# Comprehending Non-Clinical Dimensions of Aging: A Bibliometric Analysis and Systematic Review on Psychosocial Aspects of Aging in India

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# ABSTRACT

Over the last ten decades, India has experienced a significant growth in its elderly population, driven by the drastic increase in the average human lifespan. While Increased lifespans are an indicator of the country's progress, the dynamic shift in the population structure is associated with far-reaching consequences for the economic, social, and public health systems. However, the current understanding of ageing in the Indian context remains largely limited to the clinical, and biological aspects of ageing concerning the deteriorating state of health. The emerging challenges among the elderly, such as mental health issues, social isolation, changing social structures, and family dynamics have not been given due attention.

To address this gap, this study combines bibliometric analysis and a systematic review of existing literature to understand the emerging trends, and the intellectual structure and summarize the findings on the non-clinical aspects of ageing, with a special emphasis on the psychosocial dimensions. A total of 801 documents specific to this subject area were retrieved systematically using the Web of Science database and Performance analysis (Citation and publication-related metrics) along with Science mapping (Co-Citation, Co-Authorship, Co-occurrence analysis) techniques to understand the present, past, and future research trends on this issue. The same pool of literature was further systematically reviewed, and 51 articles were examined thoroughly.

The identified prominent factors influencing psychosocial well-being among the aged population were social capital, family support, financial security, living arrangements, built environment, history of mental health disorders or presence of anxiety, depression, and spirituality. The results showed that these themes were only partially explored, warranting further large-scale research studies to establish the findings. The study's findings support a holistic approach, considering psychosocial factors influencing ageing to create an enabling environment for the elderly to age well and productively.

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# ABBREVIATIONS

**LASI-** Longitudinal Ageing Study in India

**LMICs-**Low- and Middle-Income countries

**NGO**- Non-Governmental Organizations

**NSSO**- National Sample Survey Organisation

**QoL**- Quality of Life

**SAGE-** Study on Global AGEing and Adult Health

**UN** - United Nations

**WoS –** Web of Science

**WHO-** World Health Organization

# INTRODUCTION

## *1.1Ageing; An Overview*

Ageing is most often defined at a biological level, as the decline of essential "physiological functions for survival and fertility", with time (Gilbert, S.F,2000). The global population is experiencing a demographic shift towards longer lifespans, driven by advances in medicine, public health, and improved living conditions. As a result, ageing is no longer merely a biological process but a multifaceted challenge, encompassing physical, emotional, social, and economic dimensions. The aging phenomenon has become a critical global issue, with significant implications for societies, economies, and healthcare systems.

"In 2020, the number of individuals aged sixty years and above were seen to exceed children younger than 5 years" (WHO,2024) It is estimated that by 2050 one in five people in developing nations also referred to as the 'Global South' will be over the age of sixty (Kohli et al.,2020). The influence of rapid urbanization, change in social support structures, and the increasing burden of diseases on the process of ageing required a one-health approach to deal with these challenges (De Luca et al.,2021).

In response to addressing the need of the hour WHO reiterated the concept of "health ageing" by declaring 2021-2030 as the "UN Decade of Health Ageing "to facilitate global dialogue and action in promoting age-friendly and sensitive environments to enhance the lives of elder adults and their families, communities. Healthy Ageing may be described as "the process of developing and maintaining the functional ability that enables well-being in older age, where "functional ability" is characterized by the capabilities in the individual's procession that facilitate them to be and do what they have reason to value" (WHO,2020). "The ability to meet one's basic needs, make decisions, be

active and mobile, invest and maintain social relationships, and thus ultimately, contribute to the communities around oneself." (Healthy Ageing and Functional Ability,2022).

There's a growing recognition of the need for a multi-pronged approach that combines strengthening social security systems, improving healthcare infrastructure, and promoting age-friendly communities. However, existing knowledge on ageing is largely driven by research conducted in the 'Global North'(Bluinc,2024). A necessity for research and policy interventions to address the complex issues the elderly face, especially in LMICs like India, where the ageing population is growing rapidly. Yet, the support systems remain underdeveloped (Bloom et al., Alam, 2006).

## *1.2Ageing in Global Context*

Virtually every country's population is ageing, and to combat the multifaceted challenges associated with it, diverse strategies are being adopted worldwide. Comprehensive welfare systems, community-based support, and innovative healthcare solutions are being developed and introduced as part of strategies to boost the quality of life (QoL) of elderly.

Long-established welfare schemes present in the Global North nations such as Europe and North America act as the cornerstone of support for the elderly. Universal pensions, healthcare access, and extensive social support services are being offered by Scandinavian countries in consideration of the view that "ageing is a social responsibility. These countries are seen to promote "active ageing" by encouraging their citizens to remain engaged in their workforce or communities as long as they can (Walker,2006). Significant investments in age-friendly infrastructures including geriatric-sensitive designs in housing, public transportation, healthcare facilities, and long-term care services are being adopted in many European countries (Fujisawa &Colombo, 2009). In Similar terms, a mix of public and private social security schemes like Medicare and Medicaid have been rolled out in the "US" and "Canada" to ensure economic security for older adults (Turner & Hughes,2008).

Similar integrated policy frameworks and programs have been adopted in Asian countries like Japan, South Korea, and Singapore for the welfare of the elderly. These countries are known for their proactiveness in responding to the challenges of the changing demography. Japan introduced its landmark policy, "The Long-Term Care Insurance (LTCI) System" in the year 2000, which helped in shifting the burden of elderly care from families by providing government-funded access to institutional care (Fu et al.,2023). On the other side, Singapore was seen adopting, the "Successful Ageing" framework," which promoted lifelong learning, active ageing, health promotion social inclusion, and engagement (Singapore Ministry of Health,2016). Additionally, the "Aged Care Master Plan" was introduced to reduce reliance on institutional care by expanding home-based care for the elderly and supporting their caregivers (Chan,2015). Of late, many countries like South Korea, China, and Japan have all been revoking their population control policies in response to the drastically low birth rates in the country and replacing them with policies that encourage more births and child-rearing to support and balance the ageing demography (World Economic Forum,2024).

Despite the availability of comprehensive systems to cater to the holistic well-being of their ageing population, these countries face several challenges such as reduced workforce, increasing financial liabilities due to chronic disease burden, and long-term care needs, the potential population imbalances and rising cases of mental health issues ailing to social isolation (Ismail et al.,2021). Of late, many countries like South Korea, China, and Japan have all been revoking their population control policies in response to the drastically low birth rates in the country and replacing them with policies that encourage more births and child-rearing to support and balance the ageing demography (World Economic Forum,2024). The understanding of ageing in the global context can be seen shifting towards addressing the needs of the elderly with a one-health approach that has a special focus on the psychosocial aspects of health and well-being rather than the mere focus on physical health (De Luca et al.,2021).

## *1.3Ageing in India*

The status of ageing in India is marked by a significant rise in the elderly population, which is vividly expressed by the figures both in whole numbers and as a percentage of the overall population. As of 2021, nearly 10% of the total population in India, approximately 138 million people were in the category of age sixty and above (United Nations, 2022). By 2050, this number is expected to increase to more than double reaching around 319 million, highlighting the need for effective programs and policies to deal with this vulnerable demography. Moreover, the accelerated rise in life expectancy from fifty-eight years in 1990 to over seventy years by 2022 is a window into the new challenges that arise in healthcare, financial security, and social inclusion of this ageing population (Kowal et al.,2012: Raju,2017).

While countries like Japan, Singapore, and South Korea have successfully integrated government and community efforts to create a safety net for their elderly citizens, India faces significant challenges in replicating such models due to the fragmented and underdeveloped institutional support systems to cater to its vast population and diverse socioeconomic landscape (Bloom et al.,2006). For instance, “the National Policy on Older Persons (NPOP)”, enacted in 1999, and later “The Maintenance and Welfare of Parents and Senior Citizens Act, 2007” outlines, several facilities for the welfare of senior citizens, but its implementation has been inconsistent and fragmented (Rajan,2006).

While the introduction of pension schemes like the “National Pension Scheme (NPS)” and health insurance programs through “the Ayushman Bharat Health Scheme” aims to provide financial and healthcare support, these benefits are not reaching the majority of those in need (Narayana, 2019). Only a minor percentage of older adults, particularly those in rural and economically disadvantaged areas, are covered by such programs (Kalavar et al.,2018). Despite being covered by such schemes, rural areas face a greater challenge to avail geriatric care facilities due to the lack of specialized facilities. Urban centers, while better equipped, struggle with issues of affordability and accessibility for many elderly residents (Banerjee, 2021).

An assessment of the disconnection between the intent of existing policies (Kalche & Gatti,2003)., such as the "National Social Assistance Programme (NSAP)" and "the Pradhan Mantri Vaya Vandana Yojana (PMVVY)" and their implementation for catering the current needs of the elderly, need to be examined in relevance to the current context. Private sector involvement is emerging as a potential solution, with retirement communities and specialized care services gaining traction in urban areas. However, these options remain out of reach for the majority. NGOs and civil society organizations are playing an increasingly important role in bridging the gap, providing services ranging from daycare centers to mobile health clinics. Their efforts, while commendable, are limited in scale and require greater support and coordination with government activities.

Existing measures have primarily focussed on the healthcare needs of the elderly, while the psychosocial dimensions of ageing, which are closely linked to health and well-being, have not received adequate attention (Alam et al., 2015). While longer lifespans are a positive indicator of development, they also raise concerns about the QoL and the resources available to serve the needs of the elderly, particularly individuals facing financial instability, chronic illnesses, or social isolation (Dey et al.,2012). This study intends to draw attention to the grappling effect of the demographic transition and the associated psychosocial burden on older adults in India. An urgent need for innovative solutions that can leverage technology, community resources, and intergenerational solidarity to create a more inclusive and supportive environment for its ageing population is warranted.

## *1.4Psychosocial Aspects of Ageing*

The term "psychosocial" most often refers to the interplay of individual behaviors, thoughts, and social factors (Oxford Languages,2024). In understanding this complex interrelationship in the context of ageing, MP Lawton, a prominent gerontologist from the late 19$^{th}$ century developed a model. This model (Figure 1) defines the entities of a good life for older adults, and it consists of four key areas: "psychological well-being, perceived QoL, objective environment, and behavioral skills"

(Gerritsen et al., 2004). The domain of "Behavioral competence" is explained as dealing with an individual's capability to perform tasks and activities which include cognitive and physiological health. The "Psychological well-being" domain is said to include all the entiies that influence an individual's mental health concerning self and life as an entity. The 'Objective environment' domain entails all the factors of the external environment that influence the life of older adults such as housing designs, social factors, living arrangements, financial status, and more. Finally, the domain of 'Perceived Quality of life' entails the subjective perception of an individual's QoL for instance their view towards happiness and life satisfaction (Gerritsen et al., 2004)

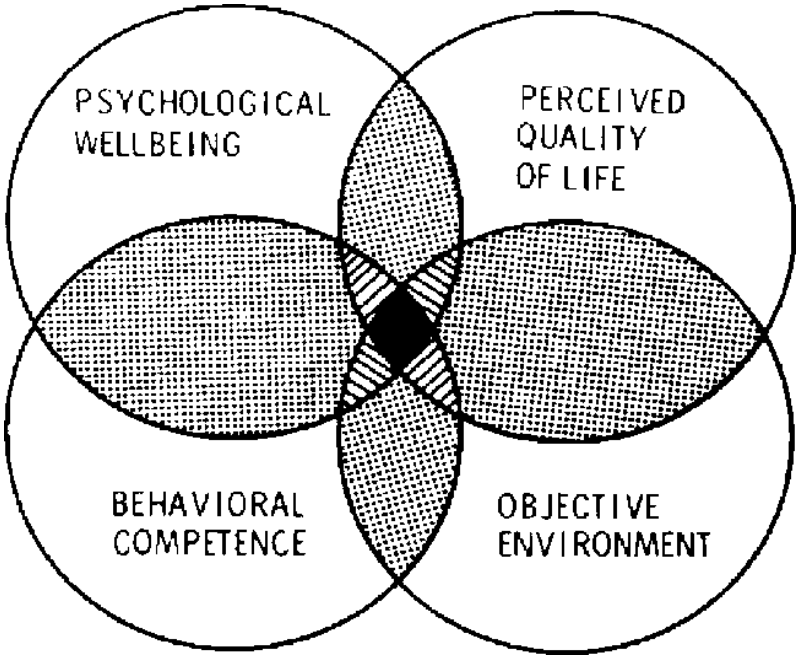


**Figure 1** Lawton's four sectors of good life (Lawton,1983)

Source: Research Gate (Gerritsen et al., 2004)

According to this model, the Equilibrium between an individual's perceived quality of life and their capabilities influences their mental well-being, indicating the interconnectedness of these factors.

***1.4.a Psychosocial Problems of the Aged: Indian Context***

Studies have demonstrated that social isolation and lack of familial support tend to exacerbate the susceptibility of older adults to conditions like depression, anxiety, and cognitive decline (Nagaraj et

al.,2020). Over the years with the advent of urbanization and globalization, the mass migration of family members belonging to the productive age to urban areas and overseas in search of work, and a better lifestyle has become a common sight. This has led to the breakdown of the traditional joint family structures in India and increased the budding of nuclear families. Researchers say that this has caused increased loneliness and emotional neglect among the elderly population (Rajan & Kumar,2003). Chadha (2020) narrates that living arrangements with family offered emotional security and a sense of self-worth to older adults, which allowed them to care for grandchildren and contribute to household decisions. The loss of this traditional role has left the Indian elderly feeling isolated and stripped of a dutiful purpose in life.

Gender disparities in ageing have demonstrated a profound influence on the psychosocial well-being of older adults in India, especially elderly women who are highly vulnerable given their lack of financial independence, widowhood, and lower literacy levels (Shankardass,2014: Kalvar & Jamuna 2011). Thereby, elderly women are prone to a disproportionate risk of poverty and social isolation (Kumar & Bhargava,2019).

Another growing concern is the rising number of elder abuse cases which report family members penetrating physical and emotional harm to their elderly for financial exploitation. According to 2018 report of HelpAge India, elder abuse cases in the country are significantly underreported due to complex socio-cultural and family dynamics existing in India. Though Legal frameworks and social protections, like the 'Maintenance and Welfare of Parents and Senior Citizens Act, 2007 are being introduced to address this issue, more comprehensive efforts are required to access the impact of such experiences on the psychological well-being of elderly. (HelpAge India,2018).

Spirituality and religious practices are central to the lives of many older adults in India, it offers a sense of meaning, community, and at times act as a psychosocial coping mechanism+ (Agrwal,2012). Religious activities are reported to provide solace and improve life satisfaction, particularly among the aged (Sharma,2013). This connection between spirituality and ageing aligns

with the broader concept of "successful ageing," which emphasizes maintaining cognitive abilities, engaging in social activities, and finding purpose in later life (Bowling &Iliffe,2011; Baltes &Baltes,1990).

Technology adoption among the elderly is slowly increasing, providing potential benefits such as enhanced social connectivity, access to information, and improved healthcare management (Bansod &Paswan,2019). However, the digital divide remains stark, particularly in rural areas and among socioeconomically disadvantaged groups, limiting the potential for technology to fully serve the needs of the ageing population (Malhotra &Goyal,2020).

Community-based organizations and NGO's needs to be identified, as the bridge to the gaps in social services, especially in under-resourced regions, and act as essential support systems for the elderly (Kalvar & Jamuna,2011). They complement government programs through their services such as daycare centers, health camps, and other social services (Rajan & Jamuna,2008). The COVID-19 pandemic exacerbated the existing vulnerabilities of older adults in terms of social isolation, access to healthcare, and financial insecurity (Srivastava &Kumar,2020). Post-pandemic, a renewed focus on the requirement for comprehensive and resilient social support structures for the elderly is being highlighted (Bansod & Paswan,2020).

This study is a review of the existing literature to understand the need to address the psychological and social requirements of older adults and not just their physical health requirements to enhance overall well-being.

## RATIONALE OF THE STUDY

The rationale of the current study is to comprehend the extent of understanding presented by the existing literature on the nonclinical dimensions of ageing, specifically the psychosocial aspects of ageing in the Indian context.

## OBJECTIVES

The study aims to:

1. To examine the non-clinical dimensions of ageing as investigated over the last 25 years in India

2. To gather insights on the psychosocial aspects of ageing in India for the last 25 years

# RESEARCH METHODOLOGY

The study was done in two stages. First, b**ibliometric methods** were used to analyze the literature on non-clinical aspects of ageing in India from 1999 to 2024. In the context of this study, "**non-clinical studies"** were defined as studies that focus on environmental, social, psychological, and behavioral processes of ageing but do not include those studies conducted primarily for medical advancement, examination, or treatment of illness. However, there was an exception for studies dealing with neurodegenerative diseases, as these studies were included due to their strong influence on cognition levels and the possibility of affecting the QoL of older adults and their caregivers. In the second stage, a **systematic review** was carried out to understand the psychosocial dimension of ageing in the Indian population. The systematic review focused on ageing studies in the Indian population within the research areas of "Psychology", "Social work" and "Social Sciences".

## *5.1 Methodology for the Bibliometric Analysis*

### *5.1.a Design*

In recent years 'Bibliometrics' has emerged as a crucial method that has been used extensively for multidisciplinary analysis (Shang et al.,2024). The Scope of the Study affirmed the use of bibliometric software to visualize large-scale data to offer a clear understanding of the evolution, composition, and linkages of concepts.

### *5.1.b Tools for Data Analysis*

The Bibliometric analysis was conducted using the graphical user interface-based network visualization software, '**VOS Viewer'** (Donthu et al.,2021**),** and **'HARZING.com Publish or Perish'** software was utilized to generate citation metrics to access the performance of the results retrieved. Additionally, the analysis generated from the '**Web of Science'** (WoS) database was used to aid further understanding.

Science mapping was done using the publications retrieved from the '**Web of Science (WoS) Core Collection'.' WoS** database was preferred over others since it is regarded as the standard reference database for bibliometric analysis due to its extensive bibliographic profiling of studies (Donthu et al,2021). The strict peer review process and careful editorial oversight of the literature made available on this database help ensure the quality of studies and hence make it a popular choice among academicians (Lin & Yu,2023). This study employed various Bibliometric methods to understand the existing literature networks and identify emerging research trends and patterns.

***5.1.c Data Search Strategy***

A comprehensive search strategy evolved by employing a group of synonymous phrases or queries corresponding to "Ageing in India" in 'Medical Subject Heading (MeSH)' Databases to perform a systematic literature search (Gu et al.,2018). The terms "**Ageing**", "**Aging**", "**Aged**", "**Elderly**", "**Older adults**" and "**India**". The search conducted using the term "**Psychosocial**" did not yield the desired results. Hence to reduce the chance of missing out on relevant studies, the term was deliberately excluded from the search string.

The Search was conducted using the **WoS Core Collection** Database in September 2024. The **WoS** Advanced Search Field Tag **TS** (Topic) was used to search the "Ageing" related query terms in the following fields: TI(Title), AB(Abstract), AK (Author Keywords), and KP (Keywords Plus) within a record. Additionally, the field tag CU(Country/Region) was used to search for the term "India" in the Addresses field within a record, and the field tag LA(Language) was used to limit the search to "English". All studies published in the timeline of 01-08-1999 to 01-08-2024 were included in the initial search. A total of **38,615** results were obtained. The search results were further refined by excluding documents categorized as Reprint, Correction, News Items, Retracted Publications, Book Reviews, Letters, and Meeting Abstracts. WoS automation tools were used to filter out articles not of relevance to the research topic by research area, Web of Science categories, and Citation Topics, and a total of 2840 results were considered for review. The complete query has been presented in **Table**

**1.** The Extensive compendium of the search strategy has been attached to the *Appendix*. The search was completed on September 7, 2024, to prevent data discrepancies due to database updates. Since database searches frequently return articles that appear applicable but are very superficially related to the topic of search, a post-search manual screening was crucial to confirm the relevance of the results (Chen et al., 2024). Manual screening was carried out based on the relevance of the title and abstract of the documents to the research topic. The Inclusion criteria defined for this study were outlined as Studies that are original and review articles, Studies involving aged or older adult human participants**,** Studies that address the psychosocial dimension of ageing, **and** Studies set in the Indian context or international studies involving the "Indian population". Finally, this study retrieved 801 valid results from the WoS Core Collection. The complete PRISMA screening process is illustrated in Fig.2.

