

THE EFFECTS OF ENVIRONMENTAL  
FACTORS ON PHYSICAL ACTIVITY OF THE  
OLDER ADULT IN  
ASSISTED LIVING FACILITIES

By

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THE EFFECTS OF ENVIRONMENTAL FACTORS ON  
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## CHAPTER I

### INTRODUCTION

The advances in medicine and technology have led to increased longevity for the aging adult (Crews, 2005). Maintaining the health of this increasing segment of the population has become an increasingly important issue since one third of the money spent on health care in America is being attributed to adults over 65 years of age (Davidson, 2009). Studies are now showing that health benefits occur through increasing daily activities moderately while developing a healthy lifestyle (Brody, 1995; Brownson, Baker, Housemann, Brennan, & Bacak, 2001; Davidson, 2009; Riewald, 2009; Westoff et al., 2007). This study will look at the environmental factors that exist in assisted living facilities that may assist in encouraging exercise in the aging population.

Physical activity is defined by the Physical Activity Guidelines Advisory Committee as moderate to vigorous activity 150 minutes per week (2008). These activities include household chores, leisure walking, childcare or other types of physical activity that is beneficial for health. Recent studies show substantial improvements in health and well being are seen after six months of performing muscle-strengthening activities or aerobics in sedentary adults (Davidson, 2009). Participants who increased their daily activities

experienced strengthening of bones, muscles, mental health and mood. By engaging in physical activity improvements in weight control, reduced cardio vascular disease, reduced Type 2 diabetes, and risk of some cancers were reported and the ability to perform daily activities were enhanced. In addition, the effects of hypertension, elevated blood pressure, arterial stiffness, diabetes, cancer, osteoporosis, obesity, depression and dementia can be reduced with regular physical activity (Davidson, 2009). Participating in resistance training is also proven to help regain the brain from mental decline and improve performance on standard neurophysiologic tests of memory and verbal reasoning (Riewald, 2009). By choosing a lifestyle that includes regular physical activity, the older adult can make an impact on their health promotion, disease prevention, and rehabilitation while increasing their psychosocial well being and quality of life.

Although the American Hypertension Guidelines suggest an aerobic exercise program consisting of walking, jogging or swimming for thirty to forty minutes, three to four times per week, a significant number of older adults do not engage in regular physical activity of any kind (Westoff, et al., 2007). The behavior of the older adult in later life is derived from beliefs from early life experiences and thus influences their current perceptions of physical activity (Buman, Yasova, & Giacobbi, 2010). Most chronic diseases occur because of poor choices made earlier in life (Davidson, 2009). The “benefits of good health and longevity for older adults can be seen in those who have regularly exercised throughout their life” (Walker, Volkan, Sechrist, & Pender, 1988).

There are many factors that influence a person’s health. These include gender, age, education, race, social support, place of residence, socioeconomic factors, work/occupation health behaviors, and active living choices (Frankish, Milligan, & Reid, 1998). Stahl, et al.

(2001) found that the social environment is the strongest independent predictor of being physically active. The social environment is defined as social support from family and friends, and has a strong role in health behavior change. The support of family and friends has been shown to influence the participation in physical activity while the lack of social support has been associated with a decrease in physical activity (Stahl, et al., 2001). In addition, social relationships have been found to influence health behavior choices. The US Surgeon General recently reported the need to develop and evaluate interventions that will include environmental support to impact health behavior change (US Department of Health and Human Services, 1996).

Despite all that is known about the benefits of exercise, the difficulty exists in getting the older adult to implement an exercise regimen. As a result, many facilities have started using digital games as a means of social interaction and physical activity to promote “successful aging.” By providing an environment offering a range of opportunities for its inhabitants, assisted living facilities can shape the conditions that affect residents’ lives and promote health. Encouraging increased physical activity will help to maintain the health and independence of the older adult. The evidence shows “that it is never too late to benefit from life-style changes” (Walker, et al., 1988).

### **Problem Statement**

This research will focus on the environmental factors; perceived wellness, built environment and social environment within assisted living facilities that affect the physical activity in their residents over the age of 65. Factors contributing to promoting/discouraging physical activity including barriers both felt and perceived by the aging adult, as well as the

impact of the social and built environment will be reviewed. Inadequate amounts of physical activity pose a problem in the health and well being of the adult population, which lead to poor health resulting in sickness and disease.

### **Purpose of the study**

The purpose of this study is to establish and understand the environmental factors, both social and built, that serve to promote physical activity among older adults. This study will seek to understand ways to promote health by using environmental factors to encourage physical activity of the older adult. Recent studies have looked at access to exercise facilities, organized physical activity programs, peer support, and the impact these differences have on physical activity. This study will also explore the environmental factors, both social and built, that exist in assisted living facilities impacting physical activity levels for the residents.

Quantitative research will be conducted at four assisted living facilities within the Stillwater area. A comparison of the different facilities and the environmental factors that exists within each facility will provide a distinction of the activities accessible to the aging adult population.

### **Definition of Terms**

- AGING ADULT- denotes those adults that are over the age of sixty- five.
- ADL (activities of daily living)- daily self-care activities within an individual's place of residence, include feeding ourselves, bathing, dressing, grooming, work, homemaking, and leisure.

- ASSISTED LIVING FACILITY- a facility that is licensed based on the capability of the residents to evacuate the facility or the types of services the facility provides.
- EXERCISE- performance of some activity in order to develop or maintain physical fitness
- HYPERTENSION- characterized by an elevation of pulse pressure.
- INACTIVITY- no moderate or vigorous activity.
- PHYSICAL ACTIVITY- moderate to vigorous activity of one hundred fifty minutes per week. \* can include exercise
  - **Sedentary category**- no activity engaged in for the past two weeks that increases the heart rate.
  - **Underactive category**- not fitting into the sedentary or active group.
  - **Active category**- engaging in physical activity three or more times per week for a minimum of 20 minutes per session that results in a significant increase in the heart rate (King, Castro, Eyer, Wilcox, Sallis, & Brownson, 2000).
- SOCIAL ENVIRONMENT- the social support from family, friends, school and workplace.
- SUCCESSFUL AGING- the combination of low probability of disease, high functioning, and active engagement with life.

### **Significance of the Study**

This study will be significant in identifying the environmental factors within each facility that create barriers as well as motivators to physical activity for the aging adult. Subsequently assisted living facilities can be designed or remodeled to incorporate the

environmental factors that motivate physical activity. In addition, this information will show how the social environment can be enhanced to encourage the aging adult to exercise. It will be useful to these facilities as they create healthful environments by altering or adapting social surroundings in ways that preserve and enhance health, thereby reducing the amount of disease of their residents. The information attained through this study will also be helpful to the aging adult, by identifying the health benefits of increasing physical activity. The goal is to provide opportunities to assisted living facilities to promote health and give social support to the residents with the hope of developing active lifestyles and improving health. This could reduce the amount spent on medications and doctor bills as well as increasing the quality of life. One main assumption made is that all the determinants associated with the lack of physical activity are identified in this study.

