Objectives

The purpose of this study is to describe the development and implementation of a walking and flexibility program for older adults with dementia. This exercise program yields outcomes for individuals at all levels of functioning. Previous literature indicates that persons with dementia are capable of engaging in such a program, which has the potential to yield positive physical, affective, and behavioral outcomes. Our program is unique for two reasons: a) it adds a defined flexibility element that is combined with a typical walking program, and b) the way we document the walking component. This article describes our full walking and flexibility program, as well as recommendations and “lessons learned” from our experience in implementing this program.

Designing a combined flexibility and walking program for adults with dementia

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Introduction

Significant declines in memory, language, and functional ability characterize cognitive impairment. Bowlby-Sifton states, however, that individuals with dementia maintain several abilities, including motor functioning. It is important to remember that older adults experience reduced flexibility and therefore have the potential for a greater risk of falls and accidents. The physical changes associated with aging are compounded by dementia, which researchers have linked with gait characteristics associated with falls.

A combined walking and flexibility program may help improve gait stability, psychological well-being, and sleep. Programs designed to enhance flexibility and strength can reduce the risk or incidence of falls, while challenging older adults at their own pace and maximizing their physical and mental benefits. In addition, aerobic exercise increases endurance, flexibility, and overall strength. Some clinicians and practitioners are resistant to beginning an exercise program for frail older adults, especially those with cognitive impairments, due to concerns about safety. Research has found, however, that older adults with dementia can successfully engage in physical exercise, and that positive outcomes are likely to be achieved.

We conducted a program consisting of walking and flexibility exercises for older adults with dementia at Virginia Tech Adult Day Services. We found that participants’ walking duration increased over the 12-week period, and that all of the adults were able to perform the prescribed stretches successfully. In
this paper, we describe our program, and conclude with recommendations for the design and implementation of a similar program in other facilities.

The literature focusing on the exercise practices of older adults centers on two primary themes, namely the development and implementation of exercise,\textsuperscript{1-4,6-8,10} and the importance of the physical environment to patient well-being.\textsuperscript{5,9} These two aspects serve as the basis for the design and implementation of programs and activities for older adults with dementia. Both themes involve several factors, and these must be addressed in order to achieve successful outcomes.

\textit{Development and implementation of exercise programs}

Both the American College of Sports Medicine\textsuperscript{9} and the Surgeon General\textsuperscript{10} recommend exercise for each aspect of fitness, including cardiorespiratory endurance, resistance training, and flexibility, which illustrates the importance of exercise for all adults. There are numerous benefits of exercise for older adults.\textsuperscript{9} Heath and Stuart\textsuperscript{11} state that as adults age, exercise becomes almost nonexistent in their daily life routines. Further, they suggest that family doctors and care providers must educate elders on the benefits and importance of exercise. They also recommend that caregivers incorporate exercise throughout older adults’ daily activities (i.e., bathing, housekeeping, and dressing). By integrating exercise into functional activities, older adults can increase their range of motion, which is an aspect of flexibility.\textsuperscript{12} Maintaining a positive attitude throughout, as well as recognizing realistic goals, can help sustain and increase motivation for exercise.\textsuperscript{11}

Similarly, Resnick\textsuperscript{7} emphasizes some of the benefits of exercise (e.g., preventing disease, improving sleep and mood, and reducing physical ailments) and suggests ways to encourage and motivate participation in physical activity. She found that both formal (i.e., tangible rewards) and informal (i.e., verbal reinforcement) encouragement increased an individual’s likelihood of continuing to exercise. In addition, the use of verbal reinforcement contributed to enhanced physical and psychological health benefits. Verbal reinforcement in the form of applause and praise motivated older adults to exercise.

Exercise maximizes the physical and functional abilities of
older adults. More specifically, the physical changes that result from exercise include increased blood flow and oxygen consumption. Physical exercise also tends to decrease vascular resistance, heart rate, and blood pressure. The benefits of physical exercise include: a) improved strength, b) improved sleep, c) enhanced mood and general well-being, and d) a decreased risk of falling. Research also indicates that exercise tends to delay or prevent the onset of disease and illness.

