

Fostering awareness of innovative technologies in modern society for advancements in geriatric healthcare



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Abstract

The global phenomenon of population ageing is characterized by a rapid increase in the number of individuals aged over 60 worldwide. Projections suggest that by 2050, the global population of older people will exceed the combined number of children under 5 years old and adolescents, with developing countries hosting a significant majority of older individuals. In India, it is estimated that the older population will account for 6.57 % of the total population by 2020. To address the needs of the ageing population, it is imperative to provide them with access to cutting-edge technologies. Non-governmental organizations and private institutions are increasingly offering personalized assistance and guidance to older individuals through door-to-door services. In order to promote social inclusion and empowerment, targeted actions such as raising awareness within the broader community about the unique needs and challenges faced by the elderly, as well as establishing peer support groups, are essential.

Keywords: Geriatric care, policies, geriatric health care, geriatric welfare

1. Introduction

The concept of aging entails a transformation from a robust physique to a fragile state susceptible to infections, injuries, and mortality. In the Indian context, individuals aged 60 years and above are classified as "senior citizens." The National Policy for Older Persons, established in 1999 by the Ministry of Statistics and Programme Implementation and the National Statistics Office of the Government of India, aims to address the needs of this demographic. The older adult population in India has seen a significant increase, from 24.7 million in the 1961 census to a projected 137.9 million and 158.7 million for the 2022 and 2025 censuses, respectively, constituting 11.1 % of the total population. Empowering the elderly involves raising awareness about existing legal safeguards and welfare schemes. Advocating for legal reforms, such as fortifying the current Welfare and Maintenance Act and expediting the resolution of pending cases in maintenance tribunals within stipulated timeframes, are pivotal actions to safeguard the rights and welfare of older individuals. By implementing these strategies, we can strive towards cultivating a more inclusive and supportive environment for the elderly population, thereby promoting their well-being and quality of life (1).

2. Geriatric care in less developed countries

Recent data on India's senior population shows a marked shift in the country's demographics towards an ageing society. There are about 158.7 million senior people in India as of 2023, and these numbers are anticipated to increase gradually during the ensuing years. Gender differences in ageing demographics are further emphasized by the fact that in the previous 20 years, the total number of older women has exceeded that of elderly men. It is critical to address the issues surrounding elder care to preserve the rights and standard of living of the ageing population.

It is considerably harder to get suitable care for the two thirds of older persons who reside in developing countries, because most of them are poor and have low literacy rates. There are less bureaucratic or legal barriers to the development of community care systems in the less developed countries, but still there are not as many government-run nursing homes or long-term care facilities there due to a lack of infrastructure. In a nation where conventional family structures are changing, there is an increasing need for professional elder care services. In poor countries, it would be significantly more practical to train healthy persons to improve community involvement and offer home care for older adults living in their neighborhoods and local communities (2).

3. Technological advancements

Rapid advances in human technology will have some unanticipated impacts on the field of geriatrics, as they do on all facets of modern life. It is critical to think about and prepare for these scenarios in order to guarantee that any future developments in the sector will be morally and safely sound.

As an example of modern technology, smart home appliances have been praised as being beneficial for senior citizens to own. Socially assistive robotics, a relatively new area covered in the American Journal of Geriatric Psychology, is expected to become much more integrated with geriatrics in the future. These robots help with daily tasks like eating, drinking, taking care of oneself, and taking medication. Large-scale pattern identification is an area of artificial intelligence that machine learning, which is already gaining traction in the IT sector, excels at. In the future, machine learning can be used to uncover useful data from scenarios with a variety of variables and predict how people could react to specific treatment options and service approaches (3).

4. Smart technology

Smart technology and wearables are transforming geriatric health care by enhancing the ability to monitor and manage health conditions while promoting independence and safety for older adults. They track vital signs and alert caregivers to potential health issues, while smart home systems automate daily tasks, reducing the burden on healthcare staff and enhancing patient safety and comfort.

The implementation of the 4Ms framework—what Matters, Medication, Mentation, and Mobility—has been instrumental in tailoring healthcare to the specific needs of older adults. This approach ensures that care is aligned with patients' goals, reduces medication-related issues, and addresses mental and physical well-being comprehensively.

