

Assessing the Effectiveness of a Walking Program on Physical Function of Residents Living in an Assisted Living Facility

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The purpose of this study was to assess the effectiveness of a resident-led walking program at an assisted living facility (ALF). Seventeen women (mean age 80, range 62–99) agreed to participate in a “walking club.” Pre and post measurements included the Tinetti Perfor-

mance-Oriented Assessment of Mobility Problems in Elderly Patients, the Functional Reach Test, and the Barthel Index to measure independence in activities of daily living (ADLs). Participants set their own goals for walking distance and frequency, with the assistance of the lead researcher if requested. Distances ranged from 75 ft to over 1 mile. At the end of the 9-week intervention, there was a significant increase in all of the pre-test measurements. In addition, post-test assessment included individual interviews with participants about their experiences with the physical activity program. Four positive themes about the walking program emerged: (a) as a pleasurable activity, (b) as a way to manage current health problems, (c) as a way to continue life-long activity, and (d) because of perceived physical and psychological benefits from the activity. The participants planned to continue the walking program. The results of this pilot study suggest that a walking program can be instituted in an assisted living facility with minimal staff effort and significant benefit to residents.

Assisted living facilities are community-based facilities that provide living arrangements, assistance with basic needs, and watchful oversight to a primarily older adult population. These homes have increased in number over the past years as the long-term care needs of the aging population have increased. In fact, this type of residential care has been identified as the fastest growing industry in healthcare (Peterson, Kielman, Albers, & McCoy, 1999). These residential care facilities are known by more than 30 different names, including personal care homes, family care homes, adult congregant living facilities, and shelter care homes (Hawes, 1999). For the purposes of this article, the term “assisted living facility” (ALF) will be used with the understanding that care homes exist and operate under these different names.

Assisted living has been proposed as a best option for “aging in place.” It is not a new option, but one that is growing in popularity among the frail elderly, who once had no option but to relinquish control and defer to professional biases and family directives. (Joel, 1998, p. 7)

But are these facilities able to meet the needs of these frail older adults? One of the positives associated with ALFs is the perceived willingness of the care provider to meet the residents’ changing needs without mandating they move to another type of facility. Although the benefits of “aging in place” are profoundly important, concerns exist about a facility being able to “meet the demands of an increasingly impaired population” (Hawes, 1999, p. 54).

The vast majority of the research in the area of care homes relates to regulatory issues, such as environment and safety, but not on the residents themselves (Morgan, Eckert, & Lyon, 1995; Quinn et al., 1999). Very little research exists about the physical and cognitive status of ALF residents. Quinn and colleagues (1999) sought to identify health characteristics of elderly ALF residents in Georgia as a critical first step in identifying residents’ health needs. They confirmed that residents often had physical deficits in combination with cognitive impairments, and 60% of the residents had some cognitive impairment. This high percentage of cognitively impaired residents is

substantially higher than what has been reported in past studies and speaks to the increasing frailty in residents' cognitive status. The most frequent activities of daily living (ADLs) requiring help were bathing, personal hygiene, and dressing, and more than 80% of the residents required assistance with medication management (Quinn et al., 1999).

It is generally accepted that as individuals grow older, there is an age-related decline in ADLs, balance, muscular strength, and flexibility. But is that decline inevitable or irreversible? Voorrips, Lemmink, Van Heuvelen, Bult, and Van Staveren (1993) found that maintaining a high level of physical activity could prevent age-related musculoskeletal declines. Lindenmuth and Lindenmuth (1994) found that in addition to the physiological benefits of physical activity, there were also cognitive benefits to increased physical activity. In their study, individuals who exercised had increased scores on the cognitive abilities screening test (CAST) compared with those individuals in the control group who were not exercising. In addition, their experimental exercise group reported an increase in quality of life. In another study with community-dwelling older adults, Blumenthal et al. (1999) concluded that exercise could be an alternative to medication for some older adults with depression. Although antidepressant drugs had a more rapid initial response in minimizing symptoms, exercise provided the same therapeutic benefits after 16 weeks.

