning their living space. Seniors’ tolerance levels for what they consider design flaws may also be lower since they may have given up hope of ever leaving the facility, thus increasing their feelings of hopelessness and helplessness. Showing older adults their new situation is better and will contribute toward improving their future fulfills these needs.

**Eden Alternative.** In 1991, Dr. William Thomas developed a theory that is based on the principle of companionship and giving meaningful care to other living things. His goal was to de-institutionalize the culture and environment of long-term care facilities (Weinstein, 1997). Thus, the Eden Alternative was born. This patient-centered principle emphasizes the need to alleviate loneliness, boredom, and helplessness in traditional nursing home settings. Restructuring an existing facility into an Eden Alternative establishment should not be rushed. The entire process takes approximately two years, so a strong base can be developed. The facility administrator is mainly responsible for encouraging the staff to be positive and energetic throughout the process (Tavormina, 1999).

As of 2011, there were 200 registered Eden Alternative long-term care facilities across the United States as well as facilities in the United Kingdom, Ireland, Canada, Germany, Austria, Switzerland, Sweden, Denmark, Finland, Norway, New Zealand, Australia, and Japan (Brownie, 2011; Astor, 2008). Each of these facilities follows Dr.
Thomas’ belief that “every creature has a habitat in which it thrives, and one in which it withers. Human beings wither in institutions” (Brownie, 2011, p. 65).

While working as a physician in a nursing home, Dr. Thomas spent time observing patient interactions specifically in the dining areas, hallways and solarium. He came to the conclusion that loneliness, boredom, and helplessness are the three biggest problems for long-term care residents to overcome (Flynn, 2008). When residents become bored and lonely, they begin acting out with complaints and symptoms of illness to gain the attention of staff. The staff interprets these complaints and symptoms as medical problems that need to be treated with medication. When patients become agitated because of boredom, medication is used to calm them. These medications increase the risk of falls and accidents since the patients are less alert. This all results in the residents being less active and subdued ultimately losing their independence and ability to care for themselves. Dr. Thomas believes there is a difference between caring for a resident and treating a resident. Caring for a person means nurturing their growth, not solely giving them medical treatment (Weinstein, 1997). The Eden Alternative follows this belief. According to Thomas, there are “three fundamental principles of care to be implemented with nursing home residents: (1) to recognize, appreciate and promote each resident’s capacity for growth; (2) in caring for others, our work must be defined by their needs and capacities and not ours; and (3) while treatment can be intermittent and brief, care must be continuous and long lasting” (Weinstein, 1997, p. 3).

Residents who interact with their surroundings are more engaged and continue to thrive in their environment. Dr. Thomas used three principles based on ecology and
anthropology to develop Eden Alternative-certified homes that promote quality of life. These principles are (Weinstein, 1997, p.4):

1. Biological diversity is as good for human habitats as it is for natural habitats;
2. Social diversity is as important to the nursing home as it is to true human community;
3. Human habitats must be driven by the same devotion to harmony that enlivens music and nature.

It is for these reasons that Eden Alternative-certified facilities are required to use plants and animals as well as organizing frequent visits by children. Having children and animals around make a more energetic environment for the residents, consequently eliminating the concerns of boredom and loneliness. “The Eden Alternative strives to break down the clinical, regulated nature of traditional care models by injecting life and spontaneity, and the change is evident the minute you walk through the doors” (Flynn, 2008, p. 92).

Table 1
10 Eden Alternative Principles

<table>
<thead>
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<th>1. Loneliness, helplessness and boredom are the plagues of the human spirit</th>
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<td>2. Close and continuing contact with children, plants and animals builds a human habitat</td>
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<td>3. Loving companionship is the antidote to loneliness</td>
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<td>4. Giving and receiving care are the antidotes to helplessness</td>
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<td>5. Variety and spontaneity are the antidotes to boredom</td>
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<td>6. Meaning is essential to human life</td>
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<td>7. Medical treatment is a partner in care, not its master</td>
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<td>8. Wisdom grows with honoring and respecting elders</td>
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<td></td>
<td>9. Growth is not separate from life</td>
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<td>10. Wise leadership is the lifeblood of thriving</td>
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To alleviate the issue of helplessness, the Eden Alternative involves residents in giving care both to each other and the animals living with them. Thomas explains, "It is a basic human need to give as well as receive care" (Weinstein, 1997, p. 4). Regardless of their abilities, people enjoy caring for others. The need is always there. It is because of these unique practices that satisfaction ratings among family members of residents living in Eden Alternative-certified homes have risen 8% above the national average as of 2008. This percentage is anticipated to continually increase (Flynn, 2008). Studies illustrate the Eden Alternative is able to achieve high-level care at a low cost with easy implementation. Dr. Thomas states, "It requires a change in attitude; more change in your heart than change in your pocket" (Weinstein, 1997, p. 67).

**Green House project.** Following the Eden Alternative mission statement, “to improve the well-being of elders and those who care for them by transforming the communities in which they live and work” (Astor, 2008, p. S9), the first four Green Houses were developed by Dr. William Thomas in 2003 and are located in Tupelo, Mississippi. The houses were each named for the oldest member living in each of them. Laney and Page were occupied by residents previously living in the on-site nursing home’s dementia care unit. Current residents of the retirement community who requested to live in a Green House occupied the other two houses, Franks and Martin. The residents were selected in order of their length of residency in the existing facilities. In May of 2003, residents began moving in to their new Green Houses at the rate of one house per week. By the next month, move-in was complete. Currently, there are 141 Green Houses in operation and 96 Green Houses in development across the United States. New York has the most Green Houses, with 20 in operation and 33 in
development. Utah is the only state that is not presently operating Green Houses, nor do they have any in development. The state of Michigan has a total of seven operating green houses in the cities of Powers (2), Grand Rapids (2), Redford (2), and Holland (1).

