

# Geriatrics health

## Community medicine seminar

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### 1- Differentiate between Geriatrics and Gerontology:

Geriatric Medicine:

is a medical specialty that focuses on the treatment and care of the elderly. The term "elderly" has no set definition; normally, individuals over the age of 65 are eligible for treatment at elder care institutions.

Gerontology:

is the study of the physical elements of aging, as well as the mental, social, and societal ramifications of aging. As the average life expectancy has increased, researchers have had more opportunity to examine the impacts of aging on individual patients, expanding their knowledge in the field. Gerontology, which analyzes how aging affects the economy and social networks, can have an influence on policy.

Geriatric vs Gerontology:

Geriatrics is concerned with the care of the old and their needs, whereas gerontology is concerned with the study of aging and its effects on society. Geriatricians deal with the care of the elderly, whereas gerontologists assist in the education and knowledge of aging. Gerontology employs an interdisciplinary approach to investigate and solve the difficulties that the old people experience. Geriatricians deal with the problems that their patients may be dealing with right now.

## 2- Physiological and pathological aging:

Constructing a single definition of aging can be challenging due to the wide variety of considerations; social, behavioural, physiological, morphological, cellular and molecular changes (Balcombe & Sinclair, 2001). Nonetheless, it can simply be defined as the process of becoming older. This process is thought to be genetically determined and environmentally modulated, leading to the decay of an organism's overall structure and function (Davis, 2021; Rodríguez-Rodero et al., 2011). This decline can be physiological or pathological.

**Physiological aging:** is the process of aging that occurs due to normal changes that are not secondary to disease states (*"Physiology of ageing"*, 2019). These changes include:

Neurological:

- Overall cerebral atrophy.

Cardiovascular system:

- Decreased cardiac output
- Vascular stiffness.

Respiratory system:

- Decreased elasticity
- Dilatation of alveoli, enlargement of airspaces

Gastrointestinal system:

- Decreased colonic motility
- Decreased intestinal absorption

Renal system:

- Decreased number of functional glomeruli
- Decreased GFR

All of these changes lead to the organ's loss of function and compensation, predisposing to many diseases and pathologies. (Flint & Tadi, 2020; Janssens et al., 1999; Soenen et al., 2016; Strait & Lakatta, 2012)

**Pathological aging:** Changes that occur because of age-related disease, as distinct from changes associated with normal healthy aging.

Most internal functions begin a gradual but continuous decline with aging. There are a variety of pathophysiological changes that occur to different body systems as we age.

#### Bones and Joints:

- Osteopenia: moderate loss of bone density
- Osteoporosis : the most commonly used bone measurement test to screen for osteoporosis is central DXA , it measures BMD at the hip and lumbar spine. Most treatment guidelines recommend using BMD to define osteoporosis and the treatment threshold to prevent osteoporotic fractures.
- The amount of calcium decreases as its absorption from food decreases.
- Certain bones are weakened more than others(femur, radius , ulna and vertebrae) making them prone to fractures.
- Damage to the cartilage often leads to osteoarthritis.

#### Muscles and Body Fat:

- Reduction in muscle mass and strength.
- Sarcopenia results from disease or extreme inactivity along with aging.
- During periods of inactivity, older people lose muscle mass and strength much more quickly than younger people do.
- By age 75, the percentage of body fat typically doubles compared with what it was during young adulthood. It can increase the risk of diabetes.
- Regular exercise to strengthen muscles (resistance training) can partially overcome or significantly delay loss of muscle mass and strength.

#### Eyes:

- A change in vision is often the first undeniable sign of aging.
- Changes in the lenses of the eye can cause or contribute to the following:
  1. Loss of near vision(presbyopia): this occurs because the lens in the eye stiffens making an ultimate need for reading glasses.
  2. Need for brighter light: because seeing in dim light becomes more difficult because the lens tends to become less transparent.
  3. Changes in color perception.

#### Ears:

- Age-associated hearing loss (presbycusis).
- Earwax, which interferes with hearing, tends to accumulate more.

#### Mouth and Nose:

- Generally, when people are in their 50s, the ability to taste and smell starts to gradually diminish.
- taste buds on the tongue decrease in sensitivity.
- The ability to smell diminishes because the lining of the nose becomes thinner and drier and the nerve endings in the nose deteriorate.
- The gums recede slightly > the teeth are more susceptible to decay and cavities and thus tooth loss is more likely.

