

AN INVESTIGATION INTO THE EFFECTS OF RESISTANCE  
EXERCISE PARTICIPATION ON THE PERCEIVED DEPRESSION  
LEVELS OF OLDER ADULTS RESIDING IN A  
LONG-TERM CARE FACILITY OVER TIME

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## CHAPTER I

### INTRODUCTION

#### *Introduction*

Depression is a complex illness that is an increasing concern in LTC facilities as the number of residents continues to increase. Many individuals exhibiting symptoms of perceived depression tend to have very limited physical activity (National Institute on Aging, 2007). Regular exercise has been associated with decreased stress levels and increased levels of neurochemicals, such as endorphins, which serve to enhance mood changes and to reduce symptoms of perceived depression among older adults (National Institute on Aging, 2007). Research has suggested that regular physical activity is associated with general feelings of wellbeing and the reduced symptoms of perceived depression. Also, physical exercise has been found to be as effective as psychotherapy in treating some depressive symptoms (Birren & Schaie, 2006).

Historically, researchers have studied individuals living in independent settings such as their own homes. These research endeavors have suggested that exercise may help to lower perceived depression levels. Therefore, it can be assumed that if depression scores can be improved through exercise in non-institutional environments, then similar results should be achievable in LTC facilities, where depression among residents continues to be a growing concern.

This study will examine the effect of a 12-week resistance band exercise recreation program on perceived depression scores for older adults residing in a local long-term care facility (LTC). As the older adult population of the United States increases, the number of individuals living in LTC facilities also increases (Birren & Schaie, 2006). According to the research literature, older adults in this country tend to become more sedentary as they age, and physically inactive people are more likely to become increasingly frail, less healthy and therefore more susceptible to depression (Nied & Franklin, 2002).

Depression is a natural response for many individuals when they have experienced intense stress and anxiety in their lives, such as (a) the death of a mate, (b) the loss of a sense of self-worth, (c) relinquishment of cherished possessions, or (d) the loss of one's physical fitness (Birren & Schaie, 2006). Older adults encounter these and other losses with greater frequency than at earlier times in their lives. Pivotal studies involving older adults living in independent settings have provided evidence to suggest that depressed individuals can improve their perceived depression scores through regular participation in organized resistance band exercise recreation programs (Singh, Clements & Singh, 2001).

#### *Statement of the Problem*

Depression is the second most common psychological problem associated with individuals residing in a LTC facility and with the boomers growing older the potential exists for a dramatic increase in the number of individuals residing in LTC facilities in the United States. Prior research has revealed a significant relationship between improved depression scores and participation in organized exercise band resistance programs for older adults living in independent settings. However, current literature has not discussed

many results of similar research studies with older adults in LTC facilities. Thus, this study will address the effect of resistance exercise training utilizing exercise bands on the perceived depression levels among older adults residing in a LTC facility.

The benefits of exercise are well established. Two of the primary benefits for older adults are the improvements in functional abilities and the promotion of independence (Berkow, Beers, Bogin & Fletcher, 2000). Research has suggested that resistance exercise can have a significant impact on physical health as well as the psychological well being, specifically perceived depression among older adults well into their 90's. Results have revealed considerable increases in muscle mass, resulting in more physical strength and endurance as well as a positive improvement in overall functional independence (Birren & Schaie, 2006). Additionally, studies have indicated that a high intensity resistance exercise program can be very effective in building muscle strength for older adults. However, even low to moderate levels of intensity have been shown to "enhance function and reduce morbidity in the final years of life" (Fries, as cited in Birren & Schaie, 2006, p. 189). Research by Berger, Pargman and Weinberg (2002) presented results suggesting that exercise at a low to moderate intensity level can be as beneficial as pharmacotherapy and psychotherapy in the treatment of perceived depression among older adults. Therefore, in general, exercise appears to be beneficial to older adults and the focus of this study will be to tease out the possibilities of exercise to improve levels of reported perceived depression levels in a LTC facility.

#### *Purpose of the Study*

The purpose of this study is to determine the effects of a resistance exercise band program on perceived depression levels among older adults residing in a LTC facility.

“Depression is the second most common mental disorder in LTC settings, after dementia” (Cravern, as cited in Best-Martini & Botenhagen-DiGenova, 2003, p. 12). Losses associated with aging, such as declining health, physical and social changes, can contribute to perceived depression. Resistance strength training exercise therapy is gaining recognition as an excellent intervention for all types of depression among those in the healthcare profession for older adults (Best-Martini & Botenhagen-DiGenova, 2003). While there is no definitive research explaining exactly how resistance exercise affects one’s mood, there is evidence showing a link between exercise training and the lowering of perceived depression. Also, research has indicated enhanced feeling of self-confidence, self-efficacy and functional independence among those older adults who participate in resistance exercise programs (Nied & Franklin, 2002).

### *Hypothesis*

Can participation in an organized resistance band exercise program alter perceived depression level scores for older adults living in a LTC facility over time?

Using a randomized controlled trial between subjects design, participants will be assessed for perceived depression use the Beck-Depression Inventory-II upon initiation 4, 8 and 12-weeks of a 12-week exercise program.

*Null Hypothesis:* There is no difference in perceived depression scores per individual due to the resistance exercise program utilizing exercise bands among older adults residing in a LTC facility across time.

*Alternative Hypothesis:* There is a difference in perceived depression scores per individual due to the resistance exercise program utilizing exercise bands among older adults residing in a LTC facility across time.

### *Significance of the Study*

With an ever-increasing older adult population in the United States, there is a continuing increase in the numbers of individuals living in LTC facilities. Depression among this group is a growing concern (Singh et al., 2001). Study results in the past have suggested that experimental groups utilizing exercise have improved group depression scores by a mean of 8.00 points and the control groups improved by 4.42 points. The differences in scores was 3.58 and was statistically significant ( $p = .010$ ), thus, the null hypothesis was rejected. Based on these results, this method of intervention appears to have the potential to become a permanent aspect of LTC facilities.

### *Definition of Terms*

The terms utilized in this study are identified and defined below:

*Long-term Care Facility (LTC)*: a protected institutional residential center providing clients with health assessments and indicated care (Birren & Schaie, 2006).

*Older Adults*: refers to individuals, males and females, 65 years and older (Ferrini & Ferrini, 2000).

*Frailty*: refers to the inability to perform regular every day activities without help (National Institute on Aging, 2007).

*Beck Depression Inventory–II (BDI-II)*: a 21-item self-report instrument for measuring the severity of depression in adults and adolescents aged 13 years and older (Beck, Steer & Brown, 1996).

*Resistance Band Exercise*: progressive resistance training involving safe exercise that utilize elastic resistance bands which condition the major muscle groups of the body (Best-Martini & Botenhagen-DiGenova, 2003).

### *Assumptions and Limitations of the Study*

Individuals of all ages can benefit from aerobic and muscle strengthening exercises. In general, the less physically fit individuals experience more benefit from resistance training exercise than from other types of physical activity. Aerobic exercise is beneficial for cardiovascular fitness, but resistance training can have a greater impact on muscular strength and endurance. Given that a major problem in older adults is frailty, that is, the inability to perform regular every day activities without help, resistance exercise can be assumed to have a significant impact on the maintenance of independence in older age (Best-Martini & Botenhausen-DiGenova, 2003). Archival data has presented evidence that even low to moderate levels of regular physical activity can improve one's health and functional independence. Studies in which exercise groups were compared to groups of sedentary people on different measures of health, physically active people were shown to be healthier and less depressed (Birren & Schaie, 2006).

Potential limitations of the study include the following:

1. In addition to depression, participants may be dealing with medical disorders that are not diagnosed and associated with aging, such as: (a) sensory losses, (b) communication difficulties, (c) cognitive losses, and (d) sarcopenia, a loss of muscle mass (Best-Martini & Botenhausen-DiGenova, 2003). Such conditions may lead to participants leaving the exercise program prior to completion.
2. When repeating an instrument during a study, there is the opportunity for the participants to become aware of the purpose of the BDI-II test and, as a result they may have the tendency to embellish their responses. Also, individuals may feel "special" because they are asked to be in the study and that may have an impact

on their BDI-II scores. However, the researcher could use a Solomon four group design to control for this, but in this study there is not a big enough proposed sample size to utilize a Solomon four group.

3. History may present limitation to internal validity, due to events that can influence results, such as increasing symptoms of stress due to outside variables such as, a death of a mate or close relative or bad weather.
4. This study will only utilize the population of one LTC facility in a southwestern city. With a random assignment and no random selection of participants, results cannot be generalized to any other LTC facility and are specifically related to the facility in which the study is conducted.
5. Subjects participating in this study will be participating in a program implemented over the Christmas season which may have an impact on their perceived depression scores during the second evaluation period.

Previous research on the subject of depression and resistance training has been primarily limited to older adults living in non-institutional settings. However, the current study will focus on residents in a LTC facility.

### *Summary*

The population of older adults in the United States is increasing at a rapid rate. Many of these individuals are now residents, or soon will be residents of LTC facilities. These older adults have special needs and various levels of frailty. Depression is a normal reaction to serious losses such as (a) death of loved ones, (b) loss of self-esteem, (c) loss of independence, or (d) loss of health and it is the second most common mental disorder in LTC settings (American Psychiatric Association, 2003). Physical inactivity plays a



major role in common medical disorders and in psychological disorders, such as depression which has now become a critical health issue in LTC facilities (Ferrini & Ferrini, 2000; American Psychiatric Association, 2003).

In addition to aiding in improving perceived depression symptoms, resistance training may potentially provide the necessary strength to increase functional independence in the areas of posture and daily living activities and, thus, it might be assumed that resistance training may have a significant positive impact on the providing independence back to the aging population. Therefore by increasing functional independence, exercise may potentially decrease perceived depression.

## CHAPTER II

### LITERATURE REVIEW

#### *Defining Older Adults*

Many terms have been used to represent the older adult population; elderly, older adults and senior citizens are among the most popular terms used. There is no clear age in which a person is considered an older adult. Most studies use the age of 65 to determine older adult status since this is the traditional age at which an individual have historically become eligible for full Social Security benefits as determined by the Social Security Act of 1935 (Dorman, Price & Alley, 1995).

Sometimes identifying a person as “old” can be characterized by other criteria such as being retired, receiving Social Security benefits, residing in a LTC facility and/or using the services of a senior center (Ferrini & Ferrini, 2000). Currently, about one in every eight persons in the United States is over the age of 65 (Administration on Aging, 2005). Of the individuals who are often considered older adults, most are age 65 years and older and comprise approximately 36.3 million people in 2005 in the United States which was about 13% of the United States population and represented an increase of approximately 9% since 1994. The increase in the older adult population means there will be more individuals dealing with the effects of the aging process and thus the need for further research (Administration on Aging, 2005).

## *Aging*

Aging has been defined as the process which leads to functional impairment, loss of adaptability, and eventually death. Even though every older adult is different, all will experience a similar aging process, such as physical decomposition, which includes a decrease in muscular strength, endurance, power, flexibility and an increase in stored body fat (Lemmer et al., 2000). However, it should be noted that the decline in physical composition differs from individual to individual dependent upon the individual's functional independence prior to identification as an older adult (Ferrini & Ferrini, 2000).

Functional independence has been defined as the ability of a person to care for. Those with high functional independence often require less assistance with day-to-day functions from family and social support systems. However, those individuals with low levels of functional independence require higher levels of service provided both by family members and social support systems. Also, individuals who lack high functional independence will most likely experience high personal, social, and economic costs related to health care provision due to injury and illness (Long, 2002). This concept is important to older adults because the level of functional independence is often considered an indicator of reported individual quality of life (QOL) and perceived depression (Long, 2002).

## *Types of Aging*

Research typically discusses two specific types of aging: primary aging processes and secondary aging processes. Primary aging processes are separate from disease or environment and are most often related to chronological age such as decreased resistance to infections or physiological changes such as menopause in females and lower

testosterone production in males. Secondary aging processes include environmental factors such as smoking, drug or alcohol abuse and other self-damaging behavior. Primary aging processes make individuals more susceptible to negative outcomes associated with the secondary aging processes, and the combining of primary and secondary aging processes may accelerate the rate of primary aging (Berger, Pargman & Weinberg, 2002).

