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Ageing – An Overview

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ABSTRACT

The present paper outlines the concept of aging. Ageing is a universal, inevitable, progressive, irreversible, developmental and intrinsic process. The paper throws light on the various social, physical and biological changes coming with advancing age and also discusses the various phases of aging. These physical, social and psychological facets of older adults effect the social functioning and wellness of beings in different ways. The paper suggests some ways to slow down aging and also to get prepared for the coming years and make certain decisions within the time as aging presents its special and unique problems. The paper also presents a brief overview of demographic profile of elderly and theoretical aspects of aging.

Introduction

Aging is a lifelong process starts from conception and continued throughout life and ends with death. Thus, it's a process of growing up and growing old, described with various terms as all human beings are aging from the time of birth. Aging is represented with different labels in different phases of life. Growth and development (in infant years), maturation (adolescence and young stage) and senescence (after age of thirty). Strehler (1959) characterized ageing as destructive - compromising functionality; progressive and irreversible process; intrinsic and universal. Aging is a process that converts young adults into old ones (Miller, 2012). Sociologists viewed ageing not only marked with various physiological and psychological changes occur with time but also accompanied with difficulties in adapting novel social environment and advanced technology.

Phases of Elderly Life or Category of Elders/ Older Adults

Aging is development of the appearance and features of old age. Older adult population can be categorised into three life-stage subgroups:

Subgroup	Age (in years)
a) Young (old)	65 - 74
b) Middle (old)	75 - 84
c) Old (old)	85 +

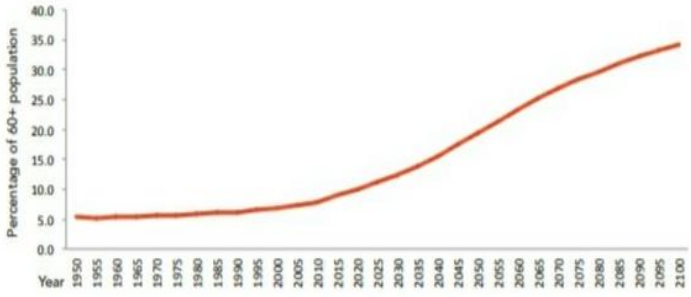
The Ageing Population in India According to its Demographics

According to Census (2011), age categorization of Indian population is done as from birth to 14 years (30.8%), 15- 59 years (60.3%) and 60+ years (8.6%). The Indian census classifies people in the age range 60 years and above as old. Hence, India has 104 million elderly population and it has increased from 5.5% (Census, 1951) to 7.7% (Census, 2001) to 8.6% (Census, 2011). It is projected that older adults' population will increase up to 19% by the year 2050. Table 1.1 represents elderly population of 60+ years as follows:

Table 1.1 Elderly Population age 60 and above (millions)

Census Year	1951	1961	1971	1981	1991	2001	2011
Elderly Population (in millions)	19.6	24.7	32.6	43.1	56.6	76.6	103.8
Percentage (%)	5.5	5.6	6.0	6.2	6.6	7.7	8.6

Figure 1.1 The proportion of the population aged 60 or older in India, from 1952 to 2100



This dramatic transition has resulted from increased longevity, reduced fertility, and rapid advancement in science and technology and better and advanced medical facilities. This depicts emerging need to raise concern over age related issues because rise in elderly population not only increase burden on resources but also develops the demand for holistic care. The government needs to pay attention for the socio-economic and health status of the elderly.

Theories of Aging

Every theory of aging endeavours to provide a framework to comprehend aging from different perspective. Table 1.2 gives brief description about theories of aging:

