
Active Living for Assisted Living

Promoting Partnerships Within a Systems Framework

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Abstract: In response to a growing need for assistance among our aging population, assisted-living facilities have been designed to fill the widening chasm between community living and nursing care. Although sedentary behavior has been linked to functional limitations and disability, no comprehensive information exists about the social and physical environments and the programming available to promote physical activity in assisted living. Accordingly, this article includes data from an exploratory study that underscores the issues clearly related to physical activity for older adults in assisted living. The intent of this exploratory study was to partner with executive directors in order to conduct an analysis of the social and physical characteristics of assisted living. Interviews were conducted with executive directors (N=21) to discuss methods for assessing and promoting positive lifestyle behaviors with distinct emphasis on the targeted behavior of physical activity. Potential ways in which the social and physical environments could be modified to promote and support physically active living were identified. Clearly, promoting physical activity in assisted living is a challenge and will require a partnership with assisted living communities to develop effective and feasible systems-based interventions designed to make environments more engaging and, thereby, promote active living.

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Introduction

The proportion of Americans aged ≥ 85 years is expected to increase by 33% between the years 2000 and 2010, as compared to a 34-fold increase since 1900 with 4.2 million people aged >85 years at the turn of the 21st century.¹ This rapid increase among the “oldest old” is forecast to continue over the next several decades, reaching approximately 19 million by 2050, thereby resulting in one of the fastest-growing age segments in our society.¹ Ultimately, the overall effect of an increase in older adults’ life expectancy will influence such outcomes as their independent functioning, the prevalence of chronic disease and disability in their population, and the need for their long-term care.²

Assisted-living facilities were developed to meet the long-term care needs of the older adult population. While the underlying objective for this intermediary level of care is to promote independence, the assisted living environment and the opportunities that this environment may or may not provide for the promotion of healthy lifestyle behaviors are not well understood. Thus, the purposes of this article are to examine physical activity participation within the context of

assisted living and to determine what factors may interact with older assisted-living residents if they attempt to become more physically active. To meet these objectives, this article will begin with an introduction to the assisted living environment for the older adult and a review of the literature on physical activity participation in this long-term care setting. Although revealing, a simple review does not deal with the specific social-environmental aspects of these settings that influence physical activity participation for assisted living residents. Accordingly, this article also includes descriptive data from our partnership with assisted living communities that underscore the issues clearly related to physical activity in older adults residing within an assisted living environment. As informed by these data, the final section of this article will entertain challenges and offer potential future directions for the promotion of physical activity in assisted living within a systems framework.

Progression of Disability

Aging has been associated with decreases in various components of functional independence.³ Approximately one quarter of the aging population has difficulty performing activities that are deemed necessary for self-sufficiency.⁴ For many older adults, the need for assistance with activities of daily living (ADLs) has a greater impact on the preservation of independence in day-to-day functioning than the chronic diseases or

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acute events from which these limitations originated.^{2,5} Although aging in place may preserve one's sense of stability, the ability to live independently in the community becomes extremely difficult for those older adults who need assistance with multiple ADLs. Further, there is a high rate of home accidents and falls among this aging population, possibly resulting from deficits in function and an inability to perform common self-maintaining activities.⁶ Consequently, nearly 25% of this group aged ≥ 85 currently reside in skilled nursing facilities.⁷

Until the past few decades, nursing homes were one of the only housing options for older adults with significant and progressive functional limitations in need of long-term care. In line with the medical model, nursing homes are typically licensed to provide 24-hour medical supervision and, therefore, can place a heavy economic strain on older adults and their families, which may also have important implications for health care. The financial burden is clear as about one third of healthcare costs, or an estimated \$300 billion, is spent annually caring for older persons.⁸ As life expectancy continues to increase, Ebersole and Hess⁹ have suggested that it is important to view "retirement as no longer just a few years of rest from the rigors of work before death. It's a developmental stage that may occupy 30 years of one's life and involve many stages."¹⁰ Simply put, there is a need among older persons who have lost independence in one or more areas of functioning but do not require skilled nursing for sustained long-term care. In response, intermediary levels of care (e.g., assisted-living facilities) have been designed to fill the widening chasm between community living and nursing care institutionalization.

