

Power Walking into the Golden Years

Statement of Need:

Our proposal combines the use of a walking program with educational lectures and one-on-one goal setting meetings to assist elderly adults in increasing their levels of physical activity to result in fewer injuries, better overall health, and increased levels of self-efficacy. For health maintenance, the American College of Sports Medicine recommends moderate-intensity aerobic physical activity for at least 30 minutes five days per week or vigorous-intensity aerobic activity for 20 minutes 3 days per week.¹ Studies have shown that a period of supervised activity by a trained professional can help older adults learn their optimal exercise intensity level.¹ However, the majority of elderly adults are not meeting this recommendation.

Older adults are least fit and less likely compared to other age groups to be physically active. Only 10-15% of those individuals who are 65 and older can be classified as “active”. Therefore, over 75% of elderly individuals are insufficiently active to gain health benefits from exercise.^{2,3} Consequently, there is a large need for activity promotion in this aging population as these less than optimal activity levels create an increasing public health issue.⁴

Physical inactivity in the elderly can have severe consequences. An astounding 55% of older adults over age 50 are estimated to have low bone mass due to a combination of physical inactivity, poor nutrition, hormonal influences, and long periods of bedrest.^{5,6} Further, risk factors associated with aging like weakness, unsteady gait, confusion, and use of psychoactive medications increase an individual's risk for falls. Falls occur in 30-60% of elderly people each year and 10-20% of these incidences result in injury, hospitalization, or even death.⁷ Research has shown that exercise is the most effective intervention for reducing risk and number of falls.⁸

Long-term regular physical activity like walking has also been found to correlate with better cognition and a lower rate of cognitive decline in elderly women.⁹ A randomized controlled trial found significant benefits from aerobic and non-aerobic physical activity in measures of subjective well-being like happiness, loneliness, and satisfaction with life. Researchers from this study suggest that the social aspects of exercising appear to increase subjective well-being.¹⁰ Being frail and elderly is not a contradiction to exercise. Clearly, exercise can have many significant health and wellness benefits in older adults. Our promotion project aims to yield some of these advantageous results in the elderly population at Givens Estates in Asheville, NC.

Exercise provides numerous other health benefits in older adults such as improving blood pressure, diabetes, and lipid profile. Regular physical activity in the elderly is also correlated with decreased mortality and morbidity.³ In addition to the above health benefits, Mullen et al. looked at the influence of physical activity on self-efficacy and functional performance in older adults. They found that walking more frequently and for longer durations resulted in stronger abilities to find one's way in a compromised environment and increased self-efficacy levels. This then resulted in better functional performance, specifically in the lower extremity and fewer functional limitations.¹¹ We propose to implement a walking program in the elderly to increase their level of physical activity and their overall health.

The city of Asheville, specifically Givens Estates, has a high percentage of elderly people. People over the age of 65 make up 18.3% of the city's population. Research also shows that the 65+ age group will double in the next 14 years.¹² Asheville also has a higher percentage of elderly people than North Carolina and the United States.¹² Givens Estates is a retirement community in Asheville that provides the full continuum of care to the elderly. This provides a good sampling of the elderly community in Asheville and their numerous sidewalks and paths are required to begin a walking program.¹³ Through implementation of a walking program at Givens, our team can help combat physical inactivity thus assisting the elderly participants in reaping the benefits of optimal duration and intensity of exercise.

Background:

This proposal chose to have one-on-one goal setting meetings with the participants, because Kerse et al has shown that physical activity counseling is effective for older adults. Kerse et al. completed a study with elderly patients who asked their doctors to provide activity counseling. This study used what is called a "Green Prescription", which involves negotiating activity goals. Trained exercise specialists followed up with these patients over a 3 month span.¹⁴ The intervention group showed statistically significant improvements in the SF-36 and a decrease in the number of hospitalizations.¹⁴ This study demonstrates the impact that one-on-one counseling and goal setting meetings can have on physical activity levels in older adults. In addition, Pinto et al found that one-on-one exercise counseling over the phone was also effective at increasing moderate-intensity physical activity among older adults; therefore if a participant is unable to attend a meeting during the program, they can still receive counseling over the phone.¹⁵