Table 1.2 Brief Description of Theories of Aging

Biological Theories of Aging	
Theory	**Concept**
Wear and Tear Theory	Body and its cells were damaged by continued usage and impaired functioning results. Cells lose their capability to rejuvenate results into mechanical or chemical exhaustion.
Neuroendocrine Theory	based on the neuroendocrine system and the wear and tear theory.
Genetic Control Theory	A person's life expectancy and rate of ageing are determined by genetic heredity.
Waste Accumulation Theory	Excess waste can obstruct a cell's ability to function normally, which could lead to cell death.
Mitochondrial Theory	One of the simplest targets for damage from free radicals that disables mitochondria is the cell.
Error and Repair Theory	The system is unable to complete all of the necessary fixes. Cell death brought on by faults in the sequence of information transmission, which leads to the production of proteins that are not similar to one another and an inability to carry out normal cellular functions. Incorrect proteins build up in the cells, a process known as error catastrophe, which leads to changes associated with ageing and, eventually, the death of cells.
Cross- linkage Theory	Patients with older immune systems are unable to eliminate excessive glucose from their blood. With age, the tough fibrous protein that holds cells together becomes stiffer, possibly as a result of a molecular process that produces "cross-links" with DNA strands. This results in the stiffening of tissues, the rigidity of blood vessels, the tightness of ligaments and tendons, cataracts, and atherosclerosis.
Gene Mutation Theory	The natural process of ageing is hastened by mutations. Changes caused by mutation can occur in somatic cells. The chromosomal structure of the cell suffers damage, which leads to the synthesis of incorrect proteins and the formation of mutant cells, both of which hasten the ageing process. Mutagenic substances disrupt the normally well-ordered process of cell creation, which in turn inhibits the capacity of cells to produce the critical enzymes necessary for the continued existence of the cell.
Immune system Theory	As individuals age, the immune system becomes less functional, thereby leading to breakdown. The body's capacity to manufacture antibodies and to discriminate between proteins and antibodies decreases with age.
Free radical Theory	Age-related changes take place due to an accumulation of free radicals. The ageing process can be slowed down by strengthening the anti-oxidative defence system to reduce damage caused by free radicals.
Programmed longevity Theory	The length of one’s life and timing of one’s death are pre-programmed and influenced by gene switch.
Telomere Theory	Telomeres are shortened every time our cells cycle, which causes cellular harm and cellular death linked to ageing.
Sociological Theories of Aging	
Activity Theory	In order to have a fulfilling old age, it is important to keep yourself active and engaged.
Disengagement Theory	Withdrawing slowly from social and interpersonal interactions helps one keep their social bearings and provides time for introspection.
Continuity Theory	Personality is stable throughout time and determines both one's positions in life and their level of pleasure with those roles. As older persons adjust to the physical, economical, and social deterioration that comes with ageing and

	begin to anticipate mortality, their previous methods of coping tend to resurface. Major challenges include coming to terms with one's own age cohort, locating a place to live that is suitable for one's restrictions, and acquiring new responsibilities after retirement.
Person- Environment Fit Theory	Ego strength, mobility, health, cognitive ability, sensory acuity, and the surroundings all have a role in how well a certain function works. Ability to respond to changes in one's environment is altered by one's level of competence.
Subculture Theory	The elderly prefers to live apart from the general populace, forming a subculture of the elderly where they can commiserate over their diminished social standing and the general public's negative views of their demographic. Both physical and mental health play important roles in determining one's social standing.
Age Stratification Theory	Resources, positions, prestige, and respect in a society are all determined by one's chronological age. Cohorts of people the same age tend to have similar life histories, perspectives, and expectations about major life events because of the effect of their shared historical background.
Psychological Theories of Aging	
Individualism Theory	A person's personality is made up of their ego, as well as their individual and collective unconscious, which each have their own unique take on life. Finding purpose in life and coping with the functional and social decline that comes with old age are common themes among the elderly.
Life span Theory	Roles, relationships, values, development, and aims all play a significant part in defining and shaping each life stage. Individuals are able to adjust to their shifting social positions and interpersonal connections. The life journey isn't complete without experiencing the defining traits and customs of various age groups.
Human Needs Theory	Human behaviour is driven by five fundamental needs in a lifelong path toward need satisfaction.
Selective Optimization Theory	People choose, optimise, and compensate for their job or activity losses as they age. Morbidity, mortality, and quality of life are important life factors. Successful ageing is facilitated by selective optimization and compensation.