Assisted Living

Although definitions of assisted living vary in the literature, accepted definitions generally include an emphasis on a home-like residential program approach that provides a range of care services to support resident independence.¹¹⁻¹³ The typical resident in assisted living is an 83-year-old woman in need of assistance with three or more ADLs. The number of assisted-living facilities has grown significantly in the past decade.¹³ From 1991 to 1999, the number of properties providing assisted-living services increased by 50%, as compared to a 22% increase in facilities offering skilled nursing care.¹⁴ Although definitional and categorical inconsistencies in classifying these facilities make precise estimates difficult, in 1998, there were approximately 11,459 assisted-living facilities in the United States, with an estimated 611,300 beds and a total of 521,500 residents.¹⁵

Assisted living was originally developed to integrate the social aspects of care into a home-like environment in order to promote independence versus adherence to

healthcare services.¹⁶ The Assisted Living Quality Coalition, a group that represents assisted living providers and consumers, has adopted a philosophy of care that maximizes residents' dignity, autonomy, privacy, independence, choice, and safety, while encouraging family and community involvement.¹⁷ Thus, the primary purpose of assisted living is to maintain the capabilities of older persons with disability so that they can remain as independent as possible, thereby enabling older persons to age in place with a higher quality of life. Recently, however, both researchers and practitioners have questioned the effectiveness of the assisted living model for promoting both physical and psychological independence.^{15,18,19}

Activity Patterns in Long-Term Care

There is scant current literature on the daily activity patterns of adults residing in long-term care, but the few studies that do exist examine nursing home residents only.^{20,21} One recent inquiry into the daily lives of nursing home residents (mean [M] age=85 years) reported that participants spend 65.5% of their day in passive activities, with the majority of activities conducted in a seated position.²² In a subsample of this long-term care population, those residing in independent housing, although more active than those in skilled nursing care, still spent a large percentage (40%) of their day physically inactive. While the Nursing Home Reform Act of the Omnibus Budget Reconciliation Act of 1987 (U.S. Congress, 1987) mandated activities to meet the physical and psychological needs of all nursing home residents, current estimates of low physical activity patterns are consistent with those of past research.²⁰ Specifically, 20 years ago, residents were engaging in passive activities with little to no movement a majority of the time (56% of the day). Thus, it appears that there has been little change in the physical activity patterns among those older adults residing in long-term care and specifically in skilled nursing facilities.

Contrary to activity mandates proposed at the national level in nursing care, there have been no federally endorsed regulations promoting standard activity practices at the assisted living level of care. Despite an emphasis on programming and therapeutic rehabilitation over the last decade, programs offered in assisted living environments are typically understaffed,¹⁹ are not tailored to participant interests,^{22,23} and all too often, are not designed to significantly improve function and mobility.^{23,24} For example, activities that are directed toward therapeutic goals most often include music, art, cooking, and game-oriented components rather than physical activity. Further, baseline and follow-up assessments are rarely conducted, making it impossible to describe current functional levels of residents, identify risk for disability, prescribe and

evaluate the effectiveness of physical activity programs, or comment on change in either function or activity levels over time.^{25,26}

Interventions that have examined the impact of structured physical activity programs on function and disability have demonstrated a wide range of beneficial effects among community-dwelling older adults.²⁷ In a recent review of the relationship between exercise and disability, Fiatarone Singh²⁸ concluded that there is strong epidemiologic evidence to suggest that regular physical activity decreases the risk for chronic disease and increases life expectancy. Moreover, older adults who are more active have less risk of functional dependency than those who are less active. Although these relationships have been examined longitudinally in both community^{27,29} and nursing care^{28,30} settings, few studies have investigated the impact of physical activity on functional limitations and disability in assisted living.¹²

Physical Activity in Assisted Living

Over the past several years, one objective of our research team has been to examine the impact of physical activity participation on both physical and psychosocial function, specifically in assisted-living communities.³¹ Although physical activity participation rates have been low in all facilities that we have examined to date, residents (M age=82 years) who reported greater levels of physical activity had higher levels of physical function ($p < 0.05$), as evidenced by better balance, faster performance times on the timed "up and go,"³² and less difficulty in self-reported ADLs. From a psychosocial perspective, increased physical activity participation was also related ($p < 0.05$) to positive self-perceptions, increased self-efficacy for physical and balance-related activities, and, finally, greater satisfaction with life.

Despite these assisted-living data and those of colleagues in nursing home and long-term care settings,^{23,33,34} the participation rate for people aged ≥ 75 years living within the community is disappointingly low. Specifically, one in three men and one in two women aged > 75 years engage in no physical activity.³⁵ It is likely that participation rates are even lower among those residents in assisted living facilities; however, current estimates of activity levels have not been published in the assisted living literature.¹⁵ As an increasing number of older adults transition from the home to assisted living, these questions arise: Are these facilities implementing policies and establishing living environments that would sustain effective and comprehensive behavioral programs designed to increase physical activity? Will older adults' participation in these programs postpone the progression of disability and positively influence quality of life?

