



CG Analysts

Slowing the biological clock: how lifestyle choices influence ageing

Dr Jyotsna Kamble
Medical Underwriter
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Introduction

Ageing can be described as the progressive physiological changes in an organism that leads to senescence (the process of growing old).¹ It is characterised by a decline in biological functions and a reduced ability to adapt to metabolic stress. The description highlights ageing as a process involving continuous physiological alterations occurring at the cellular and organ levels, resulting in decreased functionality. The process of ageing gradually diminishes an individual's physical and mental capacities.

While ageing is fundamentally a physiological phenomenon, numerous factors significantly influence the rate at which this process occurs. Certain factors can accelerate the ageing process, while some have the potential to decelerate it, influencing the rate of physiological decline.

Healthy ageing is defined as the process of developing and maintaining the functional ability that enables well-being in older age. Functional ability encompasses the capacities that allow individuals to be and do what they value, which include meeting basic needs, learning, growing, and making decisions, being mobile, building and maintaining relationships and contributing to society.²

According to WHO, functional ability results from the interactions between intrinsic capacity and environmental characteristics. Intrinsic capacity refers to an individual's mental and physical capacities, while environmental characteristics pertain to the attributes of their home, community, and society as a whole.³

Globally, life expectancy is increasing, with a majority of individuals now anticipated to live into their sixties and beyond. This trend is evident across all countries, where both the size and proportion of the elderly population are rising. According to the 2020 American Census, about 1 in 6 people were aged 65 and over. In 1920, this proportion was less than 1 in 20. The older population reached 55.8 million or 16.8% of the population of the US in 2020, growing nearly five times faster than the total population over the 100 years from 1920 to 2020.⁴

An extended lifespan presents opportunities not only for older individuals and their families but also for society as a whole. These additional years can facilitate engagement in new pursuits such as education, career development, and the exploration of life experiences. However, the fulfilment of these opportunities is fundamentally dependent on health.⁵

This article explores some of the factors which could potentially slow down the ageing process and extend life expectancy.

¹ [Ageing | Definition, Process, & Effects | Britannica](#)

² [Ageing as “Time-Related Dysfunction”: A Perspective - PMC \(nih.gov\)](#)

³ [The World Health Organization \(WHO\) approach to healthy ageing - PMC \(nih.gov\)](#)

⁴ [2020 Census: 1 in 6 People in the United States Were 65 and over](#)

⁵ [Ageing and health \(who.int\)](#)

Blue Zones

Blue Zones are geographic regions with lower rates of chronic disease and longer life expectancies. They include certain areas of Japan, Sardinia, Costa Rica and Greece. There are several common elements which contribute to longevity in these regions, and they include the following:

- Nutrition - the population consume balanced diets.
- Physical activity - regular physical activity is integral to daily life.
- Avoidance of risky substances, like tobacco and limited polypharmacy.
- Stress management - effective strategies for managing stress and maintaining good mental health.
- Restorative Sleep - prioritization of adequate and restorative sleep.
- Social connections - strong family ties and social networks.
- Purpose in life - a clear sense of purpose and meaning.
- Belonging - integration into community and social groups.
- Environmental respect - practices that show respect for the planet.

Blue Zones are often coupled with a higher quality of life. However, this scenario is not universal. As individuals age, the probability of health deterioration increases significantly, with many facing diagnoses of chronic diseases, increased risk of falls, and increased dependency. Frailty, characterised by reduced physiological reserves across multiple systems, is linked to increased vulnerability to stressors, leading to higher morbidity and mortality rates. When these additional years are marked by substantial declines in physical and mental capacities, the consequences can be detrimental not only for the individual and family but also for society as a whole.⁶

We will further examine evidence-based insights on how the characteristics of Blue Zones contribute to improved health outcomes and the promotion of a meaningful, well-rounded life.

Exercise

Various forms of exercise are essential, not only for maintaining and promoting health but also for contributing to longevity. Numerous research studies support this assertion. Below, we discuss some of the many benefits of exercise.