**Table 1**: Search Query/Vector

((((((((((TS=("Ageing")) OR TS=("Aging")) OR TS=("Aged")) OR TS=("Elderly"))) OR TS=("older people")) AND LA=(English)) AND CU=("India")) NOT TS=("Animals")) NOT TS=("Plants")) NOT TS=("Materials")) NOT TS=("Elements") and Engineering or Materials Science or Pharmacology Pharmacy or Pediatrics or Computer Science or Biochemistry Molecular Biology or Surgery or Metallurgy Metallurgical Engineering or Chemistry or Research Experimental Medicine or Physics or Psychiatry or Endocrinology Metabolism or Ophthalmology or Immunology or Oncology or Cardiovascular System Cardiology or Nutrition Dietetics or Infectious Diseases or Anesthesiology or Dentistry Oral Surgery Medicine or Polymer Science or Cell Biology or Orthopedics or Respiratory System or Biotechnology Applied Microbiology or Dermatology or Urology Nephrology or Obstetrics Gynecology or Tropical Medicine or Agriculture or Food Science Technology or Gastroenterology Hepatology or Energy Fuels or Microbiology or Business Economics or Radiology Nuclear Medicine Medical Imaging or Pathology or Mathematics or Hematology or Genetics Heredity or Otorhinolaryngology or Construction Building Technology or Biophysics or Instruments Instrumentation or Toxicology or Plant Sciences or Mechanics or Medical Laboratory Technology or Parasitology or Meteorology Atmospheric Sciences or Veterinary Sciences or Anatomy Morphology or Transportation or Electrochemistry or Mathematical Computational Biology or Nuclear Science Technology or Sport Sciences or Virology or Optics or Geology or Rheumatology or Emergency Medicine or Astronomy Astrophysics or Audiology Speech Language Pathology or Reproductive Biology or Transplantation or Developmental Biology or Water Resources or Operations Research Management Science or Zoology or Thermodynamics or Imaging Science Photographic Technology or Entomology or Allergy or Information Science Library Science or Geochemistry Geophysics or Marine Freshwater Biology or Crystallography or Forestry or Linguistics or Social Issues or Fisheries or Mycology or Acoustics or Evolutionary Biology or Geography or Remote Sensing or Oceanography or Arts Humanities Other Topics or Mineralogy or Spectroscopy or Mining Mineral Processing or Biodiversity Conservation or Literature or Microscopy or Mathematical Methods In Social Sciences or Physical Geography or History Philosophy Of Science or History or Paleontology or Philosophy or Dance or International Relations or Theater or Architecture or Art or Music or Physiology (Exclude – Research Areas) and Neurosciences or Hospitality Leisure Sport Tourism or Green Sustainable Science Technology or Automation Control Systems or Nanoscience Nanotechnology or Neuroimaging (Exclude – Web of Science Categories) and Reprint or Correction or News Item or Retracted Publication or Book Review or Letter or Meeting Abstract (Exclude – Document Types) and 1.104 Virology - General or 1.55 Urology & Nephrology - General or 2.90 Water Treatment or 6.115 Sustainability Science or 1.102 Stem Cell Research or 1.196 Micro & Long Noncoding Rna or 2.67 Nanoparticles or 3.35 Zoology & Animal Ecology or 1.249 Digestive System Disorders or 1.258 Zoonotic Diseases or 7.12 Metallurgical Engineering or 3.232 Veterinary Sciences or 1.239 Tissue Barriers or 1.297 Asbestos & Mesothelioma or 1.79 Molecular & Cell Biology - Physiology or 2.39 Polymer Science or 2.74 Photocatalysts or 3.2 Marine Biology or 4.289 Biophotonics & Electromagnetic Field Safety or 7.251 Electrical - Harvesting & Discharging or 1.219 Cancer Drugs or 1.265 Dermatology - Skin Allergies or 1.285 Cystic Fibrosis or 2.176 Drug Delivery Chemistry or 2.211 Mass Spectrometry or 4.18 Power Systems & Electric Vehicles or 1.26 Diabetes or 1.36 Ophthalmology or 1.49 Dentistry & Oral Medicine or 1.34 Orthopedics or 1.128 Fertility, Endometriosis & Hysterectomy or 1.66 Hiv or 1.104 Virology - General or 1.55 Urology & Nephrology - 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Dna Damage or 1.235 Throat & Voice Disorders or 1.130 Lymphomas or 1.164 Endocrinology & Metabolism or 4.183 Transportation or 1.68 Lipids or 1.136 Autism & Development Disorders or 1.151 Pancreas & Gall Bladder Disorders or 1.197 Molecular & Cell Biology - Mitochondria or 1.236 Liver Diseases or 3.60 Herbicides, Pesticides & Ground Poisoning or 1.148 Medical Mycology or 1.94 Cardiac Arrhythmia or 1.95 Gastrointestinal & Esophageal Diseases or 1.172 Sports Science or 1.247 Migraines & Headaches or 1.103 Blood Disorders or 1.125 Hepatitis or 1.203 Neuromuscular Disorders or 1.225 Hematologic Diseases or 1.42 Bacteriology or 1.163 Parasitology - General or 1.168 Vascular, Cardiac & Thoracic Surgery or 1.120 Inflammatory Bowel Diseases & Infections or 1.228 Virology - Tropical Diseases or 1.173 Cosmetic Surgery or 1.217 Parasitology - Malaria, Toxoplasmosis & Coccidiosis or 1.243 Kidney Diseases or 1.25 Molecular & Cell Biology - Cancer, Autophagy & Apoptosis or 1.113 Brain Imaging or 1.233 Pelvic & Renal Disorders or 1.75 Blood Clotting or 1.161 Virology - Identification & Sequencing or 4.17 Computer Vision & Graphics or 1.189 Genome Studies or 1.253 Nerve Disorders or 3.91 Contamination & Phytoremediation or 1.111 Liver & Colon Cancer or 1.54 Molecular & Cell Biology - Genetics or 1.6 Immunology or 1.199 Lung Cancer or 1.257 Birth Defects or 1.117 Pharmacology & Toxicology or 10.240 Music or 1.147 Prostate Cancer or 1.281 Auto-inflammatory Diseases or 1.324 Bacterial Toxins & Diseases or 2.244 Chemometrics or 3.32 Entomology or 1.248 Sexually Transmitted Infections or 1.278 Adrenal Disorders or 3.40 Forestry or 1.127 Molecular & Cell Biology - Pharmacology or 1.181 Molecular Toxicology or 1.291 Testicular Diseases or 3.4 Crop Science or 3.45 Soil Science or 6.223 Hospitality, Leisure, Sport & Tourism or 1.186 Chromosome Disorders or 1.195 Neuroendocrine & Intestinal Disorders or 3.171 Photoproductivity or 7.227 Manufacturing or 1.108 Molecular & Cell Biology - Cancer & Development or 1.261 Parasitology - Trypanosoma & Leishmania or 1.266 Wounds & Ulcers or 2.90 Water Treatment or 3.83 Bioengineering or 4.58 Wireless Technology or 6.115 Sustainability Science or 1.102 Stem Cell Research or 1.196 Micro & Long Noncoding Rna or 1.255 Musculoskeletal Disorders or 1.287 Dietary Stimulants or 2.67 Nanoparticles or 3.35 Zoology & Animal Ecology or 1.249 Digestive System Disorders or 1.258 Zoonotic Diseases or 7.12 Metallurgical Engineering or 1.157 Organ Donation & Transplantation or 3.232 Veterinary Sciences or 1.239 Tissue Barriers or 1.297 Asbestos & Mesothelioma or 1.79 Molecular & Cell Biology - Physiology or 2.39 Polymer Science or 2.74 Photocatalysts or 3.2 Marine Biology or 4.289 Biophotonics & Electromagnetic Field Safety or 7.251 Electrical - Harvesting & Discharging or 1.219 Cancer Drugs or 1.265 Dermatology - Skin Allergies or 1.285 Cystic Fibrosis or 2.176 Drug Delivery Chemistry or 2.211 Mass Spectrometry or 4.18 Power Systems & Electric Vehicles or 6.263 Agricultural Policy or 7.262 Explosives or 7.300 Asphalt or 1.132 Extracellular Matrix & Cell Differentiation or 1.315 Laser Surgery, Therapy & Protection or 1.96 Cell Biology or 3.220 Smell & Taste Science or 3.64 Phylogenetics & Genomics or 4.169 Remote Sensing or 6.269 Political Philosophy or 6.316 Folklore & Humor or 8.140 Water Resources or 9.143 Dynamical Systems & Time Dependence or 1.159 Membrane Channels & Receptors or 1.254 Ultrasound In Medicine or 1.271 Lysosomal Storage Disorders or 1.286 Immunology & Hematology or 10.126 Philosophy or 2.165 Nanofibers, Scaffolds & Fabrication or 2.62 Electrochemistry or 3.180 Microbial Biotechnology or 3.85 Food Science & Technology or 3.87 Paper & Wood Materials Science or 4.101 Security, Encryption & Encoding or 4.224 Design & Manufacturing or 5.30 Superconductor Science or 5.77 Applied Physics or 1.106 Rheumatology or 1.105 Strokes or 1.129 Back Pain or 1.222 Epilepsy & Seizures or 1.154 Assisted Ventilation or 1.112 Palliative Care or 4.237 Safety & Maintenance or 6.69 Language & Linguistics (Exclude – Citation Topics Meso) and 7.177.261 Biodiesel or 6.238.1700 Physician-scientists or 6.277.722 China or 6.146.2370 Indonesia or 5.31.272 Mosfet or 1.264.618 Caenorhabditis Elegans or 10.149.1978 Moriscos or 10.201.2457 Augustine or 10.99.1888 Coetzee or 2.22.798 Cisplatin or 2.241.270 Nanofiltration or 2.296.1344 Dyeing or 2.298.761 Perovskite Solar Cells or 2.166.1659 Biosimilars or 2.114.914 Stretchable Electronics or 2.145.243 Aptamer or 2.41.366 Selective Catalytic Reduction or 2.53.371 Hydrogels or 3.198.926 Endophytic Fungi or 3.274.2008 Hydra or 3.275.2177 Harvesting Robot or 3.51.115 Corpus Luteum or 4.13.896 Vehicular Ad Hoc Networks or 4.138.1329 Digital Filters or 4.174.2147 Phonocardiogram or 4.187.2488 Specific Emitter Identification or 4.61.1820 Credit Scoring or 5.250.747 Diffuse Optical Tomography or 6.146.1728 Artisanal Mining (Exclude – Citation Topics Micro) and Family Studies (Exclude – Web of Science Categories)

### *5.1.d Data Analysis*

Data was cleaned through the removal of duplicates, and non-relevant documents to the theme of the study by creating a Zotero reference manager library of the retrieved results.

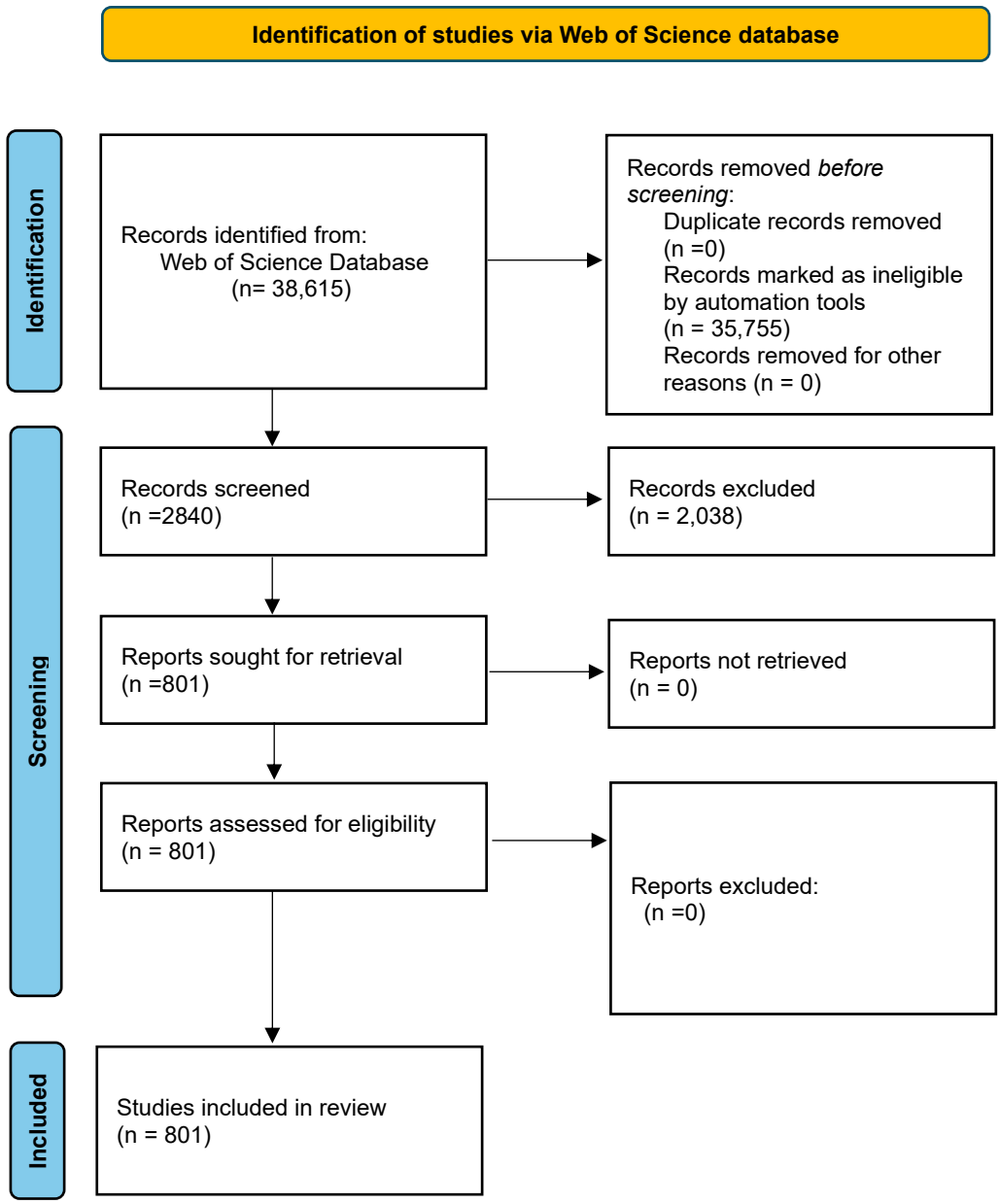


**Figure 2 PRISMA** 2020 flow diagram describes the document selection process for bibliometric analysis.

The Entire recorded contents of the included documents retrieved from the WoS database in plain text files and Tab-delimited text files were organized as input in VOS viewer software to analyze data through the identified science mapping techniques. The VOS viewer software uses specific

terminology to explain the maps or graphs generated. "'An *Item or a node or a vertex'* is referred to as the objects of interest and '*Weights'* are non-negative values that attribute the importance of an item. A '*Link'* is defined as a connection or a relation between two items while a '*Network'* is a collection of items together with links between the items" (Nees & Waltman, 2023). Alongside the same dataset in Tab-delimited text files were set as input into HARZING.com Publish or Perish software to generate Citation metrics through performance analysis of the data. WOS's "Analyze results" feature extracts data of a field of choice from all its databases and generates a report. This was utilized to generate Treemaps and Tables of selected fields to enhance the understanding.

### *5.1.e Bibliometric Methods Employed in the Study*

In general, bibliometric analysis mainly consists of two methods namely performance analysis and science mapping. Performance analysis investigates the contributions of the research entities of a certain field whereas science mapping establishes the relationship between the entities. This study uses a combination of performance analysis metrics and science mapping techniques such as Co-Citation analysis, Keyword co-occurrence, and Co-authorship analysis to comprehensively review the research field's past, present, and future (Donthu et al., 2021).

The study utilized "Performance analysis" to analytically present the performance of the results obtained on the theme of research. A combination of Citation and Publication metrics of the obtained results was generated using HARZING.com.

Co-citation analysis is a tool that uses science mapping to expose the intellectual structure of a research field by assuming that publications cited together are similar and form thematic clusters (Donthu et al., 2021; HjøRland, 2012). Identification of clusters of co-cited references by linking two or more references when they appear in the reference of the citing articles (Mustafee et al., 2013). These thematic clusters form a strong interconnected intellectual network (Gu et al., 2018). Keyword Co-occurrence analysis uses science mapping techniques to find out existing or future relationships among subtopics in the identified field of research by considering the unit of analysis on the written

content of the publication (Donthu et al., 2021). Co-authorship inspects connections between scholars in a research field and it is used to justify and inspire new research in underrepresented areas. An amalgamation of all these techniques was employed to enrich the knowledge of the psychosocial dimensions of ageing in India.

## *5.2 Methodology for Systematic Review*

The next phase of the study involved a systematic review to develop the knowledge of how psychological dimensions of ageing in the Indian population have been understood.

### *5.2.1 Study Design*

The systematic review aimed to examine the psychosocial aspects of ageing in the Indian population, specifically within the fields of sociology, social work, and psychology from the pool of "non-clinical" literature on ageing in India systematically identified for the bibliometric analysis. The process followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines and focused on identifying relevant studies published between August 1999 and August 2024 from the WoS Core Collection database.

### *5.2.2 Data Search Strategy*

The comprehensive search strategy (Refer to **Section 5.1.c**) developed for the bibliometric analysis was adapted and the predefined search query string (Refer to **Table 1**). It was used in continuation to refine the results to conduct the systematic review. The elaborate search strategy string compendium has been attached in the *Appendix* of this document. **The 801 results** from the WoS Core Collection database (Refer to **Figure 2**) were processed to narrow down the scope of the search to studies categorized within the research areas of psychology, social sciences, and social work. The WoS Core Collection Database Categorization of Research areas was used to obtain a total of **fifty-five articles** of which 23 belonged to **'psychology'**,18 to **'Social work',** and the rest 14 to **'Social Sciences Other**

**Topics'**. **Figure 3** illustrates the PRISMA flow diagram describing the process of document selection for the systematic review.

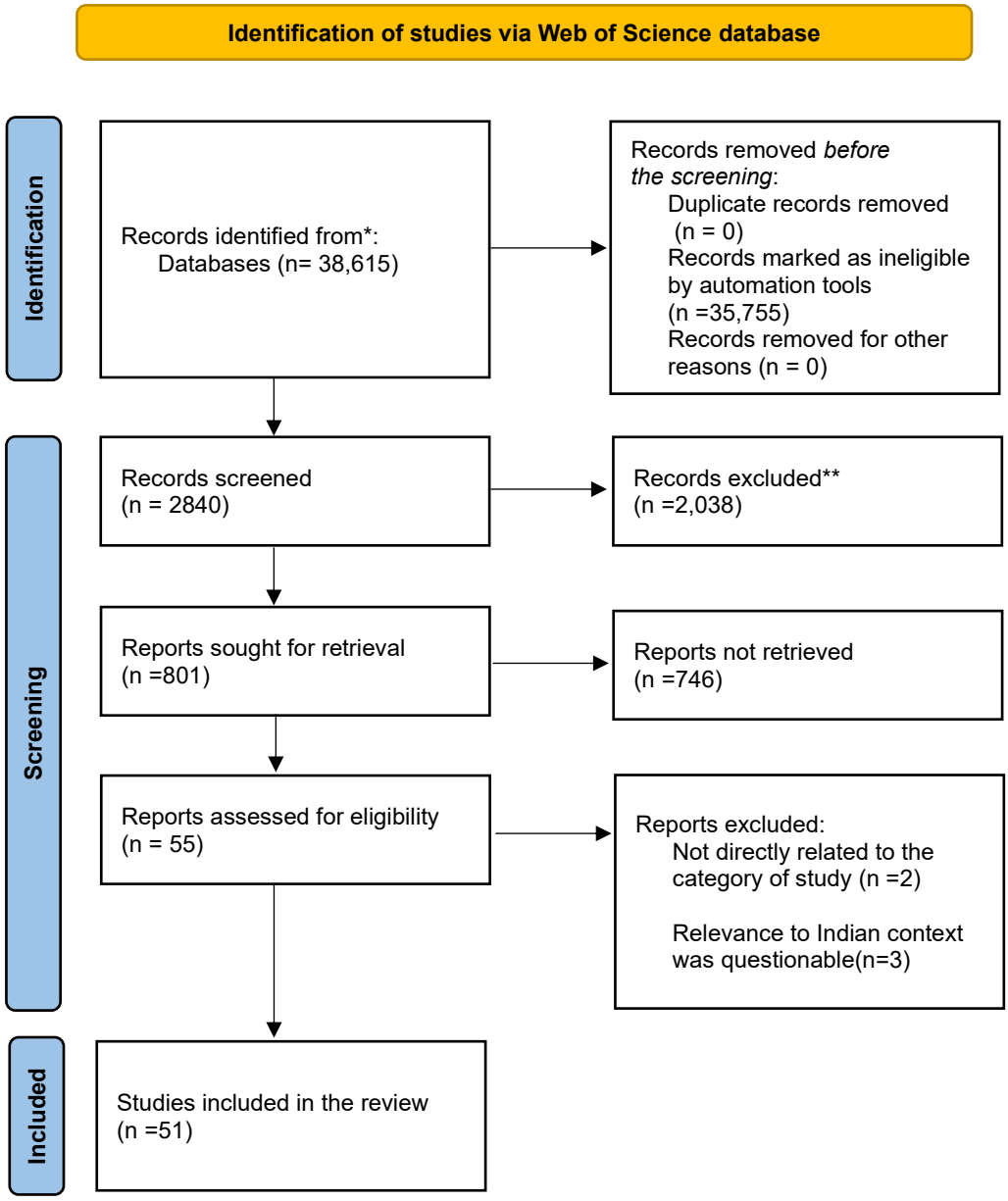


**Figure 3:** PRISMA 2020 flow diagram describes the document selection process for systematic review

### *5.2.3 Result Screening and Selection*

The fifty-five identified records were manually screened based on their titles and abstracts to ensure relevance to the research questions. The inclusion criteria required the studies to:

1. Focus on the non-clinical aspects of ageing in the Indian population.
2. Address psychosocial factors, such as mental health, social isolation, family dynamics, and social support systems.
3. Belong to the disciplines of sociology, psychology, or social work.
4. Be situated in the Indian context or involve investigations of the Indian population in an international setting.

After manual screening, about fifty-one studies were found to meet the inclusion criteria. These studies were identified as meeting the inclusion criteria and were selected for qualitative synthesis to understand the psychosocial dimensions of ageing in India.

### *5.2.4 Data extraction and quality assessment*

The Data records were extracted in the pre-defined Microsoft Excel sheet for the following parameters: Author, year of publication, Methodology employed, Location of the site of study, characteristics of the study population and Relevant Study findings. All Studies obtained are from the WoS Core Collection database were screened for relevance to the review topic. The studies retrieved are all peer-reviewed and indexed as SCIE (Science Citation Index Expanded) or SSCI (Social Sciences Citation Index) or AHCI (Arts and Humanities Citation Index) which indicate the high impact of the journals in which they are published.

### *5.2.5 Data Synthesis and Analysis*

The extracted data were synthesized to identify common themes related to the psychosocial aspects of ageing. The Data was presented in an Excel sheet in the following categories: ‘Author name’, ‘Methodology used’, ‘Location of the population studied’, ‘Other Population Characteristics’ and ‘Study findings. All Studies were further categorized based on ‘Lawton's four sectors of good life’ such as ‘Objective environment’, ‘Perceived Quality of life’, ‘Psychological well-being’ and ‘Behavioral Competence’, based on subjective interpretation. The summary of the findings was presented under subsections of the emerging themes studied in the literature such as the role of social

capital, financial security, built environment, gendered aspects of ageing, perceived quality of life, cognitive ageing, and religiosity in influencing the psychosocial wellbeing among older adults. The synthesis highlighted gaps in the existing research and areas requiring further investigation. Quantitative data presented in the studies have been presented descriptively in the review.

# RESULTS AND DISCUSSION

## *6.1 Annual Publication Trends*

The study results included a total of 801 documents published over the timespan of 1 August 1999 to 1 August 2024. **Figure 4** illustrates an observed surge in the publications on the 'non-clinical' aspects of ageing in India and it reflects the country's growing awareness of its rapidly ageing population.