Evidence suggests that exercise as a recreation activity can have a positive effect on an older adults' use of time and social relationships with other individuals, especially for those residing in a LTC facility and may help deter those factors considered secondary aging processes which are often linked to perceived depressive symptoms (Seeman, 2000). Also, recreation participation in exercise programs can often play an important role in improving functional independence and lead to lower perceived depression levels among older adults (Berger, Pargman & Weinberg, 2002).

#### *Benefits of Exercise for Older Adults*

When considering the aging process, the need to maintain functional independence may help to lower perceived depression levels for older adults in a LTC facility. Previous research indicates that regular exercise has the potential to positively impact an individual's functional independence. These benefits include both physiological and psychological aspects; for example, participating in aerobic exercises such as walking, jogging, bicycling, aerobics, or swimming regularly may postpone the normal aging decline of the central nervous system (Ferrini & Ferrini, 2000). Also, older adults who begin exercising may improve their cardiovascular functioning, increase maximum consumption of oxygen, decrease blood pressure, lower resting heart rates,

decrease body weight, improve lean body mass, and increase bone density, which ultimately may lead to the lowering of perceived depressive symptoms (Baker, Atlantis & Singh, 2007).

It has been proposed that older adults benefit from regular exercise more than any other age group (Evans, 1999). Exercises can often aid in lowering the high rates of chronic disease such as heart disease and stroke among older adults and those individuals who are physically active are twice as likely to live out their lives without any disability (Ferrini & Ferrini, 2000).

Ferrini and Ferrini (2000) also identified exercise participation as having a positive association with a variety of psychological variables. The specific psychological effects of exercise vary, but often include reduced stress levels, enhanced self-concept, and protection of cognitive performance which, when combined, can often result in decreases in reported perceived depression levels (Evans, 1999).

#### *Exercise and Stress Reduction in the Older Adult Individual*

One potential psychological effect of exercise is the reduction of reported stress levels by older adults in LTC facilities (Cox, 2002). A pivotal study conducted by Selye (1983) defined stress as the body's uncontrolled response to any demand placed upon it. According to this definition, stress has neither negative nor positive implications. Most research involving stress is usually considered negative. However, Cox (2002) reported that what most individuals refer to as "stress" is really distress which is the negative aspect of stress. Distress is important in an older adult's life because it may contribute to major illness such as high blood pressure and coronary heart disease, which can lead to other diseases such as depression (Seaward, 1997). Exercise has often been associated

with the reduction of stress in all age groups and specifically in the older adult population (Evans, 1999; Ferrini & Ferrini, 2000; Administration on Aging, 2005).

Exercise, performed at low intensity for short periods of time, has been found to be as effective for lowering participant's stress levels as meditation and relaxation (Ferrini & Ferrini, 2000). A controlled experimental study reported statistically significant improvements in reducing stress levels, increasing general well-being and quality of life in older adults when they participated in regular exercise often associated with reported levels of depression (Krawczynski & Olszewski, 2000).

#### *Exercise and Enhanced Self-Concept*

Another psychological area that can be enhanced by exercise participation is self-concept or the mental image a person has about themselves (Krawczynski & Olszewski, 2000). Berger et al. (2002) reported that older adults who exercise can create a positive self-concept by creating a positive influence on their sense of personal control. Although many older adults in LTC facilities feel a loss of control over their independence and functional ability, older adults who exercise on a regular basis in a LTC facility report a greater sense of autonomy regarding their individual physical abilities which may be linked to reported levels of depression (Berger et al., 2002).

#### *Exercise and Cognitive Performance*

The use of exercise with individuals over the age of 65 has been linked to delaying cognitive declines associated with aging, as well as the way an older adult thinks in general (Khatri et al., 2001). Areas of cognitive function that can be affected by exercise include memory, recognition, logical reasoning and independent thought. One

study noted that exercise can induce improvements in cognitive functioning among depressed older adults, specifically memory functioning (Khatri et al., 2001).

### *Exercise and Older Adults*

Due to physical decline, cognitive decline, and psychological problems associated with the effects of normal aging, exercise and the potential benefits of exercise appear to be vitally important to the older adult population. Creating the proper exercise program and exercise prescription is important for the older adult population due to individual differences such as functional independence and general well-being (Christmas & Andersen, 2000). Therefore, in determining an exercise program, one should be aware of the functional independence and abilities of the older adults involved. Timonen, Rantanen, Timonen, and Sulkava (2002) suggested that an exercise program provided for older adults should include three important components: individuality, specificity, and progressive overload. Individuality refers to the ideas that individuals adapt to stimuli at different rates and reach different outcomes. Specificity suggests that the exercises selected should lead to a designated favorable outcome such as decreasing one's level of perceived depression. Progressive overload means exercises must involve working the body harder than normal to achieve a beneficial response.

Once an exercise program is constructed, an exercise prescription should be created for each older adult and in a typical study, participants would meet with a programmer two to four times weekly for a session ranging between thirty to sixty minutes (Timonen, Rantanen, Timonen & Sulkava, 2002). An exercise prescription should be person specific and should also include the following components: mode, frequency, duration, and intensity. Mode refers to the type of exercise such as aerobic

endurance, range of motion, and resistance exercise. Frequency refers to how often the exercise should be performed. Duration is how long an exercise session should be conducted and intensity of the exercise is typically described as how much energy is needed to perform the exercise (Christmas & Andersen, 2000).

The exercise prescription in terms of frequency, intensity, and duration of exercise should vary according to the physical and psychological conditions of the older adult. A pivotal study conducted by Borg (1982) stated that, as a general rule, as people age, they require less intense activity to generate a beneficial response such as decreased depression.

#### *Resistance Exercise among Older Adults*

Research indicates that resistance exercise interventions may have a positive impact on perceived depression levels among older adults residing in LTC facilities (Macera, 2000). Morganti et al. (1995) conducted a progressive resistance training study of 39 healthy older women (mean age 69.5 years). Subjects were assigned to a control group or progressive resistance training group that trained twice a week for 12 months. Testing was performed at baseline, six months and 12 months for the control group and monthly for the experimental group. Results were considered significant if its probability value was less than or equal to .05 ( $p \leq .05$ ). Repeated measures analysis of variance showed that one repetition significantly increased functional ability for all muscle groups in the experimental group when compared to the control group ( $p \leq .0001$ ). Thus, indicating that resistance exercise increases muscle ability which helps to maintain functional independence and therefore makes it more likely for an older adult not to suffer depressive symptoms.



Most resistance exercise interventions have utilized weight machines in a workout facility but not very often in LTC facilities. For example, the FAST study (fitness and senior trial) examined the effects of three forms of an exercise intervention compared with a sedentary intervention for four groups of older adults across 18 districts for non-institutionalized individuals and 25 LTC facilities. An important feature of this study was that it examined perceived pain and disability and was correlated with perceived depression over an 18 month period for individuals not residing in LTC facilities to that of individuals residing in LTC facilities. The researchers then compared the types of exercise interventions used for non-institutionalized individuals to that of those of LTC facilities. The results indicated that resistance training was the least common form of exercise at 8% of the LTC facilities in the study utilizing it or 2 out of the 25 LTC facilities. The study indicated that no form of exercise showed to be superior, however, the important message from this study was that any form of exercise; (general aerobic, resistance exercise or muscle strengthening) can produce important positive impacts upon levels of depression and decreased pain among older adults in LTC facilities (Heath and Stuart, 2002).

#### *Resistance Exercise Utilizing Elastic Bands Among Older Adults*

Alternative forms of resistance exercise may be more accessible and feasible for older adults to maintain. Jette et al (1999) conducted a study of 102 sedentary, functionally limited, community-dwelling adults 60 to 94 years of age and 66 individuals residing in LTC facilities. Subjects were randomly assigned to 26-weeks of progressive resistance training using elastic bands. The Profile of Mood State Short Form was used to assess six different mood states (O'Neal, Dunn & Martinsen, 2000). The Profile of Mood

States Short Form consists of 30 items rated on a five-point scale, from “not at all” to “extremely.” Mean scores were computed across items, with higher scores indicating greater support of the designated mood. Coefficient alpha internal consistency reliability for the sample on each of the depression-dejection mood scale was (.84) for non-institutionalized individuals and (.89) for those residing in LTC facilities. Those residing in LTC facilities also revealed lower mood and more depressive symptoms. Results revealed subjects with baseline mental confusion as assessed by Profile of Mood States were less likely to follow the exercise plan. The finding suggests that home-based exercise may not be ideal for older adults with some mental confusion. Also, results showed that a depressed mood was positively associated with a lack of performing the exercise.

Past studies have indicated a psychological change may occur for those individuals with perceived symptoms of depression after they begin an elastic band exercise routine. Lawlor and Hopker (2001) conducted an eight-week resistance training intervention using elastic bands in 62 subjects with a mean age of 68. Subjects were randomly assigned to an exercise and control group. Pretest and posttest assessments were given for health-related QOL. Researchers distributed a self-administered battery of Health-Related QOL measures. Health and social functioning scales utilized in the questionnaire were measures identified in the psychological and health literature as Health-Related QOL concepts. Two summary Health-Related QOL measures were created: Mental and Physical Health Functioning. The two summary scores comprised 10 Health-Related QOL measures for the Medical Outcomes Study, which included: anxiety, depression, energy/fatigue, sleep problems, general health perceptions, pain, physical

functioning, positive affect, role functioning and social activity limitations. All scores were transformed to a 0 to 100 score range with higher scores indicating better health. Analysis of variance indicated significant differences between groups at baseline for all Health-Related QOL life scales; however, analysis of variance indicated significant differences ( $p \leq .05$ ) for all groups after the posttest analysis upon completion of the eight-week intervention. Therefore, those involved in the exercise band prescription showed a statistically significant increase in health-related QOL during the study, which indicates that the intervention works.

#### *Exercise Guidelines for Resistance Exercise for Older Adults*

There are several guidelines with regard to resistance training that older adults should follow (ACSM, 2006). First, health professionals should closely supervise and monitor the initial resistance training sessions. These individuals should be knowledgeable about the special needs and capabilities of the older adults. Second, minimal resistance should be employed the first eight weeks to allow for adaptations of the connective tissue elements. Proper training demonstrations and breathing techniques should be provided for all the exercises to be performed during the program. For example, older adults should be instructed to maintain their normal breathing during the exercises. Third, the resistance should be set to allow the individual to perform at least eight repetitions but no more than 12 for the older adult population. Fourth, exercises should be performed in a manner with the speed controlled. For instance, no ballistic movements should be performed. All exercises should be performed in a range of motion that is free from pain or the maximum range of motion that does not produce any pain or discomfort. Fifth, when utilizing elastic bands, the bands should be secured to protect the

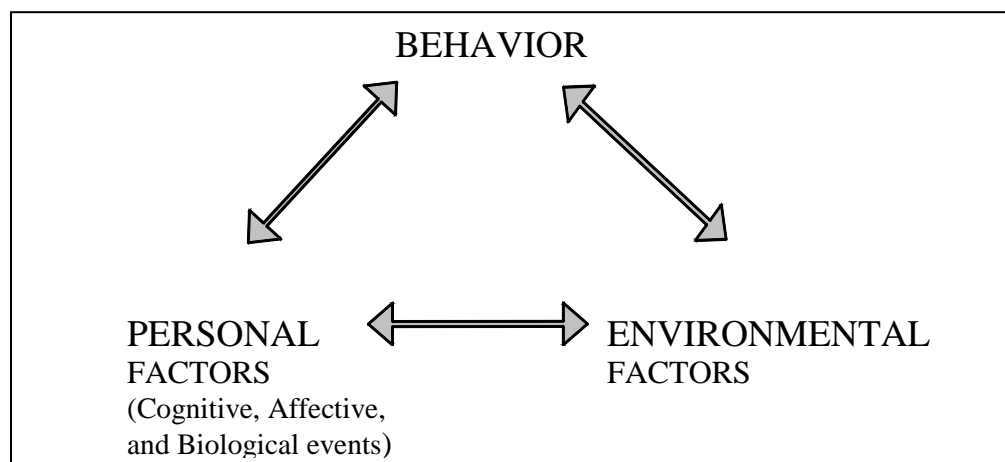
back and stabilize the user's body, which allows the person to begin with a lighter resistance. It is essential that over training does not occur; therefore a minimum number of two and a maximum number of three training sessions a week is required to produce positive psychological benefits. Additional sessions may be neither desirable nor productive depending upon the circumstances.