Most of the previous studies have reviewed the effects of exercise during a term of six months. Therefore, the effects of long-term exercise are unknown, and could be greater or less. A significant limitation to this study is the influence of factors other than environmental within the assisted living facility that might enter into the decision to exercise. These could be things such as color used in the exercise facility, odors within the facility, not having clothing that is conducive to movement or any number of influences that might result in a negative decision to exercise.

## CHAPTER II

### REVIEW OF LITERATURE

#### **Introduction**

In this study previous research has been reviewed to attain an understanding of the exercise limitations in the older adult and the presence of motivators that can facilitate activity. A look at the benefits of exercise will help to determine the importance of physical activity for this group of older adults. In addition, a review of the reasons a person may or may not choose to exercise is examined. These are categorized into barriers and motivators of physical activity. Lastly a look at the social environment and how it affects the decision to participate in exercise will be discussed. Reviewing this information will help to gain an understanding of guidelines that can be used to create surroundings that promote activity within an assisted living facility.

#### **Benefits**

One of the most perceived benefits of physical activity is weight control. Exercise helps to increase muscle mass and lose fat, which results in burning more calories. For the older adult, the loss of lean muscle tissue related to age can be minimized. In addition, the accumulation of abdominal fat that is damaging to the heart is reduced (Brody, 1995).

Exercise has been called the “secret weapon” against crippling effects that chronic

disease and disability will add to our health care system. Exercise can “reverse disease and help the older adult sustain a higher quality of life throughout the golden years” (Davidson, 2009). It provides the maintenance of health by preventing diseases while increasing the quality and longevity of life. Increased vascular stiffness and reduced large artery function are also seen in the aging adult leading to a rise of pulse pressure or hypertension (Westoff, et al., 2007). The cardiovascular effects of exercise were examined in the Westoff, et al, study and results showed improvement in blood pressure by those who participated in aerobic physical activity for 12 weeks. The risk of vascular diseases associated with aging such as elevated blood pressure were cut in half by those participating in regular physical activity. Additionally, the risk of developing colon cancer, a leading cause of cancer deaths, can also be reduced.

Engaging in exercise that is not weight bearing such as stationary cycling and water aerobics can help with bone density and the effects of osteoporosis. Increasing bone density and strengthening muscles is another benefit that enables the aging adult to perform their daily activities. This reduces the risk of fractures and injuries from falls by improving balance, strength, coordination and flexibility (Brody, 1995; Davidson, 2009). Arthritic symptoms are experienced in most adults over 65 (Davidson, 2009). Regular moderate exercise and stretching reduces the need for medication and lowers the pain of arthritis.

By participating in regular physical activity, older adults are less likely to develop diabetes (Davidson, 2009). Engaging in physical activity increases the sensitivity of the cells to insulin. This results in lower blood sugar thus reducing the need for insulin.

A stronger immune system which leads to fewer colds and respiratory infections is another benefit experienced by those who are physically fit. This is a result of the increased



circulation of immune cells fighting infections and tumors (Davidson, 2009). Improving circulation in the gestational tract is also a result of regular physical activity. Exercise significantly reduces the risk of gastrointestinal hemorrhaging seen in older adults (Brody, 1995).

In a recent study by Riewald (2009) exercise or the lack of exercise was identified as a possible factor to the mental decline that occurs with age. By speeding the transmission of nerve messages, exercise fosters clearer thinking and faster reaction times. Immediate improvements in memory result from brief periods of mild exercise (Brody, 1995). In addition, cognitive decline can be stopped and the deterioration that has taken place can be reversed with regular exercise (Riewald, 2009). Aerobic exercise such as walking has been shown to reverse the cognitive impairments experienced by those with dementia by preserving brain volume. Older adults who exercise regularly have been shown to exhibit less brain atrophy than those who are sedentary. The symptoms of Alzheimer's, as well as memory and verbal reasoning are all improved by patients who exercise regularly. Immediate improvements in memory have also been seen by those who participate in mild exercise, even for a brief period. In as little as six months, the older adult who engages in a combination of aerobic exercise and strength training can experience a significant increase in cognitive functions. Regular physical activity has been shown to regulate stress and improve one's mood. In addition to all these benefits, physical exercise improves the quality of sleep and helps the older adult fall asleep quicker.

### **Barriers**

Physical inactivity is one of the most prevalent of chronic risk factors of disease in the United States (King et al., 2000). This is especially important to the fastest growing

population of older adults who carry the greatest proportion of chronic disease burden, disability, and health care utilization. Preventative approaches begun earlier in life can promote health and limit disability before the loss of function occurs in the later years. A recent study by Yan, Wilver, Aguirre & Trego (2009) stated that physical activity levels are inversely associated with age; as the age of the older adult goes up, the activity levels go down. Participation rates actually reverse in adults over the age of 65 according to a study conducted by Frankish (1998). There are two types of barriers that serve as obstacles: individual and structural. Individual barriers are those that begin with the person, while structural barriers are those that are created outside the individual (Frankish, et al., 1998). The individual barriers are further broken down into two groups; those that are felt and those that are perceived. With this in mind, it is important to look at the barriers that are influential in impeding regular physical activity levels.

*Individual barriers: Felt.*

Physical disability and pain largely impacted the older adults decision to exercise (Buman, et al., 2010) and was found to be the main individual barrier to physical activity that was felt and was considered a chronic condition associated with age. In a study conducted by Cohen-Mansfield, Marx, & Guralnik (2003) lack of energy and lack of motivation were identified as common felt barriers to physical activity. These symptoms are associated with depression and often lead to a lack of desire or loss of interest in physical activity. Weight gain was also considered a felt barrier and created a reduced ability for the older adult to participate in regular exercise leading to a lack of energy.

*Individual barriers: Perceived.*

The fear of injury was the leading perceived barrier experienced by many adults over 60. Coupled with a lack of skill, the fear of injury had a negative effect on physical activity. Poor health such as joint damage, heart attack, neck and back pain, and breathlessness is a common concern leading to a lack of exercise. Additionally, the fear of falling, inertia, and physical ailments were commonly cited among this age group (Buman, et al., 2010). Financial costs are another barrier found to be a determinant to participation in exercise which often led to physical inactivity.