Recently, Wasner and Rimmer¹⁹ evaluated nontherapeutic exercise programs offered in 159 senior living

facilities in the state of Illinois, which included nursing homes, licensed and nonlicensed continuing-care retirement communities, and senior independent-living apartments. Specifically, the survey focused on the types of exercise programs currently offered, the educational levels of professional staff and program directors, and the amount and type of exercise settings and equipment. The most common form of nontherapeutic exercise was chair exercise (88.7%), followed by stretching (45.9%) and supervised walking (44.0%). Although 149 of the 159 responding facilities offered some type of exercise program, these programs were extremely varied and did not meet contemporary exercise recommendations for older adults.³⁶ For example, in 38.3% of the facilities offering chair exercises, the sessions lasted from 21 to 30 minutes and in 25.2% of the facilities, the chair exercise sessions were only 15 to 20 minutes in duration. Although activity directors and exercise leaders led activity programs in many of the facilities, none were reportedly trained or certified in exercise science. Further, 81% of the activities were held in multipurpose rooms such as dining halls, ignoring the importance of environmental and social influences.

These findings have important implications for adherence, as many older adults attempting to participate in an exercise or physical activity program withdraw prior to the onset of apparent health benefits.³⁷ Contrary to current programming efforts in long-term care communities, behavioral theorists would suggest that behavior change interventions may have the greatest potential impact when targets include policy, the physical environment, social interactions, and individual factors.^{38,39} To date, no comprehensive descriptive information exists about the day-to-day lives of assisted-living residents or their functional abilities and perceptions of disability or well-being.²² Additionally, little is known regarding the social and physical environments and programming available to promote physical activity in assisted-living communities.

To develop an informed basis for investigation of assisted-living interventions, collaboration between scientists and delivery agents is required. Therefore, recognizing the key role of assisted-living executive directors in promoting an active environment, we partnered with these agents in order to assess ways in which the social and physical environments can be modified to promote and support active living. The intent of this exploratory descriptive study, entitled Active Living for Assisted Living (AL²) was to identify multiple, potential points of intervention within the assisted living setting. Additionally, policy and procedures related to the promotion of wellness were identified and the potential for developing future partnerships with each assisted-living facility was explored. Following is a brief description of the study methods, sample, findings, and related conclusions.

Methods

Sample

Facilities were identified from an exhaustive list of all assisted-living communities within Forsyth County NC. Eligible facilities included those that met the following inclusion criteria: (1) minimum of 15 residents, (2) concentration of older residents 60 years or above, (3) majority of residents without significant cognitive deficits, (4) did not employ skilled nursing care, and (5) located within Forsyth County NC. Executive directors at each facility were contacted via telephone by research assistants and screened for the facility inclusion criteria. Of the 21 facilities that met the inclusion criteria, all executive directors agreed to participate in AL², resulting in a total of 21 scheduled interviews.

Measures and Procedures

Appointments were scheduled with each respective executive director to conduct the interview. Both open- and close-ended questions were employed, with the latter utilizing standard Likert-type scales. Interviews lasted approximately 1 hour and were based on a systems approach that examined the promotion of physical activity at multiple levels. Specifically, the directors were guided through a discussion of the facility's standard procedures, mission statement, organizational framework, and methods for assessing and promoting positive lifestyle behaviors, with distinct emphasis on the targeted behavior of physical activity. The assessment developed for AL² was designed to investigate director responses in the following content areas: (1) the concept of wellness; (2) assessment of space, equipment, and physical function; (3) opportunities for physical activity, including motivational and informational strategies; and (4) potential for future collaborations. Each interview concluded with a tour of the respective facility, at which time photographs were taken to provide a more in-depth assessment of the environment, including space, equipment, and informational tools. At the conclusion of the study, the research assistants again met with the executive directors to provide feedback from the assessment.

Analysis

Descriptive statistics were employed to characterize the facilities and to summarize demographic information by site. The data were then collapsed across sites to provide summary statistics for each of the four content areas outlined above. Means, standard deviations, and percentages are presented in both text and table format. A systems approach guided both the development of the interview, as well as the content analysis, including an examination of influences from the individual, interpersonal, community/organizational, and government domains. In the general discussion section at the end of this article, each level of the systems framework is drawn upon in the interpretation of AL² data.