### *Theoretical Foundation*

It is important to select an explicit theory or model to guide the research variables when conducting research on specific exercise programs and the potential benefits of exercise on older adults (Aronow, 2001; McAuley et al., 2000). Many studies about exercise behavior have used social cognitive theory (SCT) to explain older adult behaviors (Figure 1). SCT focuses mainly on the cognitive, emotional and behavioral aspects of change in the individual and is relevant for designing health education and health behavior programs because SCT helps explain how people acquire and maintain certain behavioral patterns (Bandura, 1997).

Figure 1.

### *Social Cognitive Theory*



Social Cognitive Theory Conceptual Model (Pajares, 2002).

According to Bandura (1986), SCT addresses the interrelationships among personal factors, such as cognitive processes, in association with behavior and environmental factors, such as the relationship of exercise and depression among older adults in LTC environments. Cognitive thought develops through what individuals learn, interpret, and anticipate in environmental events, which motivates their actions (Cervone, 2000). The relationship between cognitive thought and environmental factors shapes individual's actions or any change in their behaviors (Bandura, 1997). These relationships between cognitive thought and environmental factors are viewed as reciprocal determinants, but the effect of these cognitive processes of behavior, and of environment are not equal (Figure 1). The influence of one factor may be stronger than another, depending on the situation, and the influence may vary over time (Bandura, 1997).

Previous research has focused on the self-efficacy concept of SCT related to exercise and recreation for older adults. Self-efficacy is defined by SCT as the perceptions of personal efficacy, or a person's confidence in performing a particular behavior. Self-efficacy leads to the ability to perform specific behaviors along three dimensions: magnitude, strength, and generality (Bandura, 1997). Magnitude is the level of difficulty for a behavior a person believes he/she can attain at different times. For example, older adults may believe that they can maintain exercise when their health is in good condition, but when they feel unhealthy they cannot exercise. Strength refers to the confidence of a person to perform a behavior asked of them. For example, some people believe they can quit smoking at any time, and the belief helps them to perform the behavior. Generality of self-efficacy is the extent to which behaviors are considered a

success or failure. In other words, when people with strong efficacy have some level of success or failure, they tend to generalize that experience to other experiences leading to an expected outcome. For example, a person who perceives success in his/her work will generally expect successful outcomes in community volunteer efforts (Bandura, 1997).

Outcome expectations are judgments about what happens if a specific behavior is successfully carried out and are based on individual's self-efficacy expectations. Individuals anticipate the type of outcome depending on how well they think they are able to carry out the behavior. Those who believe that they can complete a certain behavior will expect a favorable outcome for the distinct behavior. Although individuals may believe that a specific behavior will yield a certain outcome, they may not believe that they are able of achieving that particular behavior. In other words, an older adult may know that exercise will benefit them in some way, but they may believe they cannot physically perform the exercise (Bandura, 1997). Therefore, the self-efficacy concept and the SCT overall indicate that variables associated in research related to older adults and exercise may include: cognitive change, emotional change, behavioral change, magnitude, strength and generality.

### *Benefits of Recreation*

Exercise as a recreational activity can be used for maintaining health and providing positive social experiences that may benefit an individual. Specifically, exercise as a recreation activity can provide benefits for improving QOL through counteracting depression among older adults in a LTC facility (Bongqok, 2001).

The Centers for Medicare and Medicaid Services (CMS) included section N in the regulations for LTC facilities (Department of Health and Human Services, 2005), which

requires provision of daily recreational activities (Bongquk, 2001). This was due to the identified potential benefits which have been historically associated with recreation participation. The recreational activities provided are an important factor in the formation of a person's self-image or an individual's concept of themselves. For example, recreation activities can be used to replace the role of work in the formation of how older adults define themselves and may help to influence their psychological well-being (Baker & Palmer, 2006),

O'Sullivan (2001) demonstrated that a positive relationship exists between participation in recreational activities and overall psychological well-being. In addition, those individuals with high levels of participation reported lower levels of depression in a LTC setting. Long (2002) indicated that appropriate recreational activities that provide optimal social, psychological and physical challenge may provide the participant feelings of accomplishment and independence, which in turn, could lead to a sense of general well-being. Active participation has also shown to help develop those skills associated with improving functional independence in addition to promoting reported improvement in QOL. Therefore, exercise as a form of recreation, appears to have the potential to reduce the symptoms of, as well as, reported levels of depression (Long, 2002).

#### *Recreation and Older Adults*

Baker and Palmer (2006) demonstrated the important role recreation plays in enhancing the QOL for older adults residing in LTC facilities, and argue that involvement in recreational activities helps residents retain a sense of control and independence while reducing stress. Before providing an exercise or other recreation program, it is important to recognize which recreation program will be most stimulating to each individual.

Pedlar, Dupuis, and Gilbert (1996) demonstrated in their case study of Eric, a LTC facility patron, the loss of role status he experienced through a lack of recreational activities. The authors found that the lack of stimulating recreational activities may have led to an increase in his perceived level of depression. Shortly after Eric was admitted into a LTC facility, he became progressively more depressed, and started to see himself as a burden. A Pearson correlation indicated that Eric's state of depression was significantly correlated with his reported lack of recreational opportunities in which he could engage. Prior to being admitted into the LTC facility, Eric had greatly enjoyed woodworking and the lack of that activity may have had a negative impact on him. However, upon the administration of woodworking as a recreational activity, Eric's perceived depression level decreased and his perceived physical ability had increased (Pedlar et al., 1996).

#### *Determinates of Recreation Participation in Older Adults*

Recreation can be beneficial to older adults, but there are many factors that often influence how an individual will respond to certain recreation programs and deter them from participating in such programs (Thompson, 1999). When an individual is admitted to a LTC facility, he/she enters a new chapter in his/her life, in this new chapter, the future often holds many uncertainties; isolation, loss of independence, and loneliness may lead residents to no longer feel like a person, but rather a job to be done or just a number. The residents adjust from a life where they made personal choices and had independence, to a life in which they cannot make complete choices and are governed by the rules, policies and regulations of the LTC facility (Thompson, 1999).



Research has indicated immutable and modifiable as two main determinants of recreation participation among older adults. Immutable determinants refer to age, gender, race or ethnicity. Modifiable determinants refer to personal traits, community settings, systems of support, environmental circumstance, disability and education level. When these immutable and modifiable determinants are negative, older adults tend to have lower exercise levels and are more likely to feel depressed and less likely to comply with an exercise prescription (Seefeldt, Malina & Clark, 2002).

Bereavement and self-presentation are also considered determinants of recreation participation that get less attention. Seefeldt, Malina and Clark (2002) suggested that bereavement can disrupt daily living tasks and is considered a determinant because almost 50% of women over the age of 65 have lost their spouses due to women having a longer life-expectancy than men (U.S. Census Bureau, 2007). Self-presentation or a person's attempt to influence how others see them appears to be important in the exercise behaviors of older adults. Mainly because older adults were not properly taught how to do the exercises, therefore they are afraid to perform them in front of others for fear they are doing them incorrectly (Seefeldt, Malina & Clark, 2002).

The provision of recreational activities, specifically exercise appears to have potential in the overall positive reported well-being and QOL of older adults residing in LTC facilities. Recreational activities should not only be assigned the sole role of providing an opportunity for social engagement, as often occurs in LTC facilities, rather, recreation activities should also be recognized for the potential positive effects, such as, improving and/or maintaining functional independence and self-respect for those residents in LTC facilities (Pickering, Deteix, Eschaliere & Dubray, 2001). Recreational

activities should be selected with the goal of improving all aspects of an individual's health, such as improvement in socialization, physical health, cognition and psychological health, all of which appear to possess the ability to increase social engagement and decrease perceived levels of depression among older adults residing in LTC facilities (Pickering, Deteix, Eschalier & Dubray, 2001).

### *Depression*

Depression among older adults is one of the most common psychological disorders in the United States and one of the most prevalent mood disorders among older adults in LTC facilities, as stated in the Diagnostic Statistical Manual-IV-Text Revision (DSM-IV-TR) (American Psychiatric Association, 2003). According to the DSM-IV-TR, depression is characterized by chronic emotional, cognitive, physical, and behavioral disruptions and is thought to be “unipolar” or without manic episode, meaning, there is no fluctuation of mood or the mood remains constant (Hirschfeld et al, 1997). Individuals often suffer from symptoms of depression even though the depression is undiagnosed. Some individuals suffer a depressed mood or loss of interest in an activity which may often be accompanied by additional symptoms of depression (American Psychiatric Association, 2003) (Table 1).

Table 1.

<i>Symptoms of Depression</i>	
Physical Symptoms	Psychological Symptoms
Loss of interest in activities	Depressed mood spanning most of the day
Unplanned weight fluctuation	Increase or decrease in worthlessness and/or inappropriate guilt
Inability to achieve restorative sleep	Inability to stay focused or concentrate through the day
Increase or decrease in fatigue	Preoccupation with death and/or suicide
Note: Does not have to be diagnosed depression to suffer symptoms.	

Older adults with depressed mood can experience other difficulties both as a function and result of depression which leads to the individual's withdrawal and to difficulties in an individual's social, academic and occupational endeavors (Allen, 2002).

### *Impact of Depression*

Depression is an illness that is treatable, but often remains undiagnosed, inappropriately treated, or not treated at all. An older adult's inability to recognize symptoms associated with depression and lack of trained providers are common barriers to proper treatment which results in approximately 30% of depressed older adults seeking out medical help. Also, at least 50% of older adults who suffer from depression do not receive proper treatment (Hirschfeld et al., 1997). Untreated or inadequately treated depression is the number one cause of suicide for older adults. In 1990, approximately 15,000 men and 3,400 women all over the age of 65, committed suicide as a result of depression (Greenberg, Leongand & Birnbaum, 2001). In other words, the older adult population comprises about 13% of the world's population and more than 20% of those older adults commit suicide.

Depression can make treatments difficult and can cause continued hopelessness that can affect many if not all parts of an individual's life. More than 2 million of the 34 million Americans age 65 and older suffer from depression and at least one third of all individuals will suffer a depressive episode during their lifetime (Neid & Franklin, 2002). Depression is most common in women, young adults, older adults, and those of lower socioeconomic status and is considered a cause of alcoholism and drug abuse among older adults (Stansfeld, Fuhrer, Shipley & Marmot, 2002).

The estimated lifetime prevalence of depression varies dependent upon the population, but it is approximately 17.1% in the United States (Brosse, Sheets, Lett & Blumenthal, 2002). Greenberg, Leongand and Birnbaum (2001) estimated that the annual cost due to depression in the United States is over \$43 billion, including \$12.4 billion in direct costs for treatment and approximately \$31 billion in indirect costs due to premature death and reduced productivity. The annual costs associated with traditional forms of treatment may prove to be a concern for out-of-pocket spenders and health insurance companies especially for older adults with minimal income residing in LTC facilities. It has been estimated that the annual cost of out-of-pocket patient care is \$2.9 billion and pharmaceutical expenses is \$1.175 billion (Greenberg, Leongand & Birnbaum, 2006).

The treatment of depression is vital in restoring normal psychological and physical health. According to Nied and Franklin (2002), the most common forms of treatment include antidepressant medication, psychotherapy, or a combination of both. Although effective, those forms are not successful or desired in all patients. It has been estimated that approximately 30-35% of older adults do not respond to antidepressant medication, which might lead to the investigation of non-pharmacological methods of treatment. Also, antidepressant medications can result in unwanted side-effects such as nausea, diarrhea, insomnia, nervousness, agitation, anxiety, constipation, blurred vision, urinary retention, postural hypotension, and weight gain, which in turn may impact QOL (Blumenthal et al., 1999). The effectiveness of antidepressants varies per individual; some patients may exhibit an improvement in symptoms with short-term antidepressant use, however are at significant risk for falling back into a depressed state within one year of terminating treatment (Blumenthal et al., 1999).

The presence of depression prevalence at reported elevated rates might be a main indicator as to why depression has and should be one of the most widely investigated mental health disorders in the United States (Blumenthal et al., 1999). Alternative forms of treatment such as exercise as a common recreational activity could be considered as an alternative method to pharmacotherapy in the quest to identify methods of management and recovery of depression.

