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Bio-Social Determinants Of Lifestyle Diseases Among Elderly In India

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ABSTRACT

The research article highlights on elderly lifestyle determinants Social determinants drivers of health include things such as income, education and one's environment such as unbalanced diet, a lack of physical activity and substance abuse can be linked to a number of major health problems. There is ample evidence that these determinants cause for example diseases like certain cancers, obesity or cardiovascular diseases. In contrast, biological determinants of health include genetics, ancestry, physical activity and personal health conditions and among others. Bio-social determinants of lifestyle in older adults encompass a complex interplay between biological aging to chronic disease, physical capacity, cognitive changes and social factors like income, education, support systems and environment. The influences include economic stability, social engagement, nutrition and mobility, which directly impact health, quality of life and mortality. Cognitive aging is a complex process influenced by diverse life experiences and environmental factors. However, some traditional over simplified this process by assuming that cognitive aging trajectories follow a uniform process and that all individuals will experience similar declines to elderly.

Key Words: Mentally & Physically Health, Income, Psychology, Bio-sociology activity etc.

Bio-social determinants of lifestyle are the combined influence of biological traits viz., genetics, age, sex and social circumstances income, education, environment that shape daily behaviours, health habits, and, ultimately, health outcomes.

1.0 Introduction:

A profound demographic shift is underway globally, with a staggering surge in the population aged 60 years and above. Once perceived as a challenge limited to industrialised nations, population ageing has emerged as a critical concern for developing countries like India, where demographic transitions are outpacing economic and infrastructural development. India's health systems and social protection mechanisms face increasing pressure, particularly in rural regions, necessitating community-based and context-specific solutions. The discourse around ageing must evolve beyond biomedical approaches to address the socio-economic and dignity-related challenges faced by rural elders. These factors dictate a person's capacity for physical activity, dietary choices and vulnerability to diseases[1]. The impact of external factors, neglecting the diversity observed in the aging population.

In fact, inter and intra-individual variability in cognitive trajectories with some individuals maintaining stable or even improving cognitive function, while others experience rapid decline. The homogenous modelling approaches used focusing on the identification of latent classes of cognitive trajectories. They revealed that three distinct cognitive trajectories low cognitive performance with early decline, un-modulated cognitive change and high cognitive performance with late decline to each uniquely influenced by specific lifestyle factors. The model of cognitive aging by identifying that factors such as concentration activities and social engagement influence the trajectories of low cognitive performance with early decline and high cognitive performance with late decline, whereas the trajectory of un-modulated cognitive change is largely unaffected by environmental influences. The critical role of individual environmental susceptibility in shaping cognitive trajectories of elder's life style[2]. The presence of chronic medical conditions of cardiovascular disease, diabetes and physical inactivity and poor diet directly impacts physical aging and disease and is a major risk factor.

Age-related changes in metabolism, sensory perception, and cognitive function influence daily activities and adaptability. Isolation and loneliness are critical issues, whereas strong family and community support to improve quality of life. Income level dictates access to healthcare, nutrition, and safe living environments[3]. Living environment to safe, accessible, and suitable housing and neighbourhood conditions are foundational to health. These interconnected factors require a comprehensive, person-centered approach, involving medical management alongside social interventions like reducing isolation and improving environmental safety to promote healthy aging.

2.0 Global and National Ageing Trends

According to the World Population Prospects 2022, the global population aged 60 years and above is expected to double from 1.05 billion in 2020 to 2.1 billion by 2050. This unprecedented demographic transition poses critical implications for health systems, pension structures, care provision, and the overall perception of ageing. Developing nations, particularly in rural or underserved areas, often lack the preparedness to manage these demographic pressures[4].

India, now the world's most populous country, is experiencing a swift demographic shift. The proportion of Indians aged 60 years and above is projected to rise from 10.1% in 2021 to 19.9% by 2050 translating to over 319 million older adults. More than 70% of these individuals reside in rural areas, where access to healthcare, transport, eldercare, and economic safety nets remains severely limited. These communities struggle with chronic illnesses, disability, absence of pension coverage, and increasing social isolation[5]. Thus, ageing in rural India reflects not only functional limitations but also compounded marginalisation due to inadequate infrastructure and socio-economic vulnerability.

