Enhancing Opportunities for Physical Activity Among Long-Term Care Residents: A Narrative Review

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ABSTRACT

Objective. To summarize the literature on improving opportunities for physical activity for residents in long-term care (LTC).

Method. Narrative review of the literature.

Results. Residents in LTC spend much of their time in sedentary activities such as sitting or lying in bed. Physical activity is important to help decrease the negative effects of sedentary time, such as poor mood and increased risk of death, and to improve physical function. This review identifies several strategies for promoting physical activity for LTC residents: incorporating simple strategies into daily activities, participating in group activities (eg, exercise, dance, or music therapy), using motivational strategies to encourage staff to promote activity, leveraging the physical environment, reducing physical and chemical restraints, and using innovative solutions such as robots or interactive technology.

Conclusion. While the quality of evidence to date is limited, preliminary work suggests that the strategies identified in this article could be included as part of a multifactorial approach to increasing physical activity in LTC.

Keywords: long-term care; nursing homes; physical activity; sedentary; mobility.

The United Nations estimates that between 2013 and 2050 the population aged 60 years or older will double.[1] Furthermore, the fastest growth rate will be seen in older adults over the age of 80 years.[1] With this demographic shift, a growing number of older adults will require supportive housing, such as long-term care (LTC). Indeed, it is projected that the number of older adults requiring LTC will double by 2036.[2]

Residents in LTC are often medically complex and experience multimorbidity, cognitive impairment, and functional decline,[3] making it difficult for them to engage in physical activity. LTC residents spend approximately 75% of their waking time in sedentary activities (eg, sitting, lying down, watching TV), which amounts to more than 12 hours per day.[4-6] Residents with cognitive impairment are even more sedentary, spending as little as 1 minute per day in moderate physical activity and approximately 87% of their time in sedentary activities.[7] Additionally, a high prevalence of use of psychotropic drugs and physical restraints contributes to high levels of physical inactivity for residents in LTC.[8] Increased time spent in sedentary activities has been associated with adverse health outcomes, such as incidence of cardiovascular disease and type 2 diabetes, and mortality.[9-11] Moreover, bed and chair rest are associated with muscle disuse, which can lead to functional impairment.[12,13]

Given the large amount of time LTC residents spend in sedentary activities and the negative consequences this has on their health, it is essential to find opportunities to engage residents in physical activity throughout the day. This article summarizes evidence about increasing opportunities for physical activity for LTC residents. Physical activity is defined as "any bodily movement produced by skeletal muscles that results in energy expenditure," while exercise, which is a subset of physical activity, is purposefully planned, structured, and repetitive and has a goal of maintaining or improving physical fitness.[14] Previous work has described exercise among LTC residents in

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detail,[8,15,16] and thus exercise is not addressed here. Also, as a narrative review, this article provides an overview of available interventions to improve physical activity for LTC residents and does not provide comments on efficacy or an exhaustive list of potential interventions. Rather, it provides a starting point for LTC homes to consider when providing opportunities to improve physical activity for their residents.

Guidelines for Increasing Physical Activity

There are currently no published evidence-based guidelines for increasing physical activity and reducing sedentary time for residents of LTC homes. However, an international task force of experts in geriatrics, exercise, and LTC research convened in 2015 and made recommendations on this matter.[8] They emphasize the importance of considering the needs of residents, family members, health care professionals, LTC staff, and policy-makers when designing strategies to promote movement in LTC.[8] This will ensure that the strategies to promote movement will be realistic and sustainable. Additionally, the task force identified motivation and pleasure as key to engaging residents in physical activities, and recommended that interests and preferences should be used to guide the selection of activities.[8] The following sections describe example strategies to improve physical activity for residents in LTC that LTC homes can use to help facilitate movement for their residents.