Fear of falling, a fear shared by many, if not all, older adults, can significantly decrease the ADLs that an individual is willing to perform without assistance (Cumming, Salkeld, Thomas, & Szonyi, 2000). In an effort to protect themselves from injuries related to falling, some older adults significantly limit their ADLs, which actually increases their risk of future falls due to declines in muscle strength, flexibility, balance, and endurance. Thus, health status deteriorates as a result of decreased activity level. It is understood that older adults move to ALFs because of increasing frailty and the need for watchful oversight with ADLs. What is the physical status of these already frail older adults, and what can be done to moderate or alleviate that decline? Schroeder, Nau, Osness, and Potteiger (1998) found that older adults living in ALFs scored significantly lower on a 7-item physical performance test and had significantly weaker lower extremity strength than their community-dwelling counterparts. Lower extremity weakness is associated with increased falls; individuals attempt to rise from a low-seated chair or commode and lack the necessary strength to complete the task, or they reach for something and lack the strength to right themselves, and fall as a result. Interventions designed to reduce the risk of falling through promotion of physical activity may have major health benefits to the older adult population.

The purpose of this preventative care intervention was to initiate a resident-led walking club in an ALF to encourage regular physical activity and maintain or increase residents' physical functional status. Pre- and post-tests to assess functional changes in residents' strength, gait ability, balance, and endurance were administered in addition to interviews with participants at the completion of the intervention.

METHODS

The Gwinnett, Rockdale, Newton County Regional Board of Mental Health, Mental Retardation, and Substance Abuse funded this research. The intent of the project was to design and develop a comprehensive, multidisciplinary intervention model aimed at improving the care practices and the social and emotional atmosphere of assisted living facilities. A 72-bed ALF in one of the counties covered by the funding agency was selected for intensive study and consultation by a multi-disciplinary team whose expertise included nutrition, physical function, medication use, and social relationships. The first year of study was intended to develop an intervention for application at several homes the following year. This study took place during that time period and no other intervention was taking place or had taken place by other research team members. The facility will be referred to by the pseudonym, “River Hills,” and staff members’ and residents’ names will be changed to ensure anonymity.

Physical Activity Program Design

Development of the walking intervention plan included a review of the literature on physical activity programs in assisted living facilities and nursing homes as well as discussions with the owners, managers, and staff members of River Hills. The intervention plan had two major foci: (a) to increase or maintain residents’ strength, gait ability, balance, and endurance through their voluntary involvement in a walking club, and (b) to enhance residents’ safety as they live in and move about their physical environment through individual room and facility assessments.

One of the primary tenets of assisted living is that the facility operates as a home, not a medical institution. Although residents may need assistance with some or many aspects of self-care, they are able to make choices about their daily activities. In designing the walking program, we were cognizant of this fact. The walking program was to be resident-led, not researcher-led. The ALF owners and staff identified a resident they felt would be a potential candidate to talk with other residents about forming a walking club. This resident was already walking on a daily basis and enjoyed the activity very much. We met with her to find out if she felt other residents might enjoy participating in a more formal “walking club.” She was immediately receptive to the idea of encouraging other residents to walk and overseeing the activity. We decided to refer to her as the “president” of the walking club. The walking club was formed by asking residents if they would like to participate. Residents were assured by the “president” that they would be in charge of their own walking program—they would decide if and when they walked each day and for what distance. Initial distances ranged from approximately 75 ft to greater than 1 mile, depending on residents’ physical status and endurance. In this way, all residents were able to participate in the club, as they self-selected their own goals (Tolley,

1997). The lead investigator was available to meet with residents to set their walking goals, if requested.

