AGING AND GERIATRIC CARE: A GLOBAL IMPERATIVE TOWARDS UNIVERSAL HEALTH COVERAGE

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Abstract
The global population of older people is projected to surpass the number of children under 5 years old and adolescents by 2050, with developing countries housing the majority of older individuals. This demographic shift necessitates adjustments in global health systems to cater to the increasing demand for age-appropriate care. Gerontology, as an interdisciplinary field, encompasses the study of biological, social, and medical aspects of aging. Anti-aging, a distinct discipline, focuses on understanding and combatting age-related ailments. This review provides insights into the distinctive aspects of anti-aging research, highlights current priority issues in health promotion and anti-aging measures, and explores implications of crises on aging research and healthcare. Furthermore, it emphasizes the need for collaboration among interdisciplinary research networks, integration of science and technology, and the involvement of key stakeholders to ensure universal health coverage. Future research should address the multidimensional aspects of healthy aging, reflect research priorities and preferences of older individuals, and promote health equity. This collective effort will contribute to the development of innovative solutions and facilitate cross-learning among countries to enhance the well-being of aging populations globally.

Keywords: aging; health; anti-aging research; science.

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Introduction
The global population of older people is expected to reach 2.1 billion by 2050, surpassing the number of children under 5 years old [1]. By 2050, the older population will also outnumber adolescents and young people aged 15-24 years. Developing countries are home to the majority of older people, with 37% residing in eastern and south-eastern Asia, 26% in Europe and North America, 18% in Central and South Asia, 8% in Latin America and the Caribbean. The number of people aged 60 years and older is projected to grow rapidly in developing countries, from 652 million in 2017 to 1.7 billion in 2050, while more developed countries will experience an increase from 310 million to 427 million [1]. Africa, Latin America, the Caribbean, and Asia are witnessing the fastest growth in their older populations.

It is estimated that by 2050, nearly 80% of the world’s older population will reside in less developed countries. The proportion of older people in the overall population is expected to increase in most countries, from one in eight in 2017 to one in six by 2030 and one in five by 2050 [2].
The speed at which the population is aging is increasing, which means that it is essential for global health to adjust quickly to address the requirements of the aging populations. The field of studying the physiological and pathological aspects of aging has seamlessly integrated itself into the realm of medicine, becoming an indispensable component. Presently, there exist diverse branches within this domain, each dedicated to scrutinizing distinct parameters and characteristics of the aging process.

Gerontology, an interdisciplinary field encompassing biology and medicine, endeavors to unravel the intricate patterns of aging in all living organisms, including the complexities exhibited by the human species. It encompasses several subdivisions, namely the biology of aging, social gerontology, and geriatrics [3]. The biology of aging delves into the mechanisms underlying the aging process across various hierarchical levels, ranging from the molecular to the organismal scale. Social gerontology examines the multifaceted aspects of aging through a lens that incorporates demographic, socio-economic, socio-hygienic, and socio-psychological factors [4]. It investigates the impact of environmental conditions and lifestyle choices on the aging trajectory of individuals while devising strategies to ensure the well-being and active longevity of the elderly population. Biogerontology, on the other hand, focuses its attention on exploring the biological dimensions of aging [5].

Anti-aging, often recognized as a distinct scientific discipline from gerontology, concentrates on comprehending the ailments that afflict the elderly and formulating effective approaches to combat them. The fundamental tenets of anti-aging revolve around age, aging, old age, longevity, and immortality, encapsulating human conceptions of life processes, the immutable laws governing existence, and mankind’s innate yearning for life extension [6]. It is crucial to draw a clear distinction between the concepts of aging and old age. Consequently, the core principles of anti-aging medicine are rooted in the application of cutting-edge scientific and medical technologies that facilitate early detection, prevention, treatment, and mitigation of age-related diseases [7]. The main goal in hindering the aging process is not just to extend lifespan, but to improve the overall quality of life in old age. Notably, renowned Ukrainian scientists such as I. I. Mechnikov and O. O. Bogomolets have made significant contributions to this field [8, 9].

In this review, our aim was to provide insights into the distinctive aspects of anti-aging research, including its primary areas of focus, challenges, and potential future prospects.

Current priority issues in health promotion and anti-aging measures

The phenomenon of population aging is a result of advancements in human development, such as better health, increased lifespan, and reduced mortality rates. However, it also presents a significant challenge for public health systems to adjust and cater to the increasing needs for age-appropriate care, including long-term care, preventive services, and technologies for disease detection and treatment. Population aging, combined with changes in lifestyle and the epidemiological transition, is a major contributing factor to the growing occurrence and prevalence of non-communicable diseases [10].

While many countries acknowledge older persons as a vulnerable group at risk of being marginalized, some countries take specific measures to prevent their exclusion. For instance, Australia emphasizes collaborative efforts between the government, private sector, and civil society to tackle workforce participation gaps. Australia also highlights investigations conducted by the Australian Human Rights Commission into employment barriers faced by older individuals [11].

The ‘National Health Programme’ of Poland for the period 2016-2020 includes the prioritization of healthy and engaged aging as one of its main focuses [12]. Poland also advocates for the Active Ageing Index, which intends to assess the capacity of older individuals to contribute more to the economy, society, and independent living [13]. The active ageing index was created by combining measures from four key areas: employment, societal participation, independent living with regards to health and safety, and potential and circumstances for active aging. In Poland, the Medicines 75+ program aims to, among other things, ensure that older individuals have access to free medications and medical devices necessary for treating age-related illnesses [14].

The Netherlands emphasizes its research priorities at specialized institutes like the Amsterdam Institute for Global Health and Development and the Rotterdam Global Health Initiative. These institutes, among others, specifically concentrate on areas such as aging and Alzheimer’s disease as well as dementia [15].
Science growth before 2022, available research infrastructure, international collaboration, available indexed journals for covering aging and geriatric care issues.