Green Houses are small, residential environments that are designed to create an atmosphere that enhances the quality of life for the elderly in a home-like setting. A Green House can house up to 10 residents needing a nursing-home level of care. Green Houses can be a group of one or more houses and are considered a “campus” if they are administratively linked. They are blended into residential neighborhoods either clustered together or scattered throughout. They also are eligible to be licensed as a nursing home. Staff members in Green Houses have unique roles. In addition to their traditional duties as certified nursing assistants, they are also expected to plan and cook meals, do light housework including residents’ laundry, and organize activities. Other staff members that are required by nursing home regulations, such as nurses, physicians, social workers, dieticians, pharmacists, and therapists, only visit instead of being on site full-time (Lum, Kane, Cutler, and Yu, 2008-2009). Green Houses are described as “an intentional community for people seeking the worth and meaning in late life that generates warmth through its commitment to small size, de-emphasis of hierarchy, and power of its belief in the genius of human longevity” (Cutler and Kane, 2009, p. 305).

The Green House philosophy puts emphasis on living and quality of life under normal circumstances rather than therapeutic circumstances. The items and amenities you find in a Green House would also be found in a residential home. There are four required essentials that should be found in each Green House. They are as follows (Cutler and Kane, 2009, p. 306):
- A hearth area with a fireplace
  - Symbolizes warmth and home
- Large dining table to accommodate all residents, staff, and guests
  - Symbolizes community
- Single rooms with private bathrooms
- Technology to improve resident functioning and communication and maximize staff effectiveness

A well-planned environment should produce balanced levels of support and stimulation to encourage positive reactions in both behavior and emotions. Physical environments designed like the Green Houses are intended to reinforce Maslow’s hierarchy of needs: physiological, safety, social, self-esteem, and self-actualization. They should also reflect cultural norms, such as privacy, for living spaces. For instance, studies have shown that regardless of income or ethnicity, seniors needing long-term care and their families strongly prefer not to share sleeping quarters with strangers (Cutler and Kane, 2009).

When a large-scale study of a nursing home was conducted in 2007, residents indicated 11 essential areas of quality of life. They included privacy, individuality, autonomy, spiritual well-being, sense of security and order, comfort, enjoyment, meaningful activity, reciprocal relationships, individual dignity, and functional competence. A relationship must exist among design decisions, social and behavioral outcomes, and care goals. To meet these needs, the following design principles were established for each Green House (Cutler and Kane, 2009, p. 307):

- Resident needs for living space are more important than staff needs for work space
• Building size should be at a residential scale, residential building materials should be used when possible, and privacy should be provided

• High lighting levels, navigation aids, and minimized walking distances are important to maximize functioning for physically impaired or memory-impaired individuals

It is important for family members to be comfortable with visiting their loved ones living in the Green Houses. Since they are usually the primary decision makers, they may not choose to move the senior into a Green House if they are not impressed with the facility. Since family members are the main source of emotional support as well as a link to outside social affiliations and relationships, it is imperative for them to remain a part of the senior’s life. Making their experience while visiting as pleasant as possible is an essential piece of the Green House principle. A study conducted by Lum et al. (2008-2009) showed family members of Green House residents to be more satisfied with general amenities, meals, housekeeping, physical environment, privacy, autonomy, and healthcare than another nursing home in the area. Typical responses received from family members during the study were: “It will seem more like home for him,” “It’s a home-type atmosphere away from institutional effects,” and “It’s as close to home as we will ever get” (Lum et al., 2008-2009, p. 46). The most common positive feedback given was regarding the home-like atmosphere of the Green House. The family members also liked that there was a smaller staff so they were able to get to know the caregivers. The private rooms for residents were also a large positive. No negative feelings concerning the actual building were recorded. However, some family members had concerns
regarding the number of staff on hand and availability of organized activities. Overall, the families said they enjoyed coming to visit their loved ones.

**Indoor Environmental Quality.** Indoor environmental quality (IEQ) refers to elements that affect the user’s perception of space. These elements are daylight, ventilation, temperature, humidity, noise, electrical light sources, and personal control of a setting (Winchip, 2007). Poor IEQ can cause serious illnesses characterized by symptoms of headache, dizziness, nausea, depression, or eye irritation. By controlling the elements affecting the user and providing a high level of IEQ, you can lessen the occurrence of these illnesses and create a safer place for its inhabitants. Considering the physical challenges that seniors are already facing when relocating to a new home, it is imperative the new home does not cause additional health problems for the senior.