Smart home technologies, including automated lighting, door locks, and climate control, can be voice-activated, making everyday tasks easier for older adults. This helps them live independently longer and reduces the need for constant caregiver presence. Smart home systems often include sensors that detect falls and automatically alert emergency services or caregivers. This immediate response can significantly reduce the risks associated with falls, which are common and dangerous for older adults (3).

Health monitoring devices like smart beds can monitor sleep patterns and detect anomalies, while smart refrigerators can track food intake and nutrition. Health Tracking Wearable devices like smart watches and fitness trackers can monitor heart rate, blood pressure, oxygen levels, and even detect atrial fibrillation. This real-time data helps in early detection and management of chronic conditions. These devices also encourage physical activity by tracking steps and providing reminders to move, which is crucial for maintaining mobility and overall health in older adults. Wearables integrated with predictive analytics can help manage chronic diseases by alerting users and healthcare professionals to possible health problems before they worsen. For instance, they can monitor glucose levels in diabetics or detect signs of dehydration. Users can set up some wearables to remind them to take their medications on time, reducing the risk of missed doses and ensuring proper medication adherence. By providing continuous health monitoring and immediate alerts in case of emergencies, these technologies help in timely medical interventions, reducing hospital admissions and improving overall safety and health outcomes. Virtual Reality (VR) and Augmented Reality (AR) are being utilized for physical therapy, pain management, and mental health support. VR, for instance, can provide immersive experiences that improve cognitive function and emotional well-being by enabling activities like virtual travel or social interactions (4,5).

The current imperative is to address long-term care disparities, improve the digital infrastructure of these facilities which have historically lagged behind other healthcare sectors in adopting technology and make these services more accessible to minority populations.

Home- and Community-Based services allow for more personalized and flexible care, enabling older adults to receive support in familiar environments. This shift also helps to alleviate the strain on traditional healthcare facilities. These advancements are collectively enhancing the quality of care and the quality of life for older adults, addressing both their medical needs and personal preferences.

5. Detailed overview of policies and schemes for elderly healthcare in India

Through a comprehensive healthcare approach, the National Programme for Health Care of the Elderly (NPHCE) seeks to offer an ageing population easily accessible, reasonably priced, and high-quality long-term care services. It includes Community-Based Primary Health Care with domiciliary visits by trained healthcare workers to provide promotional, preventive, curative, and rehabilitative services. It aims to establish geriatric units at various levels that include, Primary Health Centers (PHC) with necessary equipment and trained personnel; Community Health Centers (CHC) with additional human resources, machinery, and infrastructure for elderly care; District Hospitals with 10-bedded geriatric wards, specialized equipment, and trained staff; Regional Medical Institutes with dedicated geriatric OPDs and 30-bedded wards, offering postgraduate courses in geriatric medicine and training for healthcare personnel; Information, Education, and Communication (IEC)utilizing mass media and folk media to reach and educate the elderly population about available services is essential. These government or healthcare facility benefits for senior citizens may be fully or partially subsidized, giving the aged population of the nation access to high-quality medical treatment at affordable costs.

Supplementary Strategies include promoting public-private partnerships in geriatric healthcare. Integrating AYUSH (traditional Indian medicine) with modern healthcare to enhance the scope of elderly care. Continuous monitoring and evaluation to improve the program's effectiveness.

The Varistha Mediclaim Policy, one of India's finest public health programs, provides comprehensive health care for senior persons. Senior persons between the ages of 60 and 80 are eligible for specialist medical treatment under this scheme. Blood transfusions, medications, ambulance services, and other expenses associated with the diagnosis are covered.

The goal of Pradhan Mantri Jan Arogya Yojana (PMJAY) is to better protect the finances of the elderly and other economically disadvantaged groups in society by increasing their access to high-quality healthcare services. It covers secondary and tertiary hospitalization up to Rs. 5 lakhs

per household annually. This initiative will benefit over 10 crores impoverished and vulnerable families. Under this program, cashless and paperless medical care including surgery, medical and daycare treatments, and critical care services are provided by both public and commercial hospitals.