Results

Descriptive Statistics

Interviews were conducted with executive directors from a total of 21 assisted living facilities to address the

Table 1. Descriptive statistics (N=21 facilities)

Age (years)	
Range	60–102
Residents per facility	
Mean (SD)	65.5 (27.0)
Race (%)	
White	89.3
African American	9.2
Native American	1.5
Asian	0.0
Hispanic	0.0
Gender (%)	
Male	21.1
Female	78.9
Average resident education (%)	
High school graduate	60.0
College	40.0
Cost/month (\$)	
Range	1826–3048

SD, standard deviation.

four primary components of behavior change described above in the respective communities. Table 1 presents a description of the facilities and the residents evaluated in this study. Overall, the assisted living facilities were moderately sized (M=65.5 residents; standard deviation [SD]=27.0) and housed mostly white, older females (range, 60 to 102 years). The average basic cost per month (M=\$1826.30; SD=\$593.9) was consistent with the national basic cost average of \$1800.⁴⁰

All 21 facilities employed general activity directors, with only two facilities employing wellness directors whose job description specifically included the promotion of physical activity participation. Although 57.1% of the executive directors held a bachelor's degree or higher, areas of focus varied, with the two most common being business (22.2%) and gerontology (16.7%). North Carolina State assisted living or nursing home administrator licenses were held by 55.6% of the executive directors. Responses provided by the executive directors within each content area are presented below.

Concept of Wellness

Understanding the multiple dimensions of wellness and which behaviors may influence health and wellness is an important part of designing and implementing physical activity programs. To further examine the executive director's concept of wellness, both open-ended and close-ended questions were employed. To begin each interview, the executive directors were asked whether their respective assisted-living communities followed an organizational, as well as a wellness, mission statement. Although 71.4% of the executive directors cited an organizational mission statement, only 14.3% reported a mission statement that was specific to wellness for the residents. This has important implications, since all facilities with a mission statement

had executive directors who acknowledged the importance of designating time and effort for the implementation of programs designed to meet the main objectives put forth in that statement.

Among the executive directors interviewed, interest in health behaviors was evident, as over half of the directors identified physical activity (52.4%) or nutrition (57.1%) in open-ended questions as key factors influencing the health of their residents. Further, the executive directors thought that it was extremely important ($M=9.5$; $SD=0.7$) for residents to engage in physical activity (11-point Likert scale, with 0 indicating “not at all important” to 10 indicating “extremely important”) and that the result of increased participation in physical activity would be improved health among the residents ($M=8.7$; $SD=1.7$) (11-point Likert scale, with 0 indicating “not at all important” to 10 indicating “significant improvement”). Thus, it appears that the executive directors in this study believe that wellness is influenced by physical activity and, further, that programs encouraging physical activity participation lead to positive health outcomes for the assisted-living resident.

Assessment: Space, Equipment, and Physical Function

As noted in a previous investigation,¹⁹ long-term care facilities typically ignore the importance of environmental and social influences when designing physical activity programs, as group exercise sessions are often held in dining areas or other common areas, with poor lighting and unsafe floors. To further examine environmental limitations, an inventory was taken of the spaces provided at each facility for use in physical activity programming. Although 85.7% of the facilities had sidewalks, only 23.8% reported supervised walking as a promoted activity. Other exercise space was limited, as only six of the facilities had a designated exercise room, and only one facility had an exercise pool. Although all facilities were equipped with hallways and common areas, few regularly promoted the use of these areas for physical activity purposes. Only 25% of the facilities provided any type of exercise equipment. Specifically, only three facilities utilized strength-training machines designed with seniors in mind or had updated aerobic equipment, including treadmills and bikes, that were easily accessible. Nustep machines—a type of aerobic equipment that is safe for older adults, simple to operate, low impact, and easy to access—were used in only three of the facilities.

The importance of physical function assessment to disability among older adults has been well documented.^{25,41} Additionally, physical activity levels and functional status are an important part of the exercise prescription process. Guidelines put forth by the American College of Sports Medicine⁴² recommend that

older adults be assessed to determine the risks of participation and to allow for the design of an appropriate exercise prescription prior to beginning a physical activity program. In light of these recommendations, all executive directors in AL² were asked to describe current screening strategies and physical function assessments. Contrary to the ACSM guidelines, only one of the facilities followed established preparticipation screening procedures (e.g., Physical Activity Readiness Questionnaire or risk factor and symptoms checklists). Alternatively, four facilities required residents to sign an informed consent and to provide their medical history, whereas only one facility required a physician’s approval prior to participation. Thus, the norm in this group of facilities was to not assess physical status prior to participation.

Only two facilities (9.5%) utilized general fitness tests, such as strength and flexibility tests, to assess baseline fitness, and none of the facilities performed follow-up testing to determine change in fitness over time. One facility reported the use of an objective functional test at resident admission. Specific to North Carolina, the FL2 form is mandated to document the resident’s need for assistance with ADLs and to provide facilities with assessments of the resident’s general physical, cognitive, nutritional, and psychosocial function. This assessment is conducted by the resident’s physician upon entry into the facility and is repeated annually and at readmission due to hospitalization. On closer inspection, this measure of overall function is an inadequate assessment of physical function due to its general content and lack of either objective or self-reported evaluations of both physical function and physical activity.