Importance of physical environment to the well-being of older adults

The success of an exercise program may be optimized by providing a physical environment that accommodates the needs of older adults with dementia. Suggestions for choosing a space for exercise include: a) adjustment of lighting (i.e., ability to see without glare), b) spatial arrangement of objects (i.e., arrange objects in the environment to avoid overstimulation), and c) removal of distractions (i.e., avoid heavily populated areas, confusing routines). For example, Lawton found that using bright lights during physical activities tended to improve sleep patterns in older adults with dementia. Furthermore, addressing environmental concerns can increase the autonomy, enjoyment, and functional competence of cognitively impaired individuals.

Most of the research focusing on physical fitness in older adults suggests that their well-being seems to improve as a result of exercise. Specifically, Lawton described several types of well-being related to overall quality of life, including psychological, emotional, physical, and functional well-being. These domains are particularly important for care providers to consider when evaluating the success of an exercise program. Measures of well-being provide insight into the complexity of the numerous factors that relate to older adults and their physical fitness abilities. For example, measuring the different types of well-being could indicate the influence of the physical environment on participation in an exercise program.

Active Together Plus

We piloted Active Together Plus (AT+) as an extension of our progressive strength-training program, Active Together (AT), that involved older adults with dementia. In contrast to
AT, AT+ introduces two unique elements for activity professionals who intend to incorporate exercise into their programming for adults with dementia. The program consists of both an individually tailored walking element and a flexibility segment. Many facilities engage older adults with dementia in planned walking programs in an effort to manage inappropriate behaviors\textsuperscript{15}; however, our program sought the additional benefits of improving sleep patterns and enhancing mobility.

Our program was planned in a way that provided the opportunity for each participant to be challenged to the appropriate level. The appropriate level for each participant was determined by assessments of individuals' abilities with respect to cardiorespiratory performance and mobility level. A threshold exists for intensity, duration, and frequency of performing a task; therefore, physical gains can be realized only when this threshold is met. Physical activity that does not meet the needs of the individual will not yield gains that consequently enhance function.\textsuperscript{16}

Prior to the implementation of AT+, we took into account several considerations. We obtained informed consent from the participants (usually signed by their caregiver) and from their physicians. Our program, designed for participants with dementia, centered on the goals of improving flexibility and cardiovascular fitness, as well as decreasing anxiety and improving sleep patterns. Based on the walking assessments of the participants and staff suggestions, participants were grouped according to their physical abilities, which allowed for individual growth throughout the program. Not all participants were included in both the walking and flexibility portions of the program, due to their abilities and/or physician or staff recommendations. Other programs should set their inclusion criteria to reflect their client characteristics and program staff levels.

\textit{Walking component}

In order to be included in the walking portion of the AT+ program, participants had to fulfill the following criteria: a) a diagnosis of dementia (although not exclusive); b) an ability to walk for at least 10 minutes at their own pace, with or without nonhuman assistive devices; c) a positive response and willingness to participate; d) an ability to tolerate environmental stimuli; and e) an ability to tolerate group interaction. Participants
were no longer eligible for the program if they failed to maintain these criteria or if their physician recommended that they no longer participate.

Due to staffing issues, groups consisted of no more than four participants. The walking portion of the program required at least two staff members in the case of emergency. In facilities where this may not be an option due to short staffing issues, “walkie-talkies” or cellular phones may also be efficient for emergencies. We held our AT+ program twice a week, and the length of each walking session generally lasted ten to 15 minutes; however, the total walking time varied according to the abilities of the individuals in the group. Participation in each session was voluntary.

Prior to the start of each walking session (about 15 minutes beforehand), a staff member collected measures from each of the participants, including their resting heart rate (pulse) and their resting respiration rate (number of breaths per minute). The staff placed pedometers on each participant, directly over their hip and attached to their belt or waistband, to measure the number of steps each individual walked during the session. The sessions usually were held on the ground floor of the building, where participants walked on a rectangular “track.” On nice days, the program took place outdoors.