Perceived barriers also exist in the individual which inhibit regular exercise. In a study by Buman, et al., (2010) it was determined that lack of time was the primary perceived barrier to those adults under 60 years of age and as a result the importance of physical activity became reduced. In addition, this group also experienced misconceptions about exercise which played an important part in an individual's decision to engage in physical activity. While the participant was aware of the benefits of exercise, they often considered it too risky for people their age (Buman, et al., 2010). Past traumatic experiences can also impact the adults' decision to exercise even though they may have happened many years ago. Life circumstances may influence the individual's desire, ability and likelihood of taking part in physical activity. These perceived barriers manifest over time and become influential in determining an individual's behavior towards physical activity. In addition, a dislike for physical activity can become a barrier and have a strong influence on a person's participation in exercise.

### *Structural barriers.*

Structural barriers experienced by the individual dealt with the lack of recreational facilities, the safety of the surrounding environment, and availability of programs, accessibility and climate. In addition, access to facilities or programs is a structural barrier experienced by the older adult. Even though many facilities have a designated space to exercise, often times it is not conveniently accessible to the residents. Lack of social support from significant others also had an influence on one's decision to participate in physical activity. These barriers could result in a negative decision to exercise. Many obstacles are significantly influenced by the individuals' age, and frequency of observing others exercising.

The importance of safety in one's immediate environment or neighborhood has a direct influence on the physical activity pattern. The local climate also has an influence on the ability of the resident to participate in physical activity outdoors.

### **Motivators**

Like the barriers that are faced by the older adult, different variables can be perceived as motivators of physical activity and are formed during varying phases of a person's life. While many are constructed at a young age, they can appear over time and are cognitively represented by a person's behavior. In contrast to the barriers of exercise, literature provides variables that are significant in promoting regular physical activity.

In a study by Buman, et al. (2010), the most cited motivator to physical activity was health concerns. Many individuals are motivated to exercise as a way to increase the health related quality and longevity of their life. Issues such as weight gain, heart disease, muscle

atrophy, osteoporosis and prevention of certain conditions/diseases are important factors motivating the active individual. However, some of the variables that serve as barriers can also be motivators. While some individuals participate in exercise because of weight control, others use their weight as a barrier to engage in physical activity. Other important factors were found to be motivators including enjoyment of the activity and a connection to nature and environmental surroundings. For many, the love of nature is a motivator to take a walk and enjoy their surroundings.

### **Social Environment**

Studies show that social relationships influence health behavior choices and can be promoted by family and friends through the social environment. A strong positive association exists between social support and the amount of physical activity one engages in. According to Stahl, et al., (2001) the social environment is the strongest individual predictor of being physically active. Having a friend who encourages exercise or at least one person to exercise with, has been shown to increase activity levels (Brownson, et al., 2001).

Accountability exists when friends exercise together, which helps them both to stay physically fit. Likewise, there is a strong tendency for people with active friends to be active. In addition to family and friends, exercise program staff can provide social support for exercise and influence physical activity. The staff can be helpful to assist in using equipment properly and can be a source of encouragement when participating in an exercise program. Bringing people in contact with others through physical activities, has also been shown to prevent depression, which is very common in older adults (Brody, 1995).

Physician advocacy, peer support, class instruction and organized programs have all been shown to impact physical activity. Primary care physicians can influence the elderly in

their decision to start or maintain a healthy lifestyle, although it is harder implementing an exercise routine than simply prescribing medication to be taken daily. By increasing the awareness of life changing behavior, the physician can help lower chronic disease and disability. The primary care physician as well as health(Crews, 2005) care nurse is in a position to influence the elderly patient by discussing the risks and benefits of exercise. Additionally, the support of one's physician or nurse has a positive impact on activity. In a study conducted by Stahl (2001) social environment items were developed to determine the perceived social support for participation in physical activity. Direct influences such as family and friends were studied as well as less direct social influences that came from newspapers, TV, workplace, school, community, politicians, doctors and health insurance. The participants who were more physically active had high support from their personal environment. They were well informed about programs and local opportunities to be active. Oddly enough high media support resulted in participants that had an increased likelihood of being sedentary. Education also directly affected physical activity such that the higher educated participant was more likely to exercise (King, et al., 2000).

Digital games are tools that also assist in influencing physical activity. These are unique tools that enhance the life of seniors, and improve their mental and physical wellbeing while helping to keep them active. Digital games provide mental and physical activities that increase social interactions which enhance their social connectedness, and offer a pleasant means to spend time (Ijsselsteijn, Nap, Kort, & Poels, 2007). Improvements in motor speed as well as social and educational enrichment have been seen as a result of playing digital games. While the older adult is not interested in replacing face-to-face interaction, technology is seen as a way to help them stay in touch (Ijsselsteijn, et al., 2007).

Additionally, digital games meet the need for mental stimulation and fun while allowing elderly people to bond socially.

In addition to digital games, the use of exercise equipment can be beneficial to the aging adult, although the need for instruction usually hinders one from using it. Several companies have designed standard exercise equipment that is easier for the aging adult to use. Companies such as “NuStep” have specifically designed equipment for a wide range of users, with a comfortable, ergonomic design that also provides an effective workout. For those with exercise limitations, the NuStep helps to improve the range of motion and develop strength. It incorporates a seat with a 360 degree swivel which allows for easy access for those with limitations.

A recent study by Yan et al., (2009) reported that community-based programs were beneficial in promoting health to sedentary adults. These programs coupled behavior change with fitness classes and resulted in significant improvements in physical performance. In an article “Environmental and Policy Determinants of Physical Activity in the United States” (Brownson, et al., 2001), lifestyle modification strategies are discussed. These include supporting social environments and making programs and facilities available to encourage activity. This can be accomplished by including walking trails, facilitating activities within the assisted living facility, and providing incentives promoting physical activity and health programs. In order to enable people to develop healthier lifestyles, facilities need to provide information to promote health and social support by talking about physical activity and encouraging friend participation (Brownson, et al., 2001). The most clearly established determinant to physical activity is the social support from family, friends or exercise program staff (Brownson, et al., 2001).

## **Research Question**

What social and built environmental factors can assist in encouraging exercise in the aging adult residing in an assisted living facility?



## CHAPTER III

### METHODOLOGY

#### **Research Design and Procedure**

This is an exploratory study involving collecting data to describe the perception of exercise and the social and built environment. The study was conducted on site at four assisted living facilities; one located in Perkins, one in Guthrie and two in Stillwater. The original intent was to survey three locations in Stillwater, after meeting with the administrator of one of the facilities, it was decided by her residents' families not to allow them to participate in this study. Therefore, two facilities were selected in nearby communities as replacements. In order to conduct the study, permission was attained from the Institutional Review Board (IRB). Administrators at each facility were contacted and given the details of the study in a face to face interview. The administrators of these four facilities agreed to participate and the name of their exercise coordinator was given. Initially a site visit was conducted and the designated exercise space, equipment and programs offered in each facility were reviewed. Photographs were taken to provide additional information about the built environment used for physical activities. Two survey instruments were developed, one for the administrator/exercise coordinator of the assisted living facility

consisting of 10 questions, which assessed the demographics of the facility, and factors of the built and social environment of the facility (See Appendix A). The second survey for the residents consisted of 23 questions and addressed three areas: perceived wellness, social environment, and the built environment (See Appendix B). Both surveys utilized a combination of closed ended questions and those employing standard Likert-type scales.