#### *Effects of Exercise on Depression Levels*

Lampinen & Heikkinen (2002) suggested that regular physical exercise is associated with reduced symptoms of depression. The authors also indicated that physically active individuals over the age of 65 reported fewer depressive symptoms than sedentary individuals of the same age over an eight year period. A pivotal study indicated that depression has been identified as one of the two most common psychological impairments of advanced age along with cognitive impairment; therefore, the potential of exercise to reduce the effects of depression appears to be a critical issue within the older adult population (Hagestad, 1987).

Brown, Goldstein-Shirley, Robinson and Casey (2001) stated there is a positive correlation between increased levels of exercise and improved mental health in older adults. It was noted that the number of studies that successfully utilize non-aerobic activity to decrease depressive symptoms in patients lends evidence to using exercise as a viable treatment option for depression, even though people with depression are often less physically active and less cardiovascularly fit, than non-depressed individuals (Paluska & Schwenk, 2000).

Exercise has shown to produce possible improvements for those with depression when used in combination with standard treatment programs (Dimeo, Bauer, Varahram, Proest & Halter, 2001). Most experimental studies and research indicated that exercise appears to be more effective than placebo control conditions and is comparable to antidepressant medication or psychotherapy (Babyak et al., 2000).

According to Ferrini and Ferrini (2000), running and walking are the two most common exercise interventions reported in the literature for the treatment of depression and these particular activities should be designed to fit the specific needs and abilities of older adults. Other activity based exercise interventions used in the treatment of depression have included weightlifting, swimming, bicycling, movement therapy, and resistance exercise bands.

Ahmadi, Samavat, Sayyad, and Ghanzadeh (2002) found significant decreases in perceived depression across different types of exercise. Using the Beck Depression Inventory–II (BDI-II) as the perceived depression measurement instrument, Ahmadi et al. (2002) found that with a random sample of 60 participants there was a 3.5 point mean decrease for those in a weight-training exercise which indicates they feel less depressed. The authors also identified a significant difference between new swimmers when compared to advanced swimmers with a mean decrease of four points with a random sample of 40 participants which led the authors to believe that a new exercise can be effective in lowering perceived depression levels.

Tkachuck and Martin (1999) reviewed 14 studies that used exercise as an intervention to treat a host of problems including depression, substance abuse, and schizophrenia. The demographics differed among the 14 reviewed studies, including

three studies involving only females, and one study involving all males, and the remaining conducted with mixed participants. Although, the majority of the studies used adults, one focused specifically on older adults. Of the 14 studies reviewed, 13 used an aerobic type exercise intervention. There was different duration for all of the interventions ranging between 6 and 12 weeks and session frequency revealed the most variability between studies. The quantity of sessions per week ranged from two to four, as well as, the number of minutes each session lasted ranging from 20 minutes to an hour. Most studies used running as the intervention, however, there is little mention of the intensity at which these participants worked during the sessions.

The authors note that of the 14 studies reviewed, all reported a significant reduction in depression for their participants. The authors concluded that exercise appears to be a valid successful treatment for depression (Tkachuck & Martin, 1999). However, the significant results they all achieved were most noteworthy of the 14 studies. In each study, exercise was found to significantly reduce depression, in some cases reducing BDI-II scores by as much as 75% (Tkachuck & Martin, 1999).

O'Neal, Dunn and Martinsen (2000) conducted a meta-analysis consisting of 80 studies that utilized exercise as an intervention for decreasing depression. The authors discovered that, on average, those in exercise conditions demonstrated a full half standard deviation greater reduction in depression than those in the control condition.

#### *Effects of Exercise on Depression Levels Among Older Adults*

Mather et al. (2002) completed a randomized controlled trial in which depressed older adults completed a 10-week exercise class schedule. Despite difficulty recruiting qualified candidates, little difficulty was encountered across the span of the study with

nobody dropping out and only one individual being removed due to health concerns. Classes were held twice a week and lasted 45 minutes with a 5 to 10 minute warm-up and cool-down. Participants were randomly assigned to either exercise or a control condition. Those in the exercise condition attended a group aerobic type exercise class that was 45 minutes long and control participants attended a health education class. Participants in the exercise condition reported a 55% decrease in depression when compared to their initial baseline. Interestingly, both conditions continued for 34-weeks and attendance for exercise sessions decreased as the weeks progressed after the twelfth week. The authors hypothesized that the drop in attendance led to the lack of differences between groups and that the study was potentially too long (Mather et al., 2002).

Singh, Clements, and Singh (2001) also illustrated the potential positive impact of utilizing exercise to reduce perceived depression among older adults. In this design, a supervised resistance weight-training program was used over a 10-week period, followed by a 10-week unsupervised weight-training program while the control participants attended a health education class. Significant decreases on the BDI-II were noted for those in the exercise condition. At week 20 of the study, 73% of those in the exercise condition were classified as minimally depressed which was a significant decrease for all members in the exercise condition vs. 36% from the control group being classified as minimally depressed which was not a decrease in depression among those in this control group.

Singh, Clements and Singh (2001) also analyzed the effects of aerobic exercise versus non-aerobic exercise in the treatment of clinical depression among older adults. Ninety-nine participants were randomly assigned to an aerobic type exercise group



consisting of walking and jogging or to a non-aerobic group consisting of resistance, flexibility, and relaxation exercises. Each exercise session lasted 1-hour and met 3-times a week for 8-weeks. Post-treatment results indicated that both groups had a significant decrease in symptoms of depression as revealed by the BDI-II. The authors concluded that both aerobic type and non-aerobic type exercise were equally effective in the treatment of depression.

While most studies used aerobic type exercise, non-aerobic type exercises have shown the ability to reduce perceived symptoms of depression. A study was conducted utilizing a randomized controlled 8-week study using 60 community-dwelling older adults over the age of 65. The participants were assigned to either a high intensity non-aerobic type workout group, low intensity non-aerobic type workout group, or the general practitioner's non-aerobic type workout group. Participants in the high intensity group underwent a supervised program of the large muscle group exercises for 3-days a week for 8-weeks at 80% maximum resistance. The low group underwent low intensity resistance using the exact same program as the high group at 20% maximum resistance. Results indicated a 50% reduction in the BDI-II depression score was achieved in 61% of the high intensity workout group and 29% of the low intensity group (Singh et al., 2005).

#### *Depression Inventory Selection*

While exercise as a common recreational activity among older adults has been the focus of numerous research projects, few have considered what effect exercise participation may have on an older adult's perceived depression level in a LTC facility. To determine what effects participation may have, use of one or more depression inventories may be appropriate. According to recent literature, the most popular and more

commonly used inventories include: BDI-II, Hamilton Rating Scale for Depression, and Geriatric Depression Scale.

### *BDI-II*

In 1996, the amended Beck Depression Inventory (BDI-IA) was revised to the Beck Depression Inventory–II (BDI-II) (see Appendix B). The BDI-II was altered to make its symptom content more consistent with the diagnostic criteria for major depressive disorders (MDD) that are described in the American Psychiatric Association's (2003) DSM-IV-TR. The authors point out that the BDI-II is not valid in diagnosing depression but only to be used to assess perceived levels of depression among individuals (Steer, Rissmiller & Beck, 2000).

In a normative sample of 500 outpatients who were diagnosed with various psychiatric disorders, Beck, Steer, and Brown (1996) reported that the BDI-II was composed of two dimensions that are correlated in a positive direction. The first dimension reflected a non-cognitive factor represented by somatic symptoms, such as loss of energy and irritability. The second dimension is a cognitive factor composed of psychological symptoms, such as self-dislike and worthlessness (Steer, Rissmiller & Beck, 2000).

The BDI-II is often used to measure depression levels among the older adult population. A study conducted by Steer, Rissmiller, and Beck (2000), involving a geriatric sample of N=50 inpatients who were admitted to an acute, long-term mental health unit in a general hospital and who were diagnosed with the DSM-IV-TR disorders in which there was a unipolar depressive component, displayed a mean total score of the BDI-II for the patients of 24.56 (SD = 12.75), and the coefficient alpha was 0.89. The

mean value indicates that the overall level of depression in the sample was moderate according to the diagnostic ranges presented by Beck et al. (1996b) and the coefficient alphas between 0.80 and 0.89 are described by Cicchetti (1994) as good and therefore valid and reliable. The BDI-II is typically chosen due to the criterion that it was based; researchers who use the DSM-IV-TR as criterion for defining depression usually use the BDI-II since the criterion is from the DSM-IV-TR.

## CHAPTER III

### METHODOLOGY

#### *Selection of Participants*

A random assignment of older adults from a purposive sample individuals residing in a LTC facility in a southwestern city will be performed. The purposive sample of participants will randomly be assigned to a study group or a control group based on the designated criteria set forth by the researcher. As mentioned before the research question asks; can participation in an organized resistance band exercise program alter perceived depression level scores for older adults living in a LTC facility over time? Therefore the null hypothesis would suggest there is no difference in perceived depression scores per individual due to the resistance exercise program utilizing exercise bands among older adults residing in a LTC facility across time. The alternative hypothesis suggest there is a difference in perceived depression scores per individual due to the resistance exercise program utilizing exercise bands among older adults residing in a LTC facility across time.

The criteria for the proposed study as follows: (1) Participant must be a resident of the identified LTC facility in the southwestern city, (2) be free of diagnosis of Alzheimer's disease type dementia, (3) have no diagnosis of vascular type dementia, (4) have no current diagnosis of drug/alcohol induced dementia, (5) be at least the age of

60, (6) be physically capable of performing the prescribed resistance exercises, (7) have no diagnosis of any level of dementia above level 2, as described by Ott, Van Rossum and Van Harskamp (1999) and (8) will complete an Oklahoma State University approved informed consent form prior to the intervention (see Appendix C). The residents meeting the selection criteria will receive health clearance from a physician prior to being admitted to the study (see Appendix D).

### *Research Design*

This research study will utilize a randomized controlled trial between subjects design. Participants who meet the study criteria and agree to participate in the study will do so by signing the informed consent form. Participants will then be asked to participate in a recreation program and complete a self report BDI-II instrument consisting of a 12-week resistance band exercise program. The BDI-II will be collected prior to initiation of the resistance band exercise program then at 4, 8 and 12-weeks. A script will be provided to the Recreation Activity Director to discuss and describe the nature of the study as well as what will be required of the participants to fill out the BDI-II (see Appendix E). A control group will be utilized involving participants who meet the sampling criteria and will then be randomly assigned to the control group. These individuals will participate in the recreation activities already offered by the LTC facility.

### *Warm-up and Cool Down*

Warm-up and cool down activities will be performed prior to the actual exercise prescription. The warm-up and cool down activities will utilize the pectoral stretch for the upper body which includes the stretches of the pectoral, deltoids and upper arm muscles and the leg squat stretch for lower body stretches. All participants will perform the

stretches prior to and immediately after each exercise session for up to 30 seconds per warm-up and cool-down activity.

#### *Pectorals, Deltoids and Front Upper Arms Stretch*

The participant will be asked to sit upright with good posture, look straight ahead, and relax to begin the stretch. The programmer will then ask the participant to extend his/her arms backward with his/her palms facing downward as far as the participant can without causing discomfort, while keeping the arms at shoulder level and to hold the stretch for 10 to 30 seconds for one set. The programmer will observe the participant for proper movement and safety during the stretch. The stretch will be immediately stopped and the correct demonstration will be provided if the participant fails to demonstrate the proper technique.

#### *Leg squat stretch*

The programmer will ask the participant to sit upright, look straight ahead and relax to begin the leg squat stretch. The participant will then be asked to raise one thigh off the chair as high as possible then put it back down on the chair and repeat the process for the other leg. If the participant is unable to perform the stretch without assistance the programmer will ask the participant to use his/her arms to help lift the leg up and down. The participant will be observed for proper movement and safety during the stretch and will be immediately terminated if the participant fails to demonstrate the proper techniques. All participants will be monitored for proper exercise demonstrations. However, if a participant is unable to fully perform the exercises after multiple education sessions, then the participant will be allowed to perform the exercises, however, their

scores will not be analyzed for failure to perform the minimum standards of exercise put for the by the research study.