The Study considered a total of 801 articles published during the period August 1999 to August 2024. **Figure 4** reflects the country's growing awareness of its rapidly ageing population and associated challenges. It also vividly portrays the steep increase in the number of publications over the years on the psychosocial aspects of ageing in India. This trend supports the dynamic shift in India's demography as the proportion of older adults is anticipated to rise remarkably in the coming decades (Rajan et al.,2003). The demonstrated progression of research in this subject area can be attributed to the breakdown of conventional family support structures, changing societal systems, and urbanization in the Indian population (Chakravorty et al., 2021)

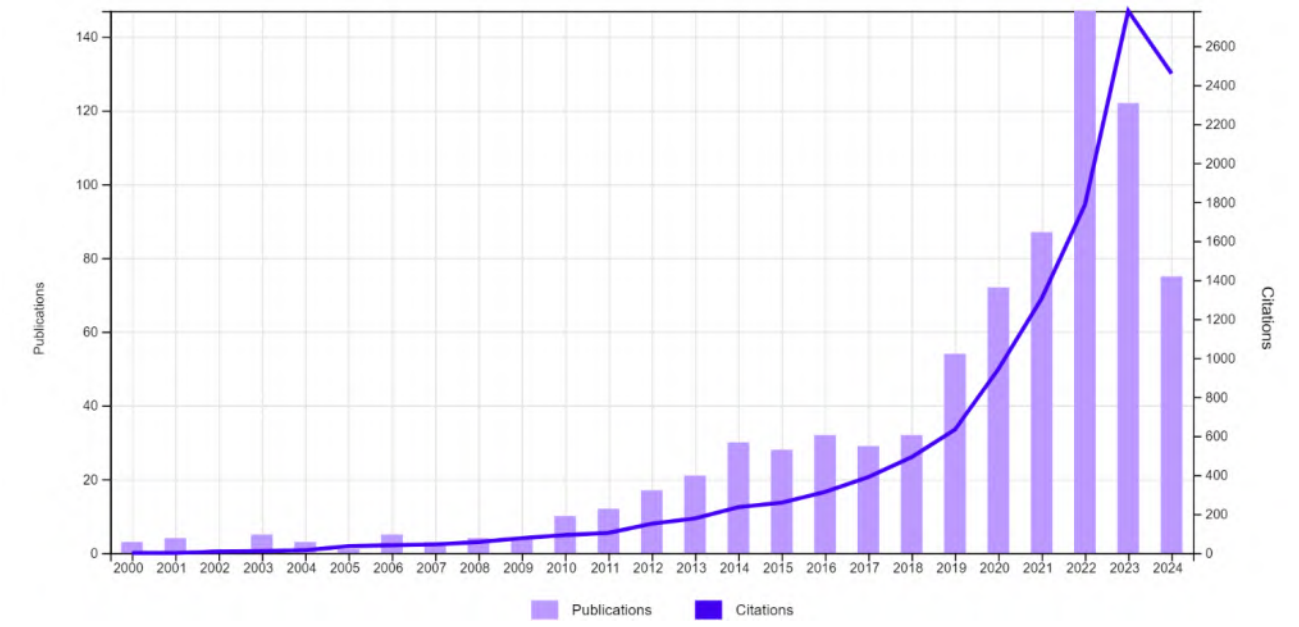


**Figure 4**: Annual Trends of Publication and Citation of the retrieved articles (Source :WoS)

2018 to 2022 witnessed an unprecedented rise in publications. This surge could be influenced by numerous factors including increased government initiatives focused on elderly care, greater funding opportunities for gerontological research, and a growing academic interest in the unique challenges faced by India's ageing. The developing recognition of the importance of ageing in the Indian context can be seen in the gradual increase in the articles post 2002 with that in 1999.

The publications doubled between 2020 and 2022 which is particularly noteworthy. This steep rise can be attributed partially to the growing ageing population and is amplified by the availability of funding and policy focus on research related to ageing (WHO,2024). The COVID-19 pandemic disproportionately affected the elderly and stimulated more research into their psychosocial well-being (Miller,2020). The significant progress in this field of study is observed by the sudden peak in publications in the year 2022 which accounted for a total of 147 publications. Further, Researchers were seen exploring diverse aspects of ageing such as mental health, social isolation, elder abuse, intergenerational relationships, and the impact of technology on elderly lives.

This growing body of research is critical to improving healthcare, and social support services, informing policy decisions and developing targeted interventions to enhance the QoL of the Indian elderly. It also reflects a shift in societal attitudes towards ageing and a recognition of the need to address the unique challenges faced by older adults in the Indian context.

## *6.2 Performance analysis*

The citation and publication metrics of the study results on the non-clinical aspects of ageing in India, generated using HARZING.com have been enlisted in **Table 2.** The bibliometric analysis reveals substantial research academic output and influence. The total 801 papers retrieved for analysis were published over the timespan of 2000 to 2024 and gathered **11,603 citations (**an average of **483.46 citations per year)**. On a per-paper basis, each publication received an average of **14.49 citations** demonstrating moderate attention per article.

### *6.2.a Authors and Paper Contributions*

Each paper has an average of **3.96 authors** implying that the research in this domain often involves collaborative efforts.

| Query | PERFORMANCE METRICS |
|---|---|
| Papers | 801 |
| Citations | 11603 |
| Years | 24 |
| Cites_Year | 483.46 |
| Cites_Paper | 14.49 |
| Cites_Author | 2875.88 |
| Papers_Author | 286.78 |
| Authors_Paper | 3.96 |
| h_index | 44 |
| g_index | 91 |
| hc_index | 39 |
| hI_index | 7.59 |
| hI_norm | 23 |
| AWCR | 2898.36 |
| AW_index | 53.84 |
| AWCRpA | 685.79 |
| e_index | 69.88 |
| hm_index | 24.72 |
| QueryDate | 25-09-2024 22:42 |
| Cites_Author_Year | 119.82 |
| hI_annual | 0.96 |
| h_coverage | 58.8 |
| g_coverage | 72.1 |
| star_count | 38 |
| year_first | 2000 |
| year_last | 2024 |
| ECC | 11603 |
| acc1 | 419 |
| acc2 | 296 |
| acc5 | 116 |
| acc20 | 15 |
| hA | 17 |

**Table 2:** Performance and Citation metrics of the study results generated using HARZING.com.

While the average number of papers per author stands at **286.78**, the average number of citations per author is **2,875.88,** suggesting that a few highly cited authors are substantial contributors to this field.

### *6.2.b H-Index and G-Index Performance*

An **h-index** of **44,** signifies that at least 44 papers have been cited 44 times or more, reflecting the depth and consistency of impactful research. The **g-index** of **91** highlights the significant influence of top-cited papers and its distribution skewed towards highly influential publications. The normalized h-index adjusted for the number of authors has been indicated by **hI-index** of **7.59.**

The h-coverage of **58.8**% and g-coverage of **72.1**% illustrate the strong citation visibility of most of the papers included in the study demonstrating the research's relevance over time.

### *6.2.c Additional Citation Metrics*

The Significant long-term impact of the research was reflected through the **AWCR (Age-Weighted Citation Rate)** of **2,898.36** and **AW-index** of **53.84.** These metrics weigh citations by the age of the publication, showing the sustained influence of the research over time. Underscoring the breadth of influence of the research results, the **e-index** of **69.88** reveals the additional citations of the study results beyond the papers contributing to the h-index.

A Steadily growing nature of this field of research was demonstrated by the **hI_annual** (annualized h-index) of **0.96** suggesting a steady increase in citation rate each year and **hm-index** of **24.72** accounting for the multi-authorship context of the papers.

### *6.2.d Citing Patterns and Coverage*

The citation trend of the study's dataset reveals a pattern of growth, with the highest number of citations occurring in the most recent year. While newer research is gaining prominence, some older papers continue to be influential indicating the field's enduring relevance. A **star count** of **38** signifies a core group of **38** highly cited papers driving much of the scholarly conversation in this domain and

a consistent presence of **17** authors (**hA**)with high h-indices, suggesting a stable community of influential researchers in the field. The Strong bibliometric indicators evidence the longevity and impact of the study's research results.

### *6.3 Analysis of the Research Areas in Psychosocial Dimensions of Ageing in India*

The distribution of research areas was analysed using the WOS database classification. The WOS database classification for research areas includes five broad categories such as "Arts & Humanities", "Life Sciences &Biomedicine", "Physical Sciences"," Social Sciences" and "Technology". **Figure 5 illustrates** the Treemap based on this classification for the study results. The analysis revealed a strong focus on health-related aspects of ageing in India. While **public health and geriatrics** dominate, there is a notable presence of interdisciplinary studies incorporating social sciences, technology, and other fields. This diversity reflects the nature of ageing issues, requiring insights from multiple disciplines.

The significant representation **of general internal medicine** highlights the importance of overall health management for the elderly population. **Science and technology** topics, though less prevalent, suggest a growing interest in technological solutions for age-related challenges. **Healthcare sciences and services** appear as a distinct category, indicating attention to healthcare systems and delivery for older adults. The presence of **psychology, neurosciences and neurology** underscores the recognition of mental health and cognitive aspects in aging research. **Social work and other social science categories**, while smaller in proportion, demonstrate efforts to understand the societal implications of an ageing population. Anthropology's inclusion suggests cultural perspectives are being considered in ageing studies.

**Rehabilitation and biomedical social sciences** categories point to research on improving the QoL and functional abilities of older adults. The appearance of demography indicates interest in population-level trends and projections related to ageing.

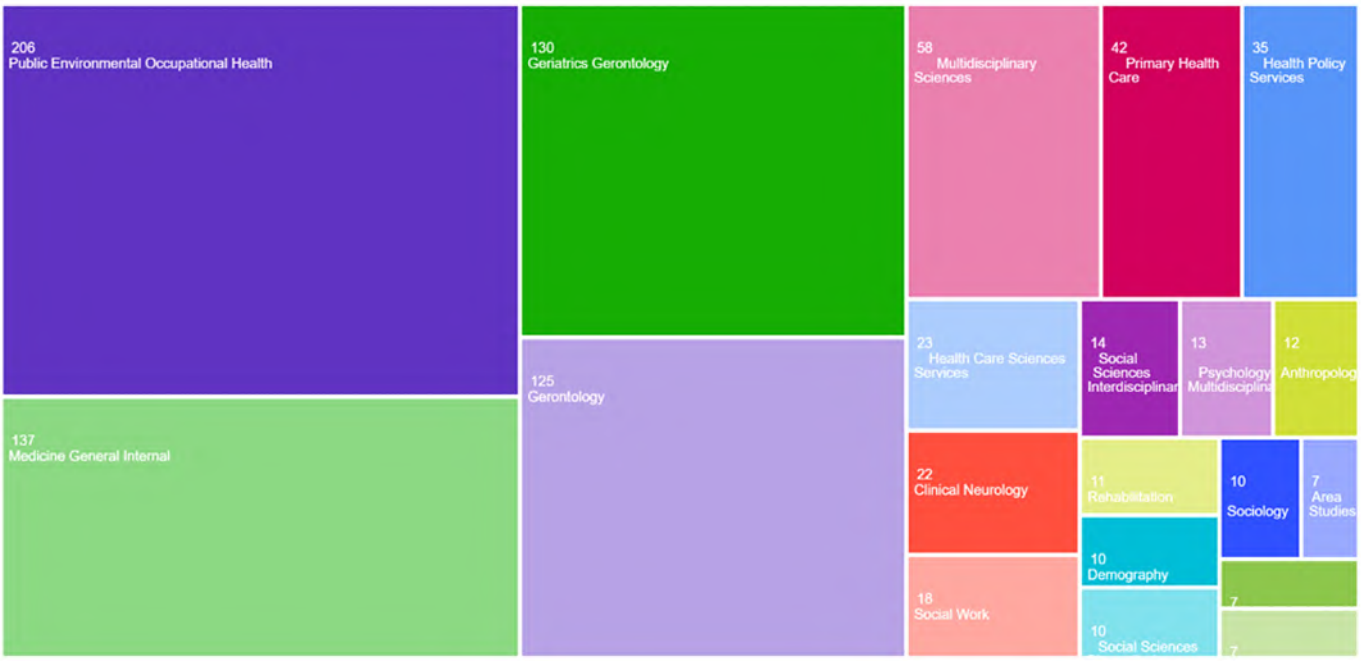


**Figure 5**: Treemap illustrating the distribution of studies based on "Research Areas".

**Education and area studies** categories though minor, hint at research on lifelong learning and regional variations in aging experiences. Environmental sciences and ecology suggest the exploration of how environmental factors impact ageing processes or how ageing populations interact with their environments. The presence of niche categories like telecommunications, ethnic studies, and integrative complementary medicine reflects the breadth of approaches being applied to ageing research in India.

**Table 3** illustrates the landscape of the Top 20 diverse research areas which indicates a holistic approach to understanding and addressing the multifaceted challenges of an ageing population in the country.

| Research Areas | Record Count | % of 801 |
|---|---|---|
| Public Environmental Occupational Health | 206 | 25.71 |
| Geriatrics Gerontology | 201 | 25.09 |
| General Internal Medicine | 179 | 22.34 |
| Science Technology Other Topics | 58 | 7.24 |
| Health Care Sciences Services | 51 | 6.36 |
| Psychology | 23 | 2.87 |
| Neurosciences Neurology | 22 | 2.74 |
| Social Work | 18 | 2.24 |
| Social Sciences Other Topics | 14 | 1.74 |
| Anthropology | 12 | 1.49 |
| Rehabilitation | 11 | 1.37 |
| Biomedical Social Sciences | 10 | 1.24 |
| Demography | 10 | 1.24 |
| Sociology | 10 | 1.24 |
| Education Educational Research | 9 | 1.12 |
| Area Studies | 7 | 0.87 |
| Environmental Sciences Ecology | 7 | 0.87 |
| Telecommunications | 7 | 0.87 |
| Ethnic Studies | 4 | 0.49 |
| Integrative Complementary Medicine | 3 | 0.37 |
| Life Sciences Biomedicine Other Topics | 3 | 0.37 |
| Public Administration | 3 | 0.37 |
| Substance Abuse | 3 | 0.37 |
| Women S Studies | 3 | 0.37 |
| Asian Studies | 2 | 0.25 |
| Medical Informatics | 2 | 0.25 |
| Behavioral Sciences | 1 | 0.12 |
| Communication | 1 | 0.12 |
| Criminology Penology | 1 | 0.12 |
| Development Studies | 1 | 0.12 |
| Government Law | 1 | 0.12 |
| Legal Medicine | 1 | 0.12 |
| Religion | 1 | 0.12 |
| 2 record(s) (0.250%) do not contain data in the field being analyzed | | |

**Table 3:** Distribution of documents based on research areas(Source: WoS analysis)

### *6.4 Prominent Publishers of the Study Results*

The Treemap visualization (Figure 6) provides a snapshot of the distribution of research publications across various publishing houses. While "Springer Nature" emerges as the leading publisher, the significant contributions from "Elsevier" and "Wolters Kluwer Med Know" Publications underscore the diverse sources of high-quality research in this field. The Collective dominance of these top publishers of the analysed literature suggests a concentration of expertise and resources in established academic publishing channels. This concentration may reflect the rigorous peer-review processes and editorial standards maintained by these publishers, further validating the credibility of the selected studies. However, it is important to note the consequences of this publishing landscape. The prominence of a few major publishers could potentially influence research trends, methodologies, and the dissemination of knowledge in the field. It may also raise questions about access to research, given the varying subscription models and open-access policies of these publishers.


**Figure 6**: Treemap of Prolific Publishers and the distribution of publications based on their contributions. (Source: WoS analysis)

The remaining literature, presumably spread across other publishers, indicates a healthy diversity in the research ecosystem with a space for small or specialized publishers that would significantly help in contributing to this field. Understanding this publishing landscape can be valuable for researchers, helping them target appropriate journals for their work and identify key sources for literature review.

### *6.5 Prominent Institutions contributing to the Psychosocial dimensions of Ageing in India*

The treemap visualization (**Figure 7**) provides a clear hierarchical representation of institutional contributions, allowing for quick comparison of publication output across different organizations. This visual format effectively highlights the relative strengths of various research centres and universities in the subject area. The International Institute of Population Sciences' prominence in this research area underscores its significant role in advancing knowledge on population-related topics. Its position at the top of the treemap may indicate a combination of factors, such as research funding, expert faculty, access to data, or strategic focus on relevant issues.


**Figure 7** Treemap of Prominent Institutions and their contribution to the study's research topic

**Table 4** quantifies this distribution pattern of the publications in the study across organizations. A Co-authorship analysis was carried out on VOS viewer software out using 'Organizations' as the unit

of analysis to understand the relationships among the affiliations and their impact on the development of the research field in concern (Donthu et al., 2021). The analysis focused on organizations with at least 5 documents and 5 citations, resulting in 69 out of 1682 organizations meeting the criteria. The full counting method was used, assigning equal weight to each link. The visualization map (**Figure 8**) displays sixty-six connected items, representing the largest set of affiliated organizations, after manually combining three items representing a single organization with variable expressions.

The network map (**Figure 8**) reveals intricate patterns of collaboration among the connected organizations. The joint efforts in research in the field and the complex web of partnerships throw light on these connections. The International Institute of Population Sciences emerged as the central node, with numerous strong links to other institutions, reflecting its pivotal role in fostering research collaboration. This prominence can be attributed to its leadership in conducting two major national studies: the Longitudinal Ageing Study in India (LASI) and the Study on Global AGEing and Adult Health (AGE, India), both of which provide substantial data for research. Other prominent clusters form around major institutions like the All-India Institute of Medical Sciences, the Indian Council of Medical Research, and the Indian Institutes of Technology, among others.

| Affiliations | Record Count | % of 801 |
|---|---|---|
| **INTERNATIONAL INSTITUTE FOR POPULATION SCIENCES** | **167** | 20.8 |
| INDIAN INSTITUTE OF TECHNOLOGY SYSTEM IIT SYSTEM | 44 | 5.4 |
| INDIAN COUNCIL OF MEDICAL RESEARCH ICMR | 38 | 4.7 |
| ALL INDIA INSTITUTE OF MEDICAL SCIENCES AIIMS NEW DELHI | 35 | 4.3 |
| MANIPAL ACADEMY OF HIGHER EDUCATION MAHE | 26 | 3.2 |
| PUBLIC HEALTH FOUNDATION OF INDIA | 26 | 3.2 |
| UNIVERSITY OF LONDON | 26 | 3.2 |
| HARVARD UNIVERSITY | 23 | 2.8 |

| | | |
|---|---|---|
| TATA INSTITUTE OF SOCIAL SCIENCES | 20 | 2.4 |
| NATIONAL INSTITUTE OF MENTAL HEALTH NEUROSCIENCES INDIA | 19 | 2.3 |
| UNIVERSITY OF DELHI | 19 | 2.3 |
| JAWAHARLAL NEHRU UNIVERSITY NEW DELHI | 18 | 2.2 |
| NATIONAL INSTITUTE OF TECHNOLOGY NIT SYSTEM | 18 | 2.2 |
| DATTA MEGHE INSTITUTE OF HIGHER EDUCATION RESEARCH DEEMED TO BE UNIVERSITY | 17 | 2.1 |
| WORLD HEALTH ORGANIZATION | 17 | 2.1 |
| KING S COLLEGE LONDON | 16 | 1.9 |
| HARVARD T H CHAN SCHOOL OF PUBLIC HEALTH | 15 | 1.8 |
| UNIVERSITY OF NEW SOUTH WALES SYDNEY | 15 | 1.8 |
| GOVT MED COLL | 14 | 1.7 |

**Table 4**: Prominent Affiliations and classification of documents based on their contributions

(Source: WoS analysis)

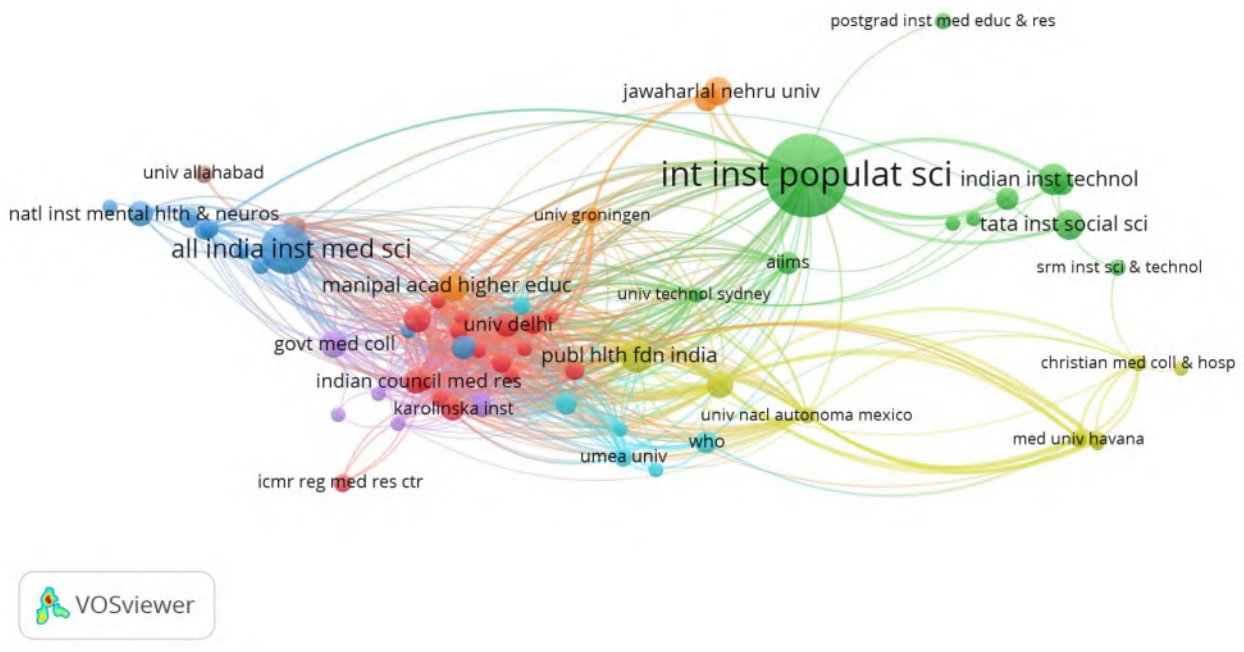

**Figure 8**: Co-authorship analysis of Organizations presented as Network Visualization

(Source : VOS viewer)

The above-mentioned clusters indicate hubs of regional expertise and collaboration, often characterized by specific research methodologies or themes. The links between Indian institutions and global partners such as WHO, Harvard University, University of London highlight the presence of international collaborations. Such cross-border collaborations indicate the flow of resources and knowledge that enriches the research landscape.

**Figure 8** unveils unexpected connections between diverse organizations, throwing light on the uniquely collaborative and interdisciplinary research projects like in the case of the links between medical institutions and social sciences organizations pointing to holistic approaches in addressing population and health issues. The strength of collaborations is indicated by the varying thickness of the connecting lines with frequent or joint efforts are represented with thicker lines. Emerging research groups or specialized areas of study in their nascent stages are represented by the smaller clusters located on the peripheries of the map. Overall, Co-authorship analysis allowed us to quickly identify the most productive partnerships and the potential areas for future collaborative growth.

### *6.6 Analysis of literature networks in psychosocial dimensions of Ageing in India*

Co-citation analysis was performed on the retrieved results using “Cited reference” as the unit of analysis on VOSviewer.This method identifies clusters of co-cited references by linking them when they appear together in citing articles’ reference lists (Mustafee et al.,2014), forming an intellectual network (van Eck and Waltman,2014). The network consisted of 87 connections between the 19 highly cited references. A cumulative strength of 241 emphasizes the robustness of these connections, indicating strong intellectual ties between the most influential publications. The co-citation network visualization highlighted 4 distinct clusters of interconnected references, indicating

subfields or research themes within the broader domain of ageing and health studies. Several studies specifically examine ageing and health issues in the Indian context, such as those by Arokiasamy, Banjare, and Ingle. These clusters represent a range of topics within gerontology and public health, including mental health assessments, functional ability in older adults, self-related health, and population ageing in India. The citation counts and link strengths suggest these are influential works in the field, with certain papers receiving over thirty citations.