A five to ten minute informational power point presentation was given at each facility during regularly scheduled exercise, discussing physical activity and its many benefits. Following the presentation, questionnaires were distributed to the administrator/exercise coordinator and voluntary participants. The answers from the questionnaires were recorded for correlational analysis. Upon completion of the data collection, the data was analyzed to provide evidence to support the research question: what environmental factors can assist in encouraging exercise in the aging adult residing in an assisted living facility?

## **Subjects**

For this study a group of assisted living centers within Stillwater and the surrounding area were selected based on their location and the age of the residents who reside within their facility. The facilities included were: Red Bud assisted living facility in Perkins, Golden Oaks and the Sterling House in Stillwater, and Ash Street assisted living facility in Guthrie. The residents of these facilities fit the criteria of being over sixty- five years of age, and all of the facilities were easily accessible. A convenience sample was selected from each facility to hear the presentation and fill out the questionnaires.

## **Instruments**

The first part of this study consisted of a site visit to meet the administrators, discuss the purpose of the study and obtain his/her permission to participate in the study. In addition the goal was to determine if the facility had an exercise coordinator, an exercise program or a designated space for exercise. In the introductory meeting with the directors all but one facility decided to participate in the study. This facility, the Renaissance, submitted copies of the IRB approval, the administrator's survey, and the participant's survey to their corporate office. It was determined by the board of directors that the facility would need the approval of the residents' family members for them to participate. The approval was not given so the facility declined to participate. Therefore, it was replaced by two facilities outside Stillwater; Ash street living facility in Guthrie, and Red Bed assisted living in Perkins.

After meeting with the administrator from each facility, a short interview with the exercise coordinator was conducted to gain specific information regarding the number of residents and the types of exercise that existed within the facility. Designated exercise spaces were analyzed based on size, ease of use, location, and photographs were taken of the space. Fliers were distributed to each facility a week before the presentation was scheduled, to inform the residents of the upcoming program regarding physical activity.

At a subsequent time, an informational presentation was given to voluntary participants at each of the facilities to educate them on the benefits of exercise. This was presented in a 5-10 minute power point. After watching a short presentation about the benefits of exercise that are seen in as little as six months of regular physical activity, the administrator and participants filled out a short survey. The survey designed to gather cognitive and affective information from the participants was divided into three sections:

perceived wellness, social environment and built environment. The survey was composed of questions regarding the participants' perception of physical activity as well as their social and built environment and recent activity performed in the residents' environment.

Statistical analysis was done on the data as a whole and on each facility separately. Additionally, descriptive statistics were performed to determine the amount of physical activity at each of these levels: sedentary, underactive, and active.

## CHAPTER IV

### FINDINGS

At the initial site visit with the administrator, the exercise coordinator's name was secured and a tour of the facility was taken. Elements of the built environment as perceived by the administrator were recorded and are discussed in the next section. In addition, the results of the survey instrument taken by the residents are detailed regarding the social and built environmental factors affecting physical activity of the residents. Factors contributing to the lack of physical activity including barriers, as well as the lack of support from the social environment will be discussed.

#### **General Information**

Interviews were conducted with the administrator of four assisted living facilities and the health benefits of physical activity were discussed. Each administrator realized the importance of participation in physical activity and the improved health that would result for their residents. All four facilities had an exercise coordinator in charge of leading exercise and promoting physical activity participation and each had a designated space where exercise was held. Information was obtained regarding programs in place at each facility. At one of

the facilities the Administrator attended the informational presentation and filled out the survey instead of the exercise coordinator. The exercise coordinators at the other three facilities filled out the survey and the answers from both are discussed below.

**Administrator/Exercise Coordinators Responses**

Table I provides the data from the selected demographics of the facilities in this study. The residents living in the assisted facilities ranged in age from 71 to 101 with an average age of 85. Of the facilities visited, three had between 21-40 residents while the last facility housed 72.

Table I.

*Selected demographic information from administrator/exercise coordinators (n=4)*

Age (in years)		# of Residents living in facility	
Range 71-101		Ash Street	31
Mean	85	Golden Oaks	72
		Red Bud	26
		Sterling House	27

Responses to questions about the built and social environment were reported on a 6 point Likert scale with one representing very strongly agree and six representing very strongly disagree.

**Built Environment**

The following four questions on the administrators/exercise coordinators survey addressed their perception of the built environment of their facility.

Question: My facility provides a place for residents to exercise.

Question: The designated space for exercise is located in a highly visible area of my facility.

Question: The designated space for exercise is conveniently located in the facility for easy access by the residents.

Question: Residents are made aware that a designated space for exercise exists within their facility.

All four facilities had a designated space and the administrators/exercise coordinators reported very strong agreement that the space is in a highly visible area, conveniently located for easy access by the residents. All but one reported very strong agreement that residents are made aware of the space, one facility reported strong agreement to this question.

All of the facilities had a place for their residents to exercise and conducted regularly scheduled exercise classes throughout the week. In two of the facilities this space was within a multipurpose room such as a dining hall and not specifically designed to promote physical activity.

### **Social Environment**

The following six questions for the administrators/exercise coordinators addressed their perception of the social environmental factors in their facility using the 6 point Likert-type scale.

Question: There is an attendant/staff member who is on duty in the designated space for exercise.

Question: Residents in my facility are educated on the health benefits of physical activity.

Question: My facility has a walking club.

Question: My facility has regularly scheduled exercise classes.

Question: My facility offers a program for family members to participate in physical activity with the residents.

Question: My facility offers a program for friends to participate in physical activity with the residents.

Table II shows the responses to the questions regarding the social environment. All of the facilities had an attendant on duty. Two of the four respondents very strongly agreed that their residents were educated on the health benefits of physical activity. According to the responses by the administrator/coordinators, it was indicated they all agreed their residents were being informed about the benefits of exercise. Every administrator/coordinator very strongly agreed their facility offered regularly scheduled exercise classes.

When asked if their facility provided programs for family members to participate, two of the administrators/coordinators very strongly agreed, while one agreed and one strongly disagreed. The results of the question regarding a program for family members to participate in physical activity with the residents yielded similar answers. Of those surveyed, one strongly disagreed, one agreed and the last two very strongly agreed.



Table II.