A self-reported dataset on leisure-time physical activities from approximately 650,000 individuals in Sweden and the US was analyzed to assess the impact of physical activity on life expectancy. Brisk walking for up to 75 minutes per week was associated with a 1.8-year increase in life expectancy compared to no activity. Increasing this activity to 150 minutes per week correlated with a gain of 3.4-3.5 years. Active individuals with normal weight had a life expectancy increase of 7.2 years compared to inactive individuals with class II obesity (BMI > 35). However, inactive individuals with normal weight had a 3.1 year shorter life expectancy compared to those with class I obesity (BMI 30-30.9) who were active.

These findings suggest that engaging in physical activity, even below recommended levels, reduces mortality risk compared to no activity. Inactive individuals, especially those with obesity, showed

⁶ [Diet and longevity in the Blue Zones: A set-and-forget issue? - PubMed \(nih.gov\)](#)

markedly reduced life expectancy, highlighting the potential health benefits of modest physical activity programs, even if there is no weight loss.⁷

Numerous studies show that specific exercises not only prevent or control disease progression but slow down the ageing processes. For example, resistance training increases muscle strength, metabolic rate, bone density, and reduces body fat, fall risk, and joint pain. It also improves lipid profiles, endothelial function, and overall well-being by stimulating muscle hypertrophy and neuromuscular control.⁸

Regular exercise also improves cognitive abilities and reduces the risk of Alzheimer's disease and mild cognitive impairments. It also enhances mental health by improving self-esteem, sleep, mood, and reducing symptoms of depression and anxiety.⁹

The benefits of various forms of exercise, including aerobic, strength training, stretching, and balance exercises, are well-supported. Each type contributes to physical and mental well-being, promoting a more healthy and longer life.

Yoga

Harvard University states that yoga began, not as a form of physical exercise, but as a practice to achieve spiritual enlightenment and mental discipline.¹⁰ Yoga is an ancient practice with roots spanning millennia and has gained widespread popularity in modern times due to its holistic approach, integrating mind and body. It encompasses breathing exercises, physical postures, meditation, and other techniques aimed at promoting both physical and mental well-being. Historically, yoga has been valued not only for its physical health benefits but also for its positive impact on mental health. Recent research supports the significant effects of yoga on both the mind and body, suggesting that it may positively influence cellular and molecular processes that are hallmarks of ageing. Here, we will briefly summarise the benefits of yoga on various physiological systems.

For the cardiovascular system, yoga is effective for lowering blood pressure in middle-aged and older adults, with or without hypertension. It is also effective in metabolic profiles, for example haemoglobin HBA1C, improvements in lipids and body composition.

Ageing is associated with a decrease in lung elasticity, resulting in a reduced total alveolar surface area. Additionally, chest wall compliance diminishes due to decreased respiratory muscle mass, increased rib cage stiffness, and kyphosis. General physical conditioning through yoga poses can help strengthen respiratory muscles and improve thoracic alignment, thereby promoting optimal breathing mechanics. Specifically, yogic breathing exercises enhance the strength of respiratory muscles and encourage efficient diaphragm use.

⁷ [Leisure Time Physical Activity of Moderate to Vigorous Intensity and Mortality: A Large Pooled Cohort Analysis - PMC \(nih.gov\)](#)

⁸ [Musculoskeletal exercise: Its role in promoting health and longevity - ScienceDirect](#)

⁹ [Physical Activity: A Viable Way to Reduce the Risks of Mild Cognitive Impairment, Alzheimer's Disease, and Vascular Dementia in Older Adults - PMC \(nih.gov\)](#)

¹⁰ [Yoga for Exercise – The Nutrition Source \(harvard.edu\)](#)