#### *Exercise Band Resistance Exercises*

Resistance exercise bands will be utilized as the recreation activity of individuals who meet the criteria to participate in the study. Exercise bands are color-coded elastic bands that progress in thickness to provide increased resistance. Three progressive bands will be utilized coded by tan (light), yellow (medium) and red (hard). The primary exercises to be utilized with exercise bands consist of chest press, biceps curl, triceps extension, leg press, hip adduction and hip abduction (see Appendix F).

#### *Experimental Group*

All participants will start with the resistance exercise band they are most comfortable with and able to perform the exercise. The study group will begin with an exercise frequency of one set of 8 to 12 repetitions for each exercise. Participants will be encouraged to progress to the next level band once they are able to complete the one set of 8 to 12 repetitions for the previous resistance band on a consistent basis. The exercise plan will involve slow repetitions to emphasize safety during the concentric (muscle shortens) and eccentric (muscle lengthens) phases of movement. For example, participants will be allowed 3 to 5 minutes of rest between sets before starting the next exercise. The exercises will be performed in the following order: 1) chest press, 2) biceps curl, 3) triceps extension, 4) leg press, 5) hip adduction and 6) hip abduction as recommended by Best-Martini and Botenhagen-DiGenova (2003).

It is recommended that the bands be distributed in a 24-inch increment in length since it is the equivalent to different pounds of pull (see Table 2, Best-Martini & Botenhagen- DiGenova, 2003).

Table 2.

*Length Recommendations Based on Band Color*

Exercise Band Description		
Color	Pounds of Pull	Length of Band
Tan	2.5 lbs.	24 inches (60 cm)
Yellow	4.5 lbs.	24 inches (60 cm)
Red	5.0 lbs.	24 inches (60 cm)

A loop tied elastic band and chair of normal height will be utilized to facilitate exercises involving the following muscle groups: the primary use of the biceps, triceps and deltoid muscles through a full range of motion. Upper arm exercises will be utilized with elastic exercise bands with a loop tied at one end to facilitate better grip for proper exercise performance. There are limited risks and the potential for benefits to the each person as well as to society by participating in the experimental group (see Appendix G).

#### *Chest press exercise*

The participant will be asked to sit upright with both feet flat on the floor with knees slightly bent, look straight ahead and relax to begin the exercise. The exercise band will be placed around the back of the chair at the level of the upper thoracic area just below the upper shoulder while the participant holds the ends of the band with one in each hand in the front with arms bent. The participant will be asked from this position to move his/her hands with the bands to the side of the chest, while keeping elbows out



away from body then press to a near straight-arm position. The participant will be asked to exhale during extension (muscle lengthen), inhale during flexion (muscle shorten), while exercising at a comfortable pace. The acting activity programmer will be kneeled in front of the participant and observed for proper movement, safety and breathing. The repetition will be immediately terminated and a correct demonstration provided if the participant fails to perform the proper technique.

#### *Triceps extension exercise*

The participant will be asked to sit upright with knees bent, look straight ahead and relax to begin the triceps extension exercise. The exercise band will be placed underneath the bottom of the seated portion of the chair. The participant will be asked to hold the loop in the band with palm facing inward. The participant will then be asked to flex his/her arm into a “V” shape near the head with the elbow about nose level. The participant will lift his/her arm above the elbow as high as is comfortable while holding the back of the upper arm with the opposite hand. The participant should exhale on the upward movement and inhale on the downward movement and focus on moving only the elbow at the joint. This should be performed for 8 to 12 repetitions then repeated on the other side upon completion of one arm. The participant will be observed for proper movement, safety and breathing throughout the exercise. The repetition will be terminated and the correct demonstration given if the participant fails to demonstrate the proper techniques.

#### *Biceps curl exercise*

The participant will be asked to sit upright, look straight ahead and relax to begin the biceps curl exercise. The exercise band will be placed under the bottom or tied to the

front leg of a chair while the participant holds the other end in one hand in the tied loop. The participant will be asked to keep the arm in a straight position parallel with the body and to keep the arm in line with the torso. The participant will be asked to bend the arm at the elbow while trying to keep the upper arm (above the elbow) in line with the torso so the hand comes as close to touching the shoulder or at the comfort discretion of the participant. The programmer will remind the participant to exhale during flexion (upward movements) and inhale during extension (downward movements) while exercising at a comfortable pace. The participant will be observed for proper movement, safety and breathing during the 8 to 12 repetitions. The repetition will be terminated and the correct demonstration will be provided if the participant fails to use the proper techniques.

#### *Hip adduction exercise*

The participant will be asked to sit upright, look straight ahead and relax to begin the hip adduction exercise. The participant will be asked to secure one end of the exercise band to the leg of a stationary object (table leg, weights). The participant will be asked to sit and face the same direction as the stationary object. The other end of the exercise band should be placed around the closest leg of the participant sitting the same direction as the stationary object. The participant will be asked to place his/her hand in a comfortable position (rest on knees), keep each foot directly below each knee. The participant will be asked to rotate the leg without bending the knee in an inward movement remembering to inhale and when moving the leg back outward to exhale for 8 to 12 repetitions. The programmer will observe the participant for proper movement, safety and breathing. If the participant performs the exercise incorrectly, the participant will be immediately stopped and a proper demonstration will be provided.

### *Hip abduction exercise*

The participant will be asked to sit upright, look straight ahead and relax to start the hip abduction exercise. The programmer will ask the participant to secure one end of the exercise band to the opposite chair leg than the leg in which they are exercising. The participant will be asked to secure the other end of the exercise band around his/her ankle. The participant will be asked to place his/her hand in a comfortable position (rest on knees), keep each foot directly below each knee. The participant will be asked to rotate the leg without bending the knee in an outward movement remembering to exhale and when moving the leg back inward to inhale for 8 to 12 repetitions. The programmer will observe the participant for proper movement, safety and breathing. If the participant performs the exercise incorrectly, the participant will be immediately stopped and a proper demonstration will be provided.

### *Leg press exercise*

The participant will be asked to sit upright with both feet on the floor, look straight ahead and relax to initiate the leg press exercise. The programmer will ask the participant to place the exercise band under both feet and hold the ends in both hands with equal distance while sitting down. The participant will be asked from this position to use his/her leg muscles to raise his/her body upward until they feel a mild stretch. The programmer will remind the participant to exhale during upward movements and inhale during downward movements while exercising at a comfortable pace. The participant does not have to stand up rather than feel a mild stretch or muscle contraction while in a seated position (Best-Martini & Botenhagen-DiGenova, 2003). The participant will be observed for proper movement, safety and breathing during the exercise. The repetition

will be immediately stopped and the correct demonstration will be provided if the participant fails to demonstrate the proper techniques.

A demonstration of the prescribed exercise repetitions will be performed prior to all exercises. The research will hold an exercise band with both hands for one-two minutes after the repetition to answer potential questions of the participants or the Renaissance of Stillwater activity programmer. The participant will perform one set of 8 to 12 repetitions for all exercises. All participants will be asked to breathe normally, use safety and proper technique, good posture and immediately stop the exercise if significant pain occurs.

### *Instrument*

The BDI-II is a self-report instrument used to measure the perceived level of depression in individuals age 13 and older (see Appendix B). The BDI-II is comprised of 21 items and was developed to suggest the perceived presence and degree of depressive symptoms as suggested by the DSM-IV-TR for diagnosing depression. The BDI-II takes into account three major areas which are the cognitive, affective and somatic symptoms associated with depression. This instrument employs a four-point scale that measures the severity of each statement, ranging from 0 to 3. The overall severity of depression is calculated by a total score based on the following scoring system: 0 to 13 is considered minimal depression, 14 to 19 is considered mild depression, 20 to 28 is considered moderate depression, and 29 to 63 is considered severe depression (Beck, Steer & Brown, 1996).

The internal consistency of the BDI-II was calculated by examining scores reported by psychiatric outpatients and college students. The coefficient alpha reported

for outpatients was .92 and the coefficient alpha for college students was .93. These results suggest that the correlation between items on the instrument are considered high, good (Cohen, Kamarck, & Mermelstein, 1983), and measure what it is designed to measure. With respect to perceived depression levels, further evidence of convergent and discriminate validity of the BDI-II is illustrated by the finding that the BDI-II was more positively correlated ( $r=.71$ ) with the Hamilton Rating Scale for Depression (Hamilton, 1960). The inter-correlations among the 21 BDI-II items helped establish evidence of factorial validity.

#### *Data Collection*

Each participant will be evaluated regarding his/her level of depression utilizing the BDI-II upon admission to the study to establish a baseline, at 4-weeks, 8-weeks and 12-weeks. An exercise log will be kept by the program leader (see Appendix H). The BDI-II instruments will be administered by the principal investigator or the programmer.

#### *Handling of Data*

Every effort will be made to ensure the safety and confidentiality of the participants in the study. The raw data collected from the participants of the study will be assigned an identification number selected from a table of random numbers. The representative number will then be utilized on all data recording instruments. The data will be stored in a locked file cabinet in the dissertation advisor's office. Once the study is completed the coded data will be destroyed ensuring confidentiality.

#### *Analysis of Data*

This study will utilize a non-parametric statistic analysis conducted utilizing the Statistical Package for the Social Sciences (SPSS) with a pre-determined alpha set at  $P <$

(.05). The specific data analysis technique utilized will be a Mann-Whitney U, because it is the equivalent to the t-test for two independent samples parametric procedure for utilizing ordinal data.

## CHAPTER IV

### RESULTS

#### *Introduction*

The purpose of this study was to determine if there were any effects of a resistance exercise band program on perceived depression levels among older adults residing in a LTC facility over time. The null hypothesis of this study was there is no difference in perceived depression scores per individual due to the resistance exercise program utilizing exercise bands among older adults residing in a LTC facility across time. The alternative hypothesis was there is a difference in perceived depression scores per individual due to the resistance exercise program utilizing exercise bands among older adults residing in a LTC facility across time.

Participants who met the study criteria were randomly assigned to either an experimental group or a control group and asked to complete a BDI-II every four weeks over the course of a 12-week period. At the beginning of the study, there were 40 qualified participants. Twenty participants were assigned to the experimental group and twenty participants to the control group.

#### *Experimental Group Statistics*

There were 20 subjects who completed a BDI-II at any one testing period. Out of the 20 subjects in the experimental group, 11 individuals completed a BDI-II

instrument at all four designated testing periods (baseline, 4-week, 8-week and 12-week). All 20 participants completed the BDI-II at baseline, 11 at the 4-week, 19 at the 8-week and 19 at the 12-week testing period. Therefore, because this study was to examine the impact on perceived depression levels over time, those 11 participants who completed the reporting instruments at the designated testing periods were used in the analysis of the experimental group. Those individuals who did not complete the BDI-II at each measurement period were allowed to continue to participate in the prescribed exercises over the 12-week period.

The research question was as follows: can participation in an organized resistance band exercise program alter perceived depression level scores for older adults living in a LTC facility? Descriptive statistics and the Mann-Whitney U statistic were utilized to determine if there was a suggested statistical significant difference between the baseline, 4-week, 8-week and 12-week scores for the experimental group.

The descriptive statistics for the experimental group subjects BDI-II scores are reported in Table 3.

Table 3.

*Means and Standard Deviation Scores for Experimental Group*

<u>Experimental (n=11)</u>							
<u>Baseline</u>		<u>4-week</u>		<u>8-week</u>		<u>12-week</u>	
<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
8.27	2.328	6.73	2.054	2.73	1.191	1.73	.647

The experimental group means continually declined over the 12-week period. The greatest change occurred from week four to week eight (4.00 difference). The least change in means occurred between the 8-week and the 12-week measurements (1.00



difference). However, from baseline over time at each designated testing interval, the mean score gradually decreased, suggesting that their perceived depression scores lowered consistently.

#### *Control Group Statistics*

There were 20 subjects, 16 female and 4 male, who completed a BDI-II at any one testing period. However, of the 20 subjects in the control group, 14 completed a BDI-II instrument at all four designated testing periods (baseline, 4-week, 8-week and 12-week), 12 female and two male. All 20 participants completed the BDI-II at baseline, 14 at the 4-week, 14 at the 8-week and 14 at the 12-week testing period. Therefore, because this study was to examine the impact on perceived depression levels over time, those 14 participants who filled out all four instruments at the designated testing periods were used in the analysis of the control group. It is important to mention that only the 14 individuals who completed the baseline, 4-week were allowed to complete the 8-week and 12-week instruments to track their scores over the 12-week time period and those who only filled out baseline were allowed to participate in the experimental group but were not used in the data analysis.