*Administrators/exercise coordinators responses of social environmental factors (n=4)*

Facility	Attendant On Duty	Educated health benefits	Walking club	Regularly scheduled exercise	Programs for family	Programs for friends
Ash Street	Yes	A	A	VSA	A	SA
Golden Oaks	Yes	SA	VSD	VSA	SD	SD
Red Bud	Yes	VSA	A	VSA	VSA	VSA
Sterling House	Yes	VSA	VSA	VSA	VSA	VSA

*(VSA-very strongly agree, SA-strongly agree, A-agree, D-disagree, SD-strongly disagree, VSD-very strongly disagree)*

### **Residents Responses**

Table III shows the demographic information of the 32 residents who participated in the survey. As shown above, 25 of the participants were female and seven were male. Of the participants, two had not finished high school, 14 had graduated from high school, seven had gone on with their studies, while nine graduated from college.

Table III.

*Selected demographic information of participants (n=32)*

Gender		Education Level	
Female	78% (n=25)	< High school	6% (n=2)
Male	22% (n=7)	High school	44% (n=14)
		Post Secondary	22% (n=7)
		College Degree	28% (n=9)

## **Perceived Wellness**

The following eight questions asked respondents about their personal perceived wellness.

Question: My physical health has restricted me from exercise in the past.

Question: My body seems to resist physical illness.

Question: For my age, I believe I am generally in good health.

Question: I am currently taking medications that eliminate my need for exercise.

Question: Compared to people I know, my physical health has been excellent.

Question: I expect to continue to be physically healthy.

Question: I expect my physical health to decline.

Question: In the last week, I have engaged in physical activity such as walking, gardening or climbing stairs.

Results indicate that one-third of the participants felt their health was not a reason to keep them from exercising. Twenty of the 32 respondents felt their body resisted physical illness while 28 agreed they were generally in good health. Of those participating in the survey, only three perceived their current medications eliminated their need for exercise. Of those surveyed 26 felt that their physical health was excellent when comparing it to other people they knew and 30 believed they would continue to be physically healthy while 11 people expected their health to decline. Within the week prior to the survey, 23 respondents reported engaging in some type of physical activity.

## **Social Environment**

The next section of the survey was designed to gain information about social environmental factors of the participants' assisted living facility. Ten questions were asked in this group.

Question: As an adult I participated in scouting.

Question: As an adult I participated in group sporting activities such as golf.

Question: As an adult I participated in different organizations.

Question: My assisted living center offers opportunities to be physically active.

Question: Would you participate in an organized program to promote physical activity at your facility?

Question: If I had a friend or family member to exercise with, I would exercise more often.

Question: Has your primary care physician mentioned the benefits of physical activity you could expect if you engaged in regular physical activity?

Question: Do you engage in physical activity within your assisted living facility?

Question: Do you have an attendant at your assisted living facility that can show you how to use the exercise equipment?

Question: Would you be more likely to use exercise equipment at your assisted living facility if you had an attendant who could assist you?

The first few questions related to the respondents' past history of participating in group activities, such as scouting, golf or other organizations. Past research indicated that involvement early in life was not a predictor of being active in the later years. Over 50% of

the group (17) had not participated in scouting as an adult and an equal amount (17) had not participated in a group sporting activity such as golf. The largest amount of adult participation was seen by those who had been involved in different organizations. Of those surveyed 24 had participated in an organization as an adult.

Almost all the residents (30) responded their place of residence offered opportunities to be physically active, and 100% of residents responding indicated they would participate in an organized program to promote physical activity within their facility.

When asked to rank the statement: “If I had a friend or family member to exercise with, I would exercise more often”, the results of the survey showed 26 of the 32 residents agreed. The next question asked if their primary care physician has mentioned the benefits of physical activity, 24 responded yes, while eight responded no. When asked if the resident engaged in physical activity within their assisted living facility, of those surveyed, two said no, and 30 yes. The last two questions in this section inquired if an attendant was available to help participants use exercise equipment. Of the residents responding, 28 indicated yes. In addition, 26 of the residents responded they would be more likely to use exercise equipment if they had an attendant who could assist them.

### **Built Environment**

The third section of the survey provided questions to determine the participants’ perception of the built environment of the exercise space within their assisted living facility.

Question: Built Environment Question:

Question: Does your facility provide a designated space for physical activity?

Question: Is the space to exercise within your assisted living facility appealing?

Question: How do you feel about the temperature within this space?

Question: Have you noticed any unpleasant odors within the designated space for physical activity at your facility which inhibits your use of the space?

Question: Is exercise equipment provided for your use at your assisted living facility?

When asked if their facility provided a designated space for physical activity, all 32 of the respondents answered yes. Figure 1 shows the responses to the questions: How do you feel about the temperature within this space?

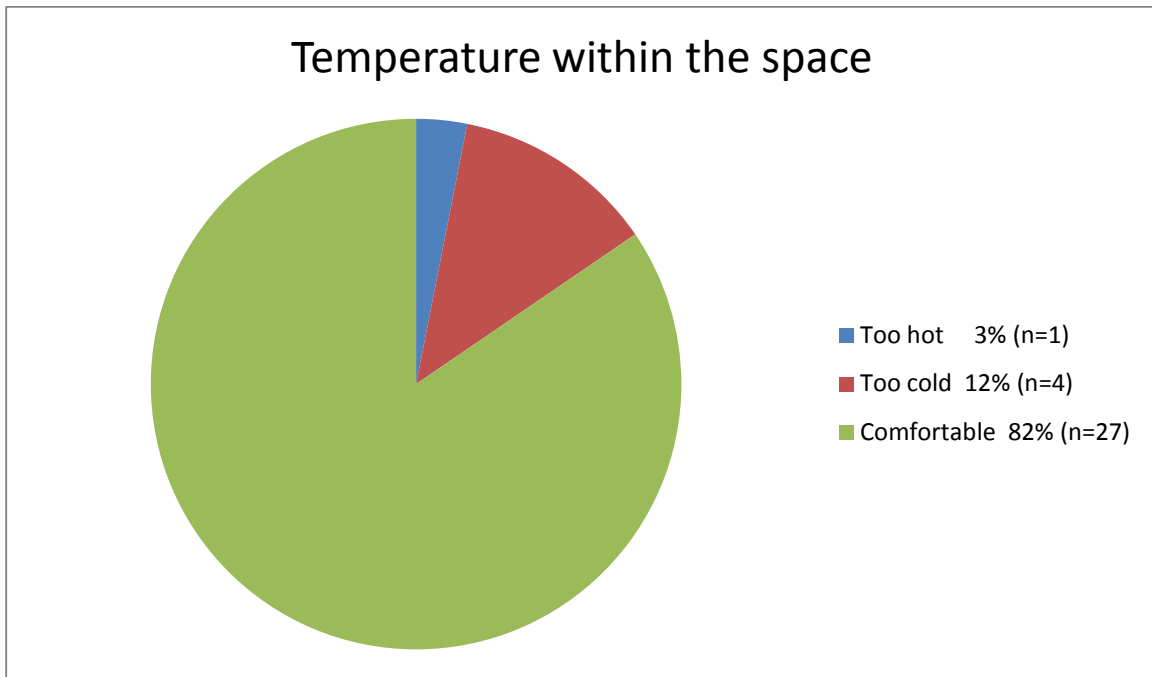


Figure 1. Temperature of the designated exercise space as described by the residents

All of the residents responding to the survey found the space to be appealing. The temperature in the space was thought to be too hot by one person, too cold by four people and comfortable for the remaining 27. Of those surveyed, no one noticed any unpleasant odors within the space. The next question sought to determine if the participant had

knowledge if their facility provided exercise equipment for their use. Of those who surveyed, 30 responded yes while two responded no.