#### Skin:

- The skin tends to become thinner, less elastic, drier, and finely wrinkled
- The skin changes partly because collagen and elastin chemically changes and becomes less flexible and tears more easily
- The fat layer under the skin becomes thinner (help to protect, conserve body heat and support the skin).
- People become less sensitive to pain, temperature, and pressure, and injuries may be more likely.
- The risk of vitamin D deficiency increases.

#### Brain and Nervous System:

- Levels of neurotransmitters in the brain tend to decrease, but some increase.
- Nerve cells may lose some of their receptors for. Blood flow to the brain decreases.
- Because of these age-related changes, the brain may function slightly less well
- Some mental functions such as vocabulary, short-term memory, the ability to learn new material, and the ability to recall words may be reduced after age 70.
- Nerve conduction is slower.

#### Heart and Blood Vessels:

- The heart and blood vessels become stiffer.
- Hypertension.

#### Lungs and the Muscles of Breathing:

- The muscles used in breathing tend to weaken
- The number of alveoli and capillaries in the lungs decreases. Thus, less oxygen absorption.
- The lungs become less elastic and less capable to fight infections.

#### Digestive System:

- The muscles of the esophagus contract less forcefully
- Food is emptied from the stomach slightly more slowly > because it is less elastic.
- The digestive tract may produce less lactase > as a result, older people are more likely to have lactose intolerance.
- The liver tends to become smaller in size with less blood flow.
- Liver enzymes that help the body process drugs and other substances work less efficiently.

#### Kidneys and Urinary Tract:

- The kidneys tend to become smaller with less blood flow.
- Blood filtration is less efficient.
- The bladder muscles weaken and may contract unpredictably (become overactive).
- Older people have urgency > (urinary sphincter) is less able to close tightly and prevent leakage.
- Urinary incontinence (uncontrollable loss of urine).
- Urinary retention > this disorder requires immediate medical care.

#### Endocrine System:

- The levels and activity of some hormones produced by endocrine glands decrease.
- Aldosterone levels decrease, making dehydration more likely.
- Growth hormone levels decrease, leading to decreased muscle mass.
- Insulin is less in production and effectiveness > prone to type 2 diabetes.

#### Blood Production:

- The amount of active bone marrow decreases, therefore fewer blood cells are produced.
- Bone marrow is less able to increase its production of blood cells in response to the body's needs (anemia, infection or bleeding).

#### Immune System:

The cells of the immune system act more slowly. This immune slowdown may partly explain several findings associated with aging.

- Cancer is more common among older people.
- Vaccines tend to be less protective in older people
- Some infections, such as pneumonia and influenza, are more common among older people and result in death more often.

### 3- Health Problems of Elderly Globally:

As people age, they are more likely to experience several health conditions at the same time. Common health issues in the elderly population can be classified into three main categories:

- Physical Health problems: chronic diseases, hearing loss, impaired vision, cataracts and refractive errors, cancer, oral and dental problems.
- Psychological Health problems: depression, Alzheimer's, dementia, and sleep disorder.
- Social Health problems: loneliness and social isolation.

Polypharmacy:

Polypharmacy in older adults is a global problem, it is defined as taking 5 or more medications including prescribed medications, over-the-counter and herbal preparations. Polypharmacy in the older adult population is not surprising, as this population has a high prevalence of medical comorbidities.

clinical consequences of polypharmacy in older adults:

1. development and worsening of geriatric syndromes.
2. increase the risk of adverse drug events (ADEs) and avoidable hospitalizations.
3. increase health care costs for the patient and the health care system.

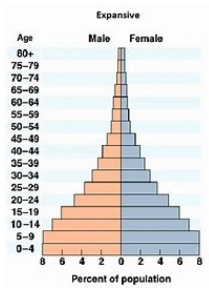
Geriatric Syndrome:

Geriatric syndrome primarily refers to one symptom or a complex of symptoms with high prevalence in geriatrics, resulting from multiple diseases and multiple risk factors. and include frailty, urinary incontinence, falls, delirium, and pressure ulcers.

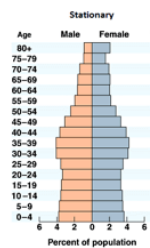
### 4- Demographic Changes Associated with Aging:

Elderly play an important role in shaping our societies. However, this dependent group has a stronger impact on the financial, public, and health aspects in comparison to other age groups, as a result creating a burden on the overall population. It was estimated that by 2050 more than 21% of the world's population will be aged 65 and above (He et al., 2016).