Descriptive statistics and the Mann-Whitney U statistic were utilized to determine if there was a suggested significant difference between the scoring periods for the control group. Descriptive statistics utilized in this analysis were means and standard deviations as presented in table 4.

Table 4.

*Means and Standard Deviation Scores for Control Group*

<u>Control (n=14)</u>							
<u>Baseline</u>		<u>4-week</u>		<u>8-week</u>		<u>12-week</u>	
<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1.55	1.368	3.91	3.048	2.36	1.362	2.58	.924

For the control group the means showed no continuous trend, starting seemingly low at baseline then increasing over the first 4-week period. The data suggests the same results from 4-week to 8-week and then increasing again over the last four weeks of the study.

*Mann-Whitney U Experimental Group Results*

The Mann-Whitney U was utilized to compare two independent samples. The two samples in this study are not the experimental group and control group. Therefore, because the researcher was tracking perceived depression over time for individuals, the samples were the testing periods, which means, the 11 individuals who filled out all BDI-II instruments were compared with each other only at different periods of the study (baseline vs. 4-week, 4-week vs. 8-week, etc.). The following table represents the P-value scores for the six comparisons (see Table 5).

Table 5.

*Mann-Whitney U Scores for Experimental Group*

<u>Data Collection Points</u>	<u>Compared to baseline</u>	<u>Compared to 4-week</u>	<u>Compared to 8-week</u>
4-week	.116		
8-week	.001**	.76	
12-week	.001**	.001**	.023*

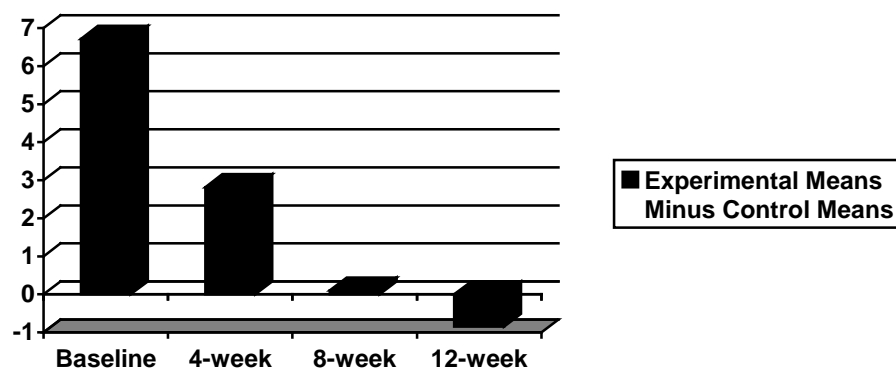
Note: \* Indicates significance at  $P \leq .05$

\*\* Indicates significance at  $P \leq .001$

The Mann-Whitney U analysis suggests that from baseline to 4-week there was no significant change in perceived depression scores. However, there was a suggested significant difference from the 8-week to 12-week testing period with a critical value of 30 ( $P \leq .001$ ). Also, analysis indicates a significant difference from the 4-week test to the 12-week test at  $P \leq .001$ . Mean score difference were calculated between the experimental group and control at corresponding testing periods to indicate mean changes over time (see Figure 2).

Figure 2.

*Differences between Mean Scores*



Overall, the experimental group demonstrated lowered means (see Figure 2). For the experimental group, the researcher would reject the null hypothesis and therefore utilize the alternative hypothesis which states, that there was a difference in perceived depression scores per individual due to the resistance exercise program utilizing exercise bands among older adults residing in a LTC facility over time.

#### *Mann-Whitney U Control Group Results*

The 14 individuals who completed all BDI-II instruments were compared between subjects at different times during the study (baseline vs. 4-week, 4-week vs. 8-week, and

12-week). The following table represents the P-value scores for the six comparisons (see Table 6).

Table 6.

<i>Mann-Whitney U Scores for Control Group</i>			
Data Collection Points	Compared to baseline	Compared to 4-week	Compared to 8-week
4-week	.183		
8-week	.372	.319	
12-week	.315	.290	.382

Note: \* Indicates significance at  $P < .05$

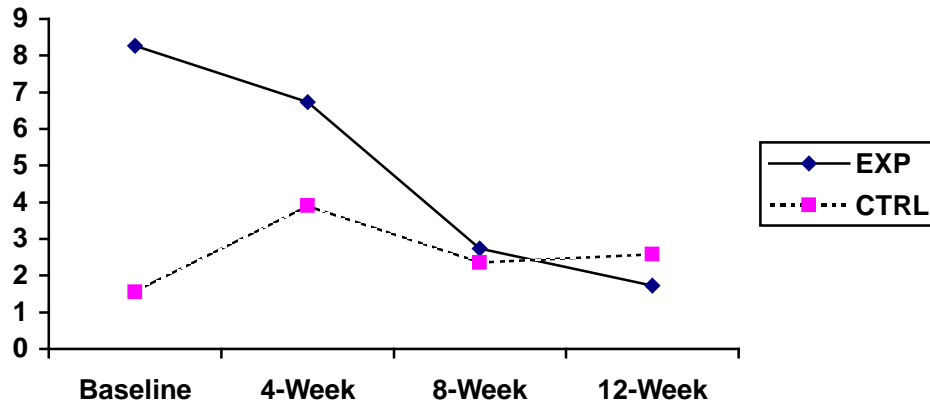
Control group Mann-Whitney U analysis suggested no significant differences among the four test periods. Baseline to 4-week analysis had the lowest reported P-value at  $P \leq .183$ . However, as indicated by table 4 mean scores, individuals in the control group, showed different mean outcomes as well as U value outcomes when compared to the experimental group. After analysis of the control group U scores, the researcher failed to reject the null hypothesis and therefore must conclude that the activities already provided by the LTC facility had no impact on the perceived depression levels among those in the control group.

#### *Group Comparison*

Figure 3 demonstrates the trends over the course of the 12-week study comparing the mean scores of the experimental group to that of the control group. This figure indicates that scores for the experimental group had a continuous decline over the course of the study and the control group had an inconsistent trend with mean scores fluctuating up and then down every other week.

Figure 3.

*Experimental Group and Control Group Comparison over Time*



*Conclusion*

For participants in the experimental group, analysis over a 12-week period suggests that they felt less depressed than before participating in the experimental group. Participation in the control group indicated no change in depression scores from baseline to 12-week scores. Further review of the data suggests that those who were in the experimental group had a significant drop in perceived depression scores when compared to the control group. For the hypothesis proposed, this study rejects the null hypothesis and therefore utilize the alternative hypothesis which suggests that there was a difference in perceived depression scores per individual due to the resistance exercise program utilizing exercise bands among older adults residing in a LTC facility across time.

## CHAPTER V

### DISCUSSION

The focus of this study was to determine if there were any effects of a resistance exercise band program on perceived depression levels among older adults residing in a LTC facility over time. The null hypothesis stated there is no difference in perceived depression scores per individual due to the resistance exercise program utilizing exercise bands among older adults residing in a LTC facility over time. The alternative hypothesis stated there is a difference in perceived depression scores per individual due to the resistance exercise program utilizing exercise bands among older adults residing in a LTC facility across time.

#### *Summary of Study*

This study involved participants who were randomly assigned to either an experimental group or control group. Each participant was asked to complete a BDI-II every four weeks over the course of a 12-week period. Participants (n=40) who qualified for the study were assigned to either the experimental group (n=20) or the control group (n=20). This study utilized a non-parametric statistic analysis conducted using the Statistical Package for the Social Sciences 16 (SPSS) with a pre-determined alpha set at ( $P < .05$ ). The specific data analysis technique utilized was a Mann-Whitney U, because

it is the equivalent to the t-test for two independent samples parametric procedure for utilizing ordinal data.

The experimental group had 11 participants complete a BDI-II at the four designated testing periods (baseline, 4-week, 8-week and 12-week) which were used in the data analysis. The control group had 14 participants complete the BDI-II instrument at all four designated testing periods which were used in the data analysis.

### *Discussion of Findings*

#### *Experimental Group*

The question posed by this study asked: Can participation in an organized resistance band exercise program alter perceived depression level scores for older adults living in a LTC facility? Visual inspection of the mean scores (see Table 3) presented by the BDI-II instruments disclosed a gradual decrease from baseline (8.27) to the 4-week (6.73) test. The baseline and 4-week mean scores were the highest when compared to the other measurement dates. This is consistent with the literature, specifically, Seefeldt, Malina and Clark (2002) who suggested that the first four weeks of a new program are the most difficult for older adults because they typically do not feel comfortable trying a new program. Usually it takes a few sessions of watching others succeed or visually seeing how easy a program is, to increase their self-efficacy enough to make them believe they can perform the activity and not be afraid of performing the exercises incorrectly (Bandura, 1997).

The idea that older adults were still getting comfortable with the program between baseline and 4-week testing periods is also supported by the Mann-Whitney U analysis

scores (see Table 5). Analysis suggested that there was no significant decrease in BDI-II scores between the baseline and 4-week testing periods ( $P = .116$ ).

Mean scores from the 4-week testing period compared to the 8-week testing period showed the biggest numerical decrease between any of the consecutive testing periods (6.73 to 2.73). There were opposing theoretical ideas conflicting during this testing period. The literature indicated that this testing period should show the most dramatic decrease, as was demonstrated, because after 4-weeks older adults begin to feel more comfortable with the exercises and have increased self-efficacy and want to show the exercise leader or programmer how good they are at the exercises (Lawlor & Hopker, 2001). Another variable “time constraint” was presented by the study, specifically the Christmas season which is traditionally considered to increase the reporting of perceived depression among all individuals especially older adults (Aronow, 2001). Thus, because the scores had such a significant decrease when compared to any other two testing periods, it is safe to assume that either the program was beneficial enough to lower depression or that these individuals did not suffer from the normative increase in perceived depression usually associated with the holiday season at this specific location.

Mann Whitney U scores for the 4-week and 8-week testing periods also help support the major decrease indicated by mean scores for these two testing periods. Although, the statistic did not suggest a significance, the U score when compared to the baseline and 4-week analysis shows that the P value was getting lower and therefore the program may possibly be working ( $P = .76$ ) when compared to the first analysis at ( $P = .116$ , see Table 5).



Scores from the 8-week testing period when compared to the 12-week testing periods indicated a decrease in means scores (2.73 to 1.73, see Table 3). This continued decrease supports the idea that participants were comfortable and enjoying the exercises enough to lower perceived depression scores. However, because the mean scores did not decrease as much as between the baseline and 4-week test, supports the idea that participants began to peak as far as their interest in the program, meaning that they may be getting use to participating in the exercise. As discussed in the literature review, Pickering, Deteix, Eschalier and Dubray (2001) indicated that programs implemented for older adults begin to lose there interest at 12-weeks and thus there becomes a need for a program change to keep participant interest as high as possible and the minimal change in mean scores suggest that this might have occurred.

Mann Whitney U analysis of 8-week scores compared to 12-week scores suggest a statistical significance ( $P = .001$ , see Table 5). This analysis suggests that as the study progressed from the last two testing sessions, participants were continuing to have a decrease in perceived depression scores even though the means were beginning to peak. However, the peak could also be attributed to the fact that mean scores were low (less than 2) for the 12-week testing period. Overall, when scores from baseline testing to the final 12-week testing periods suggest that the mean depression scores continually decreased (8.27 to 1.73, see Table 3) as well as the U score suggested significance ( $P = .001$ , see Table 5) suggest the exercise program did in fact help reduce perceived depression levels of the 11 participants who completed the BDI-II instruments at all four designated testing periods.

### *Control group*

Baseline to 4-week means scores showed a gradual increase in mean scores (1.55 to 3.91, see Table 4). The mean scores were rather low to begin with and there was no significant difference discovered by the Mann Whitney U analysis ( $P = .183$ , see Table 6). Participants in the control group actually showed an increase in perceived depression scores over the first 4-week period. Some studies suggest that because participants became aware they were in the control group because their recreation activities did not change may have led them to feel left out. Also, experimental group exercises were performed in a fun, non-stressful environment which may have led to participants in the control group wanting to participate in the experimental group exercises.

