

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
وَقَضَىٰ رَبُّكَ أَلَّا تَعْبُدُوا إِلَّا إِيَّاهُ وَبِالْوَالِدَيْنِ إِحْسَانًا إِمَّا يَبُلُغْنِ عِنْدَكَ الْكِبَرَ
أحدهما أو كلاهما فلا تقبل لهما أفض و لا تنهرهما و قل لهما قولا كريما
وأنفض لهما جناح الذل من الرحمة و قل رب ارحمهما كما ربياني صغيرا
صدق الله العظيم

سورة الاسراء- الآية 23- 24

Introduction



Objectives of the lecture

At the end of this lecture the student will be able to:

- * Define the aging process & the term of geriatric according to scientific base.
- * Identify the components of Successful ageing
- * Classify the elderly & explain the factors result in change in Saudi Arabia's age structure .
- * explain the relationship among Aging, Disease, Disability, and Death
- * Describe some of the theories of aging processes in human beings.

Definition of aging

- * is the accumulation of **Irreversible** changes in a person over time. Ageing in humans refers to a multidimensional process of physical, psychological, and social changes.
- * It is an artificial concept which describes physiological changes that occur with advancing age and varies from individual to another.

Definition of aging

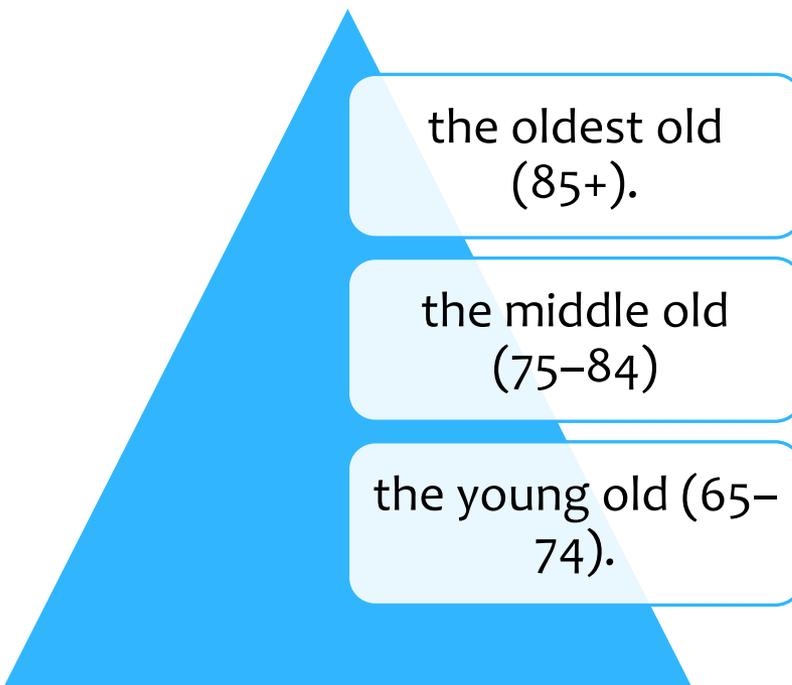
- * Age is measured chronologically, and a person's birthday is often an important event.
- * Chronological ageing may also be distinguished from "social ageing" (cultural age-expectations of **how people should act as they grow older**) and "biological ageing" (an organism's physical state as it ages).

Definition of Geriatric

is the branch of medicine concerned with the diagnosis , treatment and prevention of disease in older people and the problems specific to aging

So geriatrics deals with the care of the elderly

Classification of elderly



the oldest old
(85+).

the middle old
(75–84)