To enhance the “club” aspect of the program, photographs of the participants were taken and displayed on brightly colored blue, yellow, and white poster boards entitled “River Hills Walking Club.” The posters were displayed in the common dining area of the home. Another large poster board served as a daily check-off calendar and also was displayed in the common area. Participants’ names were printed on the left-hand column, and the days of the month were printed along the top. Walking Club participants identified if they had walked that day by placing a check in the box that corresponded to their name and date, using the felt-tip marker that was suspended from the poster. This allowed residents to map their progress. When the initial club president moved from the facility to another state 5 weeks into the intervention, she identified another participant who was enjoying the club to take over her responsibilities. Thus, resident leadership of the intervention was maintained.

Before beginning the walking program, the lead researcher assessed the facility’s common areas to ensure that the program would take place in a physically safe environment. The researcher also assessed participants’ rooms and footwear, with their permission, and provided feedback to residents, staff, and owners.

Participants

Seventeen female residents (mean age = 80, range 62–99) agreed to participate in the walking intervention (see Table 1). All participants or their legal guardians gave informed consent to participate in the program and the pre- and post-testing procedures. Of the 17 participants who were pretested, 15 completed the 9-week intervention and post-testing. One participant moved to another state to live with a family member and one was hospitalized for a psychiatric evaluation. Pre-test measurements were taken within a 5-day period in March of 2000. Post-test measurements were taken within a 5-day period after the 9-week intervention in May 2000. The pre-test assessment of each resident took approximately 30 minutes. Post-test assessments took approximately 15 min. Room assessments were done during the pre-test assessment only, hence the difference in time requirements. In addition to the pre- and post-testing, the lead investigator made weekly visits to the ALF during the 9-week intervention. Each visit lasted approximately 2.5 hr.

Measurement

Measurement instruments were selected based on established use with geriatric populations, reliability, and ease of administration. The Functional Reach Test (Duncan, Weiner, Chandler, & Studenski, 1990) was selected to measure balance and assess the

TABLE 1
Characteristics of Participants

Number of Participants	17
Mean age	80
Age Range	69–99
Sex	100% women

likelihood of falls. To administer this test, the resident would stand next to a wall with their arm extended and their hand in a fist. They were then asked to lean forward, with their arm extended as far as possible without taking a step or losing their balance. The distance extended was measured with a ruler positioned on the wall between the start and end points. A Functional Reach of less than 6 in. is associated with a significant risk for falling. The Barthel Index (Mahoney & Barthel, 1965) was selected to measure independence in ADLs. This index measures what residents can do for themselves, regarding their self-care. Credit is available for partial completion of tasks and topics include eating, transfers, toileting, hygiene, walking, walking of stairs, and controlling bowel and bladder functions. The Tinetti Performance-Oriented Assessment of Mobility Problems in Elderly Patients (Tinetti, 1986) includes subsets for balance and gait. This assessment involves watching the resident move through a series of balance activities, such as rising from a chair, standing with eyes closed, and turning in a circle, as well as observing the gait pattern and postural stance while walking. The Duncan Checklist for Home Safety was used as a model for individual room assessments. As residents do not have individual kitchens or prepare food, only those portions applicable to bedrooms and bathrooms were used. The majority of the form was used as a model for assessing the facility's common areas. Informal observations of the residents and caregivers by the lead researcher occurred on a weekly basis during the 9-week intervention. Open-ended questions to assess residents' thoughts and opinions about the walking program were prepared for the qualitative portion of the post-intervention assessment.

RESULTS

Quantitative Analysis

The paired samples *t* test for the pre- and post-test measures of the Functional Reach Test was significant at $p < .001$. The mean Functional Reach increased from 4 in. to 5.7 in. A Functional Reach of 6 or more inches is associated with a reduced risk of falling during activities of daily living. Of the 15 residents post-tested, 7 were at or above the 6 in. mark, as compared with only 3 residents who measured in that range on pre-testing.