Strategies for Promoting Physical Activity

Leveraging Daily Activities

One approach to promoting physical activity in LTC homes is to systematically use simple strategies embedded within routine care to engage residents in movement.[8] Function-focused, or restorative care,[17] is a philosophy of care that promotes increasing physical activity and maintaining functional abilities based on the resident's abilities. Examples include walking with residents to the dining room rather than pushing them in a wheelchair where appropriate, inviting residents to events that require them to leave their room, improving independent wheelchair propulsion for residents who cannot walk, and increasing opportunities for sit-to-stand activities where possible. These activities are scaled to the resident's underlying physical and cognitive capabilities. A systematic review of function-focused care revealed that it can help maintain functional skills for residents in LTC, and there is no significant risk associated with implementation.[18] In a study by Slaughter et al[19] that examined the effectiveness of techniques to encourage mobility by residents' usual caregivers, health care aides prompted residents to perform the sit-to-stand activity 4 times per day, with the number of repetitions individualized based on resident ability, fatigue, and motivation. Residents who completed the sit-to-stand activity had smaller declines in mobility and functional outcomes (ie, less decline on the Functional Independence Measure).[19] This study included residents with Alzheimer's disease and dementia who could transfer independently or with the assistance of one person,[20] indicating that this type of intervention is feasible and appropriate for residents with cognitive impairment.

Group Activities

Group activities in LTC homes are another way of engaging residents in physical activity in a motivating and pleasant setting that also encourages social engagement among residents and LTC staff. Group exercise classes can be effective for improving mood and functional outcomes. For example, a systematic review of dance classes in LTC homes revealed an improvement in problematic behaviors, mood, cognition, communication, and socialization.[21] Most studies included participants with dementia, and no adverse events were reported, supporting the feasibility and safety of implementing group dance activities for residents with cognitive impairment. Group exercise is the most common delivery method for exercise within LTC homes[22] and has been demonstrated to have small positive effects on activities of daily living (ADL; ie, improvement in ADL independence equivalent to 1.3 points on the Barthel Index).[23] Other group activities, such as music therapy, have demonstrated improvements in depressive symptoms, emotional well-being, and anxiety for LTC residents with dementia.[24] Group activities also provide the opportunity for movement as residents leave their rooms, walk to a new location (if able), and return to their rooms when the activity is complete.

Barriers to Physical Activity and Strategies to Overcome Them

Caregiver-related Factors

LTC staff have limited time to spend promoting physical activity since residents often have complex health care needs and staffing levels are often constrained.[25] Indeed, having lower staffing levels has been associated with lower levels of physical activity for residents.[26,27] LTC staff have identified a lack of time to walk with residents[28,29] and having other tasks to do (eg, clean) as barriers to promoting movement.[28,29] However, asking residents to help staff with small household chores, such as folding laundry or clearing dishes, was a facilitator to promoting movement.[30] Activating residents by helping them transfer to a wheelchair for independent mobilization around the home or by assisting them to walk where appropriate were also facilitators.[30,31] Leveraging facilitators will help staff who have limited time to help residents engage in more physical activity.

Motivation of LTC staff can also be a barrier to encouraging physical activity for residents in LTC. Fear that increasing physical activity will cause adverse events like falls, illness, or exacerbation of symptoms often decreases motivation for staff to facilitate physical activity.[32,33] Another potential barrier is the conceptualization of the role of nursing in LTC as protecting residents from harm by encouraging them to engage in "risk-free" activities like staying in bed.[34-39] Strategies to increase staff motivation to engage LTC residents in physical activity that have been shown to be effective are verbal prompts, modelling behaviors, goal setting, and home champions to promote function-focused care.[17,33,40-43]

The Physical Environment

Aspects of the physical environment of LTC homes may facilitate or limit residents' ability to be physically active. A 2017 systematic review examined elements of the physical environment that acted as barriers and facilitators to physical activity for older adults living in LTC.[30] The authors found that the person-environment fit, security, accessibility, and comfort were key components of the physical environment that were associated with residents' physical activity levels.[30] First, an appropriate fit between the residents' abilities and the demands of the environment was related to improved activity as measured by actigraphy.[44] For example, having long hallways between residents' rooms and common spaces discourages residents who can only walk short distances from walking to these locations. However, residents were more active in larger-scaled LTC homes with shorter distances between different areas (eg, resident rooms and dining rooms).[45] Clearly, there must be enough space to encourage walking between areas, but not so much space that walking is not feasible. Residents participating in a focus group identified accessibility and comfort features as being facilitators for walking in the corridor, such as wide corridors, sturdy handrails, carpet, chairs placed at short intervals for seated breaks, windows to look out, plants, and accessible activity rooms and restrooms.[45,46] On the other hand, limited things to see and do indoors and outdoors, along with restricted walking areas, were identified as barriers to corridor walking by residents.[46]