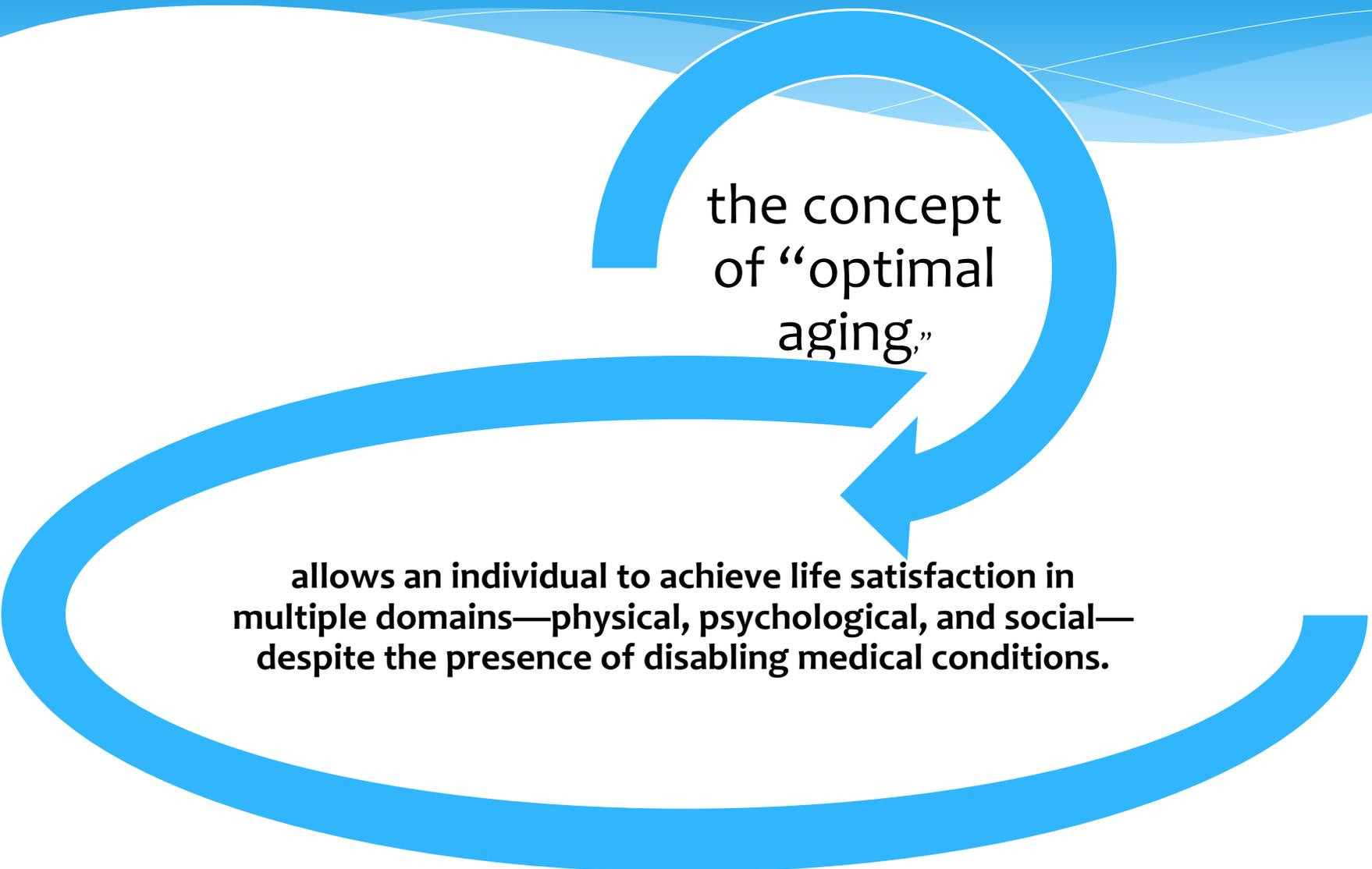
the young old (65–
74).

However problematic this is, chronological age does not correlate perfectly with functional age, i.e. two people may be of the same age, but differ in their mental and physical capacities

Successful Vs. Optimal Aging

The Concept of Successful ageing consists of three components:

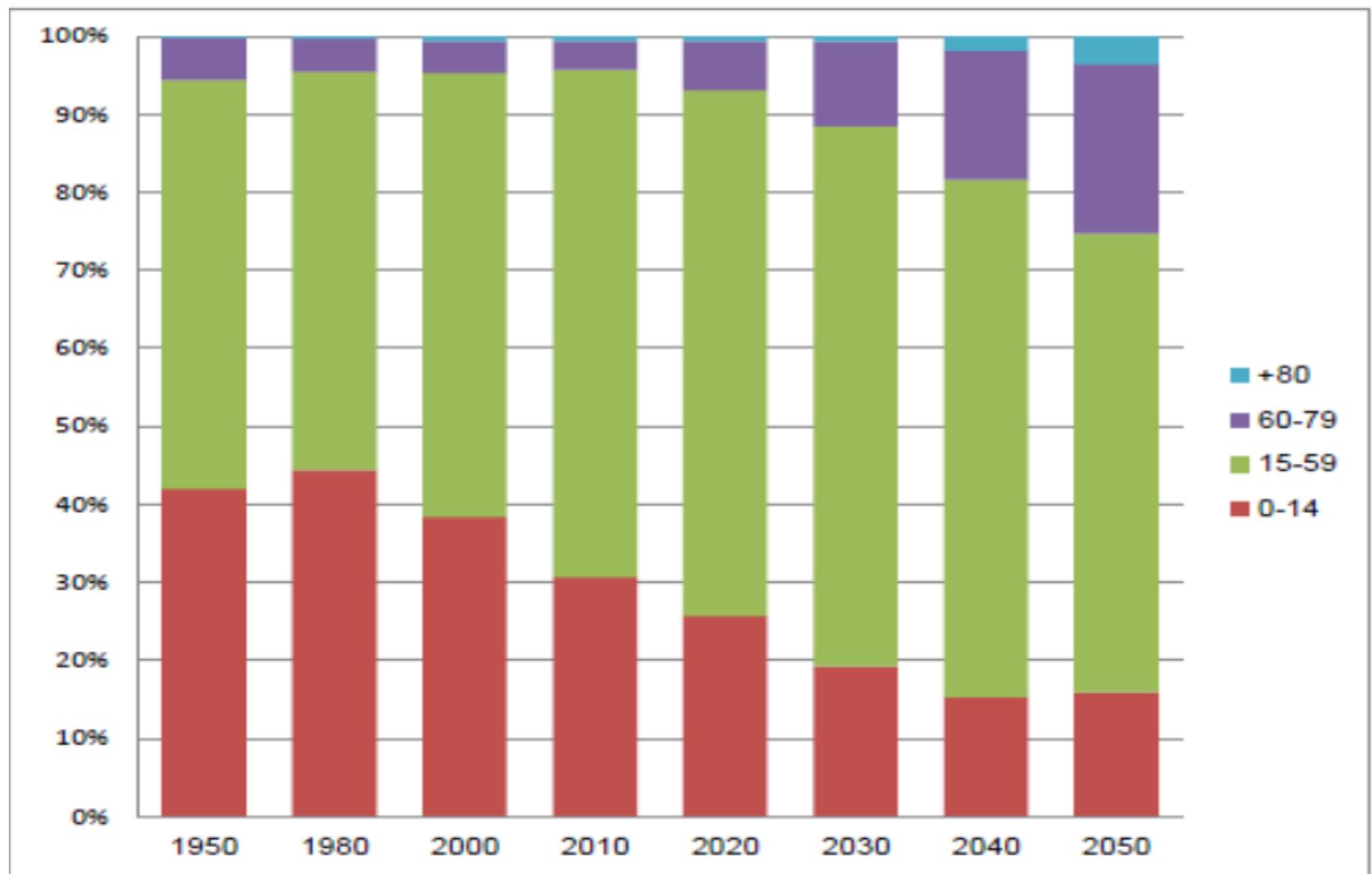
- * Low probability of disease or disability;
- * High cognitive and physical function capacity;
- * Active engagement with life.



the concept
of “optimal
aging,”

**allows an individual to achieve life satisfaction in
multiple domains—physical, psychological, and social—
despite the presence of disabling medical conditions.**

Figure 3: Age structure changes in Saudi Arabia



Source: The United Nations

Demography Saudi Arabia's age structure

Change in Saudi Arabia's age structure due to :-

1- increase in life expectancy

2- decline in fertility rates.

3- decrease in birth and death rates.

4- changes in the lifestyles of the elderly

Morbidity & Elderly

About 80% have at least one chronic condition and 50% have two or more.