**Healing environments.** “A healing environment is the result of a design that has demonstrated measurable improvements in the physical and/or psychological states of patients and/or staff, physicians, and visitors” (Hamilton and Watkins, 2009, p. 78). To determine if an environment is a healing environment, research must indicate some type of improvement in the physical or psychological state of a group of the building’s users. This environment can then be considered complementary treatment towards the patient/resident’s care. Creating a healing environment for the elderly is especially important considering they tend to be more susceptible to the impact of their environment. The longer they are exposed to their setting, the greater the potential for their environment to have a measurable impact on them. Poorly designed long-term care facilities can prove to be dangerous for this reason.
Roger Ulrich developed the Theory of Supportive Design for designers to use when developing healthcare settings. This research-based theory shows that clinical conditions are exacerbated by stress (Hamilton and Watkins, 2009). Ulrich’s theory suggests “the patient experiences the stress of the illness, which can be partially relieved by therapy; the stress of the situation, which can be partially relieved by the model of care; and the stress of the environment, which can only be relieved in part by good design” (Hamilton and Watkins, 2009, p. 80). To achieve good design, the user must be given control and choice over their environment, noise should be minimal, positive distractions and social support should be provided, and users should have access to nature. All of these suggestions are proven to reduce stress and contribute to the healing process.
Methods

Analytical Descriptive Approach: Qualitative Analysis of Research Methods

The subject of relocation stress syndrome was presented to me while I was completing my coursework in the field of gerontology. While researching another topic for a class, I came across articles discussing relocation stress syndrome. As an interior designer, this subject caught my interest. I thought back to my professional work designing my first senior living community and all of the considerations that needed to be made for the population that would be living there. I also remembered the first few weeks after the facility had been opened and how the residents reacted to being in a new place, specifically the seniors who were living in the Alzheimer's care unit. I felt strongly that through research, there could be a solution for reducing the effects of relocation stress syndrome on long-term care residents.

I began gathering data from research articles focusing on relocation stress syndrome. The articles were found using the Eastern Michigan University Internet database. A majority of the articles were located at the library on the Eastern Michigan University campus. The journals containing the articles were mainly nursing and gerontology based. When conducting a general Internet search for nursing homes, I came across the Green House project. From there, I looked further into the Eden Alternative principle and the subject of environmental gerontology. These articles provided me with the information I needed to develop my theory that the occurrence of relocation stress syndrome can be reduced by providing a safe, familiar environment for seniors to live.

It was important to research the validity of the relocation stress syndrome diagnosis. Some scientists argue that the diagnosis is inaccurate due to the lack of
validation studies. They also feel that some studies are designed to validate the presence of a diagnosis that has already been accepted. After conducting my own research review, I feel there is a significant amount of data to support the diagnosis of relocation stress syndrome. These data consistently show the occurrence of the same symptoms after an elderly person has been relocated to an unfamiliar environment.

During the writing process, I accepted a job at a post-acute rehabilitation facility that mainly treats older adults. Most of the patients are there for 30 days or less, but there is a small population of long-term care patients who also reside at this facility. In my daily interaction with the patients, I have witnessed firsthand the effects of relocation stress syndrome. In one particular instance, a patient named Tom who has lived at the facility for over five years was moved off of the “B” unit into another building away from his friends and care staff. The “B” unit had recently been converted into a locked unit for patients with cognitive disabilities. Tom’s daughters were not comfortable with their father living on a locked unit. Since Tom has moved away from the “B” unit, his own cognitive abilities have greatly declined. After one month, he no longer participates in group activities, has trouble taking care of his own personal hygiene, wanders throughout the facility not knowing where he is, has lost his teeth and his hearing aids multiple times, and sleeps most of the day. It is amazing how affected he is just by being relocated to another room in the same facility. If Tom’s daughters had been aware of the possibility of relocation stress syndrome, their decision may have been different.

The design solutions recommended in my review are based on evaluations of proven methods used in the Green Houses, causes of relocation stress syndrome, and professional experience using evidence-based design. I assessed each technique used to
provide a necessity for seniors, such as privacy, compared it to a symptom of relocation stress syndrome, and adapted it to work in this application.
Results

Research shows that not all elders have the ability to cope with a major change late in life. Symptoms appear when a disturbance in their daily routines occurs as a result of relocation. Whether this relocation is planned due to downsizing after retirement or an unplanned response to illness or disability, the senior is struggling to maintain his or her independence and autonomy in a new environment. The degree of control one has over this new environment can be the difference between a positive or negative outcome. The less change experienced, the easier the transition will be. The following concepts are most effective when designing environments to reduce the risk of relocation stress syndrome.

Eden Alternative

Dr. William Thomas' Eden Alternative principle of patient-centered care is a method that can be used in any long-term care facility to improve the resident's quality of life. Inexpensive adaptations can be made to focus on alleviating loneliness, boredom, and helplessness in any traditional nursing home setting by emphasizing companionship and caring for other living things. Initially, the Eden Alternative was intended to be a research study. The research was conducted in 1991 at two comparable nursing homes, the Chase Memorial Nursing Home in New York and a control facility at an undisclosed location. Below is a list of outcomes obtained from the research that occurred at the Chase Memorial Nursing Home after the Eden Alternative practices were implemented (Weinstein, 1997, p. 6):

- Decrease in urinary tract infections, upper respiratory infections, and other infections
• Significant decrease in mortality rates
  o 15% fewer deaths at 18 months past intervention
  o 25% fewer deaths at two years past intervention
  • This resulted in 8 lives being saved.
• 26% decrease in turnover among Certified Nursing Assistants, therefore lowering recruitment and training costs
• Decrease in medication use
  o The daily cost of medication used by residents at the control facility was $2.32 per person. The daily cost of medication used by residents at the “Edenized” facility was $1.44 per person. This is a 38% difference.