When the participants returned from the walking session, staff recorded their heart rate (pulse), respiration rate (number of breaths per minute), time walked (recorded by a stopwatch in minutes), number of laps (measured with a standard measuring wheel), number of steps (according to pedometer), and their rate of perceived exertion (RPE). RPE, a Likert scale, consists of items that rate the participants’ perceptions of the ease or difficulty of the session. Due to the cognitive impairments of some participants, staff consulted with each other to assign a value for individuals who were unable to report the ease of the walking session. After completing the walking portion of the program, participants moved on to the flexibility stations.

**Flexibility component**

The area for the flexibility portion of the program should have minimal distractions to ensure maximized participation.
from the older adults. It is important to have the area set up before beginning the program for the day to help maintain participant attention. It is also a good idea to have wheelchairs accessible nearby in case of an emergency.

Two staff members assisted the participants when performing the three stretches. The entrance and exit criteria for the flexibility component of the AT+ program were the same as for the walking component. The flexibility portion consisted of muscular stretching exercises. Three exercises were selected based on the significance of the targeted muscles in functional movement and/or mobility (Table 1). The flexibility portion of this program occurred immediately after participants completed the walking session.

When participants arrived at the flexibility station, we briefly explained the purpose of stretching to them. Sample explanations included, “Stretching makes the muscles more elastic and will allow us to do the things that we do every day, like combing our hair or putting on a hat, with greater ease.” We encouraged participants to stretch to the point of slight tension or a slight “pull,” but not to the point of pain. Due to the effects of cognitive impairment, participants should be reminded of how to stretch throughout the session.

For the shoulder stretch, a piece of tape or a target should be placed on the wall so the older adult has the goal of reaching the object. For the Achilles tendon stretch, we used a seven-inch wide incline board and directed participants to use only one foot for the stretch. For the seated hamstring stretch, we used two chairs and prompted participants to stretch one leg at a time by placing only one foot on the chair. Using this person-centered approach, we found that most persons with dementia participated in the AT+ program; however, a few individuals participated in only one or the other component based on their mobility issues or cognitive impairments.

**Overview of results of AT+**

Over the course of our 12-week intervention, we found that, in general, our participants were able to competently engage in both the walking and flexibility components of the program. Our quantitative measures and observers’ field notes indicated a general increase in the time and distance walked over the 12-week period.
<table>
<thead>
<tr>
<th>Stretch</th>
<th>Picture</th>
<th>Description</th>
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<tbody>
<tr>
<td>Shoulder stretch</td>
<td><img src="image" alt="Shoulder Stretch" /></td>
<td>Ask the participants to face the wall and with one arm at their sides, walk their fingers up the wall. Hold for 20 seconds and repeat with the other arm. Be sure to remind them to breathe during the stretch.</td>
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<tr>
<td>Achilles tendon stretch</td>
<td><img src="image" alt="Achilles Tendon Stretch" /></td>
<td>Ask the participants to stand with one foot on the floor behind the block and the other foot on the block. Participants’ palms must be flat on the wall at shoulder level. Have the participant bend the knee of the foot that is on the block and lean forward. Hold for 20 seconds and the repeat with the other foot.</td>
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<tr>
<td>Seated hamstring stretch</td>
<td><img src="image" alt="Seated Hamstring Stretch" /></td>
<td>Ask the participants to sit on the edge of one chair with one leg extended on the other chair. The other leg should be bent and the foot flat on the floor. Instruct the participant to reach toward the foot of the extended leg, keeping the chin up and the eyes forward. Hold for 20 seconds and repeat with other foot. Be sure to remind them to breathe during the stretch.</td>
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However, some daily records reflected declines (i.e., walking distance, time) resulting from a variety of factors, including participant mood, location (i.e., walking outdoors), or reduced staffing. Feedback from caregivers indicated that participants’ sleep stability at home improved slightly. Staff at our facility noticed that nap taking during the daytime hours declined. These small changes in sleep patterns likely reflect that the participants had few sleep difficulties prior to beginning the exercise program.

