The Importance of Physical Activity in the Elderly

A Research Paper by the All4Smiles Research Team

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Abstract

In this report, our research team examined the relationship between physical activity and the elderly. Through intensive reading and examination of high-quality sources, we compiled our August edition, made of five papers that look at a specific lens within the topic of focus. In this paper, we examined the biological, neurological, and psychological importance of consistent physical activity among the senior population. Further, we looked at possible methods of implementing an effective physical activity campaign for elderly.

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Physical Activity in Moderation:

Staying active has proven to prolong cognitive function and social well-being; as well as physical, emotional, and mental health. Physical activity keeps our balance and stability in check, resulting in less chances of falling. Nonetheless, the body has its limits– it is recommended that those over the age of 65 partake in moderate-intensity activities for around 150 minutes per week so as to not overwork it. Overexerting the body can be damaging and demotivating; so it is important that instead of burning out, seniors consistently exercise in manageable increments.

Seniors should be physically active around 5 days a week, for 30 minutes each day. Exercising in moderate-intensity increments of at least 10 minutes is ideal– but even more importantly, practicing within the body's limit is crucial in order to keep it from feeling worn out and to prevent injury.

Risks of Physical Inactivity:

Physical inactivity can lead to obesity, higher blood pressure, and type 2 diabetes. Not consistently staying active can result in a higher chance to develop coronary heart disease, and weakens the immune system, which is necessary to fight off any other diseases and sicknesses. Good mental health is an essential to living a full life, and physical exercise is a significant contributing factor to our emotional well-being. There are a surplus of activities done with friends and family, which could open a door for socializing and spending time in the company of our loved ones.

Finding the Right Balance:

The amount and intensity of physical activity greatly depends on the individual. In order to prevent burnout and fatigue, it is important to take into account the individual's needs and physical condition. When getting into the routine of staying active, easing into the amount of energy being used is ideal. This means that for seniors who haven't been consistently exercising, starting slow is recommended for injury prevention, and to get a good idea of the individual's personal needs and capabilities.

When exercising, there is a lot of energy being exerted– getting enough nutrients and staying hydrated is essential in order to benefit from being active. When the body is being denied the energy and nutrients it needs to recover, physical activity can be more harmful than it is helpful. Moderation is everything– paying attention to our intake and amount of exercise will help each individual find a routine that suits them best.

Association Between Physical Activity and Neurodegenerative Diseases in Elderly

For most neurodegenerative diseases– including Alzheimer's disease (AD), Parkinson's disease (PD), Huntington's disease (HD), and frontotemporal lobar dementia (FTD)– age is the primary risk factor. All of the aforementioned diseases are much more common in elderly patients, and the risk increases with age. For instance, incidence of AD nearly doubles every five years after the age of 65. If that was not frightening enough, for those that reach the age of 90, about 1/3rd meets the criteria for dementia.

Neurodegenerative Diseases

What exactly are neurodegenerative diseases and what makes them so devastating? In simple terms, neurodegenerative diseases damage parts of the brain and nervous system through killing cells in those areas. As this damage worsens, those affected lose the abilities that those damaged areas once controlled. These effects are unfortunately incurable.

In AD, certain proteins accumulate within the brain. These plaques that form cause disruptions in the hippocampal circuitry, which leads to poor short-term memory consolidation. This is also accompanied by extensive neuronal loss, faulty synaptic connections, and damage to the essential neurotransmitter systems necessary for brain functions, including memory. In fact, the most common clinical symptom of AD is selective memory impairment. Other functions, like declarative episodic memory (which is controlled by the hippocampus and medial temporal lobe), executive function, judgment, and problem-solving are also impaired.

Like AD, Parkinson's is a progressive neurological disorder. It causes tremors, muscle stiffness, unsteady walking, and balance and coordination issues over time. In PD, the frontal cortex often decreases in size while ventricles often grow in size. The most distinctive feature of PD is the loss of pigmentation in the locus coeruleus and substantia nigra pars compacta, which

are part of the brain that control bodily movement and overall cognition and behavior. This happening is a result of the loss of dopaminergic neuromelanin-containing neurons. The loss of these neurons causes a decrease in dopamine concentration, which impairs overall brain function.

Huntington's disease is incredibly similar to the previous two mentioned, also causing a loss over control of movement, thoughts, and emotions. This disease is strictly genetic, unlike Parkinson's, which can be both genetic and non-genetic. HD is caused by the mutation of a single gene, which then codes for the production of a toxic protein that damages neurons in the brain that are responsible for movement, cognition, and personality. FTD is much rarer than the previously mentioned diseases. It is a type of dementia that damages the frontal and temporal lobes of the brain by causing them to shrink, creating unwanted changes in thinking and behavior.

The Role of Physical Activity

So what role does physical activity play in all of this? Well, it is an extremely effective preventive measure for neurodegenerative diseases like those mentioned. In a study by the Health and Retirement Study Consumption and Activities Mail Survey, it was found that elderly who participated in physical activity were less likely to be diagnosed with AD or dementia later on. The current body of evidence in this field has consistently proven this point time and time again. As reported by *Neurology Journals*, the most widely read and highly cited peer-reviewed neurology journal, consistent physical activity is associated with a reduced risk for multiple types of dementia and other neurological diseases, especially Alzheimer's disease.

Regardless of whether physical activity conducted is light or vigorous, there are positive effects in preventing the risk of neurodegenerative diseases. These results are also consistent on a global basis. For instance, in a 2017 Taiwanese study, it was found that light physical activity is

associated with reduced cognitive decline in elderly. In addition, a 2022 Japanese paper reported that total physical activity and leisure-time moderate to vigorous physical activity were associated with a reduced risk of dementia. And in a Korean study from 2021, just overall increased physical activity was positively correlated with a reduced risk of dementia.

