

Dementia: A Public Health Challenge in India

Jeevitha Gowda R^{1*}, Anish Mehta², Krishnamurthy Jayanna³

¹PhD Student, MS Ramaiah University of Applied Sciences, New BEL Road, MSR Nagar, Bangalore, Karnataka, India – 560054

²Associate Professor, MS Ramaiah Medical College and Hospitals, New BEL Road, MSR Nagar, Bangalore, Karnataka, India – 560054

³Professor, MS Ramaiah University of Applied Sciences, New BEL Road, MSR Nagar, Bangalore, Karnataka, India – 560054

Corresponding Author:

Jeevitha Gowda R, MS Ramaiah University of Applied Sciences, New BEL Road, MSR Nagar, Bangalore, Karnataka, India - 560054

Email: jeevithahtr26@gmail.com

KEYWORDS

Dementia, Public Health, India, Epidemiology, Risk Factors, Early Detection, Screening, Caregiver Burden, Prevention, Intervention, Aging Population, Healthcare System, Cognitive Decline.

ABSTRACT

Background: Dementia is a progressive neurodegenerative disorder that significantly impacts the elderly population, leading to cognitive decline and increased caregiver burden. The growing ageing population in India is expected to amplify the dementia burden, posing challenges for healthcare systems and caregivers. Despite the rising prevalence of dementia, early detection remains inadequate due to various barriers. **Objective:** This narrative review aims to evaluate the epidemiological burden of dementia in India, identify risk factors, assess barriers to early detection, and suggest public health strategies for prevention and intervention. **Methods:** A comprehensive literature search was conducted using Google Scholar, PubMed, and Medline, focusing on articles published from 2010 to 2023. Keywords such as "dementia," "India," "epidemiology," "risk factors," and "public health interventions" were used to identify relevant studies. After screening, 42 articles were selected for full-text review, grouped into thematic sections: epidemiology, risk factors, barriers to early detection, and caregiver burden. **Results:** India's dementia prevalence is estimated at 5-7%, with higher rates in southern states due to better healthcare access. Key risk factors include age, genetics, comorbidities (diabetes, hypertension), and lifestyle choices. Barriers to early detection include limited awareness, healthcare infrastructure challenges, and social stigma. **Conclusion:** Addressing dementia in India requires enhanced public awareness, improved healthcare infrastructure, and targeted prevention strategies, including early screening and caregiver support. A multi-sectoral approach is essential for effective dementia management.

1. Introduction

Dementia is a significant neurodegenerative disorder that profoundly impacts the quality of life of older adults, while also placing a considerable burden on their caregivers. Characterized by a progressive decline in cognitive function, dementia affects essential abilities such as attention, learning, memory, language, decision-making, and spatial awareness. In addition to cognitive impairment, individuals with dementia frequently exhibit changes in behaviour, personality, and mood (1). This condition can stem from a variety of underlying causes, including vascular, metabolic, and neurodegenerative disorders, all of which progressively damage brain cells (2).

Globally, dementia has emerged as a critical public health issue, carrying significant implications for individuals, caregivers, and healthcare systems. With the ageing population and increasing life expectancy, a substantial rise in dementia cases is anticipated worldwide. India, home to approximately 1.4 billion people, is expected to play a crucial role in this growing burden. The elderly population in India continues to expand, leading to an expected increase in the prevalence of dementia, which necessitates a comprehensive public health response (3).

According to the Census of India (2011), over 104 million people in the country are aged 60 years or older, and this number is rapidly increasing. This demographic shift, coupled with changing lifestyles and the rising prevalence of non-communicable diseases (NCDs) such as diabetes, hypertension, and heart disease, elevates the risk of dementia among the elderly (3). Vascular conditions and metabolic disorders can negatively affect brain health, increasing vulnerability to both vascular and neurodegenerative types of dementia (2).

The World Health Organization (WHO) estimates that the global number of individuals living with dementia will reach 82 million by 2030, further escalating to 152 million by 2050 (4). Despite this alarming trend, dementia is still under-recognized as a public health priority in many low- and middle-income countries, including India(5). Families and caregivers endure significant emotional, social, and economic burdens as healthcare systems struggle to meet the escalating demand for care.

