

## Gerontology and Physiological Changes

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### About the Study

Ageing is associated with many neurological disorders, as the capacity of the brain to transmit signals and communicate reduces. Loss of brain function is the biggest fear among elderly which induces loss of the very persona from dementia (usually Alzheimer's disease). Multiple other neurodegenerative conditions like Parkinson's disease or the sudden devastation of a stroke are also increasingly common with age.

Alzheimer's and Parkinson's disease are the progressive neurodegenerative diseases associated with ageing. Alzheimer's is characterized by progressive cognitive deterioration along with a change in behavior and a decline in activities of daily living. Alzheimer's is the most common type of pre-senile and senile dementia. The disease causes nerve cell death and tissue loss throughout the brain, affecting nearly all its functions. The cortex in the brain shrivels up and this damages the areas involved in thinking, planning and remembering. The shrinkage in nerve cells especially severe in the hippocampus as well as the ventricles also grows larger. Alzheimer's disease causes an overall imbalance among the elderly by causing memory loss, changes in personality and behavior-like depression, apathy, social withdrawal, mood swings, distrust in others, irritability and aggressiveness.

According to the World Health Organization, nearly 5% of men and 6% of women aged 60 years or above are affected with Alzheimer's-type dementia worldwide. Stroke is another common cause of mortality worldwide. A mild decline in the overall accuracy is observed with the beginning of the 60s that progresses slowly, but sustained attention is good in healthy older adults. Cognitive function declines and impairments are frequently observed among the elderly. Normally, these changes occur as outcomes of distal or proximal life events, where distal events are early life experiences such as cultural, physical and social conditions that influence functioning and cognitive development.

Cognitive decline results from proximal factors including processing speed, size of working memory, inhibition of extraneous environmental stimuli and sensory losses. This is a treat to the quality of life of those affected individuals and their caregivers. Impaired cognition among elderly is associated with an increased risk of injuries to self or others, the decline in functional activities of daily living and an increased risk of mortality. Mild cognitive impairment is

increasingly being recognized as a translational state between normal ageing and dementia.

Normal ageing is characterized by a decrease in bone and muscle mass and an increase in adiposity. A decline in muscle mass and a reduction in muscle strength lead to risk of fractures, fatality, reduction in the quality of life and loss of independence. These changes in musculoskeletal system reflect the aging process as well as consequences of a reduced physical activity. The muscle wasting in frail older persons is termed 'sarcopaenia'. However, studies show that on an average, men have larger amounts of muscle mass and shorter survival than women. This makes sarcopaenia potentially a greater health concern among women than among men. Age-related deterioration of muscular strength and balance control mechanisms has been associated with a reduced performance on functional tasks.

More people living into advanced old age means that incidences of dementia, for which advanced age is a major factor, will increase. Dementia is a term for a range of diseases and conditions and dementia care is complex and multifaceted. Dementia impacts individuals, families and communities and is a prompting a re-evaluation of local and global care systems. Until relatively recently, research has predominantly focused on the biomedical aspect of dementia, aiming to find a cure and prolong life. However, there is no cure on the horizon and the focus now is shifting to how to support and care for people, currently living with dementia, to achieve the best quality of life possible. Future research should also focus on how human computer interaction and design can address this challenge and support people living with dementia, it focuses on those who have dementia and stakeholders in their care.

People living with dementia are part of a complex ecology of care. They are members of familial, local and social communities; serviced by local and national healthcare systems; impacted by the economic, legal and citizenship systems; and users of the everyday environment and so, effected by decisions made in relation to infrastructure and urban planning. With ageing, toxins and chemicals build up within the body and tissues. As a whole, this damages the integrity of muscle cells. Physical activity also decreases with age, due to change in lifestyle. Somehow, the physiological changes of the muscles are aggravated by age-related neurological changes. Most of the muscular activities become less efficient and less responsive with ageing as a result of a decrease in the nervous activity and nerve conduction.