Other studies described in an article by Sonya Brownie (2011) support these findings.
The following outcomes were referenced (Brownie, 2011, p. 66):
• 2004 study of seven Eden Alternative facilities in Michigan
  o Staff turnover reduced from 72% to 9%
  o Fewer complaints regarding quality of care from residents, their families, and staff
• 1996-1998 study of Eden Alternative facilities in Texas
  o 60% decrease in behavioral incidents
  o 57% decrease in pressure sores
  o 18% decrease in use of restraints
  o 48% decrease in staff absenteeism
• Year-long study of unspecified Eden Alternative facility vs. control group
o Decrease in level of boredom 33% to 23% (Eden Alternative)
  - Increase in level of boredom 54% to 61% (control group)

o Decrease in feelings of helplessness 38% to 24% (Eden Alternative)
  - Increase in feelings of helplessness 54% to 61% (control group)

o No significant change in feelings of loneliness between locations

o Increase in proportion of residents who considered their health to be very good to excellent 19% to 40% (Eden Alternative)

o Increase in proportion of residents who considered their health to be very good to excellent 15% to 23% (control group)

These studies prove that following the Eden Alternative principles create a better living environment for seniors. Feelings of helplessness, loneliness, health problems, and behavioral issues are all symptoms of relocation stress syndrome. The Eden Alternative illustrates verified methods of reducing these symptoms.

**Green House Project**

A study was conducted using the first four Green Houses in Tupelo, Mississippi “to study how well the physical environments of four Green Houses served the residents, staff, and visitors and to develop recommendations for similar small-house nursing home projects” (Cutler & Kane, 2009, p. 304). Before designing the Green Houses, the architect visited and photographed the homes of seniors living in the area to study the way they organized and furnished their spaces. The reasoning for this was that Green Houses should fit into a particular time and place, “thus its specific dimensions and
layouts can only be derived from the way elders live in a particular locale” (Cutler & Kane, 2009, p. 309). The design of the Green Houses were also intended to be cost effective so they could operate under the Mississippi Medicaid reimbursement rates. The overall goal was to create a setting where all residents could be taken care of at a nursing home level, where there is no higher level of care beyond a hospital, but in a home-like setting. Achieving this goal makes it more affordable and therefore a more realistic alternative for long-term care.

One of the biggest challenges when designing the Green Houses was meeting the federal and state regulations for nursing homes while keeping a home-like feel. Since each house holds only ten residents, state regulations allow for noncommercial appliances. The need for public restrooms were met since the main buildings on the campuses had separate facilities for men and women. Other requirements, such as a nursing station, were considered met since all of the functions of a nursing station were met. Private bedrooms were left unfurnished to allow space for the resident’s personal belongings and furniture. Furniture in shared spaces was purchased from local stores to be consistent with the community preferences and keep costs down.

Each Green House is 6,040 gross square feet and has ten private bedrooms that enclose all common spaces and service areas. Figure 1 (Cutler and Kane, 2009) illustrates a typical Green House layout. The common areas, such as the kitchen, include adaptations for residents with special needs. The kitchen countertops are both regular height and wheelchair height. Each stove has a metal shield for resident safety that can be used to cover it if a staff member needs to leave the room in the middle of food
preparation. The private bedrooms and bathrooms include a built-in locked medication storage unit and a ceiling lift to transport the resident from their bed to their bathroom.

**Figure 1. Green House Floor Plan**

In order to evaluate the first four Green Houses (Laney, Page, Franks, and Martin) during their first two and a half years of operation, a post-occupancy evaluation was conducted. A post-occupancy evaluation (POE) is designed to measure the relationship between design decisions, social and behavioral outcomes, and care goals. It is also intended to provide feedback on how well the building or space performs after it is occupied (Cutler and Kane, 2009). The Green Houses were equated to facilities at two comparable sites. Data was collected at the baseline of the study and at three six-month follow-up intervals. The environment studied included the buildings and their surrounding outdoor spaces, fixtures, furnishings, equipment, décor, and how it was all being used. Outcomes of the Green House residents, their family members, and the
CNA-level resident assistants were compared to those of residents, family, and CNA’s at the sponsoring nursing home and retirement campus owned by the same firm approximately 80 miles away (Cutler and Kane, 2009).

The following research questions were used to guide the post-occupancy evaluation (Cutler and Kane, 2009, p. 311):

- How have the private Green House spaces informed the nursing home experience for residents and other users (family and other visitors and staff)?
- How have the shared Green House spaces informed the nursing home experience for residents and other users?
- How well does the environment achieve its aim of being a home?
- How well does the environment function as a workspace for staff?
- Were cross-Green House differences found in the use of the environments initially or over time?
- How does the environment support specific care tasks and life functions (e.g., bathing, meals, interactions with other residents and those outside Green House, and outdoor activity)?
- What environmental changes are recommended for the next generation of Green House’s on the Tupelo campus or elsewhere?