### **Site visits**

A site visit was conducted by the researcher at each facility to provide a qualitative assessment of the designated area for exercise. This built environment was evaluated based on size, location, color, lighting, and aroma using the rubric as seen in Appendix C.

All the facilities had a designated space to exercise except one who utilized a multi-purpose room instead. At each facility an interview with the exercise coordinator revealed that chair exercises were the most common form of physical activity engaged in as a group.

In one of the smaller facilities, a separate room for activities was located just off the main common area. Group exercises were conducted by the exercise coordinator in the room as well as various board games, a puzzle station, and a wii. The room had a door leading to outside where the residents were able to go for outdoor walks when the weather permitted. The space was equipped with moveable chairs and had windows on the east side for plenty of natural light. The room followed the color combination from the common area, so it blended in with the rest of the surroundings. This built environment incorporated aspects of the social environment by providing an inviting space where the residents would want to come and socialize with others. This facility had the largest percentage of participation in the presentation and subsequent survey.

## CHAPTER V

### CONCLUSION

The environmental factors that can assist in promoting physical activity for the older adult include social and built. Having friends and family members participate in activities and organized programs with the residents in assisted living facilities was found to influence human behavior. Family members and friends, facility staff and medical personnel are part of the social environment and were social factors affecting physical activity participation. Having a designated space to exercise, as well as the visibility and ease of access to this space were factors of the built environment impacting physical activity.

#### **Social Environment**

The primary purpose of assisted living centers is to help the older adult remain as independent as possible and enable them to age in place with a higher quality of life (Mihalko & Wickley, 2003). Helping the aging adult to participate in physical activity through education programs which teach the benefits of exercise will help those who are more active have less risk of functional dependency. In order to promote independence, the residents must develop healthy lifestyle behaviors. Personal factors including demographics, attitudes regarding health, and past experiences with physical activity have a direct effect on

physical activity. Most of the group who participated perceived they were healthy, with 21 responding they were in excellent health and felt they would continue to be that way. Half of the group studied perceived their body resisted illness and the survey responses revealed that three of the participants were on medication they felt eliminated their need for exercise. These were residents who had successfully lowered their blood pressure with the use of prescription drugs. The remaining 20 still felt the need for physical activity. Of those that participated eight responded their health had restricted them from exercise in the past.

All the facilities studied had executive directors who agreed it was important for their residents to engage in physical activity and be educated about the benefits. Several of the participants were in wheel chairs, but still participated in the chair exercises. The exercise coordinator at the fourth facility modified the exercises for those who were unable to do a standard chair exercise. In doing this, she was able to encourage participation by everyone despite their disabilities.

Results of the survey showed that a large percentage (26) of the participants would exercise more often if they had a friend or family member. The assisted living family is composed of the staff, medical professionals, friends, and family members. The social support network made up of relationships between family members, friends, medical professionals and the facility staff can positively influence the participation in physical activity.

Apart from family and friends physicians play an important part in promoting physical activity to their patients. Yet, one quarter of those surveyed responded their physician had not mentioned the benefits to them.



Of the facilities studied, only one had a walking program for the residents while two of the four had programs for family members or friends to come exercise with the residents. Promoting physical activity requires the ongoing support from the assisted living family including nurses, directors, coordinators, physicians, friends and family members. In order to produce desired changes when it comes to participation in physical activity the residents need to have the support of an individuals' family and friends. The presence of this social support group, who encourage exercise or having at least one friend to exercise with, can create an accountability partnership that helps to keep everyone exercising. In addition, family members who participate in activities within the assisted living center can positively influence residents by interacting in a live setting. In order to promote healthy living, the directors and exercise coordinators may need to take a closer look at what can be done to achieve a higher level of participation. Having facility staff that realizes they are the role models for the residents, can serve to promote participation as a result of observation. The residents and staff within the assisted living facility make up a collective community with strong social ties. These leaders can increase the enjoyment and participation in activities and provide a positive impact on physical activity promotion. This can be beneficial to encourage lifestyle behavior changes among the residents. The assisted living staff, family members of the resident, and the residents should be encouraged to create a community atmosphere that encourages engagement in healthy lifestyle behaviors while rewarding participation in physical activity.

Most generally the facilities visited used activity calendars to inform their residents about upcoming programs and events. Although fliers were distributed to each facility a week before the presentation, a tour through the building the day of the presentation

indicated they were not hung in a visible place. There was an overall low participation rate in each facility that came to the presentation and subsequent exercise class. This was attributed in part to the lack of publicity on the presentation.

The fourth facility surveyed had an exercise coordinator who was very outgoing and worked to incorporate physical activity into many activities. This was accomplished through dancing and playing games throughout the day, without the residents realizing they were doing physical activity. The participants from this facility responded well to the exercise coordinator and stayed long after the program was over to engage in other activities.

Group activities are one way the social environment can affect participation. Although the results of the study showed that only 11 of the participants had participated in scouting, or a group sporting activity, this didn't seem to affect their desire to learn more about physical activity. Involvement in different organizations as an adult was found to be present in 16 of those responding, and nearly all the respondents believed their facility offered opportunities to be physically active. All of the respondents indicated they would participate in an organized program to be physically active, as was evidenced by their attendance at the informational presentation.

Digital games also provide a means to enhance the lives of seniors. Through their use, the older adult can improve their mental and physical wellbeing and have an enjoyable way to spend time. The wii game was used in the fourth facility; however, the residents did not use it much because of the difficulty of operation and the fact that they needed an attendant to help use the game. In order to play the participant is required to press two buttons at once, which was hard for many to do.

## **Built environment**

The exercise spaces studied were found to be appealing to 22 of the residents. There were no unpleasant odors reported and the spaces were found to be comfortable to most of the users, with only one responding that the room was too hot, and four that it was too cold.