Opportunities for Physical Activity

Relative to informing the older adult about physical activity, methods for educating residents about the benefits of physical activity and notifying residents about physical activity opportunities were assessed. Assisted living facilities provide a suitable environment to effectively promote physical activity through the use of several forms of media. To further investigate the current protocols for disseminating information on physical activity opportunities within assisted living facilities, the executive directors in AL² were asked to comment on the methods employed to inform their residents of facility programs and events. All 21 facilities used activity calendars as the main mode of advertising. These calendars were typically designed to list the activity programs offered in the upcoming weeks and months. Other forms of activity promotion included the use of newsletters (14 facilities), wellness boards (6), verbal announcements via PA systems (12), and verbal announcements in other venues, such as during mealtimes (18). Although cost efficient and demon-

Table 2. Number of facilities offering programs by sessions per week and average attendance (N=21 facilities)

Activity type	Number of sessions offered per week							Number of facilities offering activity (%)	Average attendance Mean (SD)
	1/wk	2/wk	3/wk	4/wk	5/wk	6/wk	7/wk		
Group chair	7	4	3	1	0	1	0	17 (81.0)	15.0 (9.1)
Structured walking	2	0	1	0	1	0	1	5 (23.8)	9.5 (4.0)
Strength training	0	0	0	0	1	0	0	1 (4.8)	9.0 (0.0)
Stretch	2	0	0	0	0	1	0	3 (14.3)	10.7 (2.5)
Balance	0	0	0	0	0	0	0	0 (0.0)	0.0 (0.0)

SD, standard deviation.

strated to increase physical activity,⁴³⁻⁴⁵ none of the facilities used signage to specifically promote this positive health behavior.

Similar to findings reported by Wasner and Rimmer¹⁹ among senior living residents, 81% of the assisted-living facilities participating in AL² offered basic chair exercises; however, 50% of these classes were held only once a week and reported low average attendance (M=15.0 residents; SD=9.1). Additionally, structured walking for exercise was promoted in less than 25% of the facilities, only one facility offered strength training, three offered stretching classes, and none of the facilities offered balance training. Table 2 summarizes the exercise classes that were available at the 21 facilities evaluated. It was encouraging to note, however, that multiple opportunities existed for the creative incorporation of physical activity into other facility-based programs. For example, most facilities offered intergenerational (n=19), faith-based (21), garden (17) and animal (16) therapy, as well as resident volunteer (16) programs. Further, these programs averaged higher attendance rates than those targeting exercise per se. Integrating physical activity into these well-attended programs may provide one potential activity opportunity for those residents who are less likely to venture into a group exercise class or the wellness center, thereby increasing the total number of physically active residents.

Future Collaborations

The final goal of this project was to assess the willingness, as well as the logistical concerns of the administrative directors, for engagement in future collaborations to promote physical activity among assisted-living residents. Overall, the executive directors in AL² reported a willingness (11-point Likert scale, 0 “not at all willing” to 10 “completely willing”) to support staff time (M=8.8; SD=1.8) and staff training (M=9.2; SD=1.1) for the promotion of physical activity. Executive directors were also willing to implement several strategies demonstrated to positively influence physical activity participation. For example, the executive directors were willing to collect monthly data on resident function (M=8.0; SD=2.2), reinforce and motivate resi-

dents to be physically active (M=9.1; SD=1.3), assist residents in the self-monitoring of their physical activity levels (M=7.9; SD=1.9), announce and promote physical activity opportunities (M=9.5; SD=1.2), and monitor access to exercise facilities and equipment (M=8.3; SD=1.9).

In addressing staff issues and feasibility, the executive directors reported concern about the interest among facility staff (11-point Likert scale, 0 indicating “not at all interested” to 10 “completely interested”) in committing to the promotion of physical activity (M=7.0; SD=2.3) and in serving as role models for residents by participating in physical activity on-site (M=6.5; SD=2.1). Similarly, executive directors were only moderately confident (11-point Likert scale, 0 indicating “not at all confident” to 10 “completely confident”) that residents would participate in facility-based programs that incorporate physical activity on an ongoing basis (M=6.4; SD=2.3) or that residents would be interested in physical activity participation (M=6.0; SD=2.2).

Although the executive directors reported multiple barriers to physical activity promotion, the three barriers most often cited were individual factors, including resident attitudes toward physical activity (57.1% of executive directors); staff issues (28.6%); and resident capabilities (23.8%). This finding is in contrast to the perceptions of older adult residents as reported by Ball et al.,⁴⁶ who interviewed assisted-living residents to identify residents’ views on quality of life. Residents identified “meaningful activities” as one of the five most significant life-quality domains, with particular emphasis on those activities that help them to maintain and improve both physical and mental functioning. Although based on differing viewpoints, this comparison highlights the importance of considering both facility staff and resident perceptions to determine whether complementary or opposing views exist with respect to the needs of older adults. The impact of such views could either facilitate or hinder physical activity promotion in the assisted living context.