The available research infrastructure for aging and geriatric care varies across different countries and institutions [16]. Countries with well-developed healthcare systems and a focus on aging populations tend to have better research infrastructure in this field. These include countries such as the United States, United Kingdom, Germany, and Switzerland [17-21]. These countries have research institutes, universities, and medical centers that conduct studies and provide resources for aging and geriatric care research. Additionally, there are specialized research centers and institutes dedicated to aging and gerontology, such as the National Institute on Aging (NIA) in the United States.

International collaboration plays a significant role in advancing research in aging and geriatric care. Collaboration between researchers and institutions from different countries allows for the exchange of knowledge, expertise, and resources, leading to a broader and more comprehensive understanding of aging-related issues (Fig. 1). International collaborations also help in addressing global challenges related to aging and developing innovative solutions.

Furthermore, it is crucial to acknowledge the significance of interdisciplinary collaboration, as it can enhance the significance of studies and provide fresh perspectives within the field of anti-aging. It is important to recognize that the study of age-related topics extends beyond the realm of medicine alone, and various disciplines can contribute valuable insights in this area (Fig. 2).

The field of aging and geriatric care is covered in indexed journals that provide valuable insights and research findings. These journals provide a platform for researchers to publish their findings, share insights, and contribute to the field. Currently there are 113 indexed journals, however, many are relatively young and have only been indexed in the 21st century. We focused on the top 10 journals in this field based on the Scimago Journal Ranking data (Fig 3).

At the top of the list is Nature Aging, a journal based in Germany, with an impressive SJR score of 4.336. This journal emphasizes the interdisciplinary nature of aging research, covering areas such as biochemistry, genetics and molecular biology, medicine, and neuroscience. With a total of 136 published documents in 2022, the Nature Aging has garnered a high number of citations per document over a two-year period, indicating the significance and impact of its publications. Notably, it was only indexed by Scopus in 2021, yet by 2022, it had already achieved the status of a Q1 journal. Additionally, it is interesting to observe that half of the top 10 journals on the list were indexed by Scopus after the year 2000, indicating the emerging nature of this scientific field.

These top 10 journals demonstrate the widespread research and scholarly contributions in the field of aging and geriatric care. These journals play a crucial role in disseminating valuable knowledge, promoting interdisciplinary collaboration, and addressing the diverse challenges associated with aging populations worldwide.
The implications of a crisis, such as a pandemic or any other significant event, on research and healthcare in aging is significant. During a crisis, research activities may be disrupted due to restrictions on travel, limited access to research facilities, and diversion of resources to address the crisis [22]. This can impact ongoing studies, delay data collection, and hinder the progress of research projects focused on aging and related areas.

During a crisis, research priorities shifted to address immediate healthcare needs and public health concerns [23]. Funding and resources are redirected towards crisis management, leaving less support for research specifically focused on aging. This shift in priorities can temporarily impact the advancement of aging-related research.

The former COVID-19 crisis has had a significant impact on clinical trials focused on interventions or treatments for age-related conditions [24]. Delays in these trials occurred as various factors were affected. The recruitment of participants, monitoring of trial participants, and regulatory processes experienced disruptions, resulting in longer timelines for trial completion and potential setbacks in therapy development [25].
The pandemic has placed significant strain on healthcare systems and resources, impacting the provision of healthcare services for older adults [26]. As a consequence, access to routine medical care has been reduced, screenings have been delayed, and specialized geriatric services have become less available. Older adults were facing difficulties in receiving timely and suitable care for their age-related conditions [27].

Nevertheless, crises can also stimulate innovation and adaptation in the fields of research and healthcare. Researchers and healthcare providers may discover novel approaches to delivering care remotely, utilizing telemedicine and digital health solutions, and harnessing the power of data analytics to support aging populations during crises [28-30]. The sense of urgency generated by such situations often fosters creative solutions and encourages collaborative efforts.

Main directions for future research

Research focused on healthy aging should address the current and future needs of older individuals while considering the multidimensional aspects of healthy aging, including social, biological, economic, and environmental factors [31]. It is essential to examine the determinants of healthy aging throughout different stages of life, from early adulthood to late life, and evaluate interventions aimed at enhancing healthy aging trajectories. Furthermore, studies should align with research priorities, address gaps in existing evidence, and take into account the preferences and perspectives of older individuals [32]. Gender sensitivity and the pursuit of health equity should also be key considerations in study design. The synthesis of evidence regarding activities and interventions that benefit older people, their families, and communities, along with strategies for scaling up these interventions to reach a larger population, should be actively encouraged. Ultimately, innovations in healthy aging research should be relevant and have a tangible impact on people’s lives. Building a comprehensive knowledge base on healthy aging is a collective effort that involves contributions from every country and offers opportunities for cross-learning [33].

Conclusion

Global health systems can make significant progress towards achieving universal health coverage by providing person-centered, integrated care and comprehensive primary health services that cater to the needs of older individuals. This necessitates collaboration among interdisciplinary research networks comprising practitioners, professionals, policy-makers, older people, and researchers. To address the challenges faced in policy and practice, it is crucial to integrate science, technology, social innovation, and business innovation to generate innovative ideas. Key stakeholders involved in this process will include multinational corporations, regional and global intergovernmental organizations, as well as academic research, development, and innovation institutions. By bringing together these diverse stakeholders and leveraging their expertise, countries can advance their efforts towards ensuring that a larger proportion of the population benefits from universal health coverage.

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BD design and conceptualisation. BD, SS, RY writing of the initial manuscript; BD, SS, RY draft review. BD construction of figures. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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REFERENCES