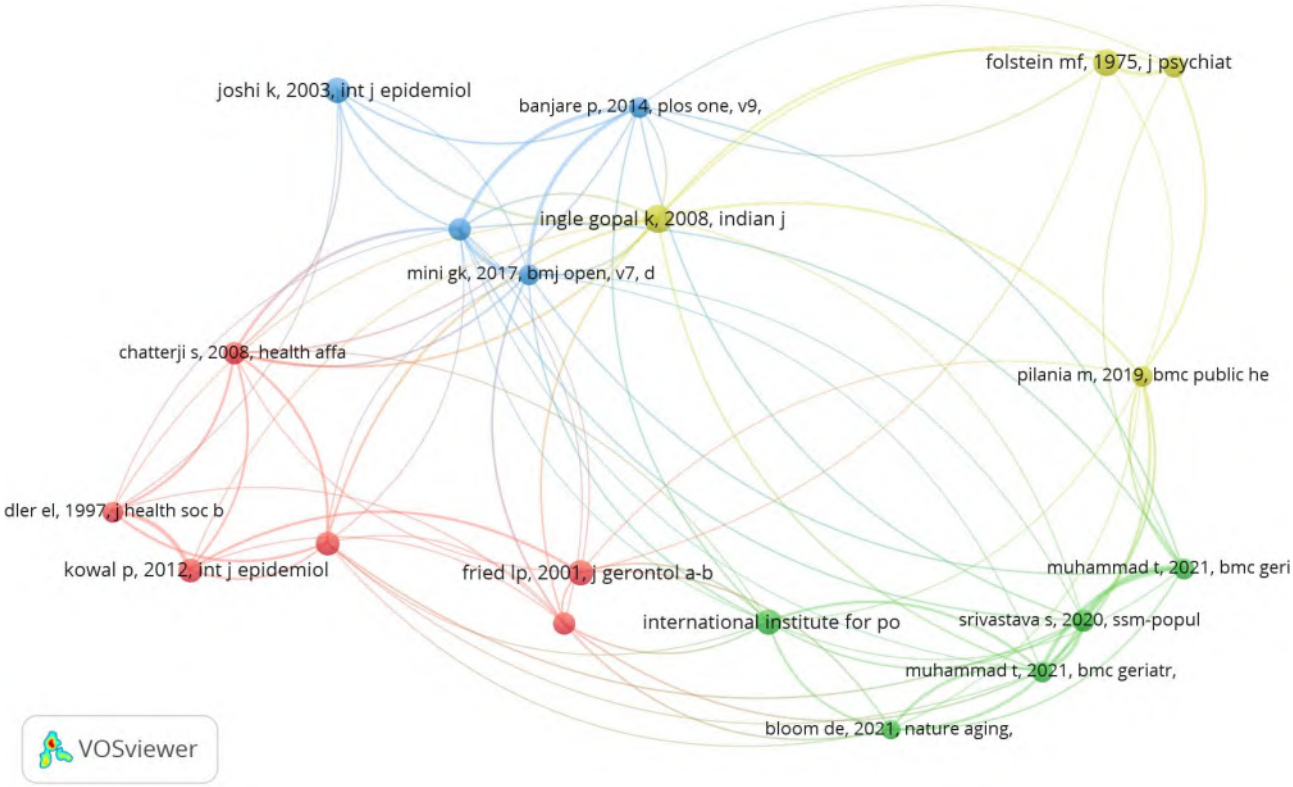


**Figure 9 Literature co-citation mapping:** Clustering network analysis of references

The temporal distribution of the cited works spanned several decades, with some seminal papers from the 1990s and early 2000s still exerting significant influence on current research. The publication dates span from 1975 to 2021, indicating the representation of both classic and contemporary research. This suggests a field built on long-standing foundational concepts while continuously evolving with new insights and methodologies.

Interestingly, the analysis revealed that, not only academic journal articles but also key policy documents and reports from international organizations such as WHO, underscoring the practical and policy-relevant nature of research in this area. These documents serve as important reference points for framing research questions and contextualizing findings within broader societal and policy landscapes. The geographical distribution of the highly cited works indicated a global perspective on ageing issues, with contributions from researchers in various countries. This international representation reflects the importance of understanding ageing in cross-cultural contexts. **Table 5** displays the list of the nineteen most cited references in the study results.

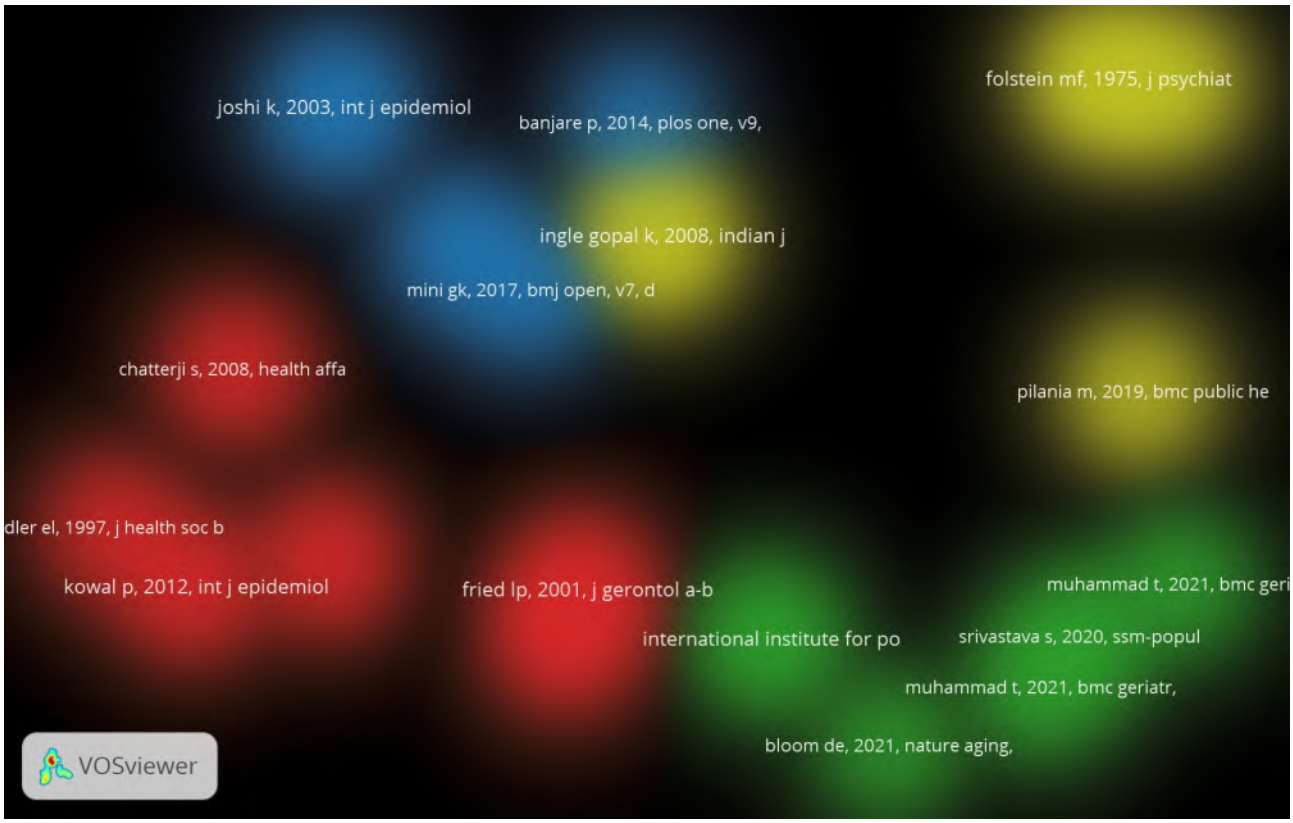


**Figure 10 Literature co-citation mapping:** Density visualization of cluster networks

| Cited Reference | Citations | Total link strength |
|---|---|---|
| ingle gopal k, 2008, indian j community med, v33, p214, doi 10.4103/0970-0218.43225 | 40 | 33 |
| folstein mf, 1975, j psychiat res, v12, p189, doi 10.1016/0022-3956(75)90026-6 | 36 | 15 |
| international institute for population sciences (iips) nphce mohfw hthcs of ph (hsph) and the u of sc (usc), 2020, india report | 32 | 22 |

| | | |
|---|---|---|
| joshi k, 2003, int j epidemiol, v32, p978, doi 10.1093/ije/dyg204 | 31 | 13 |
| fried lp, 2001, j gerontol a-biol, v56, pm146, doi 10.1093/gerona/56.3.m146 | 30 | 14 |
| kowal p, 2012, int j epidemiol, v41, p1639, doi 10.1093/ije/dys210 | 27 | 21 |
| roy k, 2008, soc sci med, v66, p1951, doi 10.1016/j.socscimed.2008.01.015 | 27 | 21 |
| yesavage ja, 1983, j psychiatr res, v17, p37, doi 10.1016/0022-3956(82)90033-4 | 26 | 15 |
| arokiasamy p, 2015, sage open, v5, doi 10.1177/2158244015571640 | 25 | 40 |
| srivastava s, 2020, ssm-popul hlth, v12, doi 10.1016/j.ssmph.2020.100702 | 25 | 38 |
| chatterji s, 2008, health affair, v27, p1052, doi 10.1377/hlthaff.27.4.1052 | 25 | 28 |
| world health organization, 2012, world health organ tech rep ser, p1 | 25 | 17 |
| muhammad t, 2021, bmc geriatr, v21, doi 10.1186/s12877-021-02314-7 | 23 | 37 |
| pilania m, 2019, bmc public health, v19, doi 10.1186/s12889-019-7136-z | 23 | 21 |
| mini gk, 2017, bmj open, v7, doi 10.1136/bmjopen-2016-013529 | 22 | 37 |
| muhammad t, 2021, bmc geriatr, v21, doi 10.1186/s12877-021-02027-x | 22 | 33 |
| idler el, 1997, j health soc behav, v38, p21, doi 10.2307/2955359 | 22 | 22 |
| banjare p, 2014, plos one, v9, doi 10.1371/journal.pone.0097832 | 21 | 34 |
| bloom de, 2021, nature aging, v1, p1070, doi 10.1038/s43587-021-00155-y | 20 | 21 |

**Table 5**: List of highest cited references from the Co-citation analysis (Data Source: VOS viewer)

### *6.7Analysis of research trends and fronts in the psychosocial dimension of Ageing in India*

#### *6.7. a Research fronts in the psychosocial dimension of Ageing in India*

The keyword co-occurrence analysis revealed the important trends and focus areas on research related to elderly populations, particularly in India. The visualization network map (**Figure 11)** generated using VOS viewer provides a comprehensive overview of the interconnections between the most frequently (**Table 5**) occurring author keywords in the study. The map displays 10 distinct clusters, suggesting that the research topics covered in the study can be broadly categorized into thematic groups, subfields, methodologies, or areas of focus within the broader research domain. The network demonstrates a high degree of interconnectivity among the selected keywords with a total of 669 links and a total link strength of 1403. A threshold of 5

occurrences for keyword inclusion ensured only relatively common and potentially significant terms were included in the analysis to focus on relevant concepts within the research landscape. The size of each node represents the frequency of occurrence and the thickness of connecting lines indicating the strength of co-occurrence relationships between keywords.

The keyword “India” had the highest co-occurrence which substantiates the validity of our search results being specific to the Indian context. Mental health emerges as a crucial theme, with “depression” being one of the most prominent keywords signifying an interest in the psychological well-being of older adults. Other related terms like “anxiety”, “dementia”, and “cognitive impairment” further emphasize the influence of mental health issues on the process of ageing. The importance of Understanding physical health and functionality among the elderly can be evidenced by keywords such as “disability,” “frailty, “activities of daily living,” and “chronic diseases”. Keywords such as “quality of life,” “life satisfaction,” and “well-being” suggests an integrated approach to studying ageing by considering overall life experiences. Socioeconomic factors impacting the aged population demonstrates with the interplay of keywords such as “caste”, “socioeconomic status,” and “food insecurity”. Keywords based on Specific health conditions of concern, including “diabetes, “hypertension,” and “Alzheimer’s disease,” highlights the psychosocial impact of morbidity caused due to medical conditions on ageing.

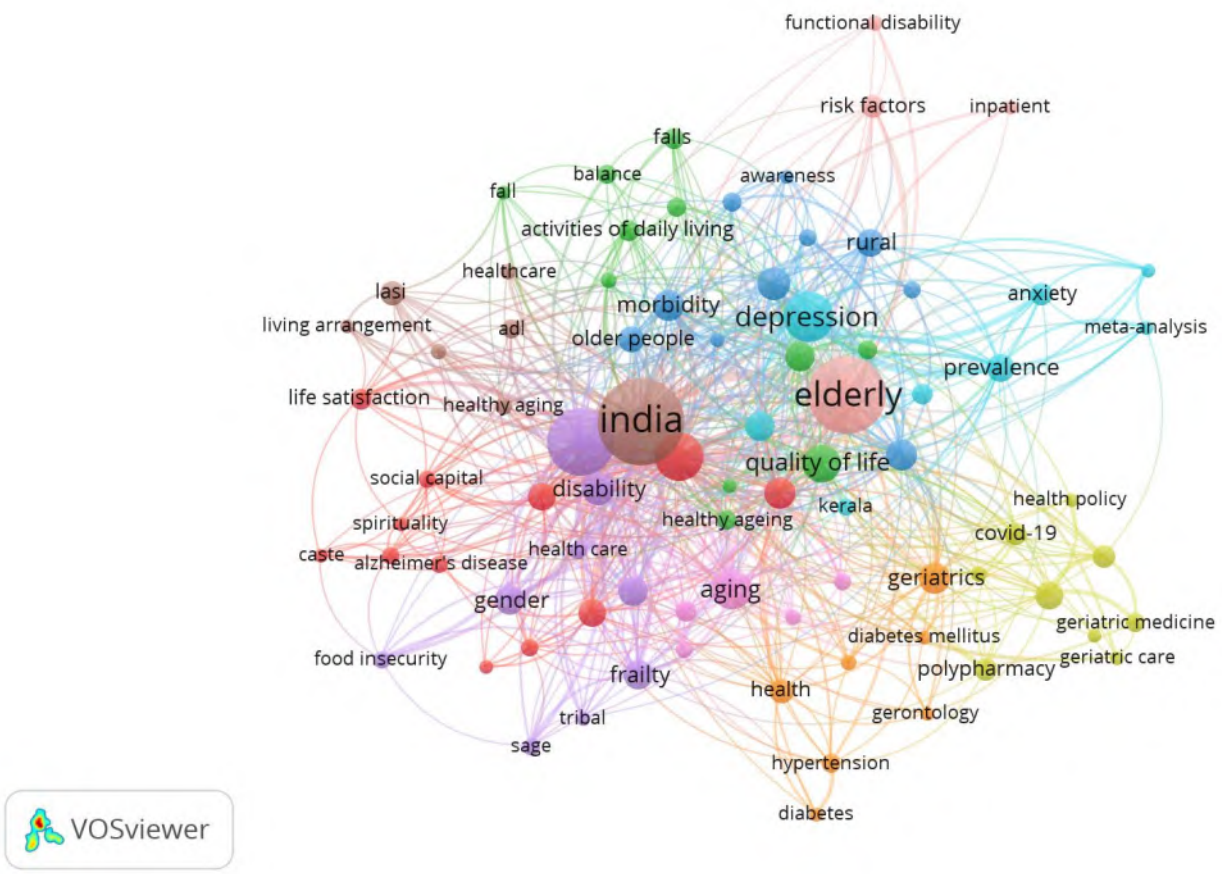


**Figure 11** Network visualization map of Author keywords' co-occurrence.

| Keyword | Occurrences | Total link strength |
|---|---|---|
| **india** | 171 | 344 |
| **elderly** | 138 | 215 |
| **older adults** | 104 | 194 |
| **depression** | 59 | 143 |
| **ageing** | 54 | 101 |
| **aging** | 36 | 82 |
| **quality of life** | 33 | 58 |
| **disability** | 26 | 70 |
| **geriatric** | 25 | 55 |
| **mental health** | 24 | 56 |
| **dementia** | 24 | 46 |
| **morbidity** | 23 | 51 |
| **cognitive impairment** | 21 | 41 |
| **aged** | 21 | 38 |
| **gender** | 21 | 38 |
| **multimorbidity** | 21 | 56 |
| **frailty** | 20 | 46 |
| **cognition** | 19 | 33 |
| **public health** | 19 | 38 |
| **rural** | 19 | 44 |

**Table 6**: List of the Occurrence of the Top 20 Author keywords

An understanding of the prominent methodological approaches used by the study results has been represented by keywords such as “meta-analysis,” “systematic review,” and “epidemiology,”. The inclusion of “COVID-19,” and “pandemic” reflects the recent impact of the public health crisis on elderly populations and the research community’s response to these challenges. Geographical distinctions are noted with keywords like “rural,” “urban,” and specific locations such as “Kerala,” suggesting studies on how ageing experiences differ across various settings. A specific interest in systemic approaches to addressing the needs of the ageing

populations can be attributed to the presence of terms related to healthcare systems, such as “healthcare,” “health policy,” and “public health”.

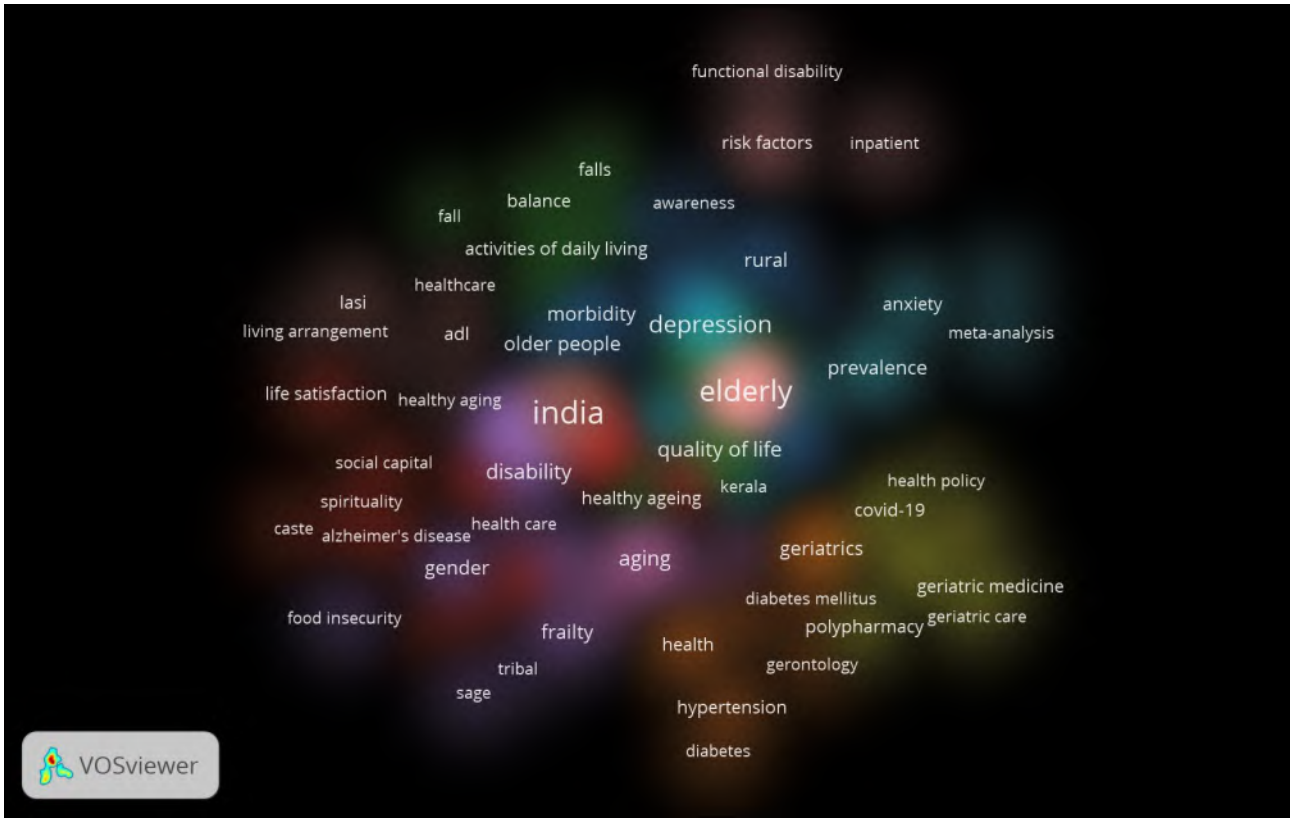


**Figure 12** Density visualization of the Author Keywords’ Cooccurrence clusters

Other relevant themes revealed through keyword clusters in the study results include the role of caregivers or living arrangements, intergenerational relationships, social capital or support networks, family dynamics, the role of spirituality, built environment, Gender differences in ageing, Technology adoption among the elderly, and more. These themes have only been briefly explored despite being an important influencing factor in the holistic well-being of the elderly.

## *6.8 Psychosocial Dimensions of Ageing in India*

Fifty-one articles were systematically retrieved from the identified pool of 801 articles on the “non-clinical” aspects of ageing for this systematic review (Refer **Section 5.2**). These fifty-one articles belonged to the subject areas of “psychology,” “social work,” and “social work” and were published between August 1999 to August 2024 in peer-reviewed and Web of Science-indexed journals. The

articles were reviewed thoroughly to gather insights about a range of entities that influence the psychosocial aspects of ageing, particularly in the Indian context.