The Wilcoxon Matched-Pairs Signed-Ranks Test was used to analyze the Barthel Index and Tinetti scale, as these data are nonparametric. The Barthel Index mean increased from 72.3 to 76.0 ($p < .05$). The change in Tinetti total scores and Tinetti Balance

subscales were significant at $p < .001$, and the difference in the Tinetti Gait subscale was significant at $p < .05$. The Tinetti total score increased from 12.2 to 16.7, whereas the Gait subscale increased from 5.4 to 7.9 and the balance subscale increased from 6.6 to 9.2. These post-scores are indicative of increased balance and stability during mobility and gait activities (refer to Tables 2 and 3).

Qualitative Analysis

Individual open-ended interviews were held with the participants after their 9-week involvement in the walking program. A series of eight questions were asked each participant and responses were recorded and analyzed using the constant comparative method (Lincoln & Guba, 1985). Four themes emerged from the interviews about their participation in the walking club. Examples of verbatim responses for each theme are provided.

1. Residents found the experience pleasurable.
 - “Oh, I love to walk. It makes me feel good.” Hamilton, age 99
 - “I enjoy talking while I’m walking. Sally and I walk together.” Sands, age 82
 - “I like to walk, I am always walking.” Cummings, age 84
 - “Oh, I love to walk. Did you notice that I would check every time I walked each day? So did Joyce. We had a little competition going.” Edwards, age 79
2. Residents walked as a means to manage current health problems.
 - “If I didn’t walk, I wouldn’t walk at all. Look at these knees, I have to keep moving. I am afraid to stop.” (Resident has severe, bilateral knee osteoarthritis.) Harris, age 84

TABLE 2
Pre- and Post-Scores of the Tinetti Performance-Oriented Assessment of Mobility Problems in Elderly Patients and the Balance and Gait Subscales

	<i>Pre-Test</i>	<i>Post-Test</i>
Tinetti total	12.2	16.7**
Balance subscale	6.6	9.2**
Gait subscale	5.4i	7.9*

* $p < .05$. ** $p < .001$.

TABLE 3
Pre- and Post-Scores of the Functional Reach and Barthel Index

	<i>Pre-Test</i>	<i>Post-Test</i>
Functional reach	4.0	5.63**
Barthel Index	71.8	76.0*

* $p < .05$. ** $p < .001$.

“The walking is supposed to help with swelling in my legs, and I believe that it does.” (Resident has congestive heart failure.) Murphy, age 77

3. Residents walked because they had been active throughout their lives.

“I was real active as a child. I see no reason to quit now.” Sanders, age 82

“My mother always said I was real active and here I am almost 100.” Hamilton, age 99

4. Residents noted positive physical and emotional benefits from the activity.

“I’m not so jittery. Do you suppose that this walking is helping me feel more settled? When I went on a car trip last weekend to my family reunion, I noticed it was easier to get in and out of my son’s car.” Ford, age 75

“My room is about the farthest away from here (the common area.) I must walk back and forth about 5 times a day. I didn’t use to. I can’t believe that I am walking a mile. I feel more stable on my feet, but the drugs for my bi-polar keep me feeling woozy.” Walters, age 81

Room and Facility Assessments

When functionally impaired and frail older adults engage in a walking program, it is important to ensure that environmental hazards are removed to minimize the likelihood of falls. Because the purpose of this program was to encourage physical activity, including ADLs, individual room assessments were completed for the initial 17 participants, as well as for the common areas of the facility where the walking program was to take place. In general, the rooms were arranged and equipped in a manner to enhance residents’ physical safety. As most residents required assistance by staff members with bathing, the issues of getting in and out a bathtub, reaching for towels, and slipping on wet floors, were essentially eliminated. Only two residents had rugs on their floor, and they were aware of the need to pick their feet up when walking in their rooms to minimize the risk of getting a toe caught under a corner. As neither resident wanted to remove their rugs, suggestions were made about using nonskid under-pads and/or securely taping the edges. In addition, footwear was a topic of conversation. Individual discussions were held with residents about the importance of wearing appropriate shoes for support and to minimize their risk of falling. Although many residents wore well-fitting shoes, some wore slides or large, bulky bedroom slippers. In the post-testing interviews, two residents commented about their choice of footwear. One resident who had previously only been seen in oversized bedroom slippers commented, “I am wearing better shoes now when I walk around” (Harris, age 86). In another case, a resident who had been walking in a pair of low-heeled pumps reported, “I got me some walking shoes! It’s my first pair of sport shoes. I had never been in to one of those stores before. My niece told me that they would be expensive, but I told her I didn’t care. I needed a good pair of shoes. My arches were hurting when I walked (wearing the pumps), so I told my niece it was time to go shopping.” When asked about