3.0 Concept of Active Ageing and the WHO Framework

Recognising the multi-dimensional nature of ageing, the World Health Organisation (WHO) introduced the concept of *Active Ageing* in 2002. Unlike conventional approaches that prioritise disease control or longevity, active ageing emphasises optimising opportunities for health, participation, and security to enhance quality of life as people age.[6]

The framework is anchored in 3 pillars:

- **Health:** Enabling functional independence and access to preventive and curative healthcare supports mobility, emotional well-being, and community participation.
- **Participation:** Continued engagement in social, economic, cultural, and civic activities fosters mental health and strengthens intergenerational ties.
- **Security:** Economic protection, housing stability, and freedom from abuse ensure dignity and reduce vulnerability in old age.

To operationalize this concept, the European Commission and the United Nations Economic Commission for Europe (UNECE) developed the Active Ageing Index (AAI) a composite measure of ageing outcomes across 3 domains. While the AAI has been widely applied in European contexts its application in India remains limited. This is especially true for rural areas, where socio-cultural norms, infrastructure, and economic realities differ significantly from those in high-income countries.

4.0 Biological Determinants of Lifestyle

These are inherent or physical factors that dictate health potential and influence lifestyle behaviours:

- **Genetics & Heredity:** Predisposition to diseases like diabetes or hypertension, which influence, for instance, necessary dietary changes or physical activity levels.
- **Age:** Different life stages necessitate different lifestyles higher nutritional needs in youth, reduced physical activity in old age.
- **Sex/Gender:** Biological differences hormone levels create different disease risks, often prompting specific, gender-related lifestyle habits.
- **Physical Functioning/Body Structure:** Physical abilities and limitations affect the capacity to engage in exercise or labour-intensive work.

5.0 Social Determinants of Lifestyle

These are external conditions that directly influence behaviour and health choices:

- **Socioeconomic Status (Income & Employment):** Higher income allows for better nutrition, safer housing, and gym memberships, while low income often limits choices to poorer diets and higher stress.
- **Education:** Higher education levels often lead to better health literacy, resulting in better, informed lifestyle choices avoiding smoking.
- **Environment (Built & Natural):** Access to green spaces, safe walking paths, and healthy, affordable food options vs. "food deserts" directly impacts physical activity and diet.
- **Social Support Networks:** Relationships with family and community provide emotional stability, affecting stress levels and health-related behaviour[7].

6.0 Interaction of Bio-Social Factors

These factors do not operate in isolation. For instance, a genetic predisposition to obesity (biological) may be triggered by a low-income environment social that restricts access to healthy food and safe exercise spaces. Addressing both is essential to reducing health disparities, as social factors can often outweigh genetic influences.

The growing prevalence of cognitive decline among older adults presents a significant public health challenge, with profound implications for individual quality of life, family relationships, and the allocation of healthcare resources. While traditional perspectives have considered cognitive decline as an inevitable consequence of aging, recent research challenges this notion, suggesting vast inter- and intra-individual heterogeneity of cognitive trajectories in later life. The diversity in cognitive outcomes reflected in some individuals experiencing rapid decline and others sustaining robust cognitive function, illustrates the complex and varied cognitive trajectories observable among older adults. However, the complexity of patterns of these cognitive trajectories remains insufficiently understood, as even when controlling for genetic, lifestyle and environmental influences, differences still arise, leaving a gap in our knowledge of the cognitive aging process. The investigation into cognitive trajectories during aging is critical for several reasons. Firstly, it enables researchers to evaluate the impact of significant life events on cognitive performance discrete events, such as retirement, may contribute to changes in cognitive functions by meaningfully altering daily routines and social interactions. Supporting this found that in older individuals, reductions in social interactions are associated with lower cognitive performance. Secondly, it allows for early detection of cognitive decline to implement timely interventions that could halt or reverse cognitive deterioration[8].