From a recent literature review of interventions to increase physical activity in older adults, authors found that using cognitive behavioral strategies were more effective than health education, exercise prescriptions, or instructions alone.¹⁶ These efficacious strategies used goal setting, self-monitoring, feedback, support, stimulus control, and relapse-prevention training.¹⁶ Other researchers have also found that older individuals with greater self-efficacy are more likely to persist with specific beneficial behaviors like exercise compared to those with lower self-efficacy.⁴ Therefore, we will implement Bandura's social cognitive theory for this wellness program specifically concentrating on helping all participants be successful in the walking program and educating them on the positive effects of exercise. When compared to traditional cardiac rehabilitation, a group-mediated cognitive behavioral intervention was more effective at improving physical activity among older adults with cardiovascular disease or who were at risk for the disease.¹⁷ In this randomized controlled trial, activities in the group setting were designed to increase participants' confidence in their abilities to maintain an optimal level of activity and to adapt to any challenges that may occur along the way.¹⁷ For this program group lectures will be offered on a weekly basis to implement the social cognitive theory described above to further increase physical activity over an extended period among the elderly participants.

Objectives:

- To create a walking program supplemented with educational interventions via lectures and handouts to residents over 70 years of age at the Givens Estates Retirement Community in Asheville, NC over a 3 month period.
- To combat the detrimental effects of a sedentary lifestyle and normal physiological aging changes through implementing individualized and group walking programs to ambulatory older adults with or without the use of an assistive device.
- To educate the elderly population on the benefits of physical activity and how to achieve an improved quality of life as one ages by having participants attend an educational lecture one time per week for 12 weeks.
- To increase the level of physical activity in adults older than 70 living in an independent living retirement community in Asheville, NC through a 25% increase in steps taken per day over a 3 month period as measured by a pedometer.

- To assist elderly individuals in setting and achieving their individual physical activity one and three month goals through one-on-one counseling sessions with a physical therapist every other week.
- To monitor falls in the elderly participants via a weekly self-report calendar during the three month program to assess whether the walking program has an effect on falls.
- To decrease the self-reported levels of pain and stiffness by 5 points on the WOMAC questionnaire over a three month period.
- To increase the distance walked by 50 meters and decrease the Borg rate of perceived exertion (RPE) scale by one unit during the 6-minute walk test after completing 3 months of the walking program.

Methods:

Design

This program will include any older adults that are able to complete a 6-minute walk test with an assistive device, but without physical assistance from another person. The walking program will incorporate one-on-one sessions with the therapist and group walks to encourage the subject's participation. This proposal is intended to benefit as many people as possible; therefore, a control group will not be utilized.

Site Parameters

This walking program will take place on the ground of Givens Estates in Asheville, NC. Any resident who is over the age of 70 and ambulatory will be included if they are willing. The program will take place over a 3 month period.

Intervention Components

The interventions will consist of:

- An education lecture series on the benefits of walking and how to use a pedometer, along with strategies to promote confidence will be offered one time per week.
- Individualized sessions with a physical therapist will be offered every other week where participants create realistic and achievable 1 and 3 months goals and receive counseling on attaining these goals.
- Group walking sessions lead by a therapist around the grounds of Givens will be held 5 times a week; participants will be asked to attend at least 3 walking sessions per week.

Outcome Measures

Pedometers will be used to measure physical activity in the older adults involved in the program. Pedometers are a popular and fairly inexpensive device used to motivate and monitor physical activity.¹⁸ In a study evaluating the association between pedometer use and physical activity among adults in the outpatient setting, researchers found using a pedometer is associated with significant increases in activity as well as decreases in body mass index and blood pressure.¹⁸ Although pedometers might not be acceptable to use with the very frail elderly patients due to slow walking speeds and gait disorders, they can be confidently used with healthier older adults for motivation and assessment.¹⁹ Research has suggested that healthy older adults need 6,000-8,500 steps/day while those with disabilities and chronic illness need at least 3,500-5,500 steps/day.²⁰

The fall rate of the elderly participants will be monitored throughout the program. Before the study begins, participants will be asked how many times they have fallen in the last month. Participants will then be given a weekly calendar for every week of the program. If a fall occurs, participants will record the incident on the calendar and turn in it into the group leaders every week at the group meeting. Using this method, researchers will be able to evaluate whether the walking program has any effect on falls and if this effect is positive or negative.