her experience with her new tennis shoes she said, “They feel great. I’m going to keep this (walking) up” (Alford, age 84).

The common areas of River Hills were found to be uncluttered, well-lit, and accessible to residents. There was adequate space for walkers and wheelchairs to maneuver hallways and the living and dining areas. The dense, low pile carpet was secure throughout the facility. The indoor stairwell had handrails and was well lit. Tables and chairs located in the home were sturdy. The paint and wallpaper combinations in the common area were of intense greens and blues, a good choice to help visually delineate wall placement.

Informal Observations

The lead researcher made weekly visits to River Hills to informally observe the residents as they participated in the walking program and to update the check-off poster board. Many residents chose to walk during the hours between breakfast and lunch, so this time was amenable to observation and informal conversations with staff members and participants. On a Monday visit to the ALF, several weeks into the intervention, the lead researcher was talking with one of the participants in her room. The participant identified that she would not be able to walk at all that day as she was so sick and so fatigued. Later that morning, the resident was observed walking along the concrete sidewalk with a fellow club member. This was not an isolated case. Residents were observed encouraging one another to walk, and often residents would walk in groups of two and three.

Staff members were observed walking with residents as well. The two primary daytime caregivers of River Hills were observed commenting to residents about their walking, congratulating them on their dedication and increased distances. One staff member noted that it was nice for the residents to have this to talk about to one another, and that she enjoyed talking to the residents about a health promotion topic. Residents and staff would remind other participants to record their activity if it appeared they had forgotten. This was particularly helpful for residents with cognitive difficulties. Two of the participants were unable to record their participation at all, and other walkers took care of that for them.

DISCUSSION

The resident-led walking program at River Hills appears to have been successful in meeting the objectives of this pilot study. Regular physical activity of the participants increased, as did scores on the tests administered for functional status. One of the most significant changes was evident in the Functional Reach test, which increased almost two inches on average. Although the post-test mean of 5.7 in. was still slightly below the 6-in. goal for increased safety during ADLs, the increase was both statistically and substan-

tively significant. Only 20% of the participants tested at 6 in. or above before the walking program, whereas 47% tested at or above 6 in. after the intervention.

The Tinetti total score, a combination of the gait and balance subscales, as well as each of the subscales, increased significantly after the intervention. The ability to perform static and dynamic activities related to balance and mobility improved and appears to correlate positively with improved functional ability. As with the Functional Reach pre-test scores, it is of interest to see how low the initial Tinetti scores were. These scores suggest a physically frail sample experiencing significant limitations in daily life related to functional status. We question whether other older adults living in ALFs would present with similarly low scores on the Tinetti. These findings support other studies that present an alarming picture of the degree of physical frailty of ALF residents (Quinn et al., 1999; Schroeder et al., 1998).

The Barthel Index also increased. Although the score increased significantly from a statistical standpoint, we were not able to identify whether ADL independence had improved based on the scoring of this index. The Barthel Index, which was developed for use with the post-CVA population in rehab facilities, has three response categories and may not be sensitive enough for this more functionally independent population. The Modified Barthel Index (Shah, Vanclay, & Cooper, 1987) addresses the same ADLs but has five possible response categories from which to choose. Funding has been extended for another year to implement this program in two ALFs, while two additional homes will serve as controls. The measurement tools, the Functional Reach and Tinetti will remain, as will the open-ended questions about the effectiveness of the exercise and walking interventions. The Barthel Index will be replaced with the Modified Barthel Index to assess ADLs.