In light of the magnitude of the issue, this narrative review seeks to evaluate the epidemiological burden of dementia in India, scrutinize the specific risk factors, and investigate preventive strategies along with early screening interventions. By synthesizing insights from existing research, the review aims to illuminate public health challenges and offer evidence-based recommendations for interventions and policies that are specifically tailored to the Indian context.

2. Methods

This narrative review follows a structured methodology to provide a comprehensive synthesis of relevant literature on dementia in India. Google Scholar, PubMed, and Medline were used as primary sources to search for peer-reviewed articles, reports, and policy documents published between 2010 and 2023. The following keywords were used: “*dementia*,” “*India*,” “*epidemiology*,” “*risk factors*,” “*public health interventions*,” and “*caregiver burden*.”

Selection Process

- **Search and Screening:** A total of 144 articles were initially identified based on the inclusion of relevant keywords. After screening the titles and abstracts, 42 articles were selected for full-text review.

- Inclusion Criteria: Articles focusing on the prevalence, risk factors, regional variations, and public health interventions for dementia in India.
- Exclusion Criteria: Articles emphasizing pharmacological treatments or unrelated to public health concerns.

We selected articles into thematic sections: (1) Epidemiology and Burden, (2) Risk Factors, (3) Public Health Challenges and Interventions, and (4) Caregiver Burden and Support Systems. Each section draws on multiple studies to provide a holistic understanding of the current state of dementia in India, highlighting gaps and opportunities for future research and intervention. By addressing the socio-economic and healthcare challenges associated with dementia, this review aims to inform evidence-based public health policies that can better manage the growing burden of dementia in India. The findings are intended to contribute to national and regional strategies that focus on early diagnosis, prevention, and caregiver support systems, ultimately reducing the impact of dementia on individuals and healthcare infrastructure.

3. Results and Thematic Sections

3.1 Epidemiology of Dementia

Dementia is a growing public health concern in India, driven by demographic shifts and lifestyle changes. Globally, over 55 million people are affected by dementia, with India's ageing population expected to contribute significantly to future cases (4). Current estimates suggest that 5-7% of older adults (aged 60 and above) in India have dementia, although underdiagnosis and inadequate reporting mechanisms may obscure the true burden (1).

India's population trends amplify the burden of dementia. Census data from 2011 indicated 104 million older adults, a number projected to rise to 319 million by 2050. As life expectancy increases, the prevalence of age-related non-communicable diseases (NCDs) like diabetes, hypertension, and cardiovascular conditions, which contribute to cognitive decline, also rises (2). However, delayed diagnosis, compounded by social stigma and limited awareness, often leaves patients without timely care (5).

3.1.1 Regional Variations in Dementia Prevalence

Dementia prevalence varies across India, reflecting disparities in healthcare access and literacy. Southern states such as Kerala report higher dementia rates, likely due to better healthcare infrastructure and higher literacy rates, which lead to more frequent diagnoses (6). In contrast, northern states like Uttar Pradesh and Bihar report fewer cases, though this may reflect underreporting and limited access to diagnostic services rather than a lower prevalence. Rural areas face significant challenges, with patients often lacking access to appropriate care and screening tools.

3.1.2 Socio-economic and Healthcare Costs

Dementia imposes a heavy economic burden on both families and healthcare providers in India. Caregiving responsibilities largely fall on family members, creating financial and emotional stress. Studies estimate that dementia care costs can exceed INR 40,000 annually per patient, covering both direct medical expenses and indirect costs such as loss of caregiver income (7). India's healthcare system struggles to meet the growing demand for dementia-related care. With limited formal care structures, the burden of care falls on families, increasing the risk of caregiver burnout. Unlike countries with established dementia policies, India lacks standardized protocols for diagnosis and management, exacerbating care gaps and limiting patient outcomes(8).