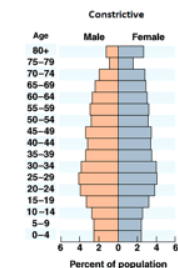
Changes in the demography can be monitored through a population pyramid which considers the age and gender variables. There are three different types of population pyramids, each of which represent different characteristics of a population including the different age groups, the migration, and the fertility and mortality.



The first type of population pyramid is the expansive pyramid, a triangular pyramid with concave edges, a wide base, and a tapering apex. This pyramid usually reflects low income or developing countries in which there is a high fertility rate and high mortality rate (Boucher, 2020).



The second type of population pyramid is the stationary pyramid, a rectangular shaped graph with similar sized age group distribution. The stationary pyramid represents developed populations with uniform fertility and mortality rates (Boucher, 2020).



Lastly, the third type of population pyramid is the constrictive population pyramid. This graph has a narrow base and a wider apex reflecting elderly population. The constrictive population pyramid represents populations in which health care services are readily accessible as well as in populations with stable socioeconomic status. This type of population pyramid can also be seen in populations that exclude the migration factor from the population graph (Boucher, 2020).

In light of the types of population pyramids, an aging population, a population with higher mean age, would be represented by either a stationary or constrictive population pyramid. Aging populations are an outcome of improved health services as well as low fertility rates, as is seen in developed countries.

To further illustrate the demographic changes associated with aging, demographic transitions have been divided into five stages: high stationary, early expanding, late expanding, low stationary, and declining. The transitions account for the mortality and fertility rates, which start with high fertility and mortality rates that slowly shift to a low

mortality and low fertility rate with a consequence of a declining population, which could be seen in aging populations.

### 5- Discuss existing Global and national programs for elderly care

Global:

The United Nations Decade of Healthy Ageing (2021-2030) is a global collaboration, aligned with the last ten years of the Sustainable Development Goals, that brings together governments, civil society, international agencies, professionals, academia, the media, and the private sector to improve the lives of older people, their families, and the communities in which they live.

To foster healthy ageing and improve the lives of older people and their families and communities, fundamental shifts will be required not only in the actions we take but in how we think about age and ageing. The Decade will address four areas for action:

Age-friendly Environments, Combating Ageism, integrated care, and long term care.

An international example of an elderly support program is Medicare. This US based federal health government program aims to provide health insurance mainly to individuals who are 65 of age or older, under 65 with disabilities and individuals with End-Stage Renal Disease(ESRD). Their service is divided into three categories; Medicare A (hospital insurance), B(medical insurance) and C (prescription drug coverage).

	Services	Covers	Funding source
Medicare in the US	-Hospital insurance - Medical insurance -Prescription drug coverage	-Senior citizens age 65 years and older -People with disability of any age -Anyone suffering from end-stage renal disease	<b>Part A:</b> Funded primarily through a dedicated payroll tax of earnings paid by employers and their employees and is Premium-Free <b>Part B:</b> financed through premiums paid by beneficiaries it costs 148.5\$/ month in 2021. <b>Part C:</b> Beneficiaries enrolled in Medicare Advantage plans typically pay monthly premiums for additional benefits covered by their plan in addition to the Part B



			premium. such as: dental, vision etc. Cost depend on the plan Part D: Is for drug prescription and costs 33\$ per month
National Programme for Health Care of the Elderly (NPHCE) in India	<ul style="list-style-type: none"> <li>-Health promotion</li> <li>-Preventive services</li> <li>-Diagnosis and management of geriatric medical problems (out and in-patient)</li> <li>-Day care services</li> <li>-Rehabilitative services and home based</li> </ul>	<ul style="list-style-type: none"> <li>-Provide preventive, curative and rehabilitative services at various levels of the health care delivery system of the country.</li> <li>- to strengthen referral system</li> </ul>	Sponsored and its implementation is monitored by the Indian Ministry of Health & Family Welfare.
National Health Service (NHS) in the UK	<ul style="list-style-type: none"> <li>-Multidisciplinary team approach</li> <li>-Rapid community response teams, to assist older persons with health difficulties before they require hospital care and to assist those who are discharged from the hospital</li> <li>-Provide additional NHS support</li> </ul>	<ul style="list-style-type: none"> <li>-The elderly</li> <li>-Cancer patients</li> <li>-Respiratory disease patients</li> <li>-Learning disabilities and autism</li> <li>- Stroke patients</li> </ul>	It's tax-funded supplemented by National Insurance contributions

National:

The Saudi government made sure to provide multiple social and health related services that supported elderly.