One method for optimizing LTC home architecture to promote movement is to provide therapeutic outdoor spaces, such as gardens. Indeed, therapeutic gardens have been studied as a nonpharmacological method of engaging LTC residents with dementia and have been shown to benefit mood, pain, and fall prevention.[47] Secure therapeutic gardens or outdoor spaces provide opportunities for various activities to increase movement, including gardening, animal care, and walking.[48] However, there is a higher propensity for residents who use walkers or wheelchairs to slide off paths or become stuck in mud or mulch.[49] Residents with physical limitations may require additional supervision in garden spaces, and as such spaces should be designed with improved safety in mind (eg, barriers between paths and places where mud could accumulate). The number of available indoor (eg, a physical therapy gym) and outdoor (eg, gardens) spaces was also found to be positively related to residents' physical activity levels.[50] However, these relationships were mediated by the number of activity programs available in the LTC homes.[50] Therefore, having staff available to facilitate activities is also important for promoting physical activity.

Chemical and Physical Restraints

Physical and chemical restraints (eg, antipsychotics and sedatives) are sometimes used to manage the behavior-

al and psychological symptoms of dementia,[51,52] which many residents in LTC experience.[3] Though there has been an emphasis in North America to decrease their use, physical and chemical restraints are still used in LTC.[53] Physical restraint use is associated with a higher risk of functional and cognitive decline.[53,54] Residents who are both physically and chemically restrained through antipsychotic use are at even higher risk for these declines.[54] Thus, to improve opportunities for movement in LTC, physical restraint use should be minimized. The risks and benefits of using psychotropic medications that often decrease residents' physical activity levels must be evaluated individually, and other nonpharmacological strategies should be used to manage the behavioral and psychological symptoms of dementia. These could include functional analysis-based interventions (ie, individualized interventions aimed at identifying unmet needs, causes, antecedents, and consequences of the behavior),[55] music therapy,[55] or other interventions described above.

Emerging Innovative Interventions

Robots are an emerging nonpharmacological intervention for improving the behavioral and psychological symptoms of dementia and facilitating physical activity in LTC. Robotic animal interventions, where LTC residents interact with robotic animals in an individual or group setting, have been shown to reduce negative behaviors and increase positive mood.[56] Additionally, robots are being used in rehabilitation to provide exercise post-stroke[57] and could easily be transitioned to do similar tasks in LTC. Robotic interventions are attractive for the LTC sector as they could help relieve the workload demands on an often overloaded sector, and, in the case of pet therapy, surmount regulations for bringing live animals into a LTC home. Though studies examining the use of robots in LTC have mainly focused on the effect of pet therapy on reducing behavioral symptoms, the use of robots to promote physical activity and exercise in LTC is a natural progression for the work that has been done in inpatient rehabilitation.[57] On a similar note, an interactive technology (similar to a Kinect system) used to promote 30-minute, twice-weekly physical activity sessions has demonstrated improvements in physical function (Short Physical Performance Battery [SPPB]) for pre-disabled (SPPB of 6 to 9) residents in LTC without dementia.[58] The role of technology to promote physical activity in LTC is an emerging area of interest, and future innovations in this area will continue to help facilitate movement.

Quality of Evidence

Most studies aimed at improving physical activity for LTC residents to date are small, have nonrandomized designs, and have limited generalizability and evidence to support the efficacy of the interventions. For example, most studies included in systematic reviews for function-focused care, dance, group exercise, and music therapy are small, observational, or quasi-experimental studies with methodological issues resulting in bias.[18,21,23,24] Likewise, the evidence surrounding nonpharmacological interventions for reducing behavioral and psychological symptoms of dementia is of very low to moderate quality.[55] Innovative interventions, such as robotics and interactive technology, to promote physical activity in LTC are in their infancy. There are no data syntheses available to date to summarize the available literature on this topic, and conclusions rely on small, nonrandomized designs or extrapolations of results from similar sectors (eg, inpatient rehabilitation). Thus, the studies described in this review can be used as preliminary evidence to support the implementation of interventions to improve physical activity, but discretion should be used when interpreting the efficacy of these interventions.