Based on projections for 2025-2026 and data from the Longitudinal Ageing Study in India (LASI), the lifestyle of the elderly (60+) in India is increasingly driven by a mix of rapid demographic shifts, economic vulnerability, and social changes, with the population expected to exceed 230 million by 2036. The "***silver economy***" is emerging to meet the needs of this group, while over 40% of the elderly are in the poorest wealth quintile.

7.0 Bio-Social Determinants of Lifestyle

7.1. Socio-Economic and Financial Status

- **Economic Dependency:** A significant role on portion of the elderly, particularly women's are economically dependent on family members, which restrict their autonomy, lifestyle choices and access to healthcare.
- **Rural-Urban Divide:** Rural elderly face greater challenges regarding healthcare access, while urban elderly often face higher costs of living and social isolation.
- **Widowhood and Gender:** Women constitute a larger share of the elderly to approx. 58% with a high percentage being widows. This increases their vulnerability to social isolation and poverty.

7.2. Family Structure and Social Environment

- **Shift to Nuclear Families:** The decline of the traditional joint family system is increasing social isolation and neglect.
- **Living Arrangements:** While 75% of elderly still co-reside with children, the trend of living alone or only with a spouse is rising.
- **Social Isolation:** A significant proportion of the elderly, particularly in old-age homes, report being left unattended by family, which impacts mental health and leads to depression.

7.3. Biological and Health Factors

- **Non-Communicable Diseases (NCDs):** Lifestyle is heavily impacted by chronic morbidities, including hypertension, diabetes, and cardiovascular diseases.
- **Functional Limitations:** Approximately 20% of the elderly face limitations in daily activities (ADLs), impacting mobility and independence.
- **Mental Health:** Stigmatized conditions like dementia and Alzheimer's, along with depression from social isolation, are major concerns.

7.4. Behavioural and Lifestyle Choices

- **Physical Activity:** Engagement in moderate to vigorous physical activity to walking, yoga is a key factor in higher functional capacity (IC), yet many remain sedentary.
- **Dietary Habits:** Nutritional habits are influenced by age-related needs and sometimes by economic constraints, with a high prevalence of poor, low-diversity diets among low-income seniors.
- **Substance Use:** Tobacco use (smoking and chewing) and alcohol consumption remain common among older men, which are negatively associated with high intrinsic capacity (IC).

7.5. Technological and Environmental Factors

- **Digital Divide:** Lack of training and access to technology restricts many elderly from using telemedicine or digital health services.
- **Age-Friendly Infrastructure:** Public spaces and transport are largely not elderly-friendly, limiting mobility and social participation.

8. 0 Key Trends to 2026

- **Feminization and Ruralization:** The elderly population is increasingly female and rural, requiring targeted policies.
- **Increased Coverage:** As of 2025, initiatives like the extension of Ayushman Bharat (PMJAY) aim to provide free health coverage to all citizens 70+.
- **"In-situ" Aging:** Policies are increasingly focused on enabling the elderly to age at home through community-based care and support.

8.1 Basic lifestyle habits helped him achieve longevity

As conversations around healthy ageing continue to rise, more people are turning their attention to practical ways to extend both lifespan and quality of life. Amid this shift, a 55-year-old man has gained widespread attention after claiming he now has the biological indicators of a 20-year-old. The Telegraph, his case stands out because he links this transformation not to high-end anti-ageing treatments or complex routines, but to everyday habits that are accessible and inexpensive.

Human biologist Gary Brecka, founder of The Ultimate Human, outlined this approach in the feature. He emphasised that the routine relies on simple habits rather than specialised devices or intensive bio-hacking tools. The approach mirrors what many researchers already recommend: daily movement, balanced nutrition, quality sleep, and staying away from harmful patterns. Although his full regimen was not revealed, the broader principles align closely with long-established lifestyle advice that appears again and again in scientific literature on ageing[9].

8.2 Habits Matter

The point to regular exercise including aerobic and strength-based activities as a core factor in maintaining muscle mass, supporting heart health, preserving metabolic function and reducing inflammation of elderly lifestyle. These factors processes linked to ageing. Daily sleep patterns and stress levels influence hormone balance, cellular repair, and immune activity, making them essential for healthy ageing. Nutrition, hydration and maintaining a moderate weight also play important role in shaping how the body ages at a molecular level[10].