Dimensions of Aging

Aging is worldwide and multidimensional phenomenon. Aging is a biological, natural and universal process. Various theories of aging explained why aging occurs and categorised aging into following:

- Chronological Aging
- Cellular Aging
- Psychological Aging
- Hormonal Aging
- Accumulative damage
- Social Aging

Chronological Aging

It refers to the number of years lived since he/ she was born. A 80 year old man is chronologically older than a woman of 78 years old. It is possible that chronological age of a person differs from his/ her biological, psychological or social age.

Cellular Aging

The accurate functioning of cells to replicate is no longer continued and this replication failure is termed as cellular senescence. It is the consequence of a gradual reduction in the proliferative ability and overall lifespan of cells. During cellular senescence, cells loses their functional features and gets accumulated leading to biological aging. Continuous exposure to exogenous factors, free radicals and environmental factors causes accumulation of cellular and molecular damage and cellular senescence develops.

Psychological Aging

Psychological aging refers to how old one feels, acts and behaves. It comprises changes or impairment in memory, mental functioning (cognition), personality, and learning resulted into slower thinking and responding. Gerontologists are of the view that it is not necessarily that chronological age of a person is equal to his/ her psychological age.

Hormonal Aging

Hormones play an important role in aging process, as

it starts with childhood. These help in building bones and muscles and facilitates the development of secondary characteristics. As life progresses, the output of various hormones diminishes resulting into signs of aging like wrinkles, loss of muscle tone, bone density, loss of elasticity and lessen sex drive. Aging and hormonal functioning is interlinked as endocrine glands functioning affected by aging (receptor sensitivity of cells declines) and hence, aging impaired their functioning and cause changes in hormonal levels.

Accumulative Damage

Continuous accumulation of harmful by-products as the result of various metabolic activities leads to progressive damage to cells. Various external factors like exposure to harmful ultraviolet rays, toxins, accumulation of harmful by products in body causes damage to DNA in cells and promotes aging.

Social Aging

Social ageing is characterised as changes in a person's social network, including their responsibilities and relationships. Social ageing varies from person to person since it is greatly influenced by how a society's culture views ageing. As a result of how society expects individuals to act, ageing may either have a beneficial or bad impact on an individual's perception of it. People's social ageing experiences will be more positive and joyful in a society with a positive attitude on ageing than in one with a pessimistic outlook.

Stages of Aging (Marak, 2016)

1. Self-Sufficiency

Self- sufficiency is the first stage of aging where the older adults are self- reliant. Most of the seniors stay at their homes during this stage. At this stage, aged persons manage their daily activities, health care and other tasks like transport, finance etc independently with ease and need no help or little help. This is the stage where the elders can make decisions or get prepared themselves for their future life in terms of caregiving and the challenges they may face in the aging process as this stage has minor cognitive decline and slower down physical activities but no major change in their life. So, it's the right time to assess and make crucial changes and execute to support yourself through major ups and downs of coming life.

2. Interdependence

Various physiological and psychological changes takes place at this stage leading to decline in physical and cognitive activities and other health issues. An older adult finds routine activities difficult and need support and assistance. Older adults resists for asking help or engaging someone for their take care. They become subjects of depression, stress and anxiety as it is difficult for them to lose their independence.

3. Dependence

This is the stage in which progressive decline in all functional activities occur and an older adult becomes dependent on family members or caregivers. Elders becomes confined to their home and need significant modifications at home and require personal care assistance to manage their medication and monitoring their other daily activities like bathing, clothing, preparing food etc.

4. Crisis Management

This stage requires extra level of care and monitoring of older adults round the clock. This is the phase when dependency increases due to physical ailments, memory loss issues like dementia etc and need immediate medical support.

5. End of Life

This phase represents difficult time for an individual and his/ her family where the life reaches to the final destination in the aging process. By this stage, the ultimate goal is to make older adult to feel comfortable as possible either getting support from home health aides, living in nursing home and receiving medical treatment or stop getting these services.

Changes accompanied with Aging

Aging, the process of becoming old, is a multifaceted biological transition that represents various changes in an entity. When the young attractiveness starts to alter, the physical growth that is so ardently presented in the early stages of life is evaluated extremely unfavourably. The first signs are most likely in our appearance.

Visible Signs of Aging

Skin is a greater signifier of youth and quick to show signs of aging as follows.