## *A brief description of the studies*

Few of the studies included international populations and contexts, but the findings of the studies were relevant to the Indian context. Nationally representative data sources such as LASI Wave 1(2017-2018), SAGE, NSSO, Census India, NFHS and IHDS data were used by most authors of the studies considered for the review. In addition to the nationally representative sample studies, there was an observed geographical clustering of the population studied in most studies. Cities in states such as Kerala, Uttar Pradesh, West Bengal, and Tamil Nadu as well as the National Capital Delhi, were prominent locations where samples of older adults were studied. This can be attributed to the rapidly ageing demography in these states and hence the availability of a larger cohort of elderly individuals in different situations of life. The studies ranged over vast subject areas such as 'Cognitive ageing,' the role of 'Social capital', subjective perceptions of QoL attributes, the role of 'Spirituality", social factors such as 'living arrangements, and socio-economic factors that influence the psychosocial well-being of older adults in India. All studies included were categorized based on Lawton's model of four sectors of a good life for older adults **(Figure 1**) to simplify our understanding. The four sectors as explained in **Section 1.4** are "Objective environment," "Psychological well-being," "Perceived Quality of Life," and "Behavioral competence"

| Author | Methodology used | Place/Location | Population characteristics | Study Findings |
|---|---|---|---|---|
| **Mukilan et al(2017)** | A **Descriptive** research study with a self-prepared semi-structured interview schedule for data collection. | The study was conducted in two blocks of **Tiruvallur district, Tamil Nadu**, India: Minjur and Sholavaram. | A total of **98 Elderly women** above the age of 58 who were former members of Self-Help Groups formed and monitored by the Centre for Rural Systems and Development. | The findings indicate substantial socioeconomic barriers experienced by elderly women. The data shows that 88% of the participants lacked home ownership, and 48% belonged to the Scheduled Caste demographic. Furthermore, a considerable proportion did not receive government support in the form of pensions or allowances. All respondents reported health problems, with limited access to healthcare due to transportation challenges. Additionally, the results underscore a gap in social security, as most women had not benefited from various governmental welfare programs designed to address housing, health insurance, and pension needs. |
| **Mubasheer (2018)** | A **descriptive study** that used an interview schedule as the data collection tool. | **Mysore,Karnataka** | The study included **60 elderly destitute women**, with 39 residing in destitute homes and 21 living on pavements and near temples. | This study investigates the mental health and social challenges faced by older women in India. The findings indicate that unmarried elderly women tend to exhibit superior psychological well-being compared to those who are married, widowed, or divorced. Additionally, the research suggests that women residing in destitute homes generally experience better mental health outcomes than those without access to such accommodations. The authors underscore the significance of governmental support, counseling services, and therapeutic interventions to enhance the quality of life of elderly women in India . |

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| **(Singh & Yesudian, 2007)** | **Secondary data analysis** of the existing datasets from the decennial Census of India and the National Sample Survey Organisation(**NSSO**) 60th Round conducted in 2004. | **India** (Nationally representative data) | **Elderly residents living across India aged 60 and above** | The study examines the rapid growth of India's elderly population and its implications. Key findings include the majority of elderly living in rural areas, varying sex ratios between urban and rural settings, and widespread economic dependence. Family support remains important, with many elderly living with spouses and children. The research calls for further investigation into psychosocial aspects of aging in India, including economic dependence, living arrangements, and social support systems. Given changing family structures and socioeconomic conditions, focused research and policy interventions are needed to address the psychosocial needs of this growing vulnerable population. |
| **Kohli et al. (2020)** | Comprehensive Conceptual and **Literature Review** | **Global: Developing context** | **Older adults** | The article highlights the diverse challenges associated with the rapid increase in the ageing population in developing countries. The necessity to recognize older adults as valuable resources and foster their continued engagement within their communities is highlighted. It underscores the need for further research into the interplay between individual and contextual factors influencing the psychosocial well-being of older adults in developing countries. An emphasis on the importance of social support and policy adaptations to promote health, active ageing through social integration, autonomy, and combating ageism is being warranted. |

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| **Bakshi and Pathak (2016)** | **Cross-sectional and quantitative Secondary data analysis** of National Sample Survey: the 42nd round (1986-87), the 52nd round (1995-96), the 60th round (2004) and data from the Building Knowledge Base on Population Ageing in India survey conducted in 2011 | India:(Nationally Representative Study) | Older adults (60 and above) living in India | The key findings of this study highlight the complex socioeconomic factors that shape the well-being of older adults in India. A notable proportion of older adults were found to be financially dependent, with older females and financially dependent individuals more vulnerable to abuse. Marital status and gender were linked to engagement in household activities, with married older adults and older males more likely to participate. Financial independence was associated with working and asset ownership. Additionally, the study identified that households with only older adults experienced greater deprivation. Overall, this research underscores the interplay of age, gender, marital status, financial stability, and living arrangements in determining the psychosocial well-being of India's older population. |
| **Pandya (2016)** | Case-Control Study using an interview schedule for data collection | Pitamaha Sadans located in Allahabad, Kanpur, Rewa, Tamaraipakkam, Coimbatore, Ellayapalle, Kothapatnam, and Kolhapur .Paid Oldage institutions in Delhi,Mumbai ,Kanpur and Allahabad. | Older persons aged 60 and above living in Pitamaha Sadans( Case group) and Other paid Oldage institutions( Control group). Both groups are predominantly educated and widowed. The Case group was entirely Hindu population but there was religious diversity in the control group. | The study found that residents of Pitamaha Sadan, an institutional setting in India, scored significantly higher on measures of spirituality, religiosity, life satisfaction, and happiness compared to a control group. Higher spirituality and religiosity were associated with greater well-being among Pitamaha Sadan residents, who viewed aging as a modifiable state of mind and death as a path to closeness with God. Women and widowed individuals in both groups tended to be more spiritual and religious, while education levels positively influenced life satisfaction and happiness, particularly in the control group. These findings suggest that religious and spiritual programs may be beneficial for the psychosocial well-being of older adults, especially in institutional settings. |

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| **Dharmarajan and Jabbar (2019)** | Self reporting Questionaires | Trivandrum,Kerala | Elderly residents living across India aged 60 and above living in the capital of the State of Kerala. | The findings of this study suggest that spirituality has a positive influence on the quality of life among the elderly population. It also highlights the role of spirituality in mitigating death anxiety in older individuals. The study argues that spiritual engagement in senior citizens may facilitate a satisfying life review, which may help resolve the conflict related to their thoughts of mortality. Understanding these multifaceted aspects can aid in developing targeted strategies to enhance the well-being of the aging population. A person-centered approach is crucial in addressing the needs of this demographic. |
| **Singh et al. (2022)** | **Thematic analysis of written transcripts** | **Delhi NCR and Bhopal** | Participants living in Delhi NCR and Bhopal within the **age group of 19 to 73** | The study examined the key factors contributing to happiness among elderly individuals in India. Family relationships and social support were identified as critical for the well-being of older adults. The loss or illness of family members was a major source of unhappiness. Maintaining good physical and mental health through healthy lifestyle practices, such as proper diet, exercise, and activities like yoga, was emphasized as crucial for happiness and quality of life. Some elderly participants also found joy in engaging with nature and nurturing plants. Additionally, religious and spiritual beliefs were important contributors to happiness for many older individuals. The findings highlight the need for a more comprehensive understanding of happiness perspectives across different age groups in the Indian context, with a particular focus on the elderly population. |

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| **Paplikar et al. (2020)** | **Validation of Lifetime Experiences Questionaire(LEQ)** | **Hyderabad** | 52 healthy Elderly from the local communities in Hyderabad and 30 patients with dementia recruited from the outpatient department of Nizam's Institute of Medical Sciences | The study reveals that lifetime experiences, particularly in midlife, play a crucial role in maintaining cognitive health and preventing dementia. Factors such as education, occupational involvement, and participation in complex leisure activities contribute to cognitive reserve, helping delay cognitive decline. Bilingualism was found to be common in India, and cultural factors like traditional skilled occupations are linked to better cognitive function in older adults. The adapted Lifetime Experiences Questionnaire, culturally tailored for India, shows that higher scores correlate with improved quality of life, self-esteem, and reduced depressive symptoms, emphasizing the benefits of an active lifestyle. |
| **Roy (2024)** | **Cross-sectional Study: LASI data:Wave one data** | **India**(Nationally representative study) | **21,000 elderly adults aged 60 and above ,**who participated in the first wave of LASI | The study indicates that underweight BMI is linked to reduced cognitive function in older adults and warrants a greater focus on the dynamic needs of underweight seniors. It also highlighted that social engagement positively influenced cognitive function. Lower Levels of Education and socioeconomic status demonstrated a negative impact on cognitive performance. It was also understood that individuals without a partner had a lower cognition in comparison to married adults with a living partner. Additionally, it was noted that rural residents had lower cognition scores than urban dwellers, likely due to limited resources and less stimulating environments,and continued employment was associated with better cognitive outcomes. |

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| **Barman et al. (2024)** | **Cross-sectional study using LASI wave one data** | **India**:(Nationally Representative Study) | **65,562** adults aged 45 and above from across India(Participants of LASI) | The study highlights the significant influence of social deprivation on cognitive health and depressive symptoms among the elderly. The findings establish that the Social deprivation index factors which include social security, financial stability, Household amenities, educational achievement, level of social engagement, and living independently are associated with the prevalence of depression and a decline in cognitive health among women ,rural residents and elderly. |
| **Patel (2021)** | **Qualitative descriptive research: Semi-structured interview schedule,observation and focus group discussion** | **Lucknow,Uttar Pradesh** | Selective sample of **220 older persons(60 & above)** living in rural-urban areas of Lucknow. The participants were from the following occupational backgrounds: teachers, businessmen, farmers, hawkers, etc. | The findings demonstrate that a complex interplay of the factors influencing the objective environment of the elderly(socio-economic and health ) affects their overall and psychosocial well-being. More than half(57.7%) of the study population reported being socially vulnerable due to social isolation or lacking social engagement. Around 53.7% of the study population reported they were financially dependent on their children 89.1% reported health challenges and the case studies substantiate the lack of social support to promote the health-seeking behavior of the elderly. Finally, the awareness of social security and health schemes among the elderly varied. Nearly half (42.2%)of the study population was aware of pension schemes and the MWPSC Act,2007/IPOP reported the lowest awareness with only 4.4% of the study population aware of the same. |

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| **Nigam and Kar (2020)** | **Conceptual Overview , followed by a Cross-sectional study .** | **Allahabad** | 79 Young ,54 Middle aged, and **43 older adults** living in the city of Allahabad. | The study provides insight into the cognitive-affective-behavioral changes correlating with ageing in India. Important findings related to the elderly are: Cognitive changes correlated with general cognitive ability among the elderly and middle age were comparable concerning the rate of learning and retrieval for verbal and visuospatial material,indication that cognitive decline starts in middle age. It was found that there was a significant between the objective measures of cognitive functions and subjective complaints among older adults. In the context of a developing country like India, self-reports of difficulties in cognitive activities may be helpful for early identification of such declines and help preserve basic cognitive abilities to engage in social interactions and activities.There was no relationship found between emotion regulation or behavioral/emotional changes and cognitive function in older adults indicating that there is a decrease in sensitivity to negative emotions with age. |
| **Singh et al. (2017)** | Secondary Data Analysis of WHO's Study of Global Aging and Adult Health **(SAGE)**WAVE 1(2007-2010) | **India**(Nationally representative study) | A sample of **7150 adults aged 50 years and above** was retrieved for the study | The study provides an understanding of the Cognitive and Other Social determinants of health and their impact on the Quality of life among the Indian elderly. The study results revealed that Indian older adults had lower scores in all three Cognitive variables measured(Verbal Fluency, Verbal Recall, and Digital Span(Forward and backward). It was established that Social determinants of health like age and education directly affected all the dimensions of QoL of the elderly in India. A Direct relationship between cognitive symptos and QoL was evident and a 7% loss of life was reported among Indian elderly due to cognitive limitations. |

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| **Chakraborty and Kundu (2024)** | An **Intersectional Secondary Data Analysis** of the (LASI; Wave1:2017-2018) | **India**(Nationally representative study) | A Sample of **31,464 adults aged 60 years and above** living across India in rural and urban settings. | Economically vulnerable older adults were prone to disproportionate levels of perceived discrimination in comparison to those from higher socioeconomic backgrounds. A complex interaction of gender, caste, and economic backgrounds was attributed to influencing the experiences with discrimination for instance: Women belonging to marginalized caste and from lower socioeconomic conditions were demonstrated to have faced higher levels of perceived discrimination. Education was seen to play an important role in decreasing the levels of perceived discrimination and in regulating the relationship between caste and perceived discrimination. Individuals from marginalized castes with an education at any level were reported to have lower levels of perceived discrimination. |
| **Vijayan et al. (2023)** | **Cross-sectional Secondary data analysis and Structural Equation Modelling** using (**LASI:**Wave 1:2017-2018) data | **India:** (Data from Sikkim was excluded from the analysis due to non availability at the time of study) | A total of **65,562 individuals** belonging to the age group of older adults **(45-59) and Elderly (Above 60 years)**were included in the study | The study findings found a gendered nature to the relationships between autonomy, social networks, physical activity, and self-rated health differences. The role of social networks in promoting the psychological well-being of the elderly was seen through their positive influence on physical activity and self-rated health. Women across both age groups were seen to be more vulnerable than men in terms of having less autonomy in decision-making, lower levels of social engagement networks, and less vigorous physical activity.The study also highlights the negative influence of funtional limitations on self rated health. |

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| **Mathuranath et al. (2003)** | Cross-sectional observational study: Two verbal fluency tasks (Letter fluency and Cateogery fluency) were administered | Trivandrum,Kerala | 153 Elderly aged (55-84 years) urban,native speakers of the language Malayalam participated in the study. | The study examined the effect of age and education on the verbal fluency of individuals. It was observed that Education levels positively influenced the performance of individuals in the verbal fluency test tasks. There was no Gender difference in the performance of tasks, but there was a differential effect of age on the tasks performed attributing the age-related cognitive changes. The study author attributed that the lower category fluency scores among the elderly aged more than 70 years of age can be due to age-related changes in semantic processing rather than a general cognitive decline. |
| **Mishra and Ahad (2017)** | **Cross-sectional Descriptive study** using a pretested schedule | **Bilaspur District, Chhattisgarh** | **120 elderly patients (60 years age and above)** who attended the outreach clinics were interviewed. | The study found that a majority (96.7%) of the respondents lived in joint families and more than half of them (62.5%) felt neglected by their family members. Lack of satisfaction or unhappiness associated with poverty and illness was reported by nearly half (48.3%) of the study population. It was reported that 33.3% of the study population experienced a loss of social recognition and felt that they were a burden to the family. Gender disparities in ageing were also evident from the study findings, with poorer understanding of social and financial security among women in comparison to men. |

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| **Pandey et al. (2020)** | **Narrative review** | **India** | **Elderly aged 60 years and above** | The review spotlights the rapidly ageing Indian population and the challenges that are faced in Elderly care. It talks about the decline of social support structures such as the traditional joint family system due to rapid urbanization and change in family structure. This has led to a strain on the concept of financial pooling towards elderly care. The authors reiterate the Indian concept of "sewa" and filial piety which has been the cultural root of respecting and caregiving for the elderly. Caregiving approaches over the years have been influenced by the Indian cultural belief in Reincarnation. It also highlights the fact that Mental health problems faced by the elderly are most often dismissed as associated with the normal process of ageing. In conclusion, the limited access to healthcare and social support as well as the lack of infrastructure were said to be major challenges in elderly care. |
| **Pandey et al. (2023)** | **Secondary Data Analysis** of **LASI**:(Wave 1 data: 2017-2018) | **India** (Nationally representative data) | **65,562** Individuals **aged 45 years and above** | The contribution of physical activity, living arrangements, and Social capital in enhancing the cognitive health of Indian older adults has been highlighted through this study. A 15% prevalence of low cognitive ability has been exhibited by individuals aged 60 and above. The findings established that the risk of cognitive impairment is reduced in the presence of increased social capital. Functional limitations demonstrated through lower scores in activities of daily living and instrumental activities of daily living were found to be associated with lower social capital in turn increasing the risk of cognitive impairment. Gender disparities in social capital were found to increase the risk of cognitive impairment among women from lower socioeconomic backgrounds with lower levels of education. |

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| **Ashraf et al. (2023)** | **Qualitative descriptive study** by Observation and semi-structure interview | **Kashmir,India** | **21 Elderly women** Out of which 3 belonged to the age group(55-59 yrs),10 to the age group(60-69 yers),7 to age group(70-79 yrs) and 1 women was 80 years of age. All elderly women included in the study were widows and had only one son | The study throws light on the impact of incarceration on the overall well-being of elderly mothers. The findings highlight the Social Ostracization and isolation experienced by these mothers from the members of their family and community. The urgent need to address the vulnerability of this section of the elderly has been emphasized throughout the study. Despite experiencing dire negligence of their psychosocial needs, the resilience of these mothers amidst uncertainty demonstrated their utmost perseverance and faith. |
| **Khare et al. (2014)** | **Narrative Overview of academic event** | **Indian context** | Indian Elderly | This document highlights how the adoption of a user-centric design can provide an enabling environment for the elderly to age well through a module designed at the Center for Human-Centric Research, School of Planning and Architecture, Bhopal. This article warranted more research in this area and attention to adopting such a perspective to facilitate productive and healthy ageing |

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|---|---|---|---|---|
| **Putran et al. (2024)** | **Intervention study**:One group pre and post-intervention design was employed. | **Kasargod,Kerala** | **35 participants** belonging to the age group of **60 to 80 years of age** were recruited from seven care homes in Kasargod,Kerala. | The study proposed a target intervention model to promote active ageing on three levels: individual, family, and institutional level. The findings of the study showed that there was a significant improvement in the overall active ageing score of the participants from 128.06 to 137.77(p=0.012). The interventions proposed at each level included the following, Individual level: Rapport-building sessions between the participants and social workers, Mental health education and individual counselling sessions, and Play therapy along with emotional support activities. At the Family level: Increased frequency of contact and visits from the family members, and Counselling and Awareness sessions for family members to provide support to the elderly participants. At the institutional level: Promoting democratic decision-making of elderly for the daily activities and the Sensitization, education of the Care home staff on active ageing and rights-based approach in caring for the elderly. The study established that such social work interventions can be used to promote active ageing among institutionalized elderly in developing countries like India. |
| **Stanley and Ramakrishnan (2007)** | **Qualitative descriptive** study by employing Standard Scales and Questionnaires for Data Collection | **Tiruchirappalli,Tamilnadu** | **55 individuals aged 15-66 years** of age, were admitted at the TRUST Neuro-Psychiatric Centre, Tiruchirappalli following a failed suicide attempt. | The study findings relevant to the elderly or the process of ageing are from the literature of previously done studies on suicide attempts among the elderly. These studies reported higher levels of suicidal feelings and physiological and psychosocial stress, such as depression, anxiety, and hostility among the elderly due to low levels of social support or a history of severe depression (Alexopolus et al.,1999). The study's General findings demonstrated that nearly 60 % of the respondents had poor family interaction patterns and low scores of Cohesions. Most respondents displayed high scores for dysfunction. Married individuals demonstrated a higher level of dysfunction in comparison to unmarried participants, but they were found to have higher scores in commitment and |

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| | | | | leadership. Unmarried individuals demonstrated higher scores in maintaining cohesiveness and social support |
| **Welch et al. (2021)** | **Systematic Review** | **Global Scope** (But the Majority of Studies from Global North) | **The map included 548 studies**, out of which 120 are systematic reviews and 428 are randomized controlled trials | This gap and evidence map showed that there are very few studies related to this topic conducted in low-income countries and the evidence in the included studies for outcomes such as social participation, relationships, communication, and financial security were noted to have major gaps. Most of the studies focussed on home-based care services such as rehabilitation services which were shown to improve physical and cognitive functioning through targeted exercises and treatments. Health services for disease prevention provided at home helped maintain independence in activities of basic self-care. Personal mobility, Adaptive ageing, family and personal support, and social engagement visits were shown to have been explored relatively less. However, the existing studies said that social care interventions can reduce isolation and improve psychological well-being, though substantial research is needed in this area. The use of technological interventions like telehealth, home adaptations, and assistive devices has been shown to enhance mobility and safety in the environment of home. |

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| **Saha et al. (2022)** | **Descriptive Qualitative Study**: Using focus group survey | **Kolkata, India** | **83 elderly respondents** belonging to the **age group of 55-59** were considered for the study | The study findings revealed that most respondents desired compassion and attention from family members and social relationships, especially with children were highly valued. The psychological well-being of the elderly was influenced by "Perceived quality of relationships" such as trust and inclusiveness rather than the mere availability of social contact. Self-worth and Social relationships were positively influenced through community and meaningful leisure activity engagement. Some reported that religious and spiritual activities provided them with a purpose and inner satisfaction, while others cherished solitude. Empathy from younger generations and the ability to adapt to the changing social patterns affected social relationships, especially among women. |
| **Mitra et al. (2022)** | **Qualitative thematic analysis** using self-administered online survey and telephonic semi-structured interviews | **West Bengal, Bihar, NCR, Tamil Nadu, Maharashtra, Jharkhand, Karnataka, Uttar Pradesh** | **20 Healthy individuals aged 60-75 years of age** were included in the study | The study findings highlight four major themes that impact technology adoption among the elderly. They are 'Usability of ICT',' Anxiety and Privacy Concerns',' Self-Perception of Technology Use', and 'Need for Assistance and Inclusive Design'. Most participants used ICT for communication, entertainment, and professional purposes. Many expressed anxieties associated with the usage of ICT which was attributed to concerns about data privacy, and fear of errors due to limited digital literacy. ICT platforms were found to be structured and accessible by some, and positive attitudes to adopting ICT were seen in individuals with higher self-efficacy. Finally, participants expressed a need to address the physical and cognitive challenges that act as barriers to adopting ICT, through awareness, training, and user-centric design that includes larger icons and adequate space between keyboard buttons, chatbots, FAQs and detailed manuals specifically designed for older adults. |

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| **Keshari and Shankar (2021)** | **Community-based Cross-sectional study** using predesigned and pretested proforma, tools and standard techniques | **Varanasi, India** | 616 geriatric subjects belonging to the age group of 60 years and above living in urban areas of Varanasi were recruited | The study emphasizes addressing the psychosocial challenges experienced by older adults by creating geriatric-sensitive environments in our communities. It was found that Socioeconomic deprivation (SED) was significantly associated with cognitive impairment. depression, food insecurity, and malnourishment among geriatric subjects. Individuals who experienced household food insecurity and chronic energy deficiency were found to experience moderate to severe levels of depression. Higher odds of depression were significantly found in individuals with functional limitations or physical dependence. |
| **Sharma and Babu (2017)** | **Correlational and Comparative Study** | Delhi and (NCR), India | **58 Participants aged between 50-64 years of age** were included in the study | The study results provide insights into Cognitive ageing in the Indian context. The creativity and certain executive functions of participants across the age group of 50-64 years did not present any significant age-related decline indicating a relatively stable level of cognitive function up until early older adulthood. The findings also suggest the interconnectedness of the Cognitive control and creative thinking abilities of middle-aged and older adults. |

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| **Kakar (2019)** | **Concept Paper and a Narrative review** | The material used for this paper was from **North and Latin America, England and India** | **Concept of Old age** | The study explores the intersection of desire and longing in the sexual imagination of older adults by analyzing such characters depicted in literary fiction, particularly the ones by authors who were elderly. The paper throws light on the difference in sexual perception among genders, where older men are seen to be seeking vitality through their attraction to younger women, which at times is accompanied by feelings of despair. Women, on the other hand, seem to be focused on their overall appearance and often rediscover sexuality and romantic love often associated with emotional complexity. It also emphasizes the diverse cultural attitudes towards the evolution of sexual identities in later life which include some who revere the elderly as wise and others who view it with distaste and mockery. |
| **Turlapati (2011)** | **Quantitative Correlational Study:** Property disposition using various tools and scales | **Hyderabad and Secunderabad** | A sample of **285 Elderly aged 60-75** years of age | The study found that older adults' perception of life satisfaction was mainly influenced collectively by four variables Social Support, Loneliness, Spiritual well-being, and Physical and Psychological health (40% of the variance in life satisfaction was attributed). Social support and Spiritual well-being were seen to influence life satisfaction positively. However Loneliness and Physical and Psychological health demonstrated a negative or inverse relationship, meaning lower levels of life satisfaction starkly marked Higher levels of loneliness or ill health. It was noted that an average of respondents reported high levels of perceived loneliness (63% of maximum score) and social support(57% of maximum score) indicating that the elderly may still experience feelings of loneliness despite the availability of social networks |