Study Conclusions and Implications

Collectively, the findings from the AL² study, when considered along with reports of older adults’ physical

activity participation in both community and other long-term care settings, suggest that successful interventions for the promotion of lifestyle behavior change should include multiple perspectives about physical activity (i.e., all those who comprise the microenvironment within the assisted living community). First, the perspectives of the residing older adults should be considered, as they are one of the primary targets for change. Second, the perspectives of facilitating agents within the residence should be considered (i.e., administrators, staff, and physicians, as well as family members). Last, the interventionists and researchers may alter the microenvironment, and their perspectives should be considered as to whether these perspectives complement or contradict those of the other people in this environment. In fact, assisted-living communities may offer a unique advantage over larger community-based interventions insofar as residents of assisted living are part of a collective community with strong social ties and direct proximity to director guidance and leadership. Thus, assisted living may provide a natural laboratory for examining the effects and the importance of addressing disability and the promotion of lifestyle behavior change at multiple levels.³⁹

To further our understanding of the determinants of physical activity participation, disability, and quality of life in assisted-living residents, as well as the interrelationships among these content areas, a systems approach underscores the need for examining the promotion of physical activity at multiple levels,³⁸ including influences from the individual, interpersonal, community/organizational, and government domains. Thus, the remainder of this article will be devoted to a discussion of the systems approach and how these four domains can be drawn upon in interpretation of the AL² data. In turn, the development and evaluation of innovative approaches for partnering with assisted living communities in an effort to increase physical activity participation is presented.

General Discussion

A Systems Approach

A systems, or ecologic, model views behavior as being determined by the interplay among multiple domains, including individual, interpersonal, institutional, community, and public policy factors.⁴⁷ Two recent reviews^{45,48} have clearly outlined the importance of targeting each of these domains when attempting to promote physical activity behavior. Further, it appears that past research has focused on the individual and behavioral levels of analysis, neglecting the critical role played by policy as well as by the social and physical environments in activity interventions.⁴⁹ The challenge, however, is not to simply put more emphasis on these understudied domains; rather, it is to acknowledge the

significant contribution of each level as well as the interplay among these determinants as they influence physical activity behavior. The following sections highlight each of the domains, grouping together the domains of community and institution within the assisted living context. Using data from AL², examples for the promotion of physical activity in assisted living at each level will be provided and future directions suggested for both research and practice. Although each domain of the systems framework is discussed separately, it is important to note that strategies and assessments may overlap categories and that the most effective interventions employ a combination of multiple levels.⁵⁰

Individual Factors

Arguably, individual factors have been the most studied determinants of physical activity behavior.^{50,51} These variables include psychological, behavioral, and biological influences; thus, interventions to promote behavior are targeted toward changing characteristics of the individual.⁴⁷ Theories of behavior change have placed the individual at the center of our interventions, with individual variables accounting for a consistent and significant, albeit modest, percentage of predicted variance in physical activity behavior and related outcomes. For example, in one study³⁰ of exercise effects on physical function and disability among nursing home residents, strength training was predictive of both increased muscular strength, as well as decreased difficulty in performing ADLs. More importantly, individual strength gains were significantly related to improved ADL status, accounting for 10.3% of the variance. Thus, individual factors, such as participation in physical activity and increased fitness parameters, are related to functional decline.

One of the most frequently employed theoretical frameworks in the physical activity determinants literature has been social cognitive theory.^{51,52} Although Bandura⁵¹ has described the multiple levels and related constructs that influence behavior within the tenets of social cognitive theory, the variable receiving the most attention in the physical activity literature has been an individual's beliefs in personal capabilities, or self-efficacy. In a recent review of the role played by self-efficacy as a determinant of physical activity, McAuley and Blissmer⁵² concluded that strong evidence exists to support self-efficacy as a predictor of various types of activity at different points along the activity continuum. Personal beliefs such as self-efficacy have also been linked to functional limitations^{53,54} and to functional decline.⁵⁵ Further, researchers^{55,56} have demonstrated a relationship between self-efficacy perceptions and levels of physical function that is strongest for those individuals with the greatest disability.

Although residents' self-efficacy for activity participation was not directly assessed in AL², executive directors cited resident capabilities and attitudes toward physical activity as two of the three top barriers to activity promotion. Certainly, resident perceptions relative to activity participation would be theorized to influence their actual engagement in activity. Further, personal control beliefs play an important role in functional decline and, in the context of a systems-based intervention, are modifiable, as efficacy beliefs for physical activity have been positively influenced among older adults.⁵² Related to the enhancement of efficacy beliefs, the executive directors were willing to encourage activities that have been positively linked to increased self-efficacy, including social persuasion via director and staff feedback, assisting with self-monitoring of residents' activity levels and progress, as well as developing strategies for utilizing fitness testing feedback to provide mastery of accomplishments.