1. Fine lines and wrinkles are a result of weakening of elastin and collagen fibres. This leads to loosening of skin and laxity leading to wrinkles.
2. The glowing skin of younger age slowly fades and becomes dull with age due to depleted moisture in the top layer of skin resulting in slower pace of renewal of older skin
3. Due to depletion of moisture, the skin becomes dry and loses radiant appearance. Older skin described as dull and dehydrated skin having dryness.
4. Pores become more visible and bigger in size with age due to loss of skin elasticity and skin being drawn down by gravity.
5. Ageing results the complexion to become uneven due to some parts of the skin harboring more melanin than others, or the changes in the hormonal levels occurs with age. Hence, uneven skin tone is another

visible sign of aging.

6. Age spots, usually, reddish or brown in color are visible. Blotchiness and age spots are resulted due to exposure to UV rays and become more evident in ageing skin.
7. With aging, as renewal of skin cells become slower, dead cells keep on accumulating, the skin texture becomes rough. As the skin matures, uneven and bumpy skin is noticeable.

Other age related structural and functional changes are as follows:

- *Biological Changes:* As with advancing age, i. hair becomes thin and loses their colour and turns gray, wrinkles on face, nails become rigid and brittle ii. receding gums and missing teeth iii. decrease in the secretion of saliva and mucus, lessen contraction of muscles in oesophagus and decline in secretion of gastric juices iv. decline or loss in functioning of senses; taste, smell, vision and hearing v. decrease in cardiac output vi. the lungs lose their elasticity and decrease in size, hence respiratory efficiency declines vii. bone loss, weakened muscles, and loss of elasticity in ligaments, fat replaces lean body mass viii. decrease in size and volume of kidneys, hence functioning of renal decline, risk of urinary tract infections raises.
- *Psychological changes* include memory loss, depression, emotional disorder, stress, Alzheimer's disease, dementia as number of brain cells declines and affects cognition.
- *Social Changes* like retiring from job, living alone, physical activities and social interactions declines, can become easily victims of abuse and fraud. Hence, older adults experience many losses.

Ways to Slow Down the Aging Process

Aging cannot be avoided. Aging of our skin is a combination of natural, environmental and life style factors. Exposure to ultra violet rays, smoking, climatic changes, lack of sleep, stress, alcohol intake, lack of exercise fasten the process of skin aging. Following are methods to slow the aging process naturally:

- *Eat Healthy and Balanced Diet*: Eating fresh fruits and vegetables, having nutritious diet (keep body functioning at optimal levels) and eliminating processed foods that fasten aging (by causing inflammation and weaken the immune system as age progresses) from diet helps to avoid aging related concerns.
- *Physical Activity:* Brisk walk and regular exercise daily can improve longevity compared to no exercise. Adding physical activity or exercise to daily routine helps in maintaining good health. Its benefits not only slow down the aging process but also improves cognition, healthy skin and reduces the risk of chronic conditions.
- *Stay Socially Active*: Maintain good and healthy relationships with family members, relatives and friends and staying connected to them keeps psychologically active and engaged. This reduces risk of various health problems and stress level leads to improve health and helps in improving longevity.
- *Hydration:* Water helps to flush out toxic materials and keep skin glowing and moistened. So, drink at least two litres water daily and stay hydrated.
- *Stop Drinking and Smoking:* Habit of taking alcohol and smoking accelerates aging. These impairs blood circulation and enhances the chance of cancer. These causes wrinkles and dull complexion.
- *Ample Sleep*: During proper night sleep, body cells repair and rejuvenate. Lack of sleep increases cortisol levels, affects the balance of blood sugar level, lead to poor health and shorter life span.
- *Reduce Stress*: Stress and anxiety trigger the increases of cortisol levels in the body which draws the essential minerals and causes diabetes, obesity, depression and loosening of skin. It is advised to learn to decrease stress level with breathing exercises and meditation techniques.

Conclusion

Aging is inevitable and universal process of regular decline of bodily functions and efficiency along with loss of cognition and social roles with feeling of loneliness and depression. There is a need to construct a knowledge base to comprehend how necessities and capabilities of beings changes with age. The projection of increasing share of elderly helps to ensure to develop such future scenario so that elderly live life with dignity.

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