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| **Sharma and Ben Prince (2023)** | **Quantitative Mixed Approach** Study: Structural equation modeling and standardized scales were used | **India** (exact states have not been mentioned) | **600 retired elderly aged 60 years and above** were included in the study. (Out of 600 respondents, 200 - Lived with their families, 200 lived alone and 200 retired people in old age homes). | The study findings highlight the importance of a holistic geriatric-sensitive approach in caring for the retired elderly in India. It reinforces the role of social, living arrangements, and family structures in improving the health and well-being of the elderly. The health of the retired population was established to be positively influenced by Self-esteem and physical activity and conversely, negatively influenced by Loneliness. Gendered differences were observed in loneliness, physical activity, and over health. Females were reported to have higher physical activity levels and better overall health. Whereas Males reported a higher level of loneliness among the retired population. Best health outcomes were reported among the retired individuals who lived with their families. |
| **Ganguli (2000)** | **Systematic review** | **India (UP, Bihar,West Bengal,Gujarat, TamilNadu and Pondicherry,Delhi)** | Different age groups across life course | The study findings relevant to the context of ageing and the elderly were the increasing prevalence of mental and cognitive health issues like depression and, Alzheimer's disease. Social isolation was found to exacerbate mental health problems. The cultural attitude towards ageing was seen to highly influence the elderly in refraining from seeking help for cognitive decline or issues concerning their psychological well-being. |
| **Arokiasamy et al. (2015)** | **Cross-Sectional Analysis of LASI Pilot Survey,2010** | **Kerala, Karnataka, Punjab and Rajasthan** | **1683 Ol**der adults aged **45 years and above** | The study findings revealed that Multimorbidity was paradoxically associated with higher socioeconomic status (education levels, caste, wealth) which can be due to increased access to care and health awareness. It was noted that with an increase in the burden of chronic diseases, the levels of Self-reported health significantly declined indicating the influence of psychosocial factors on perceived quality of life among older adults. Compared to healthy individuals with no disease individuals reporting two or more chronic diseases were six times more likely to report an activity of |

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| **Adlakha et al. (2020)** | **Qualitative research study** using semi-structured interviews and thematic analysis | **New Delhi and Chennai** | **Older adults** aged above **60** were included in the study | Study findings report that fostering supportive neighborhoods with Age-friendly and geriatric-sensitive features can help improve the well-being of older adults and promote active ageing. The participants reported that a lack of maintenance of public parks, footpath conditions, and urban disorder limited their level of physical activity and recreation. The respondents warranted the need for improved walkability, pedestrian safety, and access to facilities like parks and community spaces to foster social connections, enjoy nature, and maintain physical activity. This also included the need for urban microscale features such as seating, shaded areas, maintained footpaths, safe road crossings, and clean public toilets. |

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| **Veda and Gadkar (2016)** | **Historical Research design** based on secondary data analysis | **India** (Various regions across India) | **Older adults aged 60 years and above** | Study findings report that the inability to meet Physiological and safety needs was a prominent reason why older adults left their families. Frequent quarrels with sons and daughter-in-law, disagreements, and inability to adjust to family members highly influenced this decision. Financial dependency on children and economic insecurity force older adults to work and highly influence their decision to leave their families. Another interesting finding,was the complex family dynamics play displayed through the preference of older adults to give their properties to their sons despite the conflicts and than to daughters . |
| **Mohanty et al. (2014)** | **Cross-Sectional Observational study:** using secondary data analysis of NSS(2009-2010) | **India(**Nationally representative study) | Households across India**: elderly households** (all members 60 years or older), **households with both elderly and non-elderly member**s, and **non-elderly households** (no members 60 or above) | The findings of the study showed that households with elderly had significantly higher per capita health spending and such households demonstrated the highest health spending as a percentage of household consumption, in comparison to the non-elderly households. It was noted that elderly households with higher health expenditures were generally from states with lower birth rates. Finally, the health expenditure of households with elderly members, casual labourers, and poor households was reported to be of Catastrophic levels. |

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| **Irshad et al. (2021)** | Quantitative, **Cross-sectional** Study: Using **LASI, Wave 1** | **India** | **21,662 older adults (aged 60 and above)** | The study findings emphasized the need for social and economic support for vulnerable older adults. It was found that older adults who lived in urban areas, had higher socioeconomic status and those married were more likely to participate in household decision-making than their counterparts. The gendered relationship was observed in terms of participation in household decision making with males displaying a higher level of participation. Older adults with a higher level of life satisfaction and better health outcomes were seen to be more likely to participate in household decisions. |
| **Chhatwani (2022)** | **Cross-sectional** study: utilizes data from the **2020 wave of the Health and Retirement** Study(HRS) | **United States** | **Elderly** individuals **over the age of 50 years** | Despite this study being focused on elderly Americans, Certain findings may be relevant to the Indian Context, but the conformation of their applicability warrant further research due to the difference in cultural expressions in personality traits. The finding that Enhanced personal control positively influences financial outcomes can apply to the Indian elderly as well. The importance of considering individual differences in financial planning is demonstrated by the moderating effect of personality traits on the financial well-being of the elderly. This potentially be useful for financial advisors and policymakers. The Role of psychosocial factors such as neuroticism negatively influencing the financial well-being of the elderly has been emphasized in this study, warranting a need for a more holistic approach to maintaining good financial health, and this is encouraging to drive similar research in India to understand such relationships. |

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| **Sabeena and Kumar (2022)** | **Meta-analysis** | Studies from **multiple countries and regions** have been included | Elderly aged **60 years and above** | The findings of the metanalysis contributed to the psychosocial interventions for depression in older adults. It was noted that psychosocial interventions were effective (overall intervention effect size (Hedges' g) was 1.118(95% CI:0.835-1.402))in reducing depression among older adults. The findings establish that Cognitive Behavioral Therapy(CBT) is significantly effective (highest effect size(Hedges' g =2.432)in managing depression in the elderly across various populations and settings. |
| **Debnath and Roy (2024)** | **Cross-sectional Study** | **Koch ,Bihar District of West Bengal** | 510 households with **elderly aged (60 years and above)** | The study findings say that the elderly population in the area of study demonstrated the highest mean QOL score in the environmental health domain, followed by psychological health. This may indicate a greater satisfaction for factors such as social and economic security, healthcare accessibility, and family environment. A High prevalence of NCDs (80.39%)was noted among the ageing population, this indicates the prominent influence of QOL on morbidity. QOL score based on the Social relationship domain scored the least indicating that poor social capital drastically affects the QOL. It was interesting to note that rural ageing populations were seen to spend more time with friends and thereby were more socially connected than their urban counterparts. A Linear relationship was noted between social relationships and literacy, indicating the improvement of social relationships among individuals with higher education. |

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| **Pandya (2024)** | **Longitudinal Study** comparing two groups over seven years at 4 time points (**2013,2015,2017,2018)** | **India** (Chennai, Mumbai, Bengaluru, New Delhi) and **United States** (Chicago, IL, New York, NY, Trenton, NJ, and San Francisco, CA) | Two cohorts of Indian older adults ageing in the homeland (AIH) and diaspora adults (DOA) who have immigrated to the United States | The study findings consistently revealed a higher religiosity among the diaspora older adults than older adults ageing in the homeland (AIH). This indicates that religiosity helps Immigrant "older adults "acquire social capital and maintain cultural connections in a foreign land. Most often, Religiosity in older adults has been a source of psychosocial well-being and cultural identity. It was also found that marital status and gender influence religiosity, with females and married individuals, having a higher religiosity score in comparison to their counterparts. In the DOA cohort, living arrangements, and immigration influence the level of religiosity, and higher levels of religiosity were seen in individuals with better health outcomes and higher levels of education. |
| **Maheshwari and Mukherjee (2019)** | **Field experiment Study** | **Allahabad (Prayagraj), India** | **150 Elderly Kalpvasis** (religious pilgrims) aged **60 years and above** attending Magh Mela | The study findings revealed that contrary to traditional terror management theory (TMT) predictions, mortality salience did not significantly impact the attitudes of the Kalpvasis toward individuals from a different social group and a cultural worldview. The Role of social detachment in regulating the relationship between Death anxiety and mortality salience was established through the study where less terror towards death-threatening situations was displayed by individuals with a higher level of social detachment. Years of Kalpvas practice, social detachment, and Age were seen to have a significant impact on death anxiety. The study suggested that the TMT operates differently in the indigenous religious context when compared to traditional Western studies. |

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| **Maurya et al. (2017)** | **Comparative** Study | **India** (Specialized geographical location not mentioned) | **60 elderly** in the age group of **60-80 years of age** were included in the study. (30 lived with their families and the rest 30 lived in old age homes) | The study findings indicate varied results across both groups, the family well-being and social functioning scores were much higher among the elderly living with their families. However, the Elderly living in old-age homes reported a significantly higher happiness level, emotional stability, and slightly higher self-esteem levels. The overall self-esteem was marginally higher among those elderly living with their families. The insights from the study are crucial to understanding the psychosocial aspects of understanding ageing in different living situations. |
| **Kumar and Bhakat (2022)** | **Comprehensive empirical analysis** using the Census of India(1991-2011), National Sample Survey Organisation(NSSO) 75 th Round(2017-2018), National Family Health Survey (NFHS-4, 2015-2016),and India Human Development Survey (IHDS-II,2011-2012) | **India** (Nationally representative data) | **Elderly individuals aged 60 years and above,** a special focus was put on Elderly belonging to Scheduled Caste | The study explores the influence of social capital and marginalization among the elderly in India, with a special focus on scheduled caste. It was found that living arrangements had a significant influence on the emotional and economic security of the elderly, especially in the absence of required healthcare and pension facilities. Caste-based discrimination and social hierarchies were seen to affect the support offered to older adults through social capital and family relationships. It was observed that women tended to invest a lot more than men in family relationships but were restricted from building connections outside. Social isolation and psychological issues were seen to be more prevalent among the rural elderly, especially women and this was attributed to the out-migration of the family members belonging to the productive age group. A Higher level of socioeconomic vulnerabilities and dependency ratios were observed among the Scheduled caste elderly. The study warrants the need for concrete and comprehensive policies to support healthy and sustainable ageing , specially for marginalized communities. |

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| **Ramachandran and Radhika (2006)** | **Comparative Cross-sectional** Study | **Trivandrum,Kerala,India Tokyo,Japan** | **300 elderly woman aged 60 years above**.(150 each from India and Japan) | The study findings reveal that Elderly women in Japan had a better socioeconomic status when compared to their counterparts in India. This can be attributed to the findings that Japanese respondents reported higher employment rates and financial independence through regular personal income. Indian respondents preferred their own homes for living over old age homes, unlike the Japanese respondents who had a greater preference for nursing or care homes. Fear of death was ranked as the top concern among Japanese respondents, while Indian respondents reported health issues as their top concern. A higher awareness of government welfare programs, greater access to devices that improve functionality and more leisure time was reported by the japanese respondents. |
| **Dey (2016)** | **Qualitative Content Analysis** | **India** | **Indian families and intergenerational relationships** in popular Hindi films and advertisements from the 1990s and beyond. | The study warrants a need for a nostalgic representation of intergenerational relationships, especially in the context of increasing reports of neglect and abuse among the elderly. The study highlights the nostalgia created by popular films and advertisements, where elderly care was represented as an unconditional familial duty and reinforced the idea of a joint family as the ideal structure for elder care. Social value degradation was often associated with the physical absence of family givers, especially women. Often traditional family structures were represented as inherently good while portraying contemporary, individualistic lifestyles as demeaning or viewed negatively. Such a nostalgic analysis is essential to set the foundation for the emerging new value systems and bridging the gap between traditional an contemporary approaches to elderly care. |

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| **Gupta et al. (2006)** | **Cross-sectional survey** study with psychometric analysis | **Allahabad,India** | **259 Caregivers of Elderly**(18 years and older and fulfill the study selection criteria) | The study validates the CES-D scale for Asian Indian caregivers, thus providing a culturally appropriate tool to assess depression in Asian Indian caregivers. There were three factors identified which include somatic/depressed affect, positive affect, and interpersonal depressed affect. It was noted that there was no observed differentiation between "somatization" and "depressed affect" among the Indian caregivers in comparison to Western participants. Another finding was that Asians represented by the Indian caregivers have a high tendency to somatize depression by presenting depression as physical symptoms. A major factor contributing to this factor can be the lack of a local language-specific word for "depression". |
| **Das et al. (2024)** | **Qualitative descriptive** study | **Pancharul Gram Panchyat,Howrah District,West Bengal**,India | **27 Elderly** participants between the **age of 60-80 years.** | Study findings highlight that there was no difference in perception of frailty among rural older adults enrolled in geriatric welfare programs compared to others who are not enrolled. This can probably be attributed to the concept being new. It was observed that the process of ageing, functional dependence, and psychosocial well-being were associated with frailty. Prominent components of frailty were identified as walking speed and grip strength, of which a slow walking pace was consistently associated with frailty. Participants demonstrated an ideological dilemma when exposed to the scientific definition of frailty which was also influenced by personal experiences. |

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| **Hirve et al. (2014)** | **Cross-sectional observational study** using Structural Equation Modeling(SEM) | **Rural Pune district** | **321 adults aged 50 years and above** were included in the study | It was observed through the study findings that with an increase in age and functional limitations, Self Rated Health (SRH)and Quality of life worsened. There was no direct relationship established between Socioeconomic status, social networking, and Quality of life. However, individuals with a higher level of social networks were seen to have a better Quality of Life. These effects give insight into how these factors influence health perceptions. The importance of marital status in contributing to emotional and economic support was highlighted through the finding that the presence of a living partner was considered an indicator of functional ability, thereby improving SRH. |
| **Saini and Jaswal (2009)** | **Cross-sectional study** | **Kanpur,Uttar Pradesh** | **300 elderly aged 60 years and above** (100 living in oldage homes-Aaasra,Apna Ghar and 200 living with their families) | The study findings reported that most elders in old homes were widowed, illiterate, females aged over 70 years. The reasons for moving into old age homes reported by respondents were lack of caretakers (40%), verbal abuse by family members (36%), health issues, and financial constraints. It was also found that the elderly in old-age homes had significantly higher scores for environmental health, psychological health, and social relationships in comparison to those living with family. The study suggests that overall quality of life across all domains significantly improves with the enhancement of the quality of care offered in old age homes. |

## *6.8. a. Objective Environment Factors influencing Ageing*

"Objective Environment" is the external factors that influence the behaviour and extent of well-being experienced by an older adult during the process of ageing (Wahl et al.,2012). According to Lawton's model, this set of factors supports well-being and can include 'living arrangements', 'available social support services', and 'physical environments' among others (Lawton,1983). Most of the reviewed studies categorized under this section focus on social support structures, the built environment and other social factors including financial security, social status, and living arrangements played an important role in the overall wellness of elderly population.

### *6.8.a.1 Role of Social Capital*

Among the diverse challenges associated with the rapid increase in the ageing population especially in developing contexts, the need to recognize older adults as valuable resources, and foster their continued engagement within their communities is being understood as an important step to combating ageism and promoting active ageing (Kohli et al.,2020). Social Isolation was found to exacerbate mental health problems among the Indian elderly (Ganguli,2000), While Social Support was identified as one of the critical factors contributing to the subjective perception of happiness among the elderly in India (Singh et al.,2022).

According to Putnam (2000), social capital is the combination of relationships, norms and feelings of trust or a sense of security between individuals and their societies, that enable them to function effectively and enhance the collective their psychosocial well-being. Figure 13 illustrates the different dimensions of social capital that influence the process of ageing in the context of India. Mishra and Ahad (2017) demonstrated that the risk of cognitive impairment is reduced in the presence of increased social capital. Gendered disparities in social capital were found to increase the risk of cognitive impairment, especially among women from poor socioeconomic backgrounds with lower education levels (Pandey et al.,2023). Social Isolation and physiological issues were seen to be more prevalent among elderly women, especially in rural areas, this was because women tended to invest

a lot more than men in family relationships but were restricted from building connections outside their households (Kumar & Bhakt,2022).

| Relational Dimensions | Cognitive Dimensions | Structural Dimensions |
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| Social relationship and interactions<br>Social cohesion<br>Social network | Quality of family relations<br>Values, attitudes and beliefs system within relations<br>Kinship based associations and its boding to the other members | Availability of network resources<br>Network-based interactions<br>Cultural relationships and norms belonging to society and institutions' |
| **Changing Reflections** | | |
| (1) Reductions of emotion based-ties | | (2) Shrinking network connectivity |
| (3) Changes in life-course transitions | | (4) Enmeshed in kin-based network |

**Source:** Prepared by the authors

**Fig. 1** Measures of social capital and its applicability in old-age

**Figure 13**: Illustration of Social capital and its attributes that influence ageing among older adults

**Source:**(Kumar & Bhakt,2022)

In a study conducted among older adults living in the rural-urban areas of Lucknow, Uttar Pradesh around fifty-seven point-seven per cent of the study population reported being socially vulnerable either due to isolation or the lack of social engagement (Patel,2021). Kakar (2019), in his study, identified that social support was one of the four key factors that influence life satisfaction. Social networks were seen to have a positive influence on physical activity and self-rated health, thereby indicating the role of social relationships in enhancing the psychosocial well-being of the elderly in the country (Vijayan et al.,2023). In a Qualitative study (Stanley and Ramakrishnan.,2007) conducted among a group of older adults in Tamil Nadu, it was observed that elderly participants who had low levels of social support reported higher levels of suicidal feelings, psychological and physiological stress like depression, anxiety, and hostility. Utilizing the Structural equation Modelling approach, Hirve et al. (2014) in his study demonstrated that individuals with a higher level of social support reported having a better Quality of life. Discrimination based on caste and social hierarchies was also seen to affect the support offered to older adults through social capital and family relationships (Kumar and Bhakt,2022). Education levels among individuals were seen to play an important role in

improving social relationships establishing a linear relationship of literacy and social relationships (Debnath and Roy,2024). In the Study by Saha et al. (2022), elderly respondents reported that the quality of relationships perceived as trust and inclusiveness were seen to influence their psychological well rather than the mere availability of social contact. Community engagement and participation in meaningful leisure activities have been shown to positively influence social relationships and increase the level of Self-worth (Saha et al.,2022). Therefore, it is important to sensitize the general population to cater to the social needs of the country's ageing population through behavioural change activities.

***6.8.a.2 Family Support, Living Arrangements, and Intergenerational Relationships***

An analysis of the "Census of India 2001" and "60$^{th}$ round of NSSO (2004)" showed that family support played an important role in the well-being of older adults, especially among those elderly living with children and spouses (Singh &Yesudian,2007). In the study (Mishra and Ahad, 2017) conducted among 120 elderly patients attending outreach clinics in Chhattisgarh, it was found that, though the majority (96.7%) of the respondents lived in joint families, more than half (62.5%) of them felt neglected by their families. It was also reported that nearly (33,3%) of the study population experienced a loss of social recognition and felt that they were a burden to their families.

Pandey et al. (2020) spotlight, the Indian concept of "seva" and "filial piety" as the cultural root of respecting and caregiving for the elderly. However, with rapid urbanisation and the decline of social structures like traditional joint families, the concept of financial pooling towards elderly care has been strained. He has also emphasised the fact that the mental health problems faced by the elderly are most often dismissed as associated with the "normal process of ageing".

The findings of Sharma and Ben Prince (2023) on a group of 600 retired elderly across India in three different living arrangements, reinforced the role of social, living arrangements and family structures in improving the health and well-being of the elderly. The health of the elderly population seemed to be negatively affected by loneliness. Social isolation was found to exacerbate mental health

problems, but the cultural attitude towards ageing seemed to highly influence the health-seeking behaviour of the elderly concerning cognitive and psychological issues. The inability to meet physiological and safety needs, frequent quarrels with sons and daughters-in-law and inability to adjust with family members were the prominent reasons which influenced the elderly to leave their families. Veda and Gadakar, (2016).

***6.8.a.3 Gender and Socioeconomic Influences on Ageing***

The well-being of older adults is often shaped by the complex interaction of socioeconomic factors. Barman et al. (2024) established that social deprivation index factors such as social security, financial stability, household amenities, educational achievements, level of social engagement, and living independently are associated with the prevalence of depression and a decline in cognitive health among women rural residents and elderly. Bakshi and Pathak (2016), in their study, revealed that a notable proportion of older adults were found to be financially dependent and among them, older females were vulnerable to abuse. Marital status and gender were linked to engagement in household activities with married older adults and older adults more likely to participate. In addition to this, the study also identified that households with only older adults experienced greater overall deprivation. Mukilan et al. (2016) in their study conducted among 98 elderly women, who were former members of a self-help group formed and monitored by the Centre for Rural System and Development in Tiruvallur Dt. Tamil Nadu, found that 88% of the participants lacked home ownership and 48% belonged to the scheduled caste demographic. Further, a considerable proportion reported that they did not receive government support in the form of pensions or allowances.

In a study (Mubasheer, 2018). investigating mental health and social challenges faced by elderly Indian women, Unmarried elderly women were found to exhibit superior psychological well-being compared to those who were married, widowed or divorced. In addition, the research suggests that women living in destitute homes generally experience better mental health outcomes than those

without access to such amenities. This highlights the significance of government support, counselling services and therapeutic interventions in enhancing the quality of life of elderly women in India.

Older adults who live in urban areas enjoyed higher socio-economic status, and those married were more likely to participate in household decision-making than their counterparts. (Irshad et al.,2021) A gendered relationship was observed in terms of participation in household decision-making, with males displaying a higher level of participation.

#### *6.8.a.4 Importance of Built Environment*

The adoption of a user-centric design can provide an enabling environment for the elderly to age productively and enhance overall health (Khare et al.,2014). Fostering supportive neighbourhoods with Age-friendly and geriatric-sensitive environments can help promote active ageing (Adlaka et al.,2020). In a Qualitative research study by Adlaka et al. (2020), elderly participants reported that urban disorder, lack of efficient and geriatric-friendly design in public transport, urban microscale structures, such as footpaths, road crossings, public toilets, shaded resting areas and poor maintenance of public parks limited their physical activity and recreation. Access to facilities like public parks and community spaces was reported to help foster social connections, connect with nature maintain essential physical activity and was observed to improve the overall well-being of older adults. Involving diverse stakeholders including Development Authorities of States and relevant others would help facilitate a favourable built environment for the growing population of Indian elderly.

### *6.8.b Factors affecting Perceived Quality of Life among elderly*

Paplikar et al. (2020) reveal that lifetime experiences, particularly in mid-life play a crucial role in maintaining cognitive health and preventing dementia. Cultural factors like traditional skilled occupations were also seen to be linked with better cognitive function in older adults in India. The study also showed that factors such as education, occupational involvement and participation in complex leisure activities contributed to cognitive reserve, helping delay cognitive decline Education

levels were seen to positively influence life satisfaction and happiness among those living in "*Pithamaha Sadans*" ( religious institution) Pandiya (2016).

#### *6.8.b.1 Role of Religion and Spirituality*

Pandiya (2016) to understand the influence of religiosity and spirituality on the life satisfaction and happiness of older people, compared elderly living in "*Pithamaha Sadans*" (a hindu religious institutional setting) and other adults in paid old age institutions. The study findings suggest that higher spirituality and religiosity were associated with greater well-being among the residents of "*Pithamaha Sadans*", who viewed ageing as a modifiable state of mind and death as a path to closeness with God. It was also observed that women and widowed individuals in both groups tended to be most spiritual and religious.