Scores from 4-week to 8-week testing dates show a small decrease in mean scores (3.91 to 2.36, see Table 4). However, both perceived mean depression scores were interestingly low since the BDI-II lowest level of scores ranges as high as 13 before indicating presence of perceived depression. Mann Whitney U scores for the 4-week to 8-week analysis indicate no statistical significance between the two ( $P = .319$ , see Table 6). This was the third measure for the control group resulting in no significant difference and when compared to the first two measures (baseline and 4-week). However, interestingly enough, perceived depression scores went up from baseline to 4-week then back down at 8-week. This supports the idea mentioned earlier that since this testing period happened during the holiday season, it was not surprising to see BDI-II scores went up and then decrease 4-weeks after the holiday season was over (Borg, 1982).

Mean scores from the 8-week and 12-week testing period showed a minimal increase at 2.36 to 2.58. As stated earlier the scores were in a range which did not

indicate a significant difference ( $P = .382$ ). Therefore, statistical outcomes suggest that the control group showed an uneven trend of scores, meaning there was an increase in perceived depression from baseline to 4-week, then a drop in perceived depression among participants from 4-week to 8-week then a gradual increase again at the 12-week analysis. However, none of the statistics analyzed for this group suggested any substantial changes over the course of the study.

#### *Experimental and Control Group Comparison*

A visual inspection of the data outcomes of the experimental group compared to the control group indicated that participants in the experimental group had a decrease in perceived depression scores and those from the control group did not show a consistent decrease in their perceived depression scores (see Figure 2). Mean comparison for baseline experimental group compared to control group was much higher at 8.27 to 1.55. This could be attributed to the idea that participants assigned to the experimental group were beginning a program they have never participated in before. As stated in the literature individuals may have been less comfortable with change at this point and may have increased stress and anxiety which is closely correlated with perceived depression scores. The control group scores were much lower suggesting no change in programming did not increase the perceived depression scores. Therefore, participants in the control group may have been use to the general recreation activities already provided by the facility.

Comparison of experimental scores to those of the control group at the 4-week interval indicated closer means at 6.73 for the experimental group and 3.91 for the control group. This testing period was over the holiday season specifically Christmas and the fact

that the perceived depression scores for the experimental group decreased and those of the control group more than doubled suggested that those in the experimental group benefited from the program even during what is considered one of the most likely times of the year that older adults depression levels will increase (Cox, 2002).

Analysis indicated that during the 8-week testing session individuals in the control group had a slightly lower perceived depression level at 2.36 to 2.73 to that of the experimental group. U scores indicated that there was a significant difference for experimental participants at  $P \leq .001$ . These scores are not surprising because after 8-weeks, participants traditionally become comfortable with the program and are demonstrating that they enjoy the programs or demonstrated they do not and thus, scores may have went up. Also, both mean scores suggest a drop in depression scores as supported by the literature considering this testing period was 8-weeks after the holiday season which according to the literature, the research participant's sense of perceived depression should be decreasing (Cox, 2002).

Comparison of scores at the 12-week testing period for the experimental group suggested that perceived scores were still decreasing. However, scores for the control group showed a slight increase (see Table 4). The scores were still considerably low but the fact that they went up in the control group and not in the experimental group may be attributed to individuals in the control group wanting to participate in the experimental group activities because they could see how easy and how much fun participants were having. Where U scores indicated a statistical significance for the experimental group and no significance for control group analysis.

### *Conclusions*

In conclusion, resistance training utilizing exercise bands proved to be an effective mode of exercise for older adults residing in a LTC facility participating in this investigation. Subjects in the experimental group improved their overall perceived depression scores from the baseline analysis over time to the 12-week analysis when compared to the control group. Many subjects smiled, laughed and reported they felt less depressed which could be why control group participants wanted to join the experimental group before the 12-week study was completed which supports Bandura's (1997) SCT in which the environment the participants were in and the perception of the exercises changed. Also, it may be one of the reasons why their scores on the BDI-II had no significant changes.

The participants stated that they greatly appreciated the opportunity to have been involved in this study. Many subjects expressed a desire to continue use the exercise bands after completion of the study. Therefore, all exercise bands utilized were donated to the LTC facility in appreciation of their involvement. Also, all participants and the facility were informed about local retail outlets and fitness centers where they could purchase equipment and get additional information about exercise band resistance training because it is such a new exercise program in the realm of LTC facilities.

### *Implications for Social Change*

Considering the ever increasing older adult population in the United States and based on the findings of this study showing a benefit of exercise band resistance training on the improvement of perceived depression scores for residents of this LTC facility, the researcher recommends that all such facilities include elastic exercises utilizing exercise

bands as a permanent feature of LTC facility. Therefore, facility staff as well as patron should be properly educated on the benefits of participating in such programs.

In addition to educating staff and patron on the importance of resistance exercise in lowering perceived depression among older adults, all individuals involved in the recreation activity must be educated to the significance and benefits from this type of program. Appropriate educational information would also need to be provided to all programmers involved in LTC facilities. Also, the general population should be better informed regarding the potential benefits of resistance exercise utilizing exercise bands on perceived depression levels of older adults. There are numerous avenues in which to campaign for more public awareness regarding the United States' aging population and the necessity for exercise. The American Association of Retired Persons is one of the largest and most powerful organizations in this country (Long, 2002). Public awareness could be greatly enhanced through publications from their newsletters. The YMCA and YWCA and local churches across the country offer recreation services to hundreds of thousands of older adults. Education addressing the importance of resistance exercise should become a vital part of their programs. Also, utilization of University educational classes to promote volunteering at LTC facilities will help educate and recreate older adults as well as future professionals in the older adult population field and recreation field.

The older adult generation is active in accessing the World Wide Web with thousands of sites related to recreation programming (Ferrini & Ferrini, 2000). A web site researching LTC facilities could include study results on the benefits of resistance

exercise and, thus, offer an awareness campaign to a very broad audience of older adults and their families.

Within the LTC facility associated with this study, the researcher and the activity programmer plan to increase awareness to families and residents of the importance of regular participation in exercise based recreation programs. The researcher has suggested promoting awareness through regular columns in the monthly newsletter and inclusion of the potential benefit in information and marketing brochures provided by the facility. The researcher also plans to present to the directors, board members, and all staff members to inform them of the study results. During the research and continuing to the present day, the researcher has volunteered within the LTC facility and increased emphasis from staff encouraging residents to attend the weekly resistance exercise sessions as well as, recruited 14 volunteers from the Health, Leisure and Human Performance Department at Oklahoma State University.

Practitioners should be made aware of the changing trends in potential exercise activities appropriate for older adults. Older adults should receive programs with the primary focus of improving quality of life. Resistance exercise is a proven inexpensive and effective method to obtain lowered perceived depression levels as well as an increase in self-efficacy for participants and about other activities.

#### *Recommendations for Further Research*

There are eight recommendations for future studies. First, future studies using exercise bands might benefit from including groups with specific health conditions to more effectively measure the effectiveness of elastic bands on perceived depression levels for those specific populations. Specifically, by identifying diagnostic issues with

possible impact, it will be more effective for the activity programmer to design specific exercises to control whether the conditions get worse or better during the designated study, this will allow the research to determine whether lower scores are truly related to the program or the condition.

Second, future studies should assess individual's perception of self-efficacy. Many of the subjects smile, laughed and expressed a sense of contentment after each session. Subjects were ready to participate and complete as many repetitions as possible in the allotted time. In addition, subjects were very interested in comparing their BDI-II scores at each testing session to their other BDI-II scores from previous sessions.

Third, more participants should be recruited for future studies. More individuals would make it much more feasible to provide random assignment as well as, being able to utilize parametric statistical analysis. Thus, allowing outcomes to be generalizable to more than one location.

Fourth, future studies should utilize participants from more than one location. Multiple locations would help avoid control group participants from seeing experimental group participants enjoying a new and fun activity. Also, by utilizing more than one facility, it offers the possibility of greater random sampling therefore outcomes could be generalizable to the entire population. If the researcher had sufficient funding another suggestion would be to utilize multiple sites in multiple locations of the country. This recommendation would present control issues due to being at a different location. Therefore, analysis would assess individuals of diverse extraneous factors such as; weather, socioeconomic status, and family visits, all of which are often associated with depression levels among older adults.



The fifth recommendation is to utilize exercise bands that have a higher weight resistance. Some subjects asked if the amount of weight being lifted could be increased. The researcher and program director explained that the designated bands must continue to be utilized throughout the 12-week program. However, all participants were constantly completing all exercises for the designated sets and repetitions by the fifth week of the study, suggesting that the weight was too low.

Sixth, future exercise band resistance training programs should be conducted on persons of various ethnic groups. Hispanic Americans, Asian Americans, Native Americans and Latino Americans represent potential study groups. For example, Hispanic Americans are rapidly increasing in numbers throughout the United States. A lack of accessibility and finances are barriers to LTC facilities for these individuals. Professionals should be sensitive to the needs of minority older adult populations because they are most in need (Ferrini & Ferrini, 2000). Exercise training is a safe and inexpensive intervention that should be an option when providing rehabilitative services for different ethnic groups or populations.

Seventh, more studies should be implemented over the course of the holiday season and be compared to other similar programs not during the holiday season to determine the actual impact it may have. Researchers could then get a better idea for what the ideal time of year would be for a program change.

Finally, all subjects were “apparently healthy”, that participated in this research, but all were white/Caucasian Americans. Prior studies show that psychological change has occurred mainly for subjects that started a resistance program with moderate clinical levels of depression (Best-Martini & Botenhagen-DiGenova, 2003). Foreseeable study

groups in the future include older adults residing in their homes and receiving psychological interventions, nursing homes, mental health treatment facilities and especially Alzheimer's units.

### *Concluding Comments*

There were a few occurrences that evolved during this study, which provided the researcher more insight and a better understanding of older adults. First, it is essential that one becomes an active listener. Many subjects routinely discussed all their health conditions and other life concerns during each contact and prior to the assessments could have impacted outcomes.

Second, some frustration and disappointment was encountered with the Physician Consent Form. Many subjects who ultimately ended up participating were not allowed to participate during the initial phases of the study. Even though all participants were healthy, the physicians would not sign the forms. A personal visit was made for seven participants to the physician's office and supporting documentation of the study was given out as well as, recommendation for consideration for the study was provided by the on-site nurse. Eventually the physician signed and promoted the exercise of all seven individuals.

The results of this study support the general literature addressing the utilization of resistance band exercise in the lowering of perceived depression levels among older adults. As in previous studies discussed through the literature the exercise group program in this study did appear to have a positive effect on level of reported depression. As reported both in this study and in the literature, if the participants from this study adhere

to this particular exercise utilizing exercise bands they are more likely to have lowered perceived depression score over a 12-week period.

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## APPENDICES

### Appendix A

#### Institutional Review Board Approval

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##### Oklahoma State University Institutional Review Board

Date Thursday, November 06, 2008 Protocol Expires: 10/30/2009  
IRB Application ED08143  
Proposal Title: An Investigation into the Effects of Resistance Exercise Participation on the Perceived Depression Levels of Older Adults Residing in a Long-Term Care Facility  
Reviewed and Processed as: Expedited (Spec Pop)  
**Modification**  
Status Recommended by Reviewer(s) **Approved**  
Principal Investigator(s) :  
Tyler Tapps Tim Passmore  
180 Colvin Center 186 Colvin Center  
Stillwater, OK 74078 Stillwater, OK 74078

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The requested modification to this IRB protocol has been approved. Please note that the original expiration date of the protocol has not changed. The IRB office MUST be notified in writing when a project is complete. All approved projects are subject to monitoring by the IRB

- ☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

Signature :



Shelia Kennison, Chair, OSU Institutional Review Board

Thursday, November 06, 2008  
Date

## Appendix B

### Beck Depression Inventory - II

BDI-II

Date: 1/14

Name: \_\_\_\_\_ Marital Status: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: \_\_\_\_\_  
 Occupation: \_\_\_\_\_ Education: \_\_\_\_\_

**Instructions:** This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

#### 1. Sadness

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

#### 2. Pessimism

- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

#### 3. Past Failure

- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

#### 4. Loss of Pleasure

- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

#### 5. Guilty Feelings

- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

#### 6. Punishment Feelings

- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

#### 7. Self-Dislike

- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

#### 8. Self-Criticalness

- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

#### 9. Suicidal Thoughts or Wishes


- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

#### 10. Crying

- 0 I don't cry anymore than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't.