3.1.3 Projected Growth of Dementia Burden

The projected growth of the dementia burden in India is a pressing public health issue, primarily driven by an ageing population and increasing life expectancy. Currently, the prevalence of dementia among the elderly in India ranges from 5% to 7%, influenced by factors such as low literacy rates, socioeconomic status, and unhealthy lifestyle behaviours(9). Future projections indicate a significant rise in dementia cases, with estimates suggesting that around 20 million individuals will be living with dementia in India by 2050(10). The World Alzheimer Report (2015) supports this by projecting that the number of people with dementia globally will reach 75 million by 2030 and 132 million by 2050, highlighting the increasing burden in low- and middle-income countries like India.

The growing proportion of older adults in the Indian population—projected to increase from 10% in 2011 to approximately 20% by 2050 according to 2011 Census of India, is a critical factor contributing to this trend(11). Additionally, the National Mental Health Survey of India (2016)(12) emphasizes the challenges faced in dementia care, including lack of awareness, insufficient healthcare infrastructure, and stigma associated with mental health conditions, which lead to underdiagnosis and inadequate support for those affected. Addressing these issues calls for comprehensive dementia care policies, increased awareness, and early screening initiatives. The Indian Council of Medical Research (ICMR) recognizes dementia as a growing health concern and advocates for enhanced research and public health strategies to effectively manage this impending crisis.

Addressing the growing burden requires community-based interventions focusing on prevention, early detection, and support for caregivers. Public awareness campaigns are essential to reduce stigma and encourage participation in screening programs, especially in rural areas with low diagnosis rates (5). Preventive strategies—such as promoting physical activity, cognitive training, and managing chronic conditions—can reduce the risk of cognitive decline.

A coordinated, multi-sectoral response is essential. Collaboration between the government, healthcare providers, non-profits, and local communities will be key to developing national dementia strategies. Integrating dementia care into the primary healthcare system, strengthening infrastructure, and encouraging lifestyle modifications will help mitigate the disease's impact. Sustainable care models and evidence-based policies are critical for improving dementia outcomes and ensuring better care at the population level.

3.2 Risk Factors for Dementia

The development of dementia is influenced by a combination of non-modifiable and modifiable risk factors, including genetics, age, lifestyle choices, education, comorbidities, and environmental conditions. Understanding these factors is crucial for developing effective prevention strategies, particularly in countries like India, where the incidence of dementia is projected to rise significantly due to an ageing population.

3.2.1 Non-Modifiable Risk Factors

1. Age

Age is the strongest risk factor for dementia, with incidence doubling every five years after the age of 60. India's elderly population (aged 60 and above) is projected to increase from 104 million in 2011 to 319 million by 2050, emphasizing the need for early screening programs (5,11).

2. Genetic Predisposition

Genetic factors, including the APOE-ε4 allele, are associated with a higher risk of late-onset Alzheimer's disease (13). Around 25% of the population carries at least one APOE-ε4 allele, increasing susceptibility to cognitive decline. Additionally, rare mutations in genes like APP, PSEN1, and PSEN2 are linked to familial Alzheimer's disease (14). Identifying genetic risks can help guide personalized interventions.

3.2.2 Modifiable Risk Factors

1. Educational Attainment and Cognitive Reserve

Education enhances cognitive reserve, providing resilience against cognitive decline (15). In India, disparities in literacy contribute to regional differences in dementia rates. States with better education outcomes, such as Kerala, show lower dementia prevalence than those with lower literacy, such as Uttar Pradesh (16).

2. Lifestyle Factors and Physical Inactivity

Physical inactivity is a well-documented risk factor for dementia, with regular exercise supporting brain health and cognitive function (17). In India, sedentary lifestyles are becoming more common due to urbanization and changing work environments, raising concerns about cognitive health.

3. Diet and Nutrition

Diet plays a crucial role in brain health. Diets high in fruits, vegetables, and omega-3 fatty acids are protective, while those high in processed foods increase the risk of cognitive decline (18). Although traditional Indian diets are often rich in antioxidants and healthy fats, urban areas are witnessing a shift toward less nutritious, Westernized diets.