The Western Ontario and McMaster University Osteoarthritis Index (WOMAC) was chosen as an outcome measure for this wellness program because of its 3 dimensions: pain, stiffness, and physical function. It is easy to self-administer and only takes 5-10 minutes to complete. A visual analogue scale (VAS) version is also available for cognitively challenged older adults.²¹ A systematic review completed by McConnell et al. looked at the psychometric properties of this outcome measure.²¹ Test-retest reliability for pain, stiffness, and physical function subscales was found to be 0.88, 0.76, and 0.91. The WOMAC also demonstrates high levels of internal consistency between the subscales (pain=0.86, stiffness =0.90 and physical function =0.95). Moderate to strong correlations have been found for convergent construct validity between the WOMAC and range of motion, SF-36, and the Nottingham Health Profile function scale. Overall, the WOMAC has strong psychometric properties and has been used in a large range of patient groups and types of interventions.²¹

The 6 Minute Walk test has also been validated as a measure to use to with the elderly population when assessing physical endurance.²² Rikli et al. used 77 subjects aged 60-87 to test

the psychometric properties of the measure. Test re-test reliability was found to be 0.88. Moderate relationships were determined between the 6 Minute Walk test and self-reported functional ability. This article shows that it is a valid and reliable measure when looking at physical endurance and physical functional performance in an elderly population.²²

While completing the 6 Minute Walk test, participants will use the Borg Rate of Perceived Exertion (RPE) Scale to monitor exercise intensity. The scale values range from 6 to 20 and can be used to denote heart rates ranging from 60-200 beats per minute.²³ Optimal and safe submaximal effort during exercise can be guaranteed with intermittent use of the Borg RPE for guidance.²⁴ In patients with heart failure, the Borg RPE Scale is effective for patients to use to self-monitor and self-regulate appropriate exercise intensity.²⁴ The inter-rater reliability of the Borg RPE Scale is excellent at 0.9.²⁵

Evaluation:

Assessment

Number of steps taken per day measured by a pedometer, rate of falls, the WOMAC questionnaire, the 6 Minute Walk Test and the Borg RPE Scale will be utilized to assess the effects of the walking program on the participants at Givens. These outcome measures were chosen for their reliability and validity within the geriatric population and are described in detail above in the methods section. Along with these validated quantitative assessments, therapists will also gather qualitative information from participants about their thoughts, feelings, values, and perceptions of the program.²⁶ This will enable for a more comprehensive review of the program.

Limitations

The limitations of this program are as follows:

- Adherence rate - At the initiation of the program, it is unclear how many elderly adults in this community will be willing to participate. Once they have committed to the program, there is not a way to preemptively determine their attrition rate during the program. Using a geriatric population creates an increased risk for dropouts because of their overall poorer health and increased number of unforeseen complications. If a large number of participants drop out, this will impact the outcomes of the program.

- Climate - Asheville is an area of the state that experiences colder and unfavorable weather conditions compared to the foothills and coastal regions. The weather can greatly affect the outdoor group walking sessions and the participants' ability to use their pedometer around the ground of Givens.
- Uneven Terrain - Asheville is located in the midst of the Blue Ridge Mountains. The uneven terrain and hills might be a limitation for some of the participants. Since Givens does not have an indoor walking track, the participants must be able to complete their walking program outside around the Givens community. This has the possibility of creating a limitation for participants who are less physically active and unable to navigate the grounds. As a result, this also has the possibility of influencing the number of overall participants in the program.
- Amount of Assistance – Due to the physical and cognitive limitations of this elderly population, it is currently unclear how many therapists will be needed to assist with the program. This creates an unknown cost when trying to create a budget. Givens retirement community covers a wide spectrum of elderly adults. Depending on which of these volunteer to participate in the study will determine how many therapists are also needed.

Relevance

Optimally, our program will increase the overall physical activity levels of elderly patients living in the Givens community. If this program is effectively implemented, residents will reap the many benefits that increased levels of physical activity can have on the elderly population. Ideally, this program will inspire and instill confidence in participants to reach and maintain their optimal level of physical activity and motivate others in the community to begin exercising as well.

This program can easily be transferred to other settings and population. Research shows that increasing amounts of physical activity can benefit any population. The only piece of equipment that is required for this program is a pedometer, which is inexpensive and easy to find; therefore, subjects of all socioeconomic levels would be able to complete this program. An additional benefit is that the participants do not need access to a gym, pool or specific wellness facility. All that is needed is a safe area to walk.