In addition, these benefits are maintained regardless of the kind of exercise. In a 2022 U.K. study, it was found that 10,000 steps a day can lower the risk of dementia. On the other hand, several meta-analyses from various countries conducted in 2016 and 2020 found that aerobic exercise has a positive effect on cognition in dementia patients and can reduce cognitive decline in those with mild cognitive impairment.

Key Takeaways

As established by the existing body of literature regarding physical activity and its association with the development of neurodegenerative diseases in elderly, exercise is an incredibly effective preventative measure to lessen the risk of disease progression. Especially considering how there are no existent cures to reverse the effects of neurodegenerative diseases, prevention and advocating for proper measures are of the utmost necessity. Staying physically active is an extremely functional avenue for accomplishing this. However, it is not the only action elderly must take against neurodegenerative disease development. In fact, trying to prevent the progression of these conditions is ideally a lifelong pursuit. For those who are younger and have a family with a known history of neurodegenerative diseases, it is important that they eat a balanced diet, maintain a healthy weight, wear safety equipment to avoid any unnecessary traumatic brain injuries that can increase the risk of neurodegenerative diseases, and continue to see a doctor annually. Even for those who do not have a familial history of neurodegenerative diseases, it is important to follow these guidelines as well.

The Correlation Between Physical Activity and Cognition in Elderly

Engaging in physical activity is increasingly recognized as a crucial factor in improving cognitive health among the elderly. As people age, many aspects of their physical and mental health naturally decline. It's essential for older adults to be aware of these changes and take proactive steps to counteract them, thereby preventing negative impacts on their daily lives.

Incorporating physical activities might seem challenging, but even simple exercises can offer significant benefits. Activities like walking, swimming, and running are not only accessible but also highly effective for boosting cognitive health. Aerobic exercises, in particular, increase blood flow to the brain, reduce inflammation, and promote the growth of new brain cells, all of which are vital for maintaining mental sharpness. Partaking in both aerobic and strength training exercises can have numerous benefits:

Declining Risk of Dementia:

Physical activity is strongly linked to a lower risk of dementia, including Alzheimer's disease. Regular exercise enhances memory and thinking skills by directly affecting the brain's structure and function. For example, it increases the size of the hippocampus, the area of the brain involved in memory formation. Additionally, exercise indirectly boosts cognitive function by improving sleep, reducing stress, and lowering anxiety levels—factors that otherwise contribute to cognitive decline.

Studies suggest that even moderate amounts of exercise, such as a 30-minute walk five days a week, can significantly reduce the risk of dementia. The important thing that matters is being consistent and not pushing the body beyond its limits.

Improved Quality of Life:

Incorporating exercise into daily routines not only supports cognitive health but also improves overall quality of life. Regular physical activity fosters a positive mood, enhances social engagement, and increases the desire to participate in activities that bring joy. Adding the extra effort can help the health of seniors: maintaining their independence and enjoying life to the fullest.

While aging presents challenges, incorporating even a small amount of physical activity can have significant effects on cognitive health and overall well-being. By utilizing activities that are both enjoyable and beneficial, seniors can improve their quality of life and reduce the risk of cognitive decline.

Barriers and Solutions to Physical Activity in Elderly

Unfortunately, a multitude of barriers to physical activity exist for the elderly. According to the National Library of Medicine, among these includes physical limitations like conditions or aging, lack of professional guidance, and a lack of information about what programs or resources are available. Although most managed Medicare seniors have access to programs like *Silver Sneakers* and *EnhanceFitness*, the vast majority of these members do not take advantage of these. However, by increasing awareness of these inspiring curriculums, we can reduce the barriers one by one and lead the way to a brighter future for the elderly.

First of all, physical limitations are one the main reasons why most seniors are unable to participate. Some common conditions are reductions in muscle mass (age-related sarcopenia), joint stiffness, and decreased flexibility. All of these restrictions make it challenging for the seniors to engage in forms of physical activity, due to the fear of pain or injury. Especially for adults who have experienced major injuries or fallouts in the past, they may avoid physical exercise avidly. Additionally, chronic health conditions like heart disease, diabetes, and arthritis prevent seniors from exercising. The symptoms of these conditions make it difficult for seniors to partake in physical activity, such as shortness of breath and high blood pressure. In order to address these issues, it is important to start small. Seniors can start with at least 10 minutes of exercise at a time. In addition, incorporating proper warm-up and cool-down routines to exercise is essential to prevent injury. Avoiding the times of days when stiffness is high, like early morning, as well as wearing proper loose-fitting clothes and shoes are also solutions. For those with chronic health conditions, communicating with your healthcare providers to develop an exercise routine can help to prevent complications.

Furthermore, without social support, seniors find it difficult to get started in physical activity. Whether it be retirement, changes in social circles, or a loss of a close family member or friend, seniors can become demotivated without the proper guidance. Therefore, seeking out support groups or friends is a great way to get started. Many fitness centers offer classes catered to older adults that provide simple exercises. A lack of knowledge about what resources are available can also be solved by researching local facilities or reaching out to peers and family members. You also don't have to exercise at a gym or physical fitness center, just walking around the neighborhood or the mall is an excellent way to exercise. Transportation services can also take you to any classes you might want to partake in. Finally, many seniors have misconceptions about exercise that prevent them from participating. They might believe that they are too old or frail to benefit from physical activity. The truth is that everyone benefits from physical activity and that it can come in all forms, many of which are free and simple to do.

Overall, with some hurdles to physical activity for seniors comes solutions that are easy to implement. Reaching out to local facilities or getting started on your own by taking a walk in the local park will set you on a journey for self-improvement and longevity. Though these barriers still exist, gaining awareness of them is the first step to achieving physical fitness for all.

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