Baseline assessments of individual factors, as well as measures of change in personal variables over time are critical to evaluating the success of physical activity interventions. In the baseline assessment, assisted-living researchers have argued for a measurement process that includes individual factors such as prescreening tools and functional assessments.⁴⁶ As noted earlier, however, few of the assisted living facilities in AL² utilized adequate measures prior to engagement in physical activity programs. The information from these assessments would be valuable with respect to monitoring change over the course of activity participation or to the individual tailoring of goals and activity prescriptions. Further, residents' perceptions and beliefs regarding meaningful and valued activities should be incorporated into the design and implementation of any physical activity intervention.^{46,57} For example, residents' preferences and beliefs in their capabilities to engage in those activities (e.g., physical activity) that will lead to desired outcomes (e.g., functional independence) will ultimately influence participation in the behavior and the achievement of tailored outcomes. With individual factors being the target at this level of the system, interventions should include individually tailored strategies, such as educational programs, mastery accomplishments, and peer counseling, as well as intervention tactics shared with other levels of the framework, including director and staff leadership, physical proximity and availability, and supportive environments.

Interpersonal Factors

Social support networks and resources, including interpersonal relationships with family members, peers, medical professionals, and assisted-living staff, are important determinants of behavior and have been shown to both positively⁵⁸ and negatively⁵⁹ influence physical

activity participation and disability. Family members participating in intergenerational programs have the opportunity to positively influence participation by interacting with residents in an active setting. For example, on-site programs that involve children and related activities could be designed to incorporate physical activity in an enjoyable and meaningful manner, thereby increasing physical activity levels of both the participating child and the older resident. On the other hand, many executive directors in AL² commented on the tendency for family members to request maximal usage of available services and self-care assistance for the older assisted-living resident. Although well intended, these demands may further promote sedentariness and, ultimately, a sense of learned helplessness among residents by decreasing involvement in daily chores and basic self-care behaviors that require ambulation and physical movement.

In the context of assisted living, physical activity promotion requires the ongoing support of all members of the "assisted-living family," including nurses, directors, physicians and medical directors, friends and peers, and family members and proxies.¹⁸ As the number of assisted-living facilities continues to grow, the U.S. Bureau of Labor⁶⁰ predicts that direct care occupations will be one of the top ten employment positions with the fastest growth rate. Ironically, the average turnover rate in these long-term care positions is a disappointing 93%! This represents a fundamental problem for interventions built on the premise that educating and training staff will lead to increased activity behavior of residents.⁶¹

McLeroy et al.⁴⁷ emphasize the need for interpersonal interventions not only to target the individual level, but also to influence primary social groups, including their social norms and existing social relationships. In light of the executive directors' concern in AL² about the limited interest among facility staff to promote physical activity and to serve as active role models, one of the objectives in assisted living should be to facilitate environments that lead to staff retention and, ultimately, staff education and training in the field of exercise science. The Eden Alternative⁶² is one example of reform in nursing care that has provided direct caregivers and residents with training and support in controlling the environment to promote high levels of functioning, independence, and quality living among residents.^{10,18} Specific to mobility, Rosemond and Mercer¹⁸ recently developed a training program for staff at the Carol Woods Retirement Community in Chapel Hill NC. This program was designed to educate direct care staff on how to promote mobility on a daily basis. For example, staff members have been trained to encourage residents to actively participate in each step of the transfer process. In this manner, the staff burden is decreased while resident function and independence are promoted. In addition to staff educational pro-

grams, creating interpersonal links among all those associated with the assisted-living community will influence social norms and, potentially, daily activity patterns.

Community and Organizational Factors

The role that the community plays in influencing behavior has been a focus of public health programming. McLeroy et al.⁴⁷ defined this component of the model as “relationships among organizations, institutions, and informal networks within defined boundaries.” There are multiple opportunities for promoting physical activity within the community of assisted living. Specifically, modifying environmental supports and barriers, providing opportunities for successful engagement in activity, and encouraging a sense of social connectedness with peers, family, and staff are integral components within theories of behavior change.⁵¹ As assisted-living facilities represent a defined social environment in which older adults live and interact on a daily basis, modifying even a single component within the community may positively influence activity behaviors and provide significant health benefits.⁶³

Physical activity interventions that establish programs and opportunities that are fun, engaging, challenging, and focused on promoting function have been shown to lead to the adoption of active living practices. Such objectives may require actions such as the development of group and individual programming that takes into account the common interests of the residents; uses existing space such as accessible sidewalks (i.e., in >85% of the evaluated facilities in AL²); offers sessions at multiple time points throughout the day; and advertises activity events and programs via signage, newsletters, and verbal announcements. Among the participating assisted living facilities in AL², multiple opportunities existed for incorporating physical activity into preexisting programs, such as pet therapy and gardening. These programs were well attended and most were offered at multiple time points throughout the week as part of the basic activity calendar at the majority of facilities.