**Issues of concern and recommendations**

Along with the opportunities presented by the exercise program,
we also were faced with a number of challenges and limitations. Over the course of the program, we recognized some issues of concern. We offer recommendations for other facilities interested in designing and implementing their own similar physical exercise programs for older adults with dementia.

**Staffing**

We were fortunate to have several staff members and three to four students working on the AT+ project; however, this program may be conducted with fewer staff. Depending on the population, staffing needs may be different. If participant mobility is an issue, it is ideal to have more than one staff member present during the walking portion of the program. For example, one staff member may push a wheelchair in the case of an emergency or help with toileting while another continues walking with the rest of the group. When participants have access to more staff members, their likelihood of being interrupted is decreased and gains in their mobility and flexibility are optimized. In the case of minimal staffing, it may be necessary for staff to provide one-on-one programming for the walking and flexibility components. When only one staff member is available, he or she should carry a cellular phone or a “walkie-talkie” in the event help is needed.

**Physical environment**

Staff should be alert in order to recognize and minimize possible distractions. While some scenery provides psychological benefits, a walking route with too much to see can slow or halt walking, which decreases the associated benefits. As discussed earlier, Lawton recommends that the physical space be big enough to allow comfort but small enough to eliminate any major distractions. It is also important to select a space that provides safe distance walking. Maintaining an adequate physical environment for the older adults will maximize their participation in the program.

**Documentation**

Our program measured distance and the number of steps taken using a pedometer. Due to distractions, the walking path occasionally diverged from the measured lap and made it difficult to assess the distance walked. The use of the pedometer...
also presented challenges. For example, one woman always wore dresses to our facility; consequently, we had to attach the pedometer to her pantyhose. As a result, the pedometer shifted and we were unable to retrieve an accurate measure of the number of steps she walked. To evaluate the success of the program, it is important to recognize measurement errors and systematically document anything that may contribute to the participant’s physical fitness and well-being.

**Motivation**

As stated earlier, verbal rewards and praise are predictive of sustained engagement in tasks. Rewards are especially important for older adults with dementia as they often require high levels of feedback. Other techniques for motivation can help increase participation and can be individualized to suit client characteristics. For example, we planned a “field trip” to the Horticulture Gardens at Virginia Tech as our last session of the program. We used this as a motivation tool for participants to continue with the program. The older adults enjoyed the walk and their trip to the gardens.

By walking regularly, participants gain confidence in their abilities and are satisfied with what they are able to do. Another way to increase motivation for regular participation in exercise is to design a map and ask participants what part of the state, country, or even the world they would like to visit. Have the participants document their progress throughout the program with the ultimate goal of achieving that distance. Varying the motivational practices can encourage and maintain participant involvement and enthusiasm.

**Conclusion**

Exercise can contribute to the health and well-being of older adults, in part by delaying physical declines and illnesses. Although significant functional and cognitive declines are evident with dementia, many individuals maintain their mobility late into the disease. Despite the challenges we faced in the walking and flexibility program at the Virginia Tech Adult Day Services, our participants were able to appropriately engage in the program designed to enhance their mobility and flexibility. Our recommendations for the design and implementation of the program may support the efforts of other facilities when
developing similar programs. Realizing the extent of the issues and concerns that may arise throughout a combined exercise program can help staff anticipate and prepare for these circumstances.

Many people perceive older adults with dementia as being unable to follow the directions needed to complete even simple activities. Safety is also a significant concern that may prevent caregivers from encouraging exercise for persons with dementia. The fact is that many persons with dementia have the ability to follow an exercise program, thus maintaining or improving their physical functioning. Practitioners should document their clients' progress in a walking and flexibility program on a regular basis to determine their success and limitations.

It is important to make efforts to increase participation and cooperation with the program. Motivation, positive reinforcement, and the use of rewards are the key factors in maximizing the success of any program. A walking and flexibility program based on research and theory takes into account physical abilities, factors of well-being, and environmental and individual adaptation. A program that considers all of these factors is likely to increase the benefits of physical exercise. Our work suggests that other services should explore these opportunities and evaluate for meaningful functional outcomes.

References

8. Arkin SM: Elder rehab: A student-supervised exercise program for