Cognitively, yoga has shown moderate benefits on memory. Studies indicate that experienced yoga practitioners exhibit structural brain changes, including increased grey matter density in the insular cortex and hippocampus, when compared to matched controls. Functional neuroimaging also reveals enhanced connectivity within the frontal executive and attentional networks. Yoga may help mitigate cognitive decline by improving stress regulation and optimizing neurocognitive resource efficiency. The combination of mindful yoga movements and meditation may provide cognitive benefits that surpass those of traditional physical exercise. Due to its multimodal approach and ability to address multiple geriatric syndromes simultaneously, yoga is considered an appealing non-pharmacologic intervention. It is popular, feasible, adaptable, and generally safe, especially when practiced under initial supervision.¹¹

Diet

A study conducted in the United Kingdom examined the impact of diet on longevity. The study used a model to estimate life expectancy gains from a sustained change from median or unhealthy dietary patterns in the UK to the longevity-associated dietary pattern, or to the recommendations of the Eatwell Guide. The findings revealed adults aged 40 with median dietary patterns could expect an increase in life expectancy of approximately three years through sustained adherence to longevity-associated diets. Notably, individuals transitioning from the least healthy to longevity-associated dietary patterns could expect an approximate decade-long increase in life expectancy. In general, the more substantial the changes toward a healthier dietary pattern, the greater the expected gains in life expectancy. The dietary modifications included reducing the consumption of sugar-sweetened beverages and processed meats while increasing the intake of whole grains, fruits and nuts, which were associated with the most significant improvements in life expectancy. The improvements in life expectancy decrease with delays in initiating dietary improvements; however, even individuals beginning dietary changes at age 70 could still achieve about half of the life expectancy gain compared to those starting at age 40.¹²

Sleep

Sleep is one of the pillars towards healthy life. According to the American College of Cardiology, getting good sleep can play a role in supporting heart and overall health and ultimately maybe even how long an individual lives. New research presented at the American College of Cardiology's Annual Scientific Session together with the World Congress of Cardiology found that young people who have more beneficial sleep habits are incrementally less likely to die early. Moreover, the data suggest that about 8% of deaths from any cause could be attributed to poor sleep patterns.

Data from 172,321 participants (average age 50, 54% women) of the National Health Interview Survey (2013-2018) examined how various sleep behaviours influence life expectancy. This survey is fielded each year by the Centers for Disease Control and Prevention (CDC) and the National Center for Health Statistics to help gauge the health of the U.S. population and includes questions about sleep and sleep habits. Researchers assessed five factors of quality sleep, using a low-risk sleep score based on survey responses:

¹¹ [The impact of yoga on ageing physiology: A review - ScienceDirect](#)

¹² [Life expectancy can increase by up to 10 years following sustained shifts towards healthier diets in the United Kingdom - PMC \(nih.gov\)](#)

- 1) Ideal sleep duration of seven to eight hours per night.
- 2) Difficulty falling asleep no more than twice a week.
- 3) Trouble staying asleep no more than twice a week.
- 4) No use of sleep medication; and
- 5) Feeling well-rested at least five days a week.

Each factor was scored zero or one, with a maximum of five points indicating the highest quality sleep. Participants with all five ideal sleep behaviours had significantly longer life expectancies - 4.7 years longer for men and 2.4 years longer for women, compared to those with none or only one of the favourable sleep elements. Strong sleep patterns are characteristic of individuals who achieve excellent longevity, living into their 90s and beyond with good health. They maintain regular sleep schedules and spend more time in deep, slow-wave sleep. Consistent sleep schedules strengthen circadian rhythms, benefiting cardiovascular and metabolic health.¹³