Dharmajan and Jabbar (2019) in their study findings suggested that spirituality has a positive influence on the quality of life as well as mitigating death anxiety among the elderly population. The study also argues that spiritual engagement in senior citizens may facilitate a satisfying life review, which may help resolve the conflict related to their thoughts of morality. In a study conducted among "Kalpvasis", a group of Hindu pilgrims who take part in a month-long religious practice of social detachment, it was demonstrated that individuals with higher levels of social detachment displayed less terror towards death-threatening situations (Maheshwari and Mukherjee,2019).

## *Psychological well-being*

Singh et al. (2022) in his study found that the key factors contributing to happiness among elderly individuals in India were family relationships, social support, maintaining good physical and mental health and religious and spiritual beliefs. The loss or illness of a family member was a major source of unhappiness. Maintaining good physical and mental health through healthy lifestyle practises such as proper diet, exercise and activities like yoga were emphasised as crucial for happiness and quality of life.

## *Behavioural Competence*

Roy (2024) in his study demonstrated that underweight BMI is linked to reduced cognitive function in older adults and warrants greater focus on the dynamic needs of underweight seniors. Lower levels of education and socioeconomic status indicated a negative impact on cognitive performance. Additionally, it was understood that rural residents had a lower cognition score than urban dwellers likely due to limited resources and less stimulating environments. Continued employment was found to be associated with better cognitive outcomes.

Nigam and Kar (2020) in their study provide insight into the cognitive-affective-behavioral changes correlating with ageing in India. It was found that there was a significant difference between the objective measures of cognitive functions and subjective complaints among older adults. Singh et al.,2020 in their study found a direct relationship between cognitive symptoms and QoL, and a 7% loss of life was reported among Indian older adults due to cognitive limitations.

Overall, the findings of this review reveal diverse psychosocial factors that influence the process of ageing and are important to the overall well-being of the elderly.

## *Future Research Areas in Ageing*

Through the findings of both the bibliometric analysis and the systematic review, it was understood that though there have been studies conducted to understand the "Nonclinical dimensions" of Ageing in India, Various important sub-themes still have a dearth of evidence and supporting literature especially in the Global South and particularly in the country. The role of the built environment in providing an enabling environment for older adults to age healthy and productively has only been briefly explored. There is a need for more research to study how the current environment affects ageing, whether it is providing an enabling environment, and what all levels is it affecting the process of ageing in the context of the Global South and specifically in the Indian context. It would also be

interesting to on how the concept of built environments can be integrated into existing and upcoming policies or programs.

## CONCLUSION

The Study combines a bibliometric analysis, and a systematic review to highlight the importance of adopting a holistic approach to ageing that addresses the psychosocial needs of the elderly and facilitates an enabling environment to age well and productively. The findings provide an overview of the diverse challenges older adults face, such as the burden of mental health disorders such as anxiety and depression, the impact of changing family and social support structures, and social isolation. In addition, factors such as built environment, social capital, spirituality, cognitive ageing, living arrangements, intergenerational solidarity, and cultural hierarchies were found to critically influence the well-being of the elderly. Nevertheless, the current study emphasizes the need for further research and larger studies of national relevance that address the existing gaps in the current understanding of ageing, concerning gender disparities, marginalized communities, and the impact of policy adaptions. Overall, the study insights warrant the necessity of integrating psychosocial factors into policies, programs, and interventions targeting improving the quality of life of the ageing Indian population.

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## APPENDIX

### *1.1 Search Strategy Compendium*

**KEYWORDS USED: "Ageing", "Aging"," Aged", "Elderly", "Older adults"," India"**

**Time Span: 01-08-1999 to 01-08-2024**

**QUERY**:(((((((TS=("Ageing")) OR TS=("Aging")) OR TS=("Aged")) OR TS=("Elderly"))) OR TS= ("older people")) AND LA=(English)) AND CU=("India") --→**38,615 Results**

**Research Areas Filter applied→12,343 Results (The mentioned research areas in the quey below were excluded)**

**QUERY**: (((((((TS=("Ageing")) OR TS=("Aging")) OR TS=("Aged")) OR TS=("Elderly"))) OR TS=("older people")) AND LA=(English)) AND CU=("India") and Materials Science or Engineering or Pharmacology Pharmacy or Science Technology Other Topics or Pediatrics or Computer Science or Metallurgy Metallurgical Engineering or Chemistry or Biochemistry Molecular Biology or Surgery or Research Experimental Medicine or Physics or Dentistry Oral Surgery Medicine or Oncology or Endocrinology Metabolism or Ophthalmology or Immunology or Cardiovascular System Cardiology or Infectious Diseases or Anesthesiology or Polymer Science or Agriculture or Cell Biology or Biotechnology Applied Microbiology or Respiratory System or Urology Nephrology or Dermatology or Obstetrics Gynecology or Tropical Medicine or Telecommunications or Energy Fuels or Food Science Technology or Gastroenterology Hepatology or Radiology Nuclear Medicine Medical Imaging or Microbiology or Life Sciences Biomedicine Other Topics or Business Economics or Pathology or Plant Sciences or Otorhinolaryngology or Construction Building Technology or Mathematics or Hematology or Toxicology or Biophysics or Instruments Instrumentation or Veterinary Sciences or Anthropology or Mechanics or Automation Control Systems or Legal Medicine or Demography or Medical Laboratory Technology or Nuclear Science Technology or Meteorology Atmospheric Sciences or Parasitology or Electrochemistry or Anatomy Morphology or Optics or Transportation or Geology or Mathematical Computational Biology or Emergency Medicine or Reproductive Biology or Sport Sciences or Virology or Rheumatology or Astronomy Astrophysics or Water Resources or Transplantation or Developmental Biology or Operations Research Management Science or Zoology or Entomology or Thermodynamics or Imaging Science Photographic Technology or Allergy or Robotics or Geochemistry Geophysics or Marine Freshwater Biology or Government Law or Information Science Library Science or Forestry or Fisheries or Crystallography or Mycology or Acoustics or Linguistics or Re

mote Sensing or Evolutionary Biology or Spectroscopy or Geography or Mineralogy or Arts Humanities Other Topics or Biodiversity Conservation or Mining Mineral Processing or Oceanography or Literature or Microscopy or Physical Geography or Mathematical Methods In Social Sciences or Ethnic Studies or Art or History Philosophy Of Science or Medical Ethics or Paleontology or Architecture or History or International Relations or Philosophy or Dance or Theater or Music (Exclude – Research Areas)

**Web of Science Categories filter applied:** (Neurosciences or Hospitality Leisure Sport Tourism or Green Sustainable Science Technology or Automation Control Systems or Nanoscience Nanotechnology or Neuroimaging -**Excluded)---→8,885 Results**

**QUERY:** ((((((((((TS=("Ageing")) OR TS=("Aging")) OR TS=("Aged")) OR TS=("Elderly"))) OR TS=("older people")) AND LA=(English)) AND CU=("India")) NOT TS=("Animals")) NOT TS=("Plants")) NOT TS=("Materials")) NOT TS=("Elements") and Engineering or Materials Science or Pharmacology Pharmacy or Pediatrics or Computer Science or Biochemistry Molecular Biology or Surgery or Metallurgy Metallurgical Engineering or Chemistry or Research Experimental Medicine or Physics or Psychiatry or Endocrinology Metabolism or Ophthalmology or Immunology or Oncology or Cardiovascular System Cardiology or Nutrition Dietetics or Infectious Diseases or Anesthesiology or Dentistry Oral Surgery Medicine or Polymer Science or Cell Biology or Orthopedics or Respiratory System or Biotechnology Applied Microbiology or Dermatology or Urology Nephrology or Obstetrics Gynecology or Tropical Medicine or Agriculture or Food Science Technology or Gastroenterology Hepatology or Energy Fuels or Microbiology or Business Economics or Radiology Nuclear Medicine Medical Imaging or Pathology or Mathematics or Hematology or Genetics Heredity or Otorhinolaryngology or Construction Building Technology or Biophysics or Instruments Instrumentation or Toxicology or Plant Sciences or Mechanics or Medical Laboratory Technology or Parasitology or Meteorology Atmospheric Sciences or Veterinary Sciences or Anatomy Morphology or Transportation or Electrochemistry or Mathematical Computational Biology or Nuclear Science Technology or Sport Sciences or Virology or Optics or Geology or Rheumatology or Emergency Medicine or Astronomy Astrophysics or Audiology Speech Language Pathology or Reproductive Biology or Transplantation or Developmental Biology or Water Resources or Operations Research Management Science or Zoology or Thermodynamics or Imaging Science Photographic Technology or Entomology or Allergy or Information Science Library Science or Geochemistry Geophysics or Marine Freshwater Biology or Crystallography or Forestry or Linguistics or Social Issues or Fisheries or Mycology or Acoustics or Evolutionary Biology or Geography or Remote Sensing or Oceanography or Arts Humanities Other Topics or Mineralogy or Spectroscopy or Mining Mineral Processing or Biodiversity Conservation or Literature or Microscopy or Mathematical Methods In Social Sciences or Physical Geography or History Philosophy Of Science or History or Paleontology or Philosophy or Dance or International Relations or Theater or Architecture or Art or Music or Physiology (Exclude – Research Areas) and Neurosciences or Hospitality Leisure Sport Tourism or Green Sustainable Science Technology or Automation Control Systems or Nanoscience Nanotechnology or Neuroimaging (Exclude – Web of Science Categories)

**Document Types filter applied:** Reprint or Correction or News Item or Retracted Publication or Book Review or Letter or Meeting Abstract -**Excluded)--→ 8,684 Results**

Surgery Medicine or Polymer Science or Cell Biology or Orthopedics or Respiratory System or Biotechnology Applied Microbiology or Dermatology or Urology Nephrology or Obstetrics Gynecology or Tropical Medicine or Agriculture or Food Science Technology or Gastroenterology Hepatology or Energy Fuels or Microbiology or Business Economics or Radiology Nuclear Medicine Medical Imaging or Pathology or Mathematics or Hematology or Genetics Heredity or Otorhinolaryngology or Construction Building Technology or Biophysics or Instruments Instrumentation or Toxicology or Plant Sciences or Mechanics or Medical Laboratory Technology or Parasitology or Meteorology Atmospheric Sciences or Veterinary Sciences or Anatomy Morphology or Transportation or Electrochemistry or Mathematical Computational Biology or Nuclear Science Technology or Sport Sciences or Virology or Optics or Geology or Rheumatology or Emergency Medicine or Astronomy Astrophysics or Audiology Speech Language Pathology or Reproductive Biology or Transplantation or Developmental Biology or Water Resources or Operations Research Management Science or Zoology or Thermodynamics or Imaging Science Photographic Technology or Entomology or Allergy or Information Science Library Science or Geochemistry Geophysics or Marine Freshwater Biology or Crystallography or Forestry or Linguistics or Social Issues or Fisheries or Mycology or Acoustics or Evolutionary Biology or Geography or Remote Sensing or Oceanography or Arts Humanities Other Topics or Mineralogy or Spectroscopy or Mining Mineral Processing or Biodiversity Conservation or Literature or Microscopy or Mathematical Methods In Social Sciences or Physical Geography or History Philosophy Of Science or History or Paleontology or Philosophy or Dance or International Relations or Theater or Architecture or Art or Music or Physiology (Exclude – Research Areas) and Neurosciences or Hospitality Leisure Sport Tourism or Green Sustainable Science Technology or Automation Control Systems or Nanoscience Nanotechnology or Neuroimaging (Exclude – Web of Science Categories) and Reprint or Correction or News Item or Retracted Publication or Book Review or Letter or Meeting Abstract (Exclude – Document Types) and 1.104 Virology - General or 1.55 Urology & Nephrology - General or 2.90 Water Treatment or 6.115 Sustainability Science or 1.102 Stem Cell Research or 1.196 Micro & Long Noncoding Rna or 2.67 Nanoparticles or 3.35 Zoology & Animal Ecology or 1.249 Digestive System Disorders or 1.258 Zoonotic Diseases or 7.12 Metallurgical Engineering or 3.232 Veterinary Sciences or 1.239 Tissue Barriers or 1.297 Asbestos & Mesothelioma or 1.79 Molecular & Cell Biology - Physiology or 2.39 Polymer Science or 2.74 Photocatalysts or 3.2 Marine Biology or 4.289 Biophotonics & Electromagnetic Field Safety or 7.251 Electrical - Harvesting & Discharging or 1.219 Cancer Drugs or 1.265 Dermatology - Skin Allergies or 1.285 Cystic Fibrosis or 2.176 Drug Delivery Chemistry or 2.211 Mass Spectrometry or 4.18 Power Systems & Electric Vehicles or 1.26 Diabetes or 1.36 Ophthalmology or 1.49 Dentistry & Oral Medicine or 1.34 Orthopedics or 1.128 Fertility, Endometriosis & Hysterectomy or 1.66 Hiv or 1.104 Virology - General or 1.55 Urology & Nephrology - General or 1.26 Diabetes or 1.36 Ophthalmology or 1.49 Dentistry & Oral Medicine or 1.43 Anesthesiology or 1.34 Orthopedics or 6.178 Gender & Sexuality Studies or 1.128 Fertility, Endometriosis & Hysterectomy or 1.66 Hiv or 1.23 Antibiotics & Antimicrobials or 1.118 Soft Tissue, Bone & Nerve Cancers or 1.72 Obstetrics & Gynecology or 1.184 Physiology & Metals or 8.124 Environmental Sciences or 1.80 Bone Diseases or 1.194 Tuberculosis & Leprosy or 3.16 Phytochemicals or 1.179 Oncology or 1.65 Allergy or 8.93 Archaeology or 1.216 Abdominal Surgery or 1.71 Cardiology - Circulation or 1.7 Neuroscanning or 1.142

**QUERY**:((((((((((TS=("Ageing")) OR TS=("Aging")) OR TS=("Aged")) OR TS=("Elderly"))) OR TS=("older people")) AND LA=(English)) AND CU=("India")) NOT TS=("Animals")) NOT TS=("Plants")) NOT TS=("Materials")) NOT TS=("Elements") and Engineering or Materials Science or Pharmacology Pharmacy or Pediatrics or Computer Science or Biochemistry Molecular Biology or Surgery or Metallurgy Metallurgical Engineering or Chemistry or Research Experimental Medicine or Physics or Psychiatry or Endocrinology Metabolism or Ophthalmology or Immunology or Oncology or Cardiovascular System Cardiology or Nutrition Dietetics or Infectious Diseases or Anesthesiology or Dentistry Oral Surgery Medicine or Polymer Science or Cell Biology or Orthopedics or Respiratory System or Biotechnology Applied Microbiology or Dermatology or Urology Nephrology or Obstetrics Gynecology or Tropical Medicine or Agriculture or Food Science Technology or Gastroenterology Hepatology or Energy Fuels or Microbiology or Business Economics or Radiology Nuclear Medicine Medical Imaging or Pathology or Mathematics or Hematology or Genetics Heredity or Otorhinolaryngology or Construction Building Technology or Biophysics or Instruments Instrumentation or Toxicology or Plant Sciences or Mechanics or Medical Laboratory Technology or Parasitology or Meteorology Atmospheric Sciences or Veterinary Sciences or Anatomy Morphology or Transportation or Electrochemistry or Mathematical Computational Biology or Nuclear Science Technology or Sport Sciences or Virology or Optics or Geology or Rheumatology or Emergency Medicine or Astronomy Astrophysics or Audiology Speech Language Pathology or Reproductive Biology or Transplantation or Developmental Biology or Water Resources or Operations Research Management Science or Zoology or Thermodynamics or Imaging Science Photographic Technology or Entomology or Allergy or Information Science Library Science or Geochemistry Geophysics or Marine Freshwater Biology or Crystallography or Forestry or Linguistics or Social Issues or Fisheries or Mycology or Acoustics or Evolutionary Biology or Geography or Remote Sensing or Oceanography or Arts Humanities Other Topics or Mineralogy or Spectroscopy or Mining Mineral Processing or Biodiversity Conservation or Literature or Microscopy or Mathematical Methods In Social Sciences or Physical Geography or History Philosophy Of Science or History or Paleontology or Philosophy or Dance or International Relations or Theater or Architecture or Art or Music or Physiology (Exclude – Research Areas) and Neurosciences or Hospitality Leisure Sport Tourism or Green Sustainable Science Technology or Automation Control Systems or Nanoscience Nanotechnology or Neuroimaging (Exclude – Web of Science Categories) and Reprint or Correction or News Item or Retracted Publication or Book Review or Letter or Meeting Abstract (Exclude – Document Types)

**Citation Topics Meso filter was applied--→ 2,979 Results**

**QUERY:** ((((((((((TS=("Ageing")) OR TS=("Aging")) OR TS=("Aged")) OR TS=("Elderly"))) OR TS=("older people")) AND LA=(English)) AND CU=("India")) NOT TS=("Animals")) NOT TS=("Plants")) NOT TS=("Materials")) NOT TS=("Elements") and Engineering or Materials Science or Pharmacology Pharmacy or Pediatrics or Computer Science or Biochemistry Molecular Biology or Surgery or Metallurgy Metallurgical Engineering or Chemistry or Research Experimental Medicine or Physics or Psychiatry or Endocrinology Metabolism or Ophthalmology or Immunology or Oncology or Cardiovascular System Cardiology or Nutrition Dietetics or Infectious Diseases or Anesthesiology or Dentistry Oral

Urology or 1.158 Dermatology - General or 1.37 Cardiology - General or 1.246 Diarrheal Diseases or 1.5 Neuroscience or 1.81 Reproductive Biology or 1.150 Hearing Loss or 1.213 Thyroid Disorders or 1.231 Vitamin Metabolism or 1.134 Trauma & Emergency Surgery or 1.141 Hormone Therapy or 1.208 Vasculitis & Autoimmune Disorders or 1.119 Breast Cancer Scanning or 1.152 Molecular & Cell Biology - Dna Damage or 1.235 Throat & Voice Disorders or 1.130 Lymphomas or 1.164 Endocrinology & Metabolism or 4.183 Transportation or 1.68 Lipids or 1.136 Autism & Development Disorders or 1.151 Pancreas & Gall Bladder Disorders or 1.197 Molecular & Cell Biology - Mitochondria or 1.236 Liver Diseases or 3.60 Herbicides, Pesticides & Ground Poisoning or 1.148 Medical Mycology or 1.94 Cardiac Arrhythmia or 1.95 Gastrointestinal & Esophageal Diseases or 1.172 Sports Science or 1.247 Migraines & Headaches or 1.103 Blood Disorders or 1.125 Hepatitis or 1.203 Neuromuscular Disorders or 1.225 Hematologic Diseases or 1.42 Bacteriology or 1.163 Parasitology - General or 1.168 Vascular, Cardiac & Thoracic Surgery or 1.120 Inflammatory Bowel Diseases & Infections or 1.228 Virology - Tropical Diseases or 1.173 Cosmetic Surgery or 1.217 Parasitology - Malaria, Toxoplasmosis & Coccidiosis or 1.243 Kidney Diseases or 1.25 Molecular & Cell Biology - Cancer, Autophagy & Apoptosis or 1.113 Brain Imaging or 1.233 Pelvic & Renal Disorders or 1.75 Blood Clotting or 1.161 Virology - Identification & Sequencing or 4.17 Computer Vision & Graphics or 1.189 Genome Studies or 1.253 Nerve Disorders or 3.91 Contamination & Phytoremediation or 1.111 Liver & Colon Cancer or 1.54 Molecular & Cell Biology - Genetics or 1.6 Immunology or 1.199 Lung Cancer or 1.257 Birth Defects or 1.117 Pharmacology & Toxicology or 10.240 Music or 1.147 Prostate Cancer or 1.281 Auto-inflammatory Diseases or 1.324 Bacterial Toxins & Diseases or 2.244 Chemometrics or 3.32 Entomology or 1.248 Sexually Transmitted Infections or 1.278 Adrenal Disorders or 3.40 Forestry or 1.127 Molecular & Cell Biology - Pharmacology or 1.181 Molecular Toxicology or 1.291 Testicular Diseases or 3.4 Crop Science or 3.45 Soil Science or 6.223 Hospitality, Leisure, Sport & Tourism or 1.186 Chromosome Disorders or 1.195 Neuroendocrine & Intestinal Disorders or 3.171 Photoproductivity or 7.227 Manufacturing or 1.108 Molecular & Cell Biology - Cancer & Development or 1.261 Parasitology - Trypanosoma & Leishmania or 1.266 Wounds & Ulcers or 2.90 Water Treatment or 3.83 Bioengineering or 4.58 Wireless Technology or 6.115 Sustainability Science or 1.102 Stem Cell Research or 1.196 Micro & Long Noncoding Rna or 1.255 Musculoskeletal Disorders or 1.287 Dietary Stimulants or 2.67 Nanoparticles or 3.35 Zoology & Animal Ecology or 1.249 Digestive System Disorders or 1.258 Zoonotic Diseases or 7.12 Metallurgical Engineering or 1.157 Organ Donation & Transplantation or 3.232 Veterinary Sciences or 1.239 Tissue Barriers or 1.297 Asbestos & Mesothelioma or 1.79 Molecular & Cell Biology - Physiology or 2.39 Polymer Science or 2.74 Photocatalysts or 3.2 Marine Biology or 4.289 Biophotonics & Electromagnetic Field Safety or 7.251 Electrical - Harvesting & Discharging or 1.219 Cancer Drugs or 1.265 Dermatology - Skin Allergies or 1.285 Cystic Fibrosis or 2.176 Drug Delivery Chemistry or 2.211 Mass Spectrometry or 4.18 Power Systems & Electric Vehicles or 6.263 Agricultural Policy or 7.262 Explosives or 7.300 Asphalt or 1.132 Extracellular Matrix & Cell Differentiation or 1.315 Laser Surgery, Therapy & Protection or 1.96 Cell Biology or 3.220 Smell & Taste Science or 3.64 Phylogenetics & Genomics or 4.169 Remote Sensing or 6.269 Political Philosophy or 6.316 Folklore & Humor or 8.140 Water Resources or 9.143 Dynamical Systems & Time Dependence or 1.159 Membrane Channels & Receptors or 1.254 Ultrasound In Medicine or 1.271 Lysosomal Storage Disorders or 1.286 Immunology & Hematology or 10.126 Philosophy or 2.165 Nanofibers, Scaffolds & Fabrication or 2.62 Electrochemistry or 3.180 Microbial Biotechnology or 3.85 Food Science & Technology or 3.87 Paper & Wood Materials Science or 4.101 Security, Encryption & Encoding or 4.224 Design & Manufacturing or 5.30

Superconductor Science or 5.77 Applied Physics or 1.106 Rheumatology or 1.105 Strokes or 1.129 Back Pain or 1.222 Epilepsy & Seizures or 1.154 Assisted Ventilation or 1.112 Palliative Care or 4.237 Safety & Maintenance or 6.69 Language & Linguistics (Exclude – Citation Topics Meso)