1-A national program called the Saudi Elderly Support Organization "WAQAR" : is a non profit organization that was founded in 2015 in the capital city riyadh. Its main aim is to support the elderly, support their rights, help in their care and raise the level of interest in their status. WAQAR Also supports the elderly population by creating programs, initiatives that suit their needs, providing services to them and empowering elderlies and their role in the society.

2-Sultan bin Abdulaziz humanitarian city: is a non profit organization in Saudi Arabia, located in Riyadh.

The organization Providing health and social care, as well as comprehensive rehabilitation for the disabled and the elderly people.

- Finding convalescence, nursing and rehabilitation houses as well as providing specialized human resources, clinical and laboratory equipment.
- Providing prosthetic and compensatory devices that help the disabled and elderly people to adjust to their conditions.
- Supporting research in the field of humanitarian services provided by the Foundation.

3-King Salman Social Center:

is one of the most known Saudi centers. It aims to become a national institution to provide community services to Saudi families which helps elderly in maintaining good physical activity, health by providing specialized and broad fitness, rehabilitation programs and physiotherapy to those who suffered from past stroke and motor vehicle accidents.

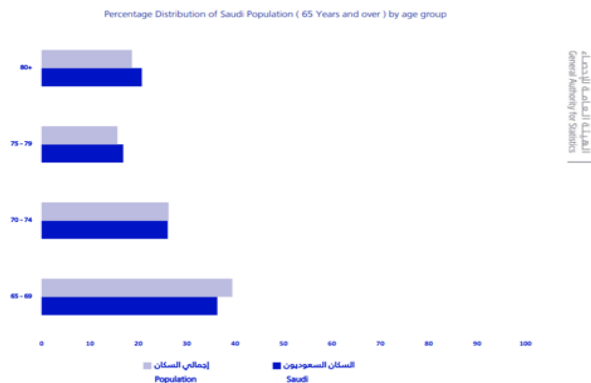
#### **6-Explain the demographic changes associated with ageing of the population in KSA:**

Population ageing has been recognized as one of the four global demographic “megatrends”—population growth, population ageing, international migration and urbanization—with continued and lasting impacts on sustainable development. Declining fertility and increasing longevity lead to rising numbers of older persons as well as a continuously growing share of older persons in the population. Preparing for the economic and social shifts associated with an ageing population is essential to ensure progress towards the achievement of the Sustainable Development Goals (SDGs) included in the 2030 Agenda for Sustainable Development.

According to the 2019 report by the United Nations on World Population Ageing, the percentage of the population in Saudi Arabia aged 65 years or over in 2019 is (3.4%) and in 2030 it is expected to be (6%). The report also indicated that the Old-age dependency ratio (65+ /20-64) in 2019 is (5.2) and in 2030 it is expected to be (9.3).

The Elderly Survey 1438H (2017) indicated that: The number of the elderly (65+ years) is (1050885), i.e. (3,23 %) of the total population. Out of this number (57,48%) were male and (42,52 %) were female. The number of the Saudi elderly (65+ years) is (854281),i.e. (4,19 %)

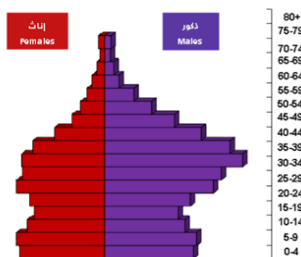
of the total Saudi population. Out of this number (48.9 %) were male and (51,1%) were female.



The Survey showed that the ratio of the elderly (65+ years) by age group is as follows: The ratio of the elderly in the age group (65 – 69) among total population (65+ years) reached (39,4 %). The ratio of the elderly in the age group (70 – 74) among the total population (65+ years) reached (26,3 %).

The ratio of the elderly in the age group (75 – 79) among the total population (65+ years) reached (15,7%). The ratio of the elderly in the age group (80+) among the total population (65+ years) reached (18,7%).

Kingdom's Total Population Pyramid



The Demography Survey (2016) indicated that: The difference in Saudi population distribution according to the wide age groups (younger than 15 years, 15-64 year old, and more than 65 years) is attributed to the large numbers of non-Saudis nationals whose age ranges between 15 and 64 years old in addition to the drop in the two other age groups (younger than 15 years and older than 65 years). The age dependency ratio in the Kingdom touched 39 percent according to the outcomes of the 1437H survey, which means every 100 Saudi national whose age range between 15 and 64 years support up to 39 persons in the age groups less than 15, 65 years and older.