4. Comorbidities: Diabetes, Hypertension, and Cardiovascular Diseases

Chronic conditions like diabetes and hypertension are strongly linked to cognitive decline. A study in Karnataka found that individuals with these comorbidities had a higher risk of dementia compared to those without them (3,19). Managing these diseases through lifestyle changes and medications is essential for reducing dementia risk.

5. Mental Health and Social Isolation

Depression and social isolation significantly contribute to cognitive decline (5). In India, increased urbanization and changing family dynamics have led to greater social isolation among the elderly, raising their vulnerability to dementia.

6. Alcohol Consumption and Smoking

Heavy alcohol consumption and smoking are associated with cognitive decline and vascular dementia. Excessive alcohol use contributes to neurodegeneration while smoking impairs blood flow to the brain, increasing dementia risk (20).

3.2.3 Environmental and Social Determinants

1. Air Pollution and Toxins

Exposure to air pollution, particularly fine particulate matter (PM_{2.5}), has been linked to neuroinflammation and cognitive decline (21). India's high levels of air pollution pose a significant environmental risk to brain health.

2. Access to Healthcare and Screening

Timely access to healthcare and early screening are crucial for managing dementia. However, rural areas in India often face healthcare infrastructure shortages, resulting in missed diagnoses(4). Increasing awareness and training among healthcare providers can improve early detection rates and interventions.

While age and genetics are non-modifiable risk factors, addressing modifiable risks like education, lifestyle, and chronic diseases can significantly reduce dementia prevalence. Public health strategies focusing on physical activity, nutrition, and mental well-being are essential to mitigate risks. Additionally, improving healthcare access and environmental conditions will help India better manage the rising dementia burden. Collaborative efforts involving the government, healthcare providers, and communities are critical to developing effective dementia prevention and care strategies.

3.3 Barriers to Early Detection and Diagnosis

Early detection of dementia is essential for effective management, but several barriers hinder timely diagnosis. These challenges include societal stigma, limited awareness, and healthcare system gaps, which collectively delay intervention and care.

3.3.1 Stigma and Cultural Beliefs

The cultural stigma surrounding dementia often frames memory loss as a normal part of ageing, discouraging individuals from seeking medical help(22). In India, many families believe cognitive decline is a natural process rather than a medical issue, leading them to dismiss early symptoms. Some communities also associate dementia with a loss of dignity, prompting families to conceal symptoms to avoid social shame (23).

Healthcare providers are not immune to these biases. Clinicians may overlook dementia symptoms, especially in older patients, due to societal preconceptions, contributing to delayed diagnoses (24). This cycle perpetuates underdiagnosis and creates barriers to appropriate care.

3.3.2 Lack of Awareness

Public awareness about dementia remains low. Many individuals and families struggle to recognize the early signs—such as memory lapses, confusion with routine tasks, and mood changes—and often attribute them to ageing or stress (1). This misunderstanding leads to underreporting and delayed medical consultations (25).

Educational initiatives targeting the general population can bridge this knowledge gap by clarifying the difference between normal ageing and dementia symptoms (26). Creating awareness fosters an environment where people feel comfortable seeking medical help early.

Healthcare providers also need improved training to recognize dementia symptoms and engage patients in discussions about cognitive health. Studies show that general practitioners often lack the knowledge or tools to diagnose dementia accurately, leading to missed opportunities for early intervention (27).

3.3.3 Healthcare Gaps

India's healthcare system faces significant challenges in detecting dementia early, especially in primary care settings. Many healthcare providers are not trained to perform cognitive assessments, and this problem is more severe in rural areas where access to specialized care is limited(28). Many healthcare workers lack the skills needed to identify dementia, resulting in misdiagnosis or no diagnosis at all(29).

Additionally, healthcare facilities often lack standardized screening tools, making it difficult for providers to incorporate cognitive evaluations into routine care (30). Without consistent protocols, early symptoms go unnoticed, leading to delayed interventions. Access to healthcare is another barrier, particularly for rural populations. Patients in remote areas often face challenges travelling to urban centres for specialized care, further delaying diagnosis and treatment (31).