Data were collected in the Green Houses from May 2003 through December 2004. Follow-up data were collected in 2006 and 2008 as part of a study being conducted at expanded Green Houses on the same campus. Any changes that had been made during these visits were noted.
Each physical aspect of the Green Houses was described in detail. The floor and site plans were studied with each room specified by size, configuration, furnishings, and design features. Cost-calculation worksheets were used to illustrate construction and operation costs. These data were collected from the architectural firm that designed and built the Green Houses. A 112-item Environmental Quality Assessment for Living (EQUAL) checklist was used to assess all resident rooms and bath areas. The checklist was used for each of the 40 residents that were living in the Green Houses at the start of the study and for each resident that moved in during the two and a half year time period.

Researchers observed the residents during specific time periods each day at each of the houses. Their behaviors were mapped into a schedule indicating the location and movement of all residents, staff, and visitors during those time periods. Notes were taken on where they were, how long they were there, and what they were doing. During these observation periods, researchers conducted unstructured interviews with staff, residents, and family members. The interviews were intended to find out what each person liked or disliked about the Green House and if they felt it was better than previous nursing home experiences. Satisfaction with the physical environment was rated according to responses from the interviews. Researchers asked residents and family members open-ended questions to gauge their reactions to private and shared spaces while staff were asked questions concerning the working environment. In addition to the observation periods and interviews, researchers walked through each house four times every day for 30 minutes to document how each space was being used at that particular time. These “observational scans” took place at 9:30 a.m., 12:30 p.m., 3:00 p.m., and 5:30 p.m. Physical tracers were observed and notated in a journal as an unobtrusive way to
determine patterns of usage in specific areas. For example, researchers were looking at the placement of dining room chairs, use of bookshelves, whether or not televisions were on or off and if it was being used, and general wear and tear on furniture and appliances. Photographs were taken periodically and were used to identify how the Green Houses were being used. This helped to identify whether or not they were being maintained and if the interiors were being used according to the intent of the model. Specific observed incidents were also photographed, whether it was a positive or negative event (Cutler and Kane, 2009).

The results of the study showed what methods worked and what areas needed improvement when planning the next Green House. There proved to be a few drawbacks to using residential equipment and materials in a high-use setting. For instance, due to the high volume of use, the residential grade appliances were not able to withstand such frequent use. This caused the staff to close off the kitchen at certain times throughout the day in order to limit resident use. Overall, the design layout was effective in minimizing distances for residents to navigate throughout the home and enhanced functioning within the space. Accessibility, stimulation, challenge, sensory compensation and enhancement, and adaptability and responsiveness to change were all supported by the layout of the home (Cutler and Kane, 2009). The design was also intended to promote a sense of community among the residents as well as encouraging communication. The openness of the kitchen, dining, and hearth areas accomplished this.

During interviews conducted at the four Green Houses, residents were asked what they liked best about living in a Green House. The following answers were received: “Best thing to hit the universe,” “I am very satisfied with my home,” “This is my little
house and I take care of it,” and “It is like a home away from home” (Cutler and Kane, 2009, p. 319). Family members had the following things to say about their loved ones living in a Green House: “It’s a beautiful home. She didn’t live this good at home. It is just a luxurious place,” “I think her living area is spacious. The bathroom is perfect for a resident” (Cutler and Kane, 2009, p. 319).

In addition to the positive feedback researchers received, residents also identified areas where improvement was needed. The small size of the private resident bathroom was most often criticized. Some residents felt there should be a door separating their bedroom and bathroom. Others did not like the size of the bathroom mirror and medicine cabinet, the placement of the grab bars, and thought the bathroom was too damp. Family members also shared the same concerns regarding the private bathrooms. Complaints of the bedrooms and bedroom closets being too small were also acknowledged.

Staff members also shared their feedback with the research team. Staff also voiced concerns with resident bathrooms. Their issues pertained more to the functionality of the bathrooms. Some staff felt the shower and toilet configuration were not ideal. Others thought the showers did not drain properly and the shower seats were uncomfortable, mounted too low, and did not offer enough support for the resident. Like the residents, staff also felt the grab bars were placed incorrectly. They also suggested containers for dirty linens and biohazard materials were needed. Staff agreed they felt the size of the bedrooms, bathrooms, and closets were too small especially for residents in wheelchairs. A recommendation was made to install window alarms on houses with residents suffering from dementia.
In relation to the shared spaces, residents and family members voiced concerns about the dining and hearth areas. Some residents felt the dining table was too large and created noise, congestion and chaos at meal times. Others thought the hearth area did not provide enough space for activities and should include a television. The carpets and furniture were beginning to show wear since they were meant for light residential use. Staff member concerns of the shared spaces once again related to function. Some critiques were as follows: A call button should be located next to the tub, wheelchairs were not able to be pulled up directly to the rinsing sink due to cabinet placement, the pantry should be closer to the kitchen, kitchen cabinets were hung too high, there was a lack of electrical outlets in the hearth area, and a lift track was needed in the dining room and hearth areas. Other concerns addressed the quality of building materials that were used.

Outdoor areas were proven not to be ideal. Residents believed there should be more outdoor seating provided and located in a spot where they can see activity going on in their community. Family members requested a portico or covered area to pick up their relatives when it is raining. A lack of parking spaces was also an issue for family members. While residents complained of not having access to the outdoors, their family members complained too many of the residents had access to the front door code. Despite the small amount of negative feedback from family members, they still showed enthusiasm towards visiting the Green Houses. Most indicated visiting the Green Houses was a much better experience than visiting their loved ones in a traditional nursing home.