A large percentage (75%) of the directors agreed their residents were made aware of the designated space within their facility to exercise. Through the participants' responses it was determined that 100% of the respondents were aware that a designated place to exercise did exist. In two of the facilities visited the designated space for exercise was located on an upper floor towards the back of the facility and quite a distance from the common area. The location of the designated space on an upper floor did not make it visible or easily accessible to those not already participating. The third facility had a space that doubled as a sitting area. It was used three times per week to do chair exercises. Although the space was highly visible and easily accessible, it didn't offer much versatility to be used for other activities due to its limited activity provoking items, such as games or puzzles. The fourth facility had an ideal setup with a designated activity room located in a highly visible area with high activity, just off the main common area. The location of this designated activity area provided views into the space as well as views of people, nature and activities. In 2005, Zimring, Joseph, Nicolle & Tsepas (2005) determined a person's behavior and choices are determined by the presence of others and visual stimuli. In addition, people will move to areas of more activity and more people when they are in view. Views by those passing by this space worked to increase the use of this space. At this facility the designated space was equipped with several round tables; one was being used for making a puzzle at the time of the site visit. In addition, it had a large TV, a bean bag toss game, a putt putt game, and a wii with many different games.

The room had a door leading to an outside porch and walking trails around the building. Each wall of the room had large windows which provided a lot of natural lighting, and a set of double doors leading from the main common area made the space inviting for residents to enter. A benefit of having the room just off the main common area was the ease of use, and high visibility to other residents. Many residents would wander in the room simply to see what was going on, and then engage in the current activity.

Only one of the facilities had a separate room with exercise equipment for the residents' use within their facility. This room utilized strength training equipment with seniors in mind. A new type of aerobic equipment that is safe for older adults and easily accessible was used within this facility. The Nu Step machine is simple to operate, low impact and is easy to access with a 360 degree rotating seat. An observation of the space revealed that it was hardly used. The responses by the participants indicated their lack of knowledge that this space existed in their facility. This may be due to the fact that it was located towards the back of the facility, which made it hard to access, and not highly visible. While studies have shown that having access to facilities to exercise is positively correlated to physical activity behavior patterns in adults, this space was accessible but not visible, so it received little use. According to the survey 18 of those responding said they were more likely to use exercise equipment if an attendant would help them. While it would be costly to have an attendant in the room full time, a program could be designed to incorporate students studying gerontology or health and wellness as attendants, thus allowing them to fulfill their internship hours.

## **Recommendations**

Developing programs that would appeal to the both males and females and to different education levels would result in increased participation. A large portion of the residents who participated in this study were female (17). The median age of those responding was 85 years old. Of this group a very small percentage had graduated from college. Given this information, programs need to be developed to encourage more male participation, and directed at those who perceive they are not in good health. In addition, promoting programs in such a way that they appeal to males as well as a range of education levels will help increase participation.

On site programs that involve the residents' friends and family members can provide ongoing support and promote physical activity participation. Programs that provide opportunities that are challenging, engaging and fun can promote physical activity and have increased attendance. One way to accomplish this is to have different exercise programs in place, to arouse interest among the residents. This could be done through walking programs at different times during the week. Friends and family members who are able to participate can interact with the residents in an enjoyable way. Programs that are done on-site that include children can be designed to incorporate physical activity beneficial to both the child and the older adult.

Simple changes in the environment, such as displaying signs that promote active living, could also prove beneficial. In addition, promoting activities that incorporate physical activity can be done on a more personal invitation basis. A verbal invitation by a staff member would be more personal and likely yield better participation. Making the activities more of a social event is likely to result in a better turnout.

Another way to promote healthy living is by designing buildings that encourage physical activity. Humans are affected by the physical aspects of a building. The layout of assisted living centers, with regard to visible indoor and outdoor facilities to exercise will help achieve the goal of increasing adult participation. Having access to designated exercise space, walking or biking trails, and exercise equipment can encourage recreational activities. An availability of space for different activities will also help to increase participation in activities within the space. Locating the space in a highly visible area with easy coupled with maintaining proper room temperatures will make the space comfortable so the residents will want to use it.

### **Limitations**

There were several limitations present in this study. Due to the age of the residents and their declining ability to read the physical abilities of some of the residents created problems with administering the survey. Therefore the surveys were administered verbally, which took a lot of time and required one on one help for many of the participants to finish.

The lack of promotion of the informational presentation was another limitation that resulted in a low participation rate of the study. In addition, the presentation was given during a regularly scheduled exercise class time which resulted in participants who already were familiar with some of the benefits of physical activity. Although those that participated were predominantly female, it was not determined if this percentage was consistent with the ratio of males to females residing within the facilities surveyed and how this affected the survey results.

## **Future Research**

This research is applicable to future studies involving the environment and how it affects physical activity. In addition, factors such as color (dark or light), sounds (noise or quiet), lighting, and material finishes can be studied to learn their effects on physical activity levels.

A larger study with multiple sites could provide more descriptive data. It would be necessary to heavily publicize the study at these sites in order to have a larger response rate. Also, conducting a survey at another time other than the regularly scheduled exercise time might increase the number of respondents. Currently the subjects in the study were already aware of the benefits of exercise.

The goal is to create a healthy community environment for the residents of an assisted living facility by designing environments that are more engaging. By providing social support people can be encouraged to develop healthier lifestyles and help to promote active living.

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## APPENDICES

### Appendix A

# Wellness Survey for Assisted Living Facility Administrator/Exercise Coordinator

This survey asks various questions about characteristics of your facility and is completely voluntary. Composite data will be shared for use in creating an environment that encourages health promotion activities. Thank you for taking the time and thought to complete this survey. We appreciate your participation!

Name of your facility:

How many residents live in your facility?

- 20 or less
- 21-40
- 41-60
- over 60

What is the average age of your residents?

- 50-59
- 60-69
- 70-79
- 80-89
- 90 and above

INSTRUCTIONS: The following statements are designed to provide information about characteristics of your facility that promote physical activity. Please carefully and thoughtfully consider each statement, and then select ONE response option with which you most agree.

1 2 3 4 5 6

Very strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very strongly agree
------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------

1. My facility provides a place for residents to exercise.

- yes
- no

If yes, go to question #2, If no, skip to question #6

2. The designated space for exercise is located in a highly visible area of my facility.

1 2 3 4 5 6

Very strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very strongly agree
------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------

3. The designated space for exercise is located in the facility for easy access by residents

1 2 3 4 5 6

Very strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very strongly agree
------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------

4. There is an attendant/staff member who is on duty in the designated space for exercise.

1 2 3 4 5 6

Very strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very strongly agree
------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------

5. Residents are made aware that a designated space for exercise exists within their facility.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

6. Residents in my facility are educated on the health benefits of physical activity

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

7. My facility has a walking club.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

8. My facility has regularly scheduled exercise classes.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

9. My facility offers a program for family members to participate in physical activity with the residents.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

10. My facility offers a program for friends to participate in physical activity with the residents.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

Appendix B

## Wellness Survey for Participants residing in an Assisted Living Facility.

This survey asks various questions about your personal wellness and is completely voluntary. Composite data will be shared for use in health promotion activities.