References

1. Nelson ME, Rejeski WJ, Blair SN, et al. Physical activity and public health in older adults: Recommendation from the American College of Sports Medicine and the American Heart Association. *Med Sci Sports Exerc.* 2007;39(8):1435.
2. Howze EH, Smith M, DiGilio DA. Factors affecting the adoption of exercise behavior among sedentary older adults. *Health Educ Res.* 1989;4(2):173-180.
3. Nied RJ, Franklin B. Promoting and prescribing exercise for the elderly. *Am Fam Physician.* 2002;65(3):419-430.
4. Schutzer KA, Graves BS. Barriers and motivations to exercise in older adults. *Prev Med.* 2004;39(5):1056-1061.
5. Cech DJ, Martin S. *Functional movement development across the lifespan.* Second ed. Philadelphia, Pennsylvania: W.B. Saunders Company; 2002:141-327.
6. Meeks SM. The role of the physical therapist in the recognition, assessment, and exercise intervention in persons with, or at risk for, osteoporosis. *Topics in Geriatric Rehabilitation.* 2005;21(1):42-56.
7. Rubenstein LZ. Falls in older people: Epidemiology, risk factors and strategies for prevention. *Age Ageing.* 2006;35(suppl 2):ii37-ii41.
8. Stevens JA. Falls among older adults—risk factors and prevention strategies. *J Saf Res.* 2005;36(4):409-411.
9. Weuve J, Kang JH, Manson JAE, Breteler MMB, Ware JH, Grodstein F. Physical activity, including walking, and cognitive function in older women. *JAMA: the journal of the American Medical Association.* 2004;292(12):1454-1461.
10. McAuley E, Blissmer B, Marquez DX, Jerome GJ, Kramer AF, Katula J. Social relations, physical activity, and well-being in older adults. *Prev Med.* 2000;31(5):608-617.
11. Mullen SP, McAuley E, Satariano WA, Kealey M, Prohaska TR. Physical activity and functional limitations in older adults: The influence of self-efficacy and functional performance. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences.* 2012;67(3):354-361.

12. Demographics and trends analysis. ESRI Business Information Solutions Web site. http://www.ashevillenc.gov/portals/0/city-documents/parks/homepage_docs/appendix_i_demographics_and_trends.pdf October 9, 2012.
13. Givens estates: United methodist retirement community. www.givensestates.org October 5, 2012.
14. Kerse N, Elley CR, Robinson E, Arroll B. Is physical activity counseling effective for older people? A cluster randomized, controlled trial in primary care. *J Am Geriatr Soc*. 2005;53(11):1951-1956.
15. King AC, Rejeski WJ, Buchner DM. Physical activity interventions targeting older adults. *Am J Prev Med*. 1998;15(4):316-333.
16. Rejeski WJ, Brawley LR, Ambrosius WT, et al. Older adults with chronic disease: Benefits of group-mediated counseling in the promotion of physically active lifestyles. *Health Psychology*. 2003;22(4):414.
17. Bravata DM, Smith-Spangler C, Sundaram V, et al. Using pedometers to increase physical activity and improve health. *JAMA: the journal of the American Medical Association*. 2007;298(19):2296-2304.
18. CYARTO EV, Myers AM, TUDOR-LOCKE C. Pedometer accuracy in nursing home and community-dwelling older adults. *Med Sci Sports Exerc*. 2004;36(2):205-209.
19. Tudor-Locke CE, Myers AM. Methodological considerations for researchers and practitioners using pedometers to measure physical (ambulatory) activity. *Res Q Exerc Sport*. 2001;72(1):1.
20. McConnell S, Kolopack P, Davis AM. The western ontario and McMaster universities osteoarthritis index (WOMAC): A review of its utility and measurement properties. *Arthritis Care & Research*. 2001;45(5):453-461.
21. Rikli RE, Jones CJ. The reliability and validity of a 6-minute walk test as a measure of physical endurance in older adults. *J Aging Phys Act*. 1998;6:363-375.
22. Borg GA. Psychophysical bases of perceived exertion. *Med Sci Sports Exerc*. 1982;14(5):377-381.
23. Carvalho VO, Bocchi EA, GUIMARES GV. The borg scale as an important tool of self-monitoring and self-regulation of exercise prescription in heart failure patients during

hydrotherapy-A randomized blinded controlled trial. *Circulation Journal*. 2009;73(10):1871-1876.

24. Riegel B, Dickson VV, Cameron J, et al. Symptom recognition in elders with heart failure. *Journal of Nursing Scholarship*. 2010;42(1):92-100.

25. Shepard KF. Are you waving or drowning? *Phys Ther*. 2007;87(11):1543-1554.