The study of the first four Green Houses conducted by Cutler and Kane found that “overall, the design goals of the Green House model were met” (Cutler and Kane, 2004,
p. 326). After the study was completed, an additional six Green Houses were built on the Tupelo, Mississippi campus. These six Green Houses used some of the suggestions given to Cutler and Kane during their study. Bathroom improvements were made including a door leading into the bedroom and the food pantry was moved so it could be accessed from the kitchen. A major difference between the new Green Houses and the old was the addition of two residents to each home. Other Green Houses that have since been built in different locations have also implemented some of the suggestions documented in this study. Some of them have increased the size of the bedrooms and connecting bathrooms as requested by residents. Garages that are connected to the house have also been added to some as well as off-street parking.

This study shows the Green House design is well received by residents, visitors, and staff members and encouraged family-like behavior among the users. Largely, the study illustrated the importance of listening to ideas recommended directly by the users. It also demonstrated the need for staff to take advantage of their environment when assisting residents in order to gain the most of what they have.

The Green House project is a unique solution to long-term care facilities. In an ideal world, all large institutionalized facilities would be transformed into small, home-like buildings. Since this is not always an option, adjustments can be made to existing facilities by using key design elements from the Green House principle. When a senior views their new environment as better than their last, the relocation is perceived as a positive change. This perception helps to reduce the occurrence of relocation stress syndrome. Based on the designs used in the Green Houses, the following considerations
should be made to increase the quality of life for residents when designing long-term care facilities:

- **Lighting**
  - Allow for plenty of natural light throughout the building.
  - Provide blinds on all windows to control light levels throughout the day and eliminate reflections at night.
    - Specify blinds that can be easily operated.
  - Use lighted rockers or pressure-type switches.
    - Illuminated switches are more easily found in the dark.
  - Dimmer switches in private rooms are preferable so residents are able to control lighting levels.
  - Switch plates should be a contrasting color from the wall to eliminate it blending into the wall.
  - Task lighting is necessary in kitchen and bedroom areas.
  - The bathroom should have a night-light to provide visibility when making trips to the bathroom in the middle of the night.

- **Kitchen**
  - Cooktops that are cool to the touch and able to be covered should be used.
  - Kitchen cabinets should include hardware with magnetic pulls.
  - Provide ample counter space around sinks for work areas.

- **Heating & Cooling**
  - Provide individual temperature controls for each bedroom.
• Safety
  o Use limited-opening hardware on all windows to prevent residents from crawling or leaning out of windows.
  o All exit doors should be kept locked. A combination keypad code should be required to open the exit doors.

• Interior Finishes
  o Provide contrast between flooring materials.
  o Use different textures on furniture and fabrics.
  o Give the residents the option of individualizing their bedrooms with different paint colors to make them feel more at home. Provide bedrooms that have already been painted different colors if individual options cannot be given.

• Human Factors
  o Outdoor seating should be covered to prevent the occurrence of heat stroke or sunburn.
  o An eye washing station should be located in the bathroom sinks for emergencies.
  o To control water temperature, single-lever faucets are preferred.
  o Create signage with the resident’s name next to each bedroom door.
    • Pictures boxes with the resident’s family and/or interests offer a visual cue for the resident to recognize their personal space.
  o Private bedrooms and bathrooms should be large enough to accommodate a wheelchair.
Allow for ample closet space to store a reasonable amount of personal belongings in each bedroom.

All spaces must be accessible by wheelchair.

Shower benches in each bathroom should be comfortable and support the resident sitting in an upright position.

Dirty linen containers and biohazard containers are needed in each bedroom.

Shared spaces should support a wide range of individual or group activities.

- Wall-mounted wheelchair-accessible flat surfaces that fold down when not in use would provide activity space for smaller areas.

By making these changes, a safer atmosphere is made available for the elderly residents to thrive in their new home. These comforts will make adapting to a new area less stressful. Safety is also important to decrease the risk of injuries and promote independence to freely move about without hesitation.

**Indoor Environmental Quality**

Remembering that the average 75-year-old has at least three chronic conditions, it is extremely important not to create additional health problems because of poor interior conditions. Providing a healthy indoor atmosphere will eliminate further risk of illness. Making good design decisions based on evidence-based research will accomplish this objective.

**Daylight.** A critical element of indoor environmental quality is daylight.

Daylight should enter every room where people live and be maximized throughout the
building. A view of the outdoors should also be accessible. Daylight should be soft, indirect, diffused light that avoids glare, harsh shadows, and heat gain. Proper use of daylighting can conserve electricity by integrating natural light with electrical sources such as luminaries. If used together, daylighting can reduce electricity by 80%. Reducing electricity used for the lamps also reduces heat produced from them, thus using less energy for operating air conditioning systems (Winchip, 2007).

Knowing the position of the sun and how it varies during the day and throughout the year is important to knowing how to maximize your daylight. The site where your building is located also affects how much daylight is available. If you are close to other buildings and surrounded by trees, they can block out daylight. Placing windows on either side of a room maximizes the daylight into the room. It also distributes the light more evenly than having a set of windows on one side of a room. Using glazing and adjustable shades on the windows helps control the amount of light coming in.

The size and shape of a window also affects the quantity of daylight entering a room. For more daylight, deeply recess the window and use light-colored surfaces with a matte finish around the opening. This will reduce the surface reflectance, which can cause glare. A horizontal window shape or arrangement provides a more natural view and allows the eye to move easily from side to side (Winchip, 2007).