**Citation Topics Micro filter was applied--→2,873 Results**

**FINAL QUERY:** ((((((((((TS=("Ageing")) OR TS=("Aging")) OR TS=("Aged")) OR TS=("Elderly"))) OR TS=("older people")) AND LA=(English)) AND CU=("India")) NOT TS=("Animals")) NOT TS=("Plants")) NOT TS=("Materials")) NOT TS=("Elements") and Engineering or Materials Science or Pharmacology Pharmacy or Pediatrics or Computer Science or Biochemistry Molecular Biology or Surgery or Metallurgy Metallurgical Engineering or Chemistry or Research Experimental Medicine or Physics or Psychiatry or Endocrinology Metabolism or Ophthalmology or Immunology or Oncology or Cardiovascular System Cardiology or Nutrition Dietetics or Infectious Diseases or Anesthesiology or Dentistry Oral Surgery Medicine or Polymer Science or Cell Biology or Orthopedics or Respiratory System or Biotechnology Applied Microbiology or Dermatology or Urology Nephrology or Obstetrics Gynecology or Tropical Medicine or Agriculture or Food Science Technology or Gastroenterology Hepatology or Energy Fuels or Microbiology or Business Economics or Radiology Nuclear Medicine Medical Imaging or Pathology or Mathematics or Hematology or Genetics Heredity or Otorhinolaryngology or Construction Building Technology or Biophysics or Instruments Instrumentation or Toxicology or Plant Sciences or Mechanics or Medical Laboratory Technology or Parasitology or Meteorology Atmospheric Sciences or Veterinary Sciences or Anatomy Morphology or Transportation or Electrochemistry or Mathematical Computational Biology or Nuclear Science Technology or Sport Sciences or Virology or Optics or Geology or Rheumatology or Emergency Medicine or Astronomy Astrophysics or Audiology Speech Language Pathology or Reproductive Biology or Transplantation or Developmental Biology or Water Resources or Operations Research Management Science or Zoology or Thermodynamics or Imaging Science Photographic Technology or Entomology or Allergy or Information Science Library Science or Geochemistry Geophysics or Marine Freshwater Biology or Crystallography or Forestry or Linguistics or Social Issues or Fisheries or Mycology or Acoustics or Evolutionary Biology or Geography or Remote Sensing or Oceanography or Arts Humanities Other Topics or Mineralogy or Spectroscopy or Mining Mineral Processing or Biodiversity Conservation or Literature or Microscopy or Mathematical Methods In Social Sciences or Physical Geography or History Philosophy Of Science or History or Paleontology or Philosophy or Dance or International Relations or Theater or Architecture or Art or Music or Physiology (Exclude – Research Areas) and Neurosciences or Hospitality Leisure Sport Tourism or Green Sustainable Science Technology or Automation Control Systems or Nanoscience Nanotechnology or Neuroimaging (Exclude – Web of Science Categories) and Reprint or Correction or News Item or Retracted Publication or Book Review or Letter or Meeting Abstract (Exclude – Document Types) and 1.104 Virology - General or 1.55 Urology & Nephrology - General or 2.90 Water Treatment or 6.115 Sustainability Science or 1.102 Stem Cell Research or 1.196 Micro & Long Noncoding Rna or 2.67 Nanoparticles or 3.35 Zoology & Animal Ecology or 1.249 Digestive System Disorders or 1.258

Zoonotic Diseases or 7.12 Metallurgical Engineering or 3.232 Veterinary Sciences or 1.239 Tissue Barriers or 1.297 Asbestos & Mesothelioma or 1.79 Molecular & Cell Biology - Physiology or 2.39 Polymer Science or 2.74 Photocatalysts or 3.2 Marine Biology or 4.289 Biophotonics & Electromagnetic Field Safety or 7.251 Electrical - Harvesting & Discharging or 1.219 Cancer Drugs or 1.265 Dermatology - Skin Allergies or 1.285 Cystic Fibrosis or 2.176 Drug Delivery Chemistry or 2.211 Mass Spectrometry or 4.18 Power Systems & Electric Vehicles or 1.26 Diabetes or 1.36 Ophthalmology or 1.49 Dentistry & Oral Medicine or 1.34 Orthopedics or 1.128 Fertility, Endometriosis & Hysterectomy or 1.66 Hiv or 1.104 Virology - General or 1.55 Urology & Nephrology - General or 1.26 Diabetes or 1.36 Ophthalmology or 1.49 Dentistry & Oral Medicine or 1.43 Anesthesiology or 1.34 Orthopedics or 6.178 Gender & Sexuality Studies or 1.128 Fertility, Endometriosis & Hysterectomy or 1.66 Hiv or 1.23 Antibiotics & Antimicrobials or 1.118 Soft Tissue, Bone & Nerve Cancers or 1.72 Obstetrics & Gynecology or 1.184 Physiology & Metals or 8.124 Environmental Sciences or 1.80 Bone Diseases or 1.194 Tuberculosis & Leprosy or 3.16 Phytochemicals or 1.179 Oncology or 1.65 Allergy or 8.93 Archaeology or 1.216 Abdominal Surgery or 1.71 Cardiology - Circulation or 1.7 Neuroscanning or 1.142 Urology or 1.158 Dermatology - General or 1.37 Cardiology - General or 1.246 Diarrheal Diseases or 1.5 Neuroscience or 1.81 Reproductive Biology or 1.150 Hearing Loss or 1.213 Thyroid Disorders or 1.231 Vitamin Metabolism or 1.134 Trauma & Emergency Surgery or 1.141 Hormone Therapy or 1.208 Vasculitis & Autoimmune Disorders or 1.119 Breast Cancer Scanning or 1.152 Molecular & Cell Biology - Dna Damage or 1.235 Throat & Voice Disorders or 1.130 Lymphomas or 1.164 Endocrinology & Metabolism or 4.183 Transportation or 1.68 Lipids or 1.136 Autism & Development Disorders or 1.151 Pancreas & Gall Bladder Disorders or 1.197 Molecular & Cell Biology - Mitochondria or 1.236 Liver Diseases or 3.60 Herbicides, Pesticides & Ground Poisoning or 1.148 Medical Mycology or 1.94 Cardiac Arrhythmia or 1.95 Gastrointestinal & Esophageal Diseases or 1.172 Sports Science or 1.247 Migraines & Headaches or 1.103 Blood Disorders or 1.125 Hepatitis or 1.203 Neuromuscular Disorders or 1.225 Hematologic Diseases or 1.42 Bacteriology or 1.163 Parasitology - General or 1.168 Vascular, Cardiac & Thoracic Surgery or 1.120 Inflammatory Bowel Diseases & Infections or 1.228 Virology - Tropical Diseases or 1.173 Cosmetic Surgery or 1.217 Parasitology - Malaria, Toxoplasmosis & Coccidiosis or 1.243 Kidney Diseases or 1.25 Molecular & Cell Biology - Cancer, Autophagy & Apoptosis or 1.113 Brain Imaging or 1.233 Pelvic & Renal Disorders or 1.75 Blood Clotting or 1.161 Virology - Identification & Sequencing or 4.17 Computer Vision & Graphics or 1.189 Genome Studies or 1.253 Nerve Disorders or 3.91 Contamination & Phytoremediation or 1.111 Liver & Colon Cancer or 1.54 Molecular & Cell Biology - Genetics or 1.6 Immunology or 1.199 Lung Cancer or 1.257 Birth Defects or 1.117 Pharmacology & Toxicology or 10.240 Music or 1.147 Prostate Cancer or 1.281 Auto-inflammatory Diseases or 1.324 Bacterial Toxins & Diseases or 2.244 Chemometrics or 3.32 Entomology or 1.248 Sexually Transmitted Infections or 1.278 Adrenal Disorders or 3.40 Forestry or 1.127 Molecular & Cell Biology - Pharmacology or 1.181 Molecular Toxicology or 1.291 Testicular Diseases or 3.4 Crop Science or 3.45 Soil Science or 6.223 Hospitality, Leisure, Sport & Tourism or 1.186 Chromosome Disorders or 1.195 Neuroendocrine & Intestinal Disorders or 3.171 Photoproductivity or 7.227 Manufacturing or 1.108 Molecular & Cell Biology - Cancer & Development or 1.261 Parasitology - Trypanosoma & Leishmania or 1.266 Wounds & Ulcers or 2.90 Water Treatment or 3.83 Bioengineering or 4.58 Wireless Technology or 6.115 Sustainability Science or 1.102 Stem Cell Research or 1.196 Micro & Long Noncoding Rna or 1.255 Musculoskeletal Disorders or 1.287 Dietary Stimulants or 2.67 Nanoparticles or 3.35 Zoology & Animal Ecology or 1.249 Digestive System Disorders or 1.258 Zoonotic Diseases or 7.12 Metallurgical Engineering or 1.157 Organ

Donation & Transplantation or 3.232 Veterinary Sciences or 1.239 Tissue Barriers or 1.297 Asbestos & Mesothelioma or 1.79 Molecular & Cell Biology - Physiology or 2.39 Polymer Science or 2.74 Photocatalysts or 3.2 Marine Biology or 4.289 Biophotonics & Electromagnetic Field Safety or 7.251 Electrical - Harvesting & Discharging or 1.219 Cancer Drugs or 1.265 Dermatology - Skin Allergies or 1.285 Cystic Fibrosis or 2.176 Drug Delivery Chemistry or 2.211 Mass Spectrometry or 4.18 Power Systems & Electric Vehicles or 6.263 Agricultural Policy or 7.262 Explosives or 7.300 Asphalt or 1.132 Extracellular Matrix & Cell Differentiation or 1.315 Laser Surgery, Therapy & Protection or 1.96 Cell Biology or 3.220 Smell & Taste Science or 3.64 Phylogenetics & Genomics or 4.169 Remote Sensing or 6.269 Political Philosophy or 6.316 Folklore & Humor or 8.140 Water Resources or 9.143 Dynamical Systems & Time Dependence or 1.159 Membrane Channels & Receptors or 1.254 Ultrasound In Medicine or 1.271 Lysosomal Storage Disorders or 1.286 Immunology & Hematology or 10.126 Philosophy or 2.165 Nanofibers, Scaffolds & Fabrication or 2.62 Electrochemistry or 3.180 Microbial Biotechnology or 3.85 Food Science & Technology or 3.87 Paper & Wood Materials Science or 4.101 Security, Encryption & Encoding or 4.224 Design & Manufacturing or 5.30 Superconductor Science or 5.77 Applied Physics or 1.106 Rheumatology or 1.105 Strokes or 1.129 Back Pain or 1.222 Epilepsy & Seizures or 1.154 Assisted Ventilation or 1.112 Palliative Care or 4.237 Safety & Maintenance or 6.69 Language & Linguistics (**Exclude – Citation Topics Meso**) and 7.177.261 Biodiesel or 6.238.1700 Physician-scientists or 6.277.722 China or 6.146.2370 Indonesia or 5.31.272 Mosfet or 1.264.618 Caenorhabditis Elegans or 10.149.1978 Moriscos or 10.201.2457 Augustine or 10.99.1888 Coetzee or 2.22.798 Cisplatin or 2.241.270 Nanofiltration or 2.296.1344 Dyeing or 2.298.761 Perovskite Solar Cells or 2.166.1659 Biosimilars or 2.114.914 Stretchable Electronics or 2.145.243 Aptamer or 2.41.366 Selective Catalytic Reduction or 2.53.371 Hydrogels or 3.198.926 Endophytic Fungi or 3.274.2008 Hydra or 3.275.2177 Harvesting Robot or 3.51.115 Corpus Luteum or 4.13.896 Vehicular Ad Hoc Networks or 4.138.1329 Digital Filters or 4.174.2147 Phonocardiogram or 4.187.2488 Specific Emitter Identification or 4.61.1820 Credit Scoring or 5.250.747 Diffuse Optical Tomography or 6.146.1728 Artisanal Mining **(Exclude – Citation Topics Micro)**

**Web of Science Categories:(Family Studies excluded)→ 2840 Results--→2741**

**QUERY**: ((((((((((TS=("Ageing")) OR TS=("Aging")) OR TS=("Aged")) OR TS=("Elderly"))) OR TS=("older people")) AND LA=(English)) AND CU=("India")) NOT TS=("Animals")) NOT TS=("Plants")) NOT TS=("Materials")) NOT TS=("Elements") and Engineering or Materials Science or Pharmacology Pharmacy or Pediatrics or Computer Science or Biochemistry Molecular Biology or Surgery or Metallurgy Metallurgical Engineering or Chemistry or Research Experimental Medicine or Physics or Psychiatry or Endocrinology Metabolism or Ophthalmology or Immunology or Oncology or Cardiovascular System Cardiology or Nutrition Dietetics or Infectious Diseases or Anesthesiology or Dentistry Oral Surgery Medicine or Polymer Science or Cell Biology or Orthopedics or Respiratory System or Biotechnology Applied Microbiology or Dermatology or Urology Nephrology or Obstetrics Gynecology or Tropical Medicine or Agriculture or Food Science Technology or Gastroenterology Hepatology or Energy Fuels or Microbiology or Business Economics or Radiology Nuclear Medicine Medical Imaging or Pathology or Mathematics or Hematology or Genetics Heredity or Otorhinolaryngology or Construction Building Technology or Biophysics or Instruments Instrumentation or Toxicology or Plant

Sciences or Mechanics or Medical Laboratory Technology or Parasitology or Meteorology Atmospheric Sciences or Veterinary Sciences or Anatomy Morphology or Transportation or Electrochemistry or Mathematical Computational Biology or Nuclear Science Technology or Sport Sciences or Virology or Optics or Geology or Rheumatology or Emergency Medicine or Astronomy Astrophysics or Audiology Speech Language Pathology or Reproductive Biology or Transplantation or Developmental Biology or Water Resources or Operations Research Management Science or Zoology or Thermodynamics or Imaging Science Photographic Technology or Entomology or Allergy or Information Science Library Science or Geochemistry Geophysics or Marine Freshwater Biology or Crystallography or Forestry or Linguistics or Social Issues or Fisheries or Mycology or Acoustics or Evolutionary Biology or Geography or Remote Sensing or Oceanography or Arts Humanities Other Topics or Mineralogy or Spectroscopy or Mining Mineral Processing or Biodiversity Conservation or Literature or Microscopy or Mathematical Methods In Social Sciences or Physical Geography or History Philosophy Of Science or History or Paleontology or Philosophy or Dance or International Relations or Theater or Architecture or Art or Music or Physiology (Exclude – Research Areas) and Neurosciences or Hospitality Leisure Sport Tourism or Green Sustainable Science Technology or Automation Control Systems or Nanoscience Nanotechnology or Neuroimaging (Exclude – Web of Science Categories) and Reprint or Correction or News Item or Retracted Publication or Book Review or Letter or Meeting Abstract (Exclude – Document Types) and 1.104 Virology - General or 1.55 Urology & Nephrology - General or 2.90 Water Treatment or 6.115 Sustainability Science or 1.102 Stem Cell Research or 1.196 Micro & Long Noncoding Rna or 2.67 Nanoparticles or 3.35 Zoology & Animal Ecology or 1.249 Digestive System Disorders or 1.258 Zoonotic Diseases or 7.12 Metallurgical Engineering or 3.232 Veterinary Sciences or 1.239 Tissue Barriers or 1.297 Asbestos & Mesothelioma or 1.79 Molecular & Cell Biology - Physiology or 2.39 Polymer Science or 2.74 Photocatalysts or 3.2 Marine Biology or 4.289 Biophotonics & Electromagnetic Field Safety or 7.251 Electrical - Harvesting & Discharging or 1.219 Cancer Drugs or 1.265 Dermatology - Skin Allergies or 1.285 Cystic Fibrosis or 2.176 Drug Delivery Chemistry or 2.211 Mass Spectrometry or 4.18 Power Systems & Electric Vehicles or 1.26 Diabetes or 1.36 Ophthalmology or 1.49 Dentistry & Oral Medicine or 1.34 Orthopedics or 1.128 Fertility, Endometriosis & Hysterectomy or 1.66 Hiv or 1.104 Virology - General or 1.55 Urology & Nephrology - General or 1.26 Diabetes or 1.36 Ophthalmology or 1.49 Dentistry & Oral Medicine or 1.43 Anesthesiology or 1.34 Orthopedics or 6.178 Gender & Sexuality Studies or 1.128 Fertility, Endometriosis & Hysterectomy or 1.66 Hiv or 1.23 Antibiotics & Antimicrobials or 1.118 Soft Tissue, Bone & Nerve Cancers or 1.72 Obstetrics & Gynecology or 1.184 Physiology & Metals or 8.124 Environmental Sciences or 1.80 Bone Diseases or 1.194 Tuberculosis & Leprosy or 3.16 Phytochemicals or 1.179 Oncology or 1.65 Allergy or 8.93 Archaeology or 1.216 Abdominal Surgery or 1.71 Cardiology - Circulation or 1.7 Neuroscanning or 1.142 Urology or 1.158 Dermatology - General or 1.37 Cardiology - General or 1.246 Diarrheal Diseases or 1.5 Neuroscience or 1.81 Reproductive Biology or 1.150 Hearing Loss or 1.213 Thyroid Disorders or 1.231 Vitamin Metabolism or 1.134 Trauma & Emergency Surgery or 1.141 Hormone Therapy or 1.208 Vasculitis & Autoimmune Disorders or 1.119 Breast Cancer Scanning or 1.152 Molecular & Cell Biology - Dna Damage or 1.235 Throat & Voice Disorders or 1.130 Lymphomas or 1.164 Endocrinology & Metabolism or 4.183 Transportation or 1.68 Lipids or 1.136 Autism & Development Disorders or 1.151 Pancreas & Gall Bladder Disorders or 1.197 Molecular & Cell Biology - Mitochondria or 1.236 Liver

Diseases or 3.60 Herbicides, Pesticides & Ground Poisoning or 1.148 Medical Mycology or 1.94 Cardiac Arrhythmia or 1.95 Gastrointestinal & Esophageal Diseases or 1.172 Sports Science or 1.247 Migraines & Headaches or 1.103 Blood Disorders or 1.125 Hepatitis or 1.203 Neuromuscular Disorders or 1.225 Hematologic Diseases or 1.42 Bacteriology or 1.163 Parasitology - General or 1.168 Vascular, Cardiac & Thoracic Surgery or 1.120 Inflammatory Bowel Diseases & Infections or 1.228 Virology - Tropical Diseases or 1.173 Cosmetic Surgery or 1.217 Parasitology - Malaria, Toxoplasmosis & Coccidiosis or 1.243 Kidney Diseases or 1.25 Molecular & Cell Biology - Cancer, Autophagy & Apoptosis or 1.113 Brain Imaging or 1.233 Pelvic & Renal Disorders or 1.75 Blood Clotting or 1.161 Virology - Identification & Sequencing or 4.17 Computer Vision & Graphics or 1.189 Genome Studies or 1.253 Nerve Disorders or 3.91 Contamination & Phytoremediation or 1.111 Liver & Colon Cancer or 1.54 Molecular & Cell Biology - Genetics or 1.6 Immunology or 1.199 Lung Cancer or 1.257 Birth Defects or 1.117 Pharmacology & Toxicology or 10.240 Music or 1.147 Prostate Cancer or 1.281 Auto-inflammatory Diseases or 1.324 Bacterial Toxins & Diseases or 2.244 Chemometrics or 3.32 Entomology or 1.248 Sexually Transmitted Infections or 1.278 Adrenal Disorders or 3.40 Forestry or 1.127 Molecular & Cell Biology - Pharmacology or 1.181 Molecular Toxicology or 1.291 Testicular Diseases or 3.4 Crop Science or 3.45 Soil Science or 6.223 Hospitality, Leisure, Sport & Tourism or 1.186 Chromosome Disorders or 1.195 Neuroendocrine & Intestinal Disorders or 3.171 Photoproductivity or 7.227 Manufacturing or 1.108 Molecular & Cell Biology - Cancer & Development or 1.261 Parasitology - Trypanosoma & Leishmania or 1.266 Wounds & Ulcers or 2.90 Water Treatment or 3.83 Bioengineering or 4.58 Wireless Technology or 6.115 Sustainability Science or 1.102 Stem Cell Research or 1.196 Micro & Long Noncoding Rna or 1.255 Musculoskeletal Disorders or 1.287 Dietary Stimulants or 2.67 Nanoparticles or 3.35 Zoology & Animal Ecology or 1.249 Digestive System Disorders or 1.258 Zoonotic Diseases or 7.12 Metallurgical Engineering or 1.157 Organ Donation & Transplantation or 3.232 Veterinary Sciences or 1.239 Tissue Barriers or 1.297 Asbestos & Mesothelioma or 1.79 Molecular & Cell Biology - Physiology or 2.39 Polymer Science or 2.74 Photocatalysts or 3.2 Marine Biology or 4.289 Biophotonics & Electromagnetic Field Safety or 7.251 Electrical - Harvesting & Discharging or 1.219 Cancer Drugs or 1.265 Dermatology - Skin Allergies or 1.285 Cystic Fibrosis or 2.176 Drug Delivery Chemistry or 2.211 Mass Spectrometry or 4.18 Power Systems & Electric Vehicles or 6.263 Agricultural Policy or 7.262 Explosives or 7.300 Asphalt or 1.132 Extracellular Matrix & Cell Differentiation or 1.315 Laser Surgery, Therapy & Protection or 1.96 Cell Biology or 3.220 Smell & Taste Science or 3.64 Phylogenetics & Genomics or 4.169 Remote Sensing or 6.269 Political Philosophy or 6.316 Folklore & Humor or 8.140 Water Resources or 9.143 Dynamical Systems & Time Dependence or 1.159 Membrane Channels & Receptors or 1.254 Ultrasound In Medicine or 1.271 Lysosomal Storage Disorders or 1.286 Immunology & Hematology or 10.126 Philosophy or 2.165 Nanofibers, Scaffolds & Fabrication or 2.62 Electrochemistry or 3.180 Microbial Biotechnology or 3.85 Food Science & Technology or 3.87 Paper & Wood Materials Science or 4.101 Security, Encryption & Encoding or 4.224 Design & Manufacturing or 5.30 Superconductor Science or 5.77 Applied Physics or 1.106 Rheumatology or 1.105 Strokes or 1.129 Back Pain or 1.222 Epilepsy & Seizures or 1.154 Assisted Ventilation or 1.112 Palliative Care or 4.237 Safety & Maintenance or 6.69 Language & Linguistics (Exclude – Citation Topics Meso) and 7.177.261 Biodiesel or 6.238.1700 Physician-scientists or 6.277.722 China or 6.146.2370 Indonesia or 5.31.272 Mosfet or 1.264.618 Caenorhabditis Elegans or 10.149.1978 Moriscos or 10.201.2457 Augustine or 10.99.1888 Coetzee or 2.22.798 Cisplatin or 2.241.270 Nanofiltration or 2.296.1344 Dyeing or 2.298.761 Perovskite Solar Cells or 2.166.1659 Biosimilars or 2.114.914 Stretchable Electronics or 2.145.243

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