8.3 Understanding Calendar Age vs Biological Age

Experts often differentiate between chronological age the number of years a person has lived and biological age, which reflects how efficiently the body's cells and systems are functioning. Biological age is shaped not just by genetics but by lifestyle, including movement, diet, sleep, stress, and measurable biomarkers such as DNA methylation patterns and telomere-related changes. The suggests his body is functioning far younger than his actual years, adding to growing public interest in whether ageing can be slowed through consistent behavioural changes.

9.0 Changing Biological Age

Biological age can shift in response to long-term habits. A "Life's Essential 8" a set of heart-healthy behaviours to found that individuals who maintained these habits showed younger biological markers regardless of chronological age. Regular movement, quality sleep, reduced stress, and a whole-food diet have been associated with improved DNA repair, better immune strength, and healthier metabolic function, reinforcing the view that ageing may be more flexible than once believed.

10.0 Main Principles in Daily Life

Daily movement remains one of the most effective habits, with activities like brisk walking, cycling, or strength training helping maintain fitness and overall well-being. Even 30 minutes a day can make a meaningful difference. Alongside exercise, building meals around whole foods such as vegetables, fruits, whole grains, lean proteins, and healthy fats is widely recommended, while processed foods and excess sugar are best kept to a minimum. Sleep and stress control also play a major role, and researchers advise aiming for seven to nine hours of rest each night while managing stress through mindfulness, hobbies, or relaxation techniques. Staying hydrated, avoiding smoking and excessive alcohol, and keeping the body active throughout the day further contribute to healthier ageing. When combined consistently, these straightforward habits create a foundation that supports better cellular function and long-term biological health. The case shows a broader idea that lifestyle choices can influence how the body ages. While genetics sets the starting point, longevity consistently highlight the role of daily habits in shaping biological age[11]. Consistency, rather than expensive treatments, emerges as the defining factor in long-term health.

10.1 Talked honestly about ageing

Ageing has been treated in public conversation as something to delay, deny or disguise. Wrinkles, grey hair, sagging skin and slow joints have often been discussed as aesthetic problems to be fixed. But in 2025, the narrative shifted toward a more honest, holistic and practical conversation about ageing: one that acknowledges both the realities of growing older and the power of lifestyle choices to age. Ageing stopped being about fear and fantasy and started becoming about health span, function, dignity and resilience[12].

10.2 Understanding ageing beyond wrinkles

One of the most critical shifts this year has been how ageing is understood not just as an inevitable biological decline, but as something profoundly influenced by behavioural choices throughout life. From actor Bhagyashree's recommended step-up exercise to Namita Thapar's mindful approach to diet and health during her perimenopause journey, factors such as nutrition, physical activity, mental health, social connection and stress management play a significant role in how health evolves with age, and often more

than genetics alone[13]. Well a person moves, thinks, feels and lives as they grow older, and it resonated widely with those looking for practical, empowering approaches to ageing well.

11.0 To accelerates ageing and slows it down

In 2025, we increasingly grappled with the factors that genuinely accelerate biological ageing, from processed foods and chronic stress to a sedentary lifestyle and poor sleep. Practical, evidence-based breakdowns of everyday habits, such as foods that can speed up ageing, helped ground the discussion in real choices that matter. Dr Somnath Gupta, consultant physician & diabetologist, Yashoda Hospitals, Hyderabad, mentioned that caffeine and alcohol consumption, excessive sugar, processed carbs and sun exposure after consuming citrus fruits can speed up ageing. This kind of straight-talk content helped shift attention from superficial anti-ageing fixes to meaningful health decisions that actually affect metabolism, immunity, inflammation and cellular health[14].