Exterior building design also affects daylighting indoors. External shading techniques and natural vegetation can be used together to provide an effective solution for reducing the negative effects of sunlight. Light shelves, overhangs, fins and sun louvers, window recesses, and window treatments are all decorative solutions to control the amount of sunlight entering a building. When using these solutions, a view from a
window should never be obstructed. Research has shown a pleasant view of the outdoors is critical to the health and well-being of individuals.

While an outdoor view is enjoyable during the day, it can have a negative effect at night. Depending on the view, the window can become a black hole at night and cause anxiety for elderly residents. The glass can also function like a mirror and reflect images, which may frighten an individual with cognitive impairments. This can become a safety issue. To reduce the reflection on the glass, a matte glaze should be used.

**Ventilation, temperature, and humidity.** By maintaining an efficient heating, ventilation, and air conditioning system (HVAC), comfortable temperatures, clean air, and optimum humidity can be controlled. HVAC systems provide ventilation and regulate the temperature and humidity in a building. Humidity contributes to the overall temperature of the space. A level of humidity that is too high or too low can affect the occupant’s comfort. In addition to making the occupants uncomfortable, high levels of humidity can also create excess water or moisture that causes damage to structural components and interior materials. Moisture also creates mold, which can cause various respiratory illnesses and allergic reactions (Brunk, 2003). Mold will also destroy building materials, furniture, fabrics, wood, carpet, drywall, and plaster. Too little moisture can also have negative effects such as dry skin and irritation of the nose, throat, and lungs. Dry air can also damage wood structures and furniture, and cause finishes to peel and crack.

The World Health Organization estimates every year “indoor air pollution is responsible for the death of 1.6 million people – that’s one death every 20 seconds” (Winchip, 2007, p. 179). The indoor air quality of a building needs to be assessed to
ensure the health and safety of the building occupants. Outdoor air pollutants, such as automobiles and tobacco smoke, coming into the building should be filtered through the building ventilation system.

**Noise.** Equipment and lighting systems within a building can create distracting noise. Noise within a building can cause negative effects such as fatigue, sleep loss, high blood pressure and heart rates, slower recovery times, and stress. Noise also affects staff members, which causes stress and job strain that can lead to high risk of error (Ulrich, 2006). In order to reduce noise, sound-absorbing materials can be placed between walls, quiet HVAC and lighting systems should be specified, loud equipment should be placed away from public areas, high-performance ceiling tiles, and noiseless paging systems. White sound machines can also help block out mechanical noise.

**Personal control of a setting.** Allowing the residents to have control over their personal environment, such as their bedroom, can create a tolerance for a wider range of temperatures. It can also increase overall satisfaction with their environment (Toftum, 2008).

**Healing Environments**

Environmental studies have shown that nature itself is a powerful stress reducer (Nayar, 2011). By invoking nature into design, calming surroundings can be created to reduce resident anxiety while enhancing their level of comfort, thus reducing the risk of relocation stress syndrome. In a study conducted by Roger Ulrich, patients who had recently had surgery were divided into rooms with a view of nature and rooms with a view of a brick wall. The patients who had a view of nature were released from the hospital sooner, used fewer pain medications, and displayed other signs of improvement.
as compared to the patients who could only see a brick wall (Hamilton and Watkins, 2009). This evidence shows views of nature should be implemented when designing long-term care facilities.

Residents need to view their new home as better than their last. The following design solutions should be implemented to create a healing environment (Hamilton and Watkins, 2009; Looker and Stichler, 2003):

- Earthy, neutral hues
- Curved walls
- Recycled wood
- Outdoor views
- Greenery, fresh flowers, plants
- Access to exterior spaces, such as gardens and courtyards with walking paths and seating
- Abundant daylight
- Resident-controlled supplementary lighting
- Artwork depicting nature
- Water features such as fountains and water walls
- Comfortable furniture with seating arrangements encouraging conversation
- Use of products with low toxicity, such as low VOC paint
- Private rooms
- Identical resident rooms
Many studies have been conducted concerning the benefits of private rooms in healthcare facilities. While some facilities may feel single rooms are not cost effective due to space, research has shown there are several benefits. A study conducted at the Bronson Methodist Hospital in Kalamazoo, Michigan, reported an 11% reduction in hospital-acquired infections when patients were given their own rooms and properly located hand washing facilities were provided (Hamilton and Watkins, 2009). A review of 700 studies conducted in acute care hospitals showed negative results for patients who shared rooms (Ulrich, 2006). Having a roommate creates additional disruptions and causes higher infection rates for the patients. Single rooms create privacy and confidentiality. This allows more room for families and friends to visit, gives them flexible visiting hours, and makes it easier for them to provide stronger emotional support for their loved one. Privacy also helps the staff to communicate with the patient better. Evidence shows having a roommate causes more stress for the patient instead of social support. There is also the possibility that roommates will be incompatible and request a transfer, which causes more disruption and work for the staff. Overall, patient satisfaction levels are much higher when they are given a private room.

When attempting to design the world’s safest hospital in West Bend, Wisconsin, the architect of St. Joseph’s Community Hospital designed all of the patient rooms to be private and have the same layout. A standardized layout reduced the possibility of staff error when searching for items in an emergency situation. The toilet was located on the bathroom wall directly behind the patient’s headboard. A continuous handrail was installed along both walls so the patient could safely get from the bed to the toilet.