Addressing the barriers to early dementia detection requires a multi-faceted approach. Reducing stigma through public education, improving awareness about dementia symptoms, and enhancing healthcare provider training are critical first steps. Integrating cognitive health into primary care and equipping healthcare workers with standardized tools can improve diagnosis rates. By addressing these barriers, India can better support individuals with dementia and their families, ultimately improving patient outcomes and reducing the overall burden of the disease.

3.4 Public Policy and Healthcare Challenges

India's healthcare system has traditionally emphasized acute care, leaving chronic conditions like dementia under-addressed. While initiatives like the National Mental Health Programme (NMHP) have aimed to integrate mental health into public policy, dementia care remains insufficiently prioritized, creating challenges for early detection, diagnosis, and support.

3.4.1 Limited Infrastructure

One of the primary challenges is the lack of infrastructure dedicated to dementia care. Memory clinics, essential for early diagnosis, are scarce and mainly concentrated in urban areas, limiting access for rural populations (32).

This limited availability leads to delayed or missed diagnoses. Individuals in rural areas often rely on general practitioners who may lack specialized training to identify cognitive disorders. Additionally, the absence of standardized diagnostic protocols in primary care settings contributes to misdiagnosis and inappropriate treatment(33). Even when memory clinics are accessible, factors like long waiting times, high out-of-pocket expenses, and limited healthcare coverage deter families from seeking care.

3.4.2 Caregiver Burden

The majority of individuals with dementia in India receive care at home, with family members—particularly women—bearing the brunt of caregiving responsibilities (34). This unpaid labour places immense physical, emotional, and financial pressure on caregivers.

Women, in particular, experience higher levels of stress due to caregiving, often facing social expectations that exacerbate their emotional burden(35). Many caregivers experience anxiety, depression, and burnout, with limited access to formal support services such as respite care or counselling(3). The lack of caregiver support adds to the challenge of managing dementia effectively and sustainably.

3.4.3 Rural Healthcare Barriers

Rural areas face significant challenges in providing adequate dementia care. A lack of trained healthcare professionals means that individuals with dementia often go without appropriate screening or treatment (36). Additionally, transportation barriers make it difficult for rural patients to access the limited specialized services available in urban areas, resulting in delays in care.

According to the National Health Mission, about 70% of India's population lives in rural areas, where healthcare infrastructure remains insufficient (37). Many families rely on traditional remedies or untrained practitioners, further delaying diagnosis and access to modern care. Strengthening rural healthcare services and integrating cognitive health evaluations into primary care systems are critical for improving early detection and treatment.

Addressing these barriers requires targeted public policy efforts and systemic reforms:

1. **Increase Awareness and Education:** Nationwide campaigns should raise awareness about dementia symptoms and the importance of early detection. Educational programs should target both the public and healthcare professionals to encourage timely diagnosis and reduce stigma.
 2. **Enhance Healthcare Infrastructure:** Establish more specialized memory clinics across both urban and rural areas to ensure equitable access to care. Providing incentives for healthcare providers to specialize in geriatrics and cognitive disorders can further strengthen services.
 3. **Support for Caregivers:** Develop formal support programs, including respite care, caregiver training, and support groups, to alleviate the emotional and physical burden placed on family caregivers, particularly women.
 4. **Integrate Dementia Care into Existing Health Frameworks:** Expand the NMHP to address dementia care by incorporating strategies for early detection, diagnosis, and treatment within mental health services.
 5. **Strengthen Rural Healthcare Systems:** Invest in rural healthcare infrastructure to ensure trained professionals are available and transportation barriers are minimized.
- Telehealth services can also bridge the gap by connecting rural patients with specialists.

A comprehensive approach that integrates policy, infrastructure, and community support is essential to improve dementia care in India. By addressing these challenges, the country can create a healthcare system that recognizes dementia as a critical issue and provides the necessary support for individuals and their families.