Arthritis

more common
among women

Hypertension

more common among
women

Heart disease

more prevalent among
men

Stroke

More in non-Hispanic
blacks

Diabetes
equally

Hearing and vision
impairments

Fractures

Osteoporosis
is four times more likely
among women and
substantially increases
the risk of fracture

Aging, Disease, Disability, and Death

aging

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graph TD; A[aging] --> B[Gradual decrease in physiological capacity of various system]; B --> C[Increase provenance of diseases eg. Arthritis , stroke, hypertension, dementia]; C --> D[Decrease in function capacity]; D --> E[Obesity, falls, depression social isolation]; E --> F[Chronic disability]; F --> G[Death];
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Gradual decrease in physiological capacity of various system

Increase provenance of diseases eg. Arthritis , stroke, hypertension, dementia

Decrease in function capacity

Obesity, falls, depression social isolation

Chronic disability

Death

why aging

- * There are two kind of theories to explain why aging occurs

Theories based on intrinsic factors

Theories based on extrinsic factors

Theories based on intrinsic factors

- * These theories indicated that aging is intrinsic to the organism and is genetically controlled and programmed .
- * **The Neuro-endocrine Theory** is focusing on the neuro-endocrine system, the complicated network of biochemicals that governs the release of our hormones and other vital bodily elements
- * Different organs release various hormones all under the governance of the hypothalamus

Cont.

- * Hormones are vital for repairing and regulating our bodily functions.
- * aging causes a drop in hormone production, it causes a decline in our body's ability to repair and regulate itself as well.

Theories based on intrinsic factors

- * **Errors and Repair Theory:** According to this theory, the aging process is, in part, caused by damage to the genetic structure of the DNA
 - * It states that, while the cell can repair over 99 % of these point mutations, thousands of errors go un-repaired each day, leading to a life-long accumulation of molecular rubbish that, in turn, leads to errors in the manufacture of related proteins and helps accelerate the aging
- * **The free redical theory**

It state that the accumulation of free radicals, which are very reactive, can cause random damage within the cell .

Cont.

- * Free radical

is a term used to describe any molecule that differs from conventional molecules in that it possesses a free electron, a property that makes it react with other molecules in highly volatile and destructive ways.

In a conventional molecule the electrical charge is balanced. Electrons come in pairs so that their electrical energies cancel each other out.

Cont.

- * free radicals also attack the structure of our cell membranes, creating metabolic waste products, including substances known as **lipofuscins**.
- * An excess of lipofuscins in the body is shown as a darkening of the skin in certain areas, so-called "aging spots."



Cont.

* Lipofuscins in turn interfere with:

1. The cells ability to repair and reproduce themselves
2. They disturb DNA and RNA synthesis.
3. Interfere with synthesis of protein.
4. Prevent the body from building muscle mass.
5. Destroy cellular enzymes, which are needed for vital chemical processes.
6. attack& break collagen and elastin, where folds of skin and deep-cut wrinkles are resample.

Cont.

- * This type of free-radical damage begins at birth and continues until we die.
- * In our youth its effects are relatively minor since the body has extensive repair and replacement mechanisms that in healthy young people function to keep cells and organs in working order.
- * The first line of defense against free radicals consists of three protective antioxidant enzyme systems within the cell.
- * With age when people age, their ability to make these important functional proteins starts to falter. Once cells can no longer make sufficient amounts of these antioxidants, or produce faulty copies that don't work very well, then free radicals begin to accumulate and oxidative damage begins to take its toll.

Theories based on extrinsic factors

- * These point out that aging results from either environmental insults or mistake.
- * One of these theories suggested that background radiation may produce cellular mutations that accumulate and lead to function failure & death.

Theories based on extrinsic factors

- * Also photochemical event that is the end product of the UVR induced chemical excitation due to over-exposure to sunlight → alteration in cell biochemistry & cellular metabolism. → alteration in the synthesis of DNA & RNA, Protein & enzyme production → cell inactive or dead .

Theories based on extrinsic factors

- * **Wear and Tear Theory:** Posed by Dr. August Weismann (1982), the theory postulates that the daily grind of life, in particular **abuse or overuse**, leading to disease states & damaged of cells .
- * The degeneration of cartilage and eventual grinding of bone on bone is an example of the aging process on body joints, as wear and tear exceed the body's ability to repair.

Cont.

- * With age the body loses its ability to repair damage caused by diet, environmental toxins, bacteria or a virus. Thus many elderly people die of diseases that they could have resisted when they were younger.
- * So there is more than one factor responsible for aging , possibly a combination of intrinsic & extrinsic factors

Q?
Thank you