Social relationships

Humans are inherently social beings, with a long evolutionary history of forming groups for hunting, protection, and social bonding. Despite substantial evolutionary advancements, social connectedness remains a critical factor for well-being. Experimental evidence shows that social relationships significantly influence mental health, morbidity, and mortality. For instance, Berkman and Breslow's prospective study in Alameda County demonstrated that greater involvement with both formal (e.g., religious organizations) and informal (e.g., friends and relatives) social networks was associated with healthier behaviours over a ten-year period. Social connections impact health behaviours by influencing or regulating health-related habits. These ties can foster a sense of responsibility and concern for others, motivating individuals to engage in behaviours that promote the well-being of both themselves and others. Social networks also provide information and establish behavioural norms, further shaping health habits. Thus, in a variety of ways, social ties may influence health habits that in turn affect physical health and mortality.¹⁴

Pet Ownership

Owning and caring for a pet has a positive impact on longevity. Some of the key factors contributing to this are noted below:

- Pet owners, especially dog owners, are more likely to meet recommended activity levels. One study found that new dog owners increased their walking hours after 12 months, with an average of one extra hour per week. Dog owners have a 34% higher chance of achieving at least 150 minutes of walking per week and a 69% higher chance of engaging in leisure-time physical activity compared to non-owners. Obesity risk is lower among dog owners.
- Pet ownership can aid recovery from cardiovascular events and increase resilience to such events. A study of 2,400 cat owners found a significantly lower risk of death from cardiovascular disease, including stroke and heart attack over 20 years, compared to non-owners. This is thought to be related to the buffering effect on stress that cats offer.

¹³ [Getting Good Sleep Could Add Years to Your Life - American College of Cardiology \(acc.org\)](https://www.acc.org/press-releases/2018/01/11/153636/getting-good-sleep-could-add-years-to-your-life)

¹⁴ [Social Relationships and Health: A Flashpoint for Health Policy - PMC \(nih.gov\)](https://pubmed.ncbi.nlm.nih.gov/26011111/)

- Human-animal interaction triggers the release of hormones like dopamine and oxytocin, promoting relaxation and bonding. This increased relaxation helps protect against stress-related illnesses.
- Pet owners are more socially connected. A study of nearly 400 Australian suburban residents found that pet ownership was associated with increased social contact, interaction, and perceptions of neighbourhood friendliness compared to non-owners. The benefits of social relationships have been covered in the previous paragraph.¹⁵

Conclusion

Compared to previous decades, the healthcare system today is significantly more advanced, characterised by systematic and efficient approaches. However, much of this care tends to focus on individual systems in isolation. As individuals age, multiple systems are affected, often in an interconnected manner. Given the ageing population and its growing size, there is a need to shift focus toward preventive measures and adopt a more holistic approach to healthcare. Current evidence-based interventions emphasise multicomponent physical activity programs, nutritional supplementation, health behaviour education, and modifications to the home environment to address the complex needs of the ageing population.

Here we have given examples which are very basic requirements and are essential towards healthy ageing. There are numerous other factors which influence longevity, such as engaging in hobbies, going on vacations, minimizing gadget use, staying connected with nature, listening to or learning music, or simply taking time out for selfcare. Each of these elements positively impacts overall health. Adopting healthier habits, whether it's exercising, dietary changes or being mindful, not only increases longevity, but also enhances the quality of later life.

From a life settlement underwriting perspective, information regarding lifestyle habits such as cigarette smoking and alcohol consumption is generally readily accessible, whereas other relevant details may be less forthcoming. Given this, it is crucial to be on the lookout for any information that may provide insights into the insured's overall approach to health and well-being. For example, there may be mention of recent or planned vacations or dietary preferences. Similarly, a medical report may include details of the insured's pets or exercise regime, or if they are socially active. A medical report may also give us clues as to the insured's sleeping pattern and mental health status. These small details not only provide insights into the individual's current health status, but also reveal their overall approach to life and well-being.

As discussed, life expectancy can be extended through specific lifestyle choices, underscoring the importance of gathering as much comprehensive information as possible during the underwriting process. This information will help form a holistic view of the insured, which in turn will assist the underwriter in calculating the most realistic and accurate life expectancy prediction.

¹⁵ [The Relationship Between Pet Ownership and Longevity | HABRI](#)