Subtotal Page 1

Continued on Back

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**11. Agitation**

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

**12. Loss of Interest**

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

**13. Indecisiveness**

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

**14. Worthlessness**

- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

**15. Loss of Energy**

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

**16. Changes in Sleeping Pattern**

- 0 I have not experienced any change in my sleeping pattern.
- 1a I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.
- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.
- 3a I sleep most of the day.
- 3b I wake up 1-2 hours early and can't get back to sleep.

**17. Irritability**

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

**18. Changes in Appetite**

- 0 I have not experienced any change in my appetite.
- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.
- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.
- 3a I have no appetite at all.
- 3b I crave food all the time.

**19. Concentration Difficulty**

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

**20. Tiredness or Fatigue**

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

**21. Loss of Interest in Sex**

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

NOTICE: This form is printed with both blue and black ink. If your copy does not appear this way, it has been photocopied in violation of copyright laws.

Subtotal Page 2

Subtotal Page 1

Total Score

22 23 24 25 26 27 28 29 30 A B C D E

## Appendix C

### Informed Consent

#### Project Title:

An Investigation into the Effects of Resistance Exercise  
Participation on the Perceived Depression Levels of Older  
Adults Residing in a Long-Term Care Facility

#### Investigators:

Tyler Tapps M.S. and Dr. Tim Passmore

#### Purpose:

The purpose of this study is to identify relationships that may exist between types of exercise programming and related levels of individual perceived depression among those residing in this long-term care facility. You are being asked to participate in this study because of your meeting the study requirements set forth by the researcher. The type of information which this study wishes to collect includes your gender, age, levels of reported depression on the Beck Depression Inventory-II over a 12-week time frame with four separate measures.

## Procedures:

You will be asked to complete a Beck Depression Inventory-II at time of admission to the study, at 4, 8, and 12-weeks while following the prescribed elastic band protocol for the exercise group and complete the BDI-II at baseline, 4, 8, and 12-weeks for those in the control group.

As part of this study you will be assigned to either the exercise group or the control group. The exercise group will utilize resistive exercise by use of elastic exercise bands 3 days per week throughout the 12-week study. The control group will receive normal long-term care programming which is already offered by the Renaissance of Stillwater LTC facility. The exercise group will participate in 2 warm-up and cool-down activities (pectorals, deltoids and front upper arms stretch, leg squat stretch) 6 exercises (chest press, biceps curl, triceps extension, leg press, hip adduction and hip abduction) for 1 set of 8 to 12 repetitions per exercise.

The participant may experience minor muscle soreness associated with beginning a new exercise routine. To ensure your ability to participate in this study a medical clearance will



be obtained from your attending physician at the Renaissance of Stillwater LTC facility.

**Risks of Participation:**

There are no known no known risks associated with this project which are greater than those ordinarily encountered in daily life other than the minor muscle soreness you may experience at the beginning of the new exercise program.

**Benefits:**

A potential benefit from participation in this study may include decreased reported levels of perceived depression, increased physical fitness, and overall general feelings of wellbeing.

**Confidentiality:**

The records of this study will be kept private. Any written results will discuss group findings and will not include information that will identify you. Research records will be stored securely and only researchers and individuals responsible for research oversight will have access to the records. It is possible that the consent process and data collection will be observed by research oversight staff responsible for

safeguarding the rights and wellbeing of people who participate in research.

The investigators will attend to ensuring the confidentiality of the participants of this study by assigning a random number representing each participant and removing individual names and other identifiable information from the BDI-II Instruments by the Recreation Activity Facilitator (Weston Kensinger) at the Renaissance of Stillwater LTC facility and after the study is completed by the Principal Investigator (PI) Tyler Tapps M.S. The records with the associated random numbers of the participants will be kept in a locked file cabinet by the PI of this study at Oklahoma State University in the dissertation advisor's office (Dr. Tim Passmore). The Recreation Activity Director currently administers exercise and recreation programs as the fundamental purpose of her position at the Renaissance of Stillwater LTC facility and therefore has access to patron medical records. The data will be transported from the Renaissance of Stillwater LTC facility by the PI and will be transported in a locked box. Upon arriving at campus the PI

will perform all coding and entry of data in the Dissertation Advisor's office. The PI and the research staff will be the only individuals with access to the locked cabinet containing the documents. After the coding of the research documents only the random number will appear on reports and publications regarding the program; no reference will be made to the names of the participants, after completion of data analysis the original research documents will be shredded. It is expected the documents will be maintained approximately 2 years from initiation of the study.

#### Compensation:

I understand that no funds have been set aside by Oklahoma State University to compensate me in the event of illness or injury resulting from this study.

If you decide to not participate in this research study you will still receive a regular exercise group which is provided as part of your regular weekly schedule programming provided to you as a resident at the Renaissance of Stillwater LTC facility.

## Contacts:

If you have questions about the research you may contact Tyler Tapps M.S., Principal Investigator at 117 Colvin Center, Stillwater, OK 74078, 660-541-0493. Or Dr. Tim Passmore, dissertation advisor at 186 Colvin Center, Stillwater, OK 74078, 405-744-1811

Or

If you have questions about your rights as a research volunteer, Dr. Shelia Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, 405-744-1676 or [irb@okstate.edu](mailto:irb@okstate.edu)

## Participant Rights:

Participation is voluntary and you may discontinue the research activity at any time without reprisal or penalty. Your participation in the research activity may at any time be terminated if you fail to complete the Beck Depression Inventory-II or cannot perform the prescribed exercises comfortably.

Signatures:

I have read and fully understand the consent form. I sign it freely and voluntarily. A copy of this form has been given to me.

---

Signature of Participant

---

Date

I certify that I have personally explained this document before requesting that the participant sign it.

---

Signature of Participant

---

Date

## Appendix D

### Physician Medical Clearance Form

Participant\_\_\_\_\_ is physically able to participate in an exercise program which will consist of a chair based elastic band resistance exercises for 12-weeks. The program will consist of three sessions a week utilizing 6 resistance exercises (chest press, biceps curl, triceps extension, leg press, hip adduction and hip abduction) and 2 warm-up/cool-down activities (Pectorals, deltoids and front upper arms stretch, leg squat stretch). Each exercise should be performed for 1 set of 8 to 12 repetitions. Those who qualify for the study but who are randomly assigned to the control group will continue the prescribed recreational activities previously offered by the Renaissance of Stillwater LTC facility\_\_\_\_\_

Physician's Signature

## Appendix E

### Activity Programmer's Script

The Recreation Activity Facilitator (Weston Kensinger) will ask participants who qualify for the study at the Renaissance of Stillwater long-term care facility to do the following:

**Recreation Activity Director:** Mr./Ms/Mrs. *Insert Participants Name* we are currently conducting a research study in conjunction with Oklahoma State University addressing exercise and depression. You have met the criteria provided by the researcher to be considered for this study. Would you be interested in participating? There will be no negative consequences for deciding to not participate and you will still receive the programs provided by the Renaissance of Stillwater LTC facility. If you do wish to participate in the study there is a chance that you will be placed either to an exercise group or a control group. The exercise group will utilize resistive exercise by use of elastic exercise bands 3 days per week throughout the 12-week study consisting of 2 warm-up/cool-down activities and 6 exercises. The exercises include 1) chest press, 2) biceps curl, 3) triceps extension, 4) leg press, 5) hip adduction and 6) hip abduction. The control group will receive normal long-term care programming which is already offered by the Renaissance of Stillwater LTC facility.

## Appendix F

### Prescribed Exercise Routines

#### *Exercise Group (A)*

The exercise group will participate in 12-week exercise program utilizing 6 exercises and 2 warm-up and cool-down activities, 3 times per week.

#### *Control Group (B)*

The control group will participate in the programs already offered by the Renaissance of Stillwater. Recreation Activity Director.



## Appendix G

### Potential Benefits/Risks

#### Benefits That Might Accrue to Either the Subjects or Society

Risks to subjects are no greater than those which may occur during the regularly prescribed Recreational Activities provided by the Renaissance of Stillwater LTC facility. The benefits which may accrue to the subjects of the study include but are not limited to: decreased levels of reported perceived depression, increased physical fitness, improved self-esteem and a possible increase in functional independence. The benefits which may accrue to society include but are not limited to: increased knowledge regarding the prescription of exercise as a treatment for individuals in a long-term care setting, increased knowledge regarding which specific exercises may have a greater impact on perceived depression levels, and the identification of a low cost intervention for individuals in a long-term care setting.

## Appendix H

### Workout Log

WEEK: \_\_\_\_\_

Day	Time	Chest Press	Biceps Curl	Triceps Extension	Leg Squats	Hip Adduction	Hip Abduction	ALL DONE
Sun.								
Mon.								
Tue.								
Wed.								
Thur.								
Fri.								
Sat.								

Please code the appropriate letter(s) for the designated elastic band used during the exercise. Also, indicate the number of times the exercise was performed

#### **CODE**

T = Tan  
Y = Yellow  
R = Red

#### **REPITITIONS**

8 – 12 Repetitions  
8 – 12 Repetitions  
8 – 12 Repetitions

## VITA

Tyler Nicholas Tapps

Candidate for the Degree of

Doctor of Philosophy

**Thesis: AN INVESTIGATION INTO THE EFFECTS OF RESISTANCE EXERCISE PARTICIPATION ON THE PERCEIVED DEPRESSION LEVELS OF OLDER ADULTS RESIDING IN A LONG-TERM CARE FACILITY OVER TIME**

Major Field: Health, Leisure, and Human Performance: Option in Leisure Studies

### Biographical:

Education: Graduated from Coon Rapids – Bayard High School, Coon Rapids, Iowa in May of 2000; received a Bachelor of Science degree in Corporate Recreation/Wellness from Northwest Missouri State University, Maryville in 2004; received a Master of Science degree in Recreation from Northwest Missouri State University, Maryville in May 2006; completed requirements for the Doctorate of Philosophy with a major in Health, Leisure, and Human Performance in May 2009.

Experience: Fuel Maintenance Technician, United States Air Force, Des Moines, IA, 6 years; Physical Therapy Technician, Family Specialty Medical Center, Carroll, IA; Wellness Coordinator, City of Maryville, MO; Programming Director, Missouri Academy of Math and Science; Teaching Assistant, Oklahoma State University Leisure Studies Program, 3 years; Research Associate for Oklahoma State University, 2 summers.

Professional Memberships: National Recreation and Park Association, Oklahoma Recreation and Parks Society, Therapeutic Recreation Association of Oklahoma, Rho Phi Lambda, United States Veterans of Foreign War.

Name: Tyler Tapps

Date of Degree: May 2009

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: AN INVESTIGATION INTO THE EFFECTS OF RESISTANCE EXERCISE PARTICIPATION ON THE PERCEIVED DEPRESSION LEVELS OF OLDER ADULTS RESIDING IN A LONG-TERM CARE FACILITY OVER TIME

Pages in Study: 89

Candidate for the Degree of Doctor of Philosophy

Major Field: Health, Leisure and Human Performance

Scope and Method of Study: The purpose of this study was to determine the effects of a resistance exercise band program on perceived depression levels among older adults residing in a LTC facility. The study describes whether or not a change in recreation programming at a LTC facility will potentially lower perceived depression levels among participants over a 12-week period. Participants in the study included 40 total participants randomly assigned to a control or experimental group who met the purposive criteria and reside in the LTC facility. A Mann-Whitney U non-parametric analysis was utilized to determine the differences between individual scores at 4-week intervals over the course of 12-weeks. The Mann-Whitney U was also utilized to compare experimental group scores to control group scores. Each participant completed a Beck Depression Inventory –II at baseline, 4-week, 8-week and 12-week over the course of the new program implementation.

Findings and Conclusions: Analysis procedure included a Mann-Whitney U as well as descriptive statistical analysis utilizing means and standard deviations. The findings of this study suggested that those who participated in the experimental group or new program over the course of 12-weeks had lower perceived depression levels when compared to those of the control group. These findings suggest that change in programming during certain periods of the year and for a recommended duration (12-weeks) can have an impact on the perceived depression levels of both groups. The experimental group change in self-efficacy and control group continued comfort due to no change in programming. Further, these findings can help recreation programmers to determine what activities are beneficial and at what time periods they should be utilized.

ADVISER'S APPROVAL: Dr. Tim Passmore

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