One of the objectives of the intervention was to establish a physical activity program that would encourage regular physical activity of the residents. The significant and sustained “buy-in” from the residents and care-giving staff about the walking program allowed that objective to be reached. The importance of the resident leadership and camaraderie, as well as the caregiver involvement, cannot be overstated and is probably the most significant “intangible” related to the success of the endeavor. Residents encouraged each other to walk and walked together. The resident dynamic seemed particularly encouraging and the social support component of this intervention cannot be minimized. Competition became readily apparent as well. Residents would check up on each other by surveying the poster board to see who had walked that day. It appeared to serve as an incentive for them to walk if their rival had already documented their walk for the day.

As with all adults, older individuals need a reason or motivation to engage in physical activity (Ball et al., 2000). Everard’s study (1999) considered the relationship between activity and well-being in an older adult population and found that when individuals engaged in activity for social reasons, there was a positive correlation to well-being. However, activities engaged in merely to pass the time were negatively correlated to well-being. Our study supports the findings of Ball and colleagues (2000)

and Everand (1999), as evidenced by the interview data. Participants identified meaning in engaging in the walking program on social, physical, and emotional levels.

Another possible reason for the program's success is due to the architectural layout of the facility. The facility's campus, both interior and exterior, proved ideal for a walking program. Long, straight hallways, which extend literally end to end within the facility, are well-lit, with handrails and well-secured short-pile carpet. Behind the facility, adjacent to a large concrete patio is a level, cement walkway that extends at least 100 feet. This patio and walking area, visible from the dining area, was a popular gathering spot for the participants of the walking club. The owner of the facility had designed the facility with this in mind, to maximize opportunities for residents to ambulate freely and for long distances, both indoors and out, and to have the option to ambulate at will on days of inclement weather. Understandably, not all personal care homes will have the long, level interior and exterior surfaces available in which case group trips to a local mall or a neighborhood track to walk might be an option.

The room assessments were advantageous. Even though few changes or recommendations were made, the process of looking at the residents' rooms with them provided an opportunity to discuss safety issues such as poor lighting, inappropriate placement of things such as towels and telephones, and various items on the floor that are tripping hazards.

This pilot study, limited by its small sample size and nonexperimental design, is nonetheless of interest to community and home health caregivers in that it is the first study to assess the effectiveness of a resident-led walking program in an ALF. It was not possible to control for intensity and duration of walking, as this project was resident-led. Community-based initiatives such as this one can be effective and manageable with relatively little effort by caregiving staff. An activity such as a walking "club" can enhance the physical functional status of residents and be a meaningful activity that enhances quality of life. Residents of ALFs have been described as an underserved and marginalized population (Morgan et al., 1993). Given the frailty of this group of older adults, the lack of medical monitoring by the caregivers in most facilities is troubling (Hawes, 1995). "Because the elderly have the highest incidence of chronic illness, knowledgeable caregivers are paramount to the provision of quality care to senior citizens in all types of living arrangements, particularly those in ALFs" (Peterson et al., 1999). Quinn and colleagues (1999) noted how visits from a community health nurse could be advantageous for residents by training ALF providers in basic monitoring of residents and in resident-care techniques, such as bathing and dressing. The goal of these activities in the ALF is not merely the completion of the task. It should involve the opportunity for residents to complete as many tasks as possible independently or with minimal assistance, yet in a manner that is safe for both the resident and caregiver. Community health nurses and/or physical therapists could offer training programs (e.g., transfers, body mechanics, walking programs, environmental safety) to ALF directors and staff, as well as residents. Opportunities exist for community health care providers to meet the preventative health care needs of this often under-served and over-looked population of frail elderly.

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