12.0 Honest, inspiring and accessible role models of ageing

Another key development was the rise of ageing role models whose stories were neither polished nor overly inspirational in a hollow way, but realistic and relatable. For example, we profiled a 97-year-old professor whose disciplined daily routine, purposeful lifestyle and emphasis on stress management helped him preserve strength and health far beyond what many expect of someone his age. ***I may have inherited my parents***' genes (My father lived till the age of 96 and my mother till 91), but there are several factors that can hasten premature ageing. Among them, stress is one of the greatest contributors, and hence it is necessary to develop a sense of purpose in life[15].

13.0 The myth of anti-ageing medicines

Another significant discussion this year came in the wake of Shefali Jariwala's death, when her husband Parag Tyagi publicly dismissed rumours that she had been taking anti-ageing medicines. Instead, he highlighted that her youthful appearance was the result of consistent discipline with diet and lifestyle, not quick fixes or medications. He said, "Shefali didn't want to take multivitamins daily as she would forget them, so she took them through an IV drip once a month. These included multivitamins, Vitamin C, collagen, and glutathione, which is one of the best antioxidants (sic)," Dr Jagadish Hiremath, a public health intellectual, stressed, It is important that such treatments are undertaken only under the supervision of a qualified healthcare professional[16].

14.0 The lesson reflect a broader cultural moment

These shifts reflect a broader cultural moment of ***ageing is no longer a taboo*** or a cosmetic problem to be hidden, but a shared human experience with meaningful, evidence-based ways to approach it intelligently. As we move into 2026, the hope is that these frank conversations lead to deeper awareness, better policies and healthier, more fulfilling lives for people at every stage of adulthood[17].

15.0 Rural Ageing in India: Specific Challenges

Rural India presents unique and complex challenges for ageing populations. Many older adults are employed in informal sectors, lacking retirement benefits or financial security. With limited access to formal social protection schemes, they depend heavily on family members who may themselves face economic hardship. Gender-based disparities exacerbate the situation older women are more likely to experience widowhood, lower educational attainment, poor health, and reduced mobility. Healthcare access remains a significant barrier. Rural regions are underserved in terms of trained health professionals and lack geriatric care infrastructure. Geographic isolation, low community engagement, and the migration of younger family members to urban areas increase the risk of loneliness and neglect. Despite India lacks a standardised tool to measure quality of life or levels of active ageing, particularly for rural populations[18]. There is need for culturally adapted instruments that reflect the heterogeneity of rural ageing and inform targeted policy interventions.

16.0 Policy Integration

The ***National Policy for Senior Citizens (2011)*** acknowledges the compounded disadvantages faced by elderly women—especially widowed, landless, and economically dependent individuals. Although it advocates for gender-sensitive measures, implementation at the grassroots remains sporadic and inadequate. Similarly, the ***National Social Assistance Programme (NSAP)***, through initiatives such as the ***Indira Gandhi National Old Age Pension Scheme (IGNOAPS***) and ***Indira Gandhi National Widow Pension Scheme (IGNWPS),*** attempts to provide minimal support[19]. However, low benefit amounts, poor awareness, and administrative bottlenecks often limit its effectiveness, especially for rural elderly women.

17.0 Conclusions:

In conclusion by identifying distinct trajectories, including one largely unaffected by environmental factors, our study provides a novel perspective on cognitive aging by emphasizing its complexity as a heterogeneous process shaped by individual responsiveness. This challenges the traditional view of a uniform cognitive decline with age and highlights the importance of considering individual-specific responses to environmental exposures. The identification of trajectories of low cognitive performance with early decline, high cognitive performance with late decline and unmodulated cognitive change underscores the meaningful heterogeneity in cognitive aging and the significant role of lifestyle and genetic factors. Our findings suggest that cognitive aging trajectories are associated with the relationship between individual environmental sensitivity and lifestyle factors, potentially contributing to the need for considering trajectory-specific approaches in cognitive health research, rather than assuming a one-size-fits-all solution. The low cognitive performance with early decline trajectory might benefit from research exploring whether interventions that promote social engagement or participation in cognitively stimulating activities could be effective. Similarly, maintaining beneficial behaviours and minimizing detrimental ones could be particularly relevant for individuals in the high cognitive performance with late decline group preserve their cognitive performance.

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