Two types of therapeutic gardens have been proven to be beneficial to long-term
care residents. Wandering gardens are specifically designed for individuals with Alzheimer’s disease to help ease their symptoms. An enabling garden utilizes raised beds, containers, and adaptive tools so it is accessible to everyone (Raske, 2010). A study conducted in a small mid-western nursing home showed how the use of gardens improved the quality of life for residents. The seniors looked forward to being outside in an area where they felt comfortable. They enjoyed being away from the noise of the facility. Residents also stated they felt safer when in the garden since they could wander freely without worrying about getting lost. Tending to the garden gave the residents purpose through meaningful activities such as watching the garden, watching birds and butterflies, selecting and planting seeds, watering and cultivating the garden, touching and smelling the plants, picking produce, and having meals or picnics in the garden (Raske, 2010). The enabling garden also helped to cultivate relationships between residents, their families, and the community residents. Residents of the nursing home got to know each other by spending time together taking care of the garden. Family members reported that the garden gave them something to talk about while visiting. Community residents helped in the planning of the garden, which brought people in who would otherwise not have visited. Working in the garden also proved to improve behaviors helping residents to be less agitated after spending the afternoon outside. Residents gained a higher sense of individuality, dignity, and autonomy by seeing something they contributed to making grow. One staff member commented, “Some of the residents can come out here and go as they please. They have their freedom back” (Raske, 2010, p. 345). This study discusses the therapeutic gardens lessening many symptoms that are also related to relocation stress syndrome. Residents suffering from relocation stress
syndrome as well as other health problems could greatly benefit from utilizing these gardens.
Discussion

Research tells us relocation stress syndrome begins with the voluntary nature of relocating to a new home. If the move is involuntary, the risk of relocation stress syndrome occurring increases. In order to reduce this occurrence, changes to the environment can be made. These changes should support the individuals' independence and autonomy as well as their social status in the community. Giving individuals control over their new environment will aide in their adjustment to their surroundings.

Ideally, seniors should make the decision to move into a long-term care facility for themselves. Unfortunately, due to health problems and other situations that may be out of their control, seniors are not always given the choice. Any options that are available should be given to the older adults. If seniors are resistant to the move, offering them options may ease their minds and help them to become more willing to move. One way of doing this is to negotiate their personal needs and preferences (Bekhet et al., 2009). Another possibility is to allow them to decide when the actual move will take place. Providing seniors with an explanation of the benefits of the new location may also help them to be more positive about the decision (Walker et al., 2008).

"Environmental scholars hold that a relationship must exist among design decisions, social and behavioral outcomes, and care goals" (Cutler and Kane, 2009, p. 307). When taking into account the effects of relocation stress syndrome caused by being placed in a new environment, special consideration should be made to lessen these effects. To help familiarize seniors with their new surroundings, give them a tour of their new home and identify specific landmarks within the facility to help them understand and become familiar with their new surroundings. This is especially important if the senior
was not able to visit the facility prior to moving in. Explain where they can store personal items so they know their belongings are safe (Morse, 2000). It is important to grant them control over their personal space. Choices of where personal belongings will be placed should be offered. In order to provide privacy, physical boundaries should be clearly defined. After the move, involving residents in routine activities, such as setting a table and food preparation, are also very important to maintain their autonomy (Melrose, 2004). Promote personal identity by creating an ongoing biography or “life-story” scrapbook to keep on display in the senior’s room. Providing hosting areas for residents to spend time with their visitors and offer them simple refreshments is important for encouraging residents to maintain relationships with their family members and friends outside of the facility. This should lessen their feelings of depression.

In addition to encouraging seniors’ independence in their new home, design considerations need to be made to ensure the building’s safety. Windows with outdoor views that provide ample daylighting, a high-performance HVAC system, individual temperature controls in resident rooms, and noise-reducing materials should all be implemented into the building’s design. These elements will reduce the risk of illness and provide a better quality of life for the residents.

Along with ensuring a high level of indoor environmental quality, the building should also be a healing environment. Using natural elements such as gardens, earthy colors, water features, artwork depicting nature, and wood will decrease the level of stress among residents. All of these design strategies together will create a safer environment, which will reduce the risk of relocation stress syndrome.
Conclusion

Research has shown that relocation stress syndrome is a legitimate diagnosis that affects older adults when relocating to a new environment. Seniors suffering from relocation stress syndrome need a safe place that will ease their symptoms and promote health. Gathering design strategies that have been proven to alleviate these symptoms and implementing them into one building should reduce the risk of relocation stress syndrome in older adults. Future work needs to be done to ensure these strategies will alleviate symptoms of relocation stress syndrome. The study framework should include two long-term care facilities. One facility should include the improvements suggested in this paper such as private resident rooms, high level of indoor environmental quality, home-like environment, and healing elements. The other facility should be untouched and represent a typical, institutional-like atmosphere. A post-occupancy evaluation will need to be conducted to determine what symptoms seniors display after moving into each of the facilities over the course of a year. Interviews should be conducted with these residents, their families, and staff members before their arrival, immediately following their arrival, and at three-month intervals thereafter. Behavioral observations should also be recorded at these times. The data collected during this study should provide valuable information showing which environmental factors were proven to alleviate relocation stress syndrome in the residents of the long-term care facilities.
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