## 7- List the health and social problems associated with ageing in KSA:

Ageing process is usually associated with various changes in an individual life which can result in problems that would reflect on both health and social levels. Most common health problems in geriatric population in Saudi Arabia are the following:

### Comorbidities:

more than one disease existing at the same time associated with decreased level of health status and increased likelihood of disability. A study was conducted in Jeddah estimated that the prevalence of having at least two co-morbidities among elderly people is 60.4%, also a study was carried out in southern Saudi Arabia showed even higher prevalence 89%. Most prevalent disease was hypertension followed by diabetes mellitus. Other diseases were also reported but were variable such; stroke, osteoarthritis, and sexual adjustments.

### Polypharmacy:

as a result of co-morbidities many elderly patients will end up in using multiple medications to maintain their health condition. (55% of the patients have polypharmacy, An average of 6.4 medications were prescribed for patients aged between 65 and 70 years).

### Malnutrition:

among elderly is common and it is defined as "faulty or inadequate nutritional status (or) undernourishment characterized by insufficient dietary intake, poor appetite, muscle wasting and weight loss" that may be due to sensory changes accompanied by ageing such as taste or smell or low income.

other health problems they may face:

Impaired special senses: (smell, hearing & vision).

Unintentional injuries: mostly falls in the elderly own home → fracture, increase dependency.

Deterioration of functional abilities.

They may also experience emotional disorders and mental problems such as: dementia, depression, Alzheimer's and Sleep disorders.

Social problems that face geriatric population are varies from social isolation which is the biggest problem to the consequences of their comorbidities as it limits their daily activity especially they are more prone than any age group for falling and may lead to serious injuries, making them more dependent on others and as a result of dependency they may face some physical abuse. They also require someone who takes care of them to help them throughout daily activities, for example having a caregiver, these changes and consequences may contribute to the most common psychological disorders among elderly, like depression. Other social problems they may face are: financial instability, poverty, victimization, lack of access to appropriate health care and inadequate housing.

## **8- Describe the interaction between physical ill-health, social problems, psychological problems and functional limitations:**

At the biological level, aging is caused by the accumulation of a range of molecular and cellular damage throughout time. This results in a progressive loss of physical and mental capacity, as well as an increased risk of disease and, eventually, death. Hearing loss, cataracts, and refractive errors, back and neck discomfort, and osteoarthritis, chronic obstructive pulmonary disease, diabetes, depression, and dementia are all common illnesses among older people. People who are older are more prone to suffer from multiple illnesses at the same time. Late-life depressive disorders are common in the setting of chronic medical conditions and disability, causing suffering and worsening the outcomes of many medical conditions as well as increasing mortality.

It is estimated that up to 16% of the US population between the ages of 18 and 44 have at least one functional disability. According to the same US sample, prevalence estimates grow with age, reaching 26% among those aged 45–64 and 36% among those aged 65 and above. Understanding the prevalence of disability is critical for public health programs to effectively serve the needs of disabled people. Depression and anxiety disorders have been demonstrated to be a risk factor for disability, while disability has also been found to be a risk factor for depression. Psychological distress in the elderly has been attributed to the lack of social support and physical health problems. Low social support behaved as a mediator, meaning that the negative impact of physical health problems on psychological distress is mediated by low social support. For example, the burden of hearing loss increased because of the absence of social support in addition to social isolation and loneliness as results, which caused an increase in psychological distress.

## **9-Top ten causes of years lived with disability, disability adjusted life years lost and death among elderly 70+ years in KSA:**

### **1. Cardiovascular and circulatory diseases:**

Cardiovascular disease is now recognized as the leading cause of death and disability worldwide, The World Health Organization (WHO) estimated that in 2008, CVD was estimated to be responsible for 42% of deaths in Saudi Arabia. The main risk factors of CVD were Hypertension, Diabetes, Obesity, Sedentary lifestyle.

- Hypertension, Ischemic heart disease, Heart failure, Stroke.

### **2. Endocrine disorders:**

Diabetes mellitus (DM) is rapidly becoming one of the main health issues among humans in the 21st century and the number of patients is steadily increasing, globally. The World

Health Organization (WHO) has reported that Saudi Arabia ranks the second highest in the Middle East, and is seventh in the world for the rate of diabetes.

-Diabetes.