Discussion

This review identifies several strategies for promoting physical activity for LTC residents, including incorporating simple strategies into daily activities, participating in group activities (eg, exercise, dance, or music therapy), using motivational strategies to encourage staff to promote activity, leveraging the physical environment, reducing physical and chemical restraints, and using innovation solutions like robots or interactive technology. While the quality of evidence to date is limited, preliminary work suggests that strategies identified in this paper could be included as part of a multifactorial approach to increasing physical activity in LTC.

The current evidence does not suggest that any one strategy is more effective at improving physical activity,

and it is likely that LTC homes will need to employ a combination of strategies to help residents move more. Additionally, residents' preferences, goals, and capabilities should always be considered when designing an individualized physical activity plan. For example, if a resident does not like to be outdoors or gardening but enjoys dancing and music, then their physical activity plan should include group dance class and music therapy rather than gardening. LTC homes will need to have a menu of opportunities for movement that residents can choose from so that activities are pleasant and motivating, and therefore more likely to be completed.

Many of the interventions described in this review are safe and feasible to implement with residents who have physical or cognitive impairments. Function-focused care is scaled to the residents' capabilities and did not increase the risk of falling, though LTC staff require the skills to scale physical activities appropriately.[18] Likewise, group dance activities and music therapy were tested with residents with dementia, with no adverse events reported.[21,24] However, more work is needed to determine the feasibility of implementing emerging methods, such as robotics and interactive technology, for increasing physical activity for residents with physical and cognitive impairments. Most studies to date have included mobile residents or those with minimal cognitive impairment. Similarly, outdoor garden spaces may be less safe for residents who use walkers or wheelchairs if there is an opportunity for them to slip off paths or get stuck in mud or mulch. LTC homes implementing any of these interventions should evaluate the benefits and risks of each intervention, the resources available within the home to support them (eg, trained staff), and the target residents' physical and cognitive capabilities.

While increasing physical activity is important, structured exercise is needed to see gains in components of physical fitness such as strength, aerobic capacity, and balance. Indeed, one major consideration highlighted by the aforementioned task force is that every resident who does not have contraindications must also have a personalized multicomponent exercise program as part of their care plan.[8] The task force recommends moderate- to high-intensity strength, aerobic, and balance exercises 2 times per week for 35 to 45 minutes per session.[8] There is an interrelationship between physical activity and structured exercise: structured exercise programs can certainly be part of a physical activity plan, but physical activity can include more than structured exercise. Physical activity also includes any activity that involves movement, such as walking in gardens or between home areas, or physically participating more in personal care activities (eg, assisting with bathing or dressing).[14] Both structured exercise and physical activity are important for LTC residents. Structured exercise provides an opportunity to improve strength and cardiovascular fitness, which aim to decrease the negative effects of sarcopenia and cardiovascular disease, such as disability and death.[59,60] However, structured exercise should not be done daily for the same muscle groups.[8] Rather, it is recommended for LTC residents to engage in structured exercise 2 times per week.[8] Increasing physical activity is a daily goal, as daily physical activity decreases sedentary time, which has negative consequences such as decreased mood[61] and increased mortality.[62] LTC homes should incorporate strategies to both increase daily physical activity and promote individualized, structured exercise programs.

Conclusion

Residents in LTC spend much of their time in sedentary activities such as sitting or lying in bed. Physical activity is important to help decrease the negative effects of sedentary time, like poor mood and increased risk of death, and to improve physical function. This review describes several strategies to promote physical activity within LTC homes, such as leveraging daily activities and the physical environment, providing group activities, reducing physical and chemical restraint use, and using innovative technology such as robots. LTC homes can use the information in this review to plan strategies to promote physical activity.

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