National Policy on Older Persons (NPOP) enacted in 1999, the NPOP aims to ensure the well-being of senior citizens by providing them with social, financial, and healthcare support, ensuring a regular income source through pensions and other financial schemes. It also played an important role in the establishment of healthcare services dedicated to the elderly, promoting preventive and rehabilitative care. It has created a supportive environment through community programs and NGOs, providing companionship and mental health support

Seniors who fall under the Below Poverty Line (BPL) category can enhance their quality of life by receiving physical assistance and assisted living equipment from Rashtriya Vayoshri Yojana (RVY). Devices provided include walking sticks, wheelchairs, hearing aids, spectacles, and other assistive devices. The scheme is implemented through the Artificial Limbs Manufacturing Corporation (ALIMCO), ensuring the distribution of these devices across the country.

Atal Vayo Abhyuday Yojana (AVYAY) encompasses various initiatives aimed at improving the living conditions and well-being of senior citizens. NGOs that manage nursery facilities, retirement residences and mobile medical units are given funds by the Integrated Programme for Older Persons (IPOP). National Helpline for Senior Citizens (14567) offers support and assistance to elderly individuals facing abuse, neglect, or needing emergency support.

Reverse Mortgage Scheme introduced in 2007, helps senior citizens convert their residential property into a source of income without having to sell it. These schemes reflect the Indian government's commitment to supporting the elderly by providing comprehensive healthcare services, financial security, and social support. The focus on integrating modern healthcare with traditional practices and promoting public-private partnerships ensures a holistic approach to elderly care (1,2).

6. Mental health services

Late-life psychotic diseases arise from the intricate interplay of multiple biological, psychological, social, and environmental components. A thorough work-up must be promptly carried out as soon as psychotic disorders are discovered, considering the substantial morbidity and mortality linked to them in later life.

According to research by Meesters and colleagues, 0.14% of persons over 60 had schizoaffective disorder 12 months of the time. Schizoaffective disorder appears to affect older persons more severely and with worse results, such as increased treatment resistance and suicide risk. Comorbidities should always be carefully considered when treating patients with late-life psychotic illnesses, since this requires individualized care. Furthermore, when combined with pharmaceutical approaches, the application of evidence-based non-pharmacological therapy can improve outcomes. When it comes to proven treatments, cognitive skills training, functional adaptation skills training, social rehabilitation, supported employment, and job rehabilitation are the non-pharmacological approaches for late-life psychotic diseases that have the best quality of evidence. Using computational methods to integrate multimodal data such as genetics, EEG, MRI, cognitive function tests, clinical information, and patient history may also aid in capturing the complete heterogeneity of symptom clusters and identifying subgroups that respond more favorably to certain treatment options than others (6,7).

7. The new era of Alzheimer's dementia therapies

Globally, an estimated 55 million people suffer from dementia; as the population ages, this figure might rise to 139 million by 2050. Dementia caused 1.6 million deaths worldwide in 2019 and was

result in 1.3 trillion dollars. The Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER) showed that among older people at risk for dementia, a multidomain intervention aimed at lowering risk factors related to lifestyle and vascular health was effective in preventing cognitive decline. In light of the benefits of bridging the blood-brain barrier and therapeutic modalities such as symptomatic alleviation, N,N-Dimethyltryptamine therapy, and hallmark diagnosis, more translational research investigating the dynamics of nanoparticles in a biological interface ought to be conducted (8,9).

8. Oral health

The World Health Report on Primary Health Care (2008) suggested that in order to improve the efficacy of care for patients with special needs, such as elderly patients or patients with cognitive or physical disabilities, the oral health sector should be integrated into a multidisciplinary care pathway within the healthcare system. In older persons, oral health is associated with overall health, morbidity, and mortality. To lessen health disparities among nations, the integrated healthcare system would offer universal access to a variety of health services. This integration will help the healthcare system reallocate workers and resources while also improving oral healthcare affordability and accessibility for everybody, particularly underserved populations like senior citizens. "Home dentistry or domiciliary dental care" is the best way to assist residents; however it is still not a common practice in India (10).

9. Conclusion

As the global population gets older, our healthcare systems are changing dramatically, necessitating creative thinking and all-encompassing solutions to meet the special requirements of our elderly. Technology helps close the communication gap between patients and healthcare providers by providing prompt interventions and individualized treatment plans through telemedicine, remote monitoring, and wearable vital sign trackers.

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