### 3. Mental and behavioural disorders:

A study included 400 elderly patients (200 males and 200 females). Their age ranged between 65 and 80 years with a mean of 71.9 years and a standard deviation of 4.2 years. Depression, regardless of its severity, was recorded among 63.7% of elderly patients. Elderly patients of the following characteristics showed more significant depression; females, singles or divorced, smokers, diabetics, cancer patients, osteoarthritis patients, patients with end-stage renal disease, hepatic patients and those having visual impairment

-Depression, Anxiety, Bipolar disorders, Schizophrenia.

### 4. Cancers:

Cancer is a serious problem facing the entire world. In Saudi Arabian males incidence of each of the cancers remained fairly stable up to the age of 35 years. After this point, incidence increased exponentially to reach the peak at 70-74 years and Colorectal cancer being the most common. In females thyroid cancer incidence started to increase at age of 15-19 years, reaching a peak of 22.7 at 60-64 years. Breast cancer incidence rose steeply from the age of 20-24 years to 50-54 years. It then decreased slightly before rising again to reach a peak at 70-74 years.

-Colorectal and Prostate cancer in men.

-Endometrial and Breast cancer in women.

### 5. Respiratory system disorders:

Respiratory disease has a major effect on morbidity and mortality at all ages, especially elderly. Asthma, COPD and pneumonia were the leading causes of hospitalization among patients with respiratory disorders.

-Pneumonia, COPD, Asthma.

### 6. Accidental injuries:

Falls are the leading cause of admissions for trauma emergencies in Saudi Arabia.

It has several implications for population health and the utilization of health care. Around one-fifth of falls result in serious injuries, the most serious of which are those that affect the brain or cause hip fractures. A study in Riyadh indicated that 57% of the elderly (>60 years) reported that they had sustained a fall injury.

Furthermore, A retrospective analysis was conducted using a trauma registry from a level-I trauma center in Riyadh. All patients admitted as a result of a fall between 2001 and 2018 were included. Lower limb fractures were more prevalent among the older patients (70.2%). Fall injuries in the elderly were significantly associated with higher mortality (3.5%).

-Car accidents, Falls, Fractures.

#### 7. Musculoskeletal system disorders:

Osteoporosis and its associated complications have become a major public health concern in many countries, including Saudi Arabia. The growing prevalence of the disease, in addition to its substantial impact on morbidity, mortality. It has been estimated that at least one in three women older than 50 years and one in five men older than 50 years will experience a fragility fracture as a result of osteoporosis during their lifetime.

-Osteoporosis,Osteoarthritis.

#### 8. Neurologic disorders:

Alzheimer's disease (AD) and its related disorders are conditions characterized by a gradual and unpreventable deterioration of multiple cognitive functions (including complex attention, executive function, learning and memory, language, perceptual-motor, or social cognition from a previous level of performance), serious enough to interfere with the daily lives of those affected in both social and professional terms.

One of the special characteristics of AD is dementia, a "neurocognitive disorder", according to DSM-5. These disorders indubitably have a major negative impact on the lives of the patients, their families, and society. The reviewed literature on the prevalence of dementia and AD in KSA was 5.2-3.85%.

Parkinson's disease is caused by damage to a certain part of the basal nucleus in the brain, Clinical symptoms usually begin between the ages of 40 to 60 with a higher incidence in later stages of life. The prevalence of Parkinson's disease in Saudi Arabia has been estimated to be 27 per 100,000 population.

-Alzheimer's disease,Parkinson's disease.

#### 9. Urogenital disorders:

-Chronic Kidney Diseases (CKD) is becoming a major public health problem among elder in Saudi Arabia. The high prevalence of diabetes and hypertension is a main factor aggravating this problem.

-Senile prostatic enlargement due to benign prostatic hyperplasia (BPH) is a common problem among older men, and is responsible for considerable disability.

-Urinary tract infections,Renal impairment,BPH in men.

#### 10. Gastrointestinal disorders:

Gastrointestinal diseases are among the common health problems that affect the elderly. According to the Saudi National Survey for Elderly Health (SNSEH) 2006–2015 GIT disorders are the third most common conditions that elderly suffer from and females suffer from these disorders more than males especially functional disorders like IBS.

It is now well documented that oral diseases are considered from conditions that impact people's life, they have functional, emotional, and social consequences and oral health-related pain can disrupt people's food choices and speech, thereby diminishing the quality

of life. Some of the oral diseases and conditions like caries, dental fluorosis, tooth loss, dental injuries, oral cancer, and many more have had a negative impact on QoL.  
-IBS, Chronic liver diseases, Dental disorders.

## Resources:

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