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Gender

- Male
- Female

In what year were you born?

Education: Please select the best answer

- Less than High School
- High School
- Some Post Secondary Work
- College Degree

**INSTRUCTIONS** The following statements are designed to provide information about your wellness perceptions. Please carefully and thoughtfully consider each statement and then select ONE response option with which you most agree.

1      2      3      4      5      6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

## Perceived Wellness

1. My physical health has restricted me from exercise in the past.

1 2 3 4 5 6

Very strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very strongly agree
------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------

2. My body seems to resist physical illness.

1 2 3 4 5 6

Very strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very strongly agree
------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------

3. For my age, I believe I am generally in good health.

1 2 3 4 5 6

Very strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very strongly agree
------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------

4. I am currently taking medications that eliminate my need for exercise.

1 2 3 4 5 6

Very strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very strongly agree
------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------

5. Compared to people I know, my physical health has been excellent.

1 2 3 4 5 6

Very strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very strongly agree
------------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------

6. I expect to continue to be physically healthy.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

7. I expect my physical health to decline.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

8. In the last week I have engaged in physical activity such as walking, gardening or climbing stairs.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

## Social Environment

9. As an adult I participated in Scouting.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

10. As an adult I participated in sporting activities such as golf.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------



11. As an adult I participated in different organizations.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

12. My assisted living facility offers opportunities to be physically active.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

13. Would you participate in an organized program to promote physical activity at your assisted living facility?

- Yes
- No

14. If I had a friend or family member to exercise with, I would exercise more often.

1 2 3 4 5 6

Very strongly disagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very strongly agree
------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---------------------

15. Has your primary care physician mentioned the benefits of physical activity you could expect if you engaged in regular physical activity?

- Yes
- No

16. Do you engage in physical activity within your assisted living facility?

- Yes
- No

## Built Environment

17. Does your assisted living facility provide a designated space for physical activity?

- Yes
- No

## If yes go to Question #18, if no skip to Question #21

18. Is the space to exercise appealing?

- Yes
- No

19. How do you feel about the temperature within this space?

- Too hot
- Too cold
- Comfortable

20. Have you noticed any unpleasant odors within the designated space for physical activity that inhibits your use of the space?

- Yes
- No

21. Is exercise equipment provided for your use within your assisted living facility?

- Yes
- No

## If yes go to Question #22, if no skip to Question #23

## Social Environment

22. Do you have an attendant who can show you how to use the exercise equipment?

- Yes
- No

23. Would you be more likely to use exercise equipment at your assisted living facility if you had an attendant who could assist you?

- Yes
- No

## Appendix C

### Rubric for analyzing designated exercise space on site

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Size : \_\_\_\_\_ in square feet

Location:     Downstairs\_\_\_\_\_     Upstairs\_\_\_\_\_

                  Front of facility\_\_\_\_\_     Back of facility

                  Highly visible: Yes/No

                  Accessible: Yes/No

Color: Wall: Light colors\_\_\_\_\_     Dark colors\_\_\_\_\_

                  Ceiling: Light colors\_\_\_\_\_     Dark colors\_\_\_\_\_

                  Floors: Light colors\_\_\_\_\_     Dark colors\_\_\_\_\_

Lighting:     Fluorescent\_\_\_\_\_     Natural lighting:\_\_\_\_\_

                  Windows present: Yes/No

                  How many?\_\_\_\_\_     Which direction do they face? East/West/North/South

Aroma:     Pleasant: Yes/No     Unpleasant: Yes/No

## VITA

Angela Theresa McCully

Candidate for the Degree of

Master of Science

Thesis: THE EFFECTS OF ENVIRONMENTAL FACTORS ON PHYSICAL ACTIVITY  
OF THE OLDER ADULT IN ASSISTED LIVING FACILITIES

Major Field: Environmental Design

Biographical:

Personal Data: Born in Burlington, North Carolina in 1961 to Lloyd and Fern Savoie.

Education: Graduated from Yukon High School in 1979, Yukon, Oklahoma. Received a Bachelor of Science degree in Marketing with a minor in Management from Oklahoma State University in 1984. Completed the requirements for the Master of Science in Environmental Design at Oklahoma State University, Stillwater, Oklahoma in December, 2010.

Experience: Owned and operated an Interior Design business *Uniquely Yours by Angie* since 1993. The business fabricates custom bedding and draperies and is a retailer for window coverings from many manufacturers.

Professional Memberships: International Facility Management Association,  
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Name: Angie McCully

Date of Degree: December, 2010

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: THE EFFECTS OF THE SOCIAL ENVIRONMENT ON PHYSICAL  
ACTIVITY OF THE OLDER ADULT IN ASSISTED LIVING  
FACILITIES

Pages in Study: 52

Candidate for the Degree of Master of Science

Major Field: The advances in medicine and technology have led to increased longevity for the aging adult (Crews, 2005). Maintaining the health of this increasing segment of the population has become an increasingly important issue since one third of the money spent on health care in America is being attributed to adults over 65 years of age (Davidson, 2009).

Scope and Method of Study: The study was conducted on site at four assisted living facilities within the Stillwater area. Administrators at each facility were interviewed and given the details of the study. The name of their exercise coordinator was learned and a site visit was conducted and current exercise programs were reviewed. Two survey instruments were developed which assessed the demographics of the facility, and factors of the built and social environment as perceived by the administrators/exercise coordinators and the residents.

Findings and Conclusions:

All of the facilities had a designated space for their residents to exercise and conducted weekly exercise classes. It was believed by all of the administrators/coordinators that the space was highly visible and conveniently located for the residents wanting to use it. Almost all the residents (30) responded their place of residence offered opportunities to be physically active, and 100% of residents responding indicated they would participate in an organized program to promote physical activity within their facility.

The environmental factors that can assist in promoting physical activity are both social and built. Having friends and family members, facility staff and medical personnel participate in activities and organized programs with the residents was found to influence human behavior. Having a designated space to exercise, as well as the visibility and ease of access to this space was found to be a factor of the built environment impacting physical activity.

The goal is to create a healthy community environment for the residents of an assisted living facility by designing environments that are more engaging. By providing social support people can be encouraged to develop healthier lifestyles and help to promote active living.

ADVISER'S APPROVAL: Dr Randall Russ

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