Environmental supports and barriers should also be assessed and modified as potential factors to increase attendance and support the maintenance of behavior over time.⁶¹ Once the environment has been evaluated, simple and cost-efficient modifications, such as displaying signs that specifically promote active living, improving lighting, and designing physical activity stations throughout the facility, may prove beneficial. Effective leadership qualities have also been linked to increased enjoyment and adherence.⁶⁴ However, activity and wellness directors in the AL² assisted-living facilities typically had little to no training in either exercise prescription or promotion. Could this lack of training have a potential negative impact on the initiation of activity, as

well as on the maintenance of activity behaviors over time? Building on the interplay between levels of social support and community factors, assisted living staff, residents’ families, and residents themselves should be encouraged to create a “community” atmosphere that rewards participation in physical activity and fosters collective efficacy for engagement in healthy lifestyle behaviors.³⁸

Government and Policy Factors

Some public health policies designed to reduce the prevalence of chronic disease and negative health behaviors in the United States, such as cardiovascular disease and smoking, have proven to be beneficial. McLeroy et al.⁴⁷ defined public policy as the combination of “local, state, and national laws and policies.” In recent years, policies have been directed toward the promotion of physical activity within the community. For example, the Task Force on Community Preventive Services⁶⁵ published a report providing recommendations to community leaders, policymakers, and public health providers for the design of interventions to promote and increase nationwide participation in physical activity. Currently, with the support of the U.S. Department of Health and Human Services and the Centers for Disease Control and Prevention, this Task Force is creating policy in the form of a *community guide* that can be used to address the objectives outlined in *Healthy People 2010*. Additionally, the development of the National Blueprint: Increasing Physical Activity Among Older Adults Age 50 and Older⁶⁶ was a significant collaborative effort to summarize and disseminate information on physical activity promotion for America’s aging population.

Currently, assisted living facilities are largely regulated and monitored at the state level. Although this provides each state with flexibility in developing and implementing region-appropriate policies, it creates a lack of uniformity. From a public health perspective, leadership roles and activity policies generated at the national level would lend a significant voice in current intervention efforts to improve physical activity levels and possibly reduce levels of mobility disability among older adults. Organizations such as the Assisted Living Federation of America provide opportunities for long-term care professionals to collaborate on current industry issues; however, the executive directors in AL² reported that little has been done to bridge the state-to-state gap for promoting physical activity in long-term care, particularly in assisted living.

Although many states require the use of broad functional assessment tools such as the FL2 form, policies to ensure continued assessment of residents’ physical function, activity level, and risk for disability are lacking, thereby limiting the likelihood of monitoring change over time.²⁵ Further, there is a need for a data

monitoring system to house this information and to evaluate the effectiveness of programs and policy. Staff training, education and licensure requirements, and manuals to demonstrate how to assess function and to integrate physical activity programming into long-term care environments are warranted.¹⁹ In line with a systems approach, directors and staff in assisted living facilities, national organizations on aging, and public health professionals are encouraged to work together to develop, modify, and implement policies that promote physically active living.

Overall Implication

Promoting physical activity within a systems framework provides the foundation for an exciting geriatric research agenda for the development and evaluation of interdisciplinary approaches to increase physical activity participation in assisted-living communities. Although there are few comprehensive community-based physical activity interventions tapping multiple levels of the systems framework, there has been increased attention directed toward understanding participation influences at multiple levels, especially investigations of both environmental and policy strategies.^{45,48} The AL² study represents a necessary first step toward understanding the social ecology of assisted-living facilities and identifying potential ways in which the social and physical environments can be modified to promote and support physically active living. Moreover, these findings will be useful in informing a multiple level intervention and the feasibility of such systems-based approaches.

It is important to note, however, that these data were exploratory and that future investigations are encouraged to examine these relationships in a longitudinal manner rather than rely on single-point assessments. Further, the generalizability of these findings is limited in that the sample consisted of residents who were predominantly Caucasian and of a higher socioeconomic status. Thus, interventions for other subgroups within assisted living may need to be tailored to reflect different resource bases and environments. Clearly, promoting physical activity in the community and, particularly, in assisted living, is a challenge. It will require a partnership with assisted-living communities to develop effective and feasible systems-based interventions designed to make environments more engaging and thereby promote active living.

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