3.5 Caregiver Challenges

In India, family members serve as the primary caregivers for individuals with dementia, making caregiving largely informal and unpaid. This arrangement places significant emotional, financial, and physical burdens on caregivers, often with limited institutional support. Despite the essential role caregivers play, they struggle with multiple challenges, including emotional stress, financial strain, physical demands, and minimal access to support services.

3.5.1 Emotional Stress and Isolation

Caregiving for people with dementia can be emotionally exhausting. Caregivers often experience anxiety, frustration, and depression due to the constant need to manage behavioral changes, including aggression, confusion, and memory loss(38). Social stigma surrounding dementia further aggravates this emotional burden. Many families conceal the condition, fearing social exclusion, which isolates caregivers and limits their access to social support.

According to a qualitative study(39), also mentions that caregivers often feel ashamed or embarrassed, leading them to avoid seeking help from friends and community members. This isolation compounds their stress, leaving them with few outlets to share their struggles or seek emotional support.

3.5.2 Financial Strain

Caring for a person with dementia entails significant financial costs. Families face out-of-pocket expenses for medications, therapies, and assistive devices, which can strain already limited financial resources. Many caregivers also reduce their work hours or leave jobs to manage caregiving responsibilities, resulting in a loss of income (40).

The financial burden disproportionately affects women, who are more likely to take on caregiving roles. Women caregivers often sacrifice their careers and financial independence, leaving them vulnerable to long-term financial insecurity. This situation is exacerbated by the lack of comprehensive healthcare coverage for dementia-related services, further increasing the economic pressure on families.

3.5.3 Physical Strain

The physical demands of caregiving are considerable, particularly when it involves tasks such as lifting patients, managing daily hygiene, and assisting with feeding. Many caregivers experience health problems like back pain, fatigue, and sleep disturbances due to these demands(41).

Caregivers often prioritize the needs of the person with dementia over their own, leading to neglect of self-care routines, including exercise and healthy eating. A survey by the Alzheimer's and Related Disorders Society of India in 2020 reported that many caregivers lack the time or energy to maintain their well-being, increasing their risk of burnout and chronic health issues(42).

3.5.4 Limited Access to Support Services

Despite the challenges caregivers face, structured support services in India are scarce. Respite care, psychological support, and formal training programs for caregivers remain underdeveloped (43). Caregivers often manage the complexities of dementia care on their own, with minimal external assistance.

The stigma around mental health also discourages caregivers from seeking psychological support. Many caregivers and healthcare providers avoid accessing mental health services due to fears of judgment, further exacerbating their emotional stress(44).

To alleviate the burden on caregivers and improve the quality of dementia care, several interventions are necessary:

1. **Respite Care Services:** Establishing community-based respite care programs can offer caregivers temporary relief, allowing them to rest and recharge.
2. **Support Groups:** Creating caregiver support groups provides a safe space for caregivers to share experiences and coping strategies, reducing feelings of isolation.
3. **Education and Training:** Offering educational programs on dementia care can equip caregivers with skills to manage challenging behaviors and practice self-care.
4. **Policy Advocacy:** Integrating caregiver support into national health policies, such as the National Mental Health Programme, will ensure that caregivers receive the recognition and support they deserve.
5. **Public Awareness Campaigns:** Increasing awareness about dementia through public campaigns can reduce stigma, encouraging communities to offer support to affected families.

Caregivers play a critical role in dementia care in India, but they face immense emotional, financial, and physical challenges. Addressing these challenges through structured

interventions is essential, not only for the well-being of caregivers but also to enhance the care provided to individuals with dementia. Supporting caregivers will foster a more compassionate healthcare system, improving outcomes for both patients and their families.

4. Discussion

Dementia has emerged as a significant public health concern in India, characterized by a rapid increase in cases associated with the ageing population and exacerbated by socio-economic disparities and limitations within the healthcare system. As the prevalence of dementia is projected to rise, there is a need for immediate action and strategic intervention. India's socio-economic landscape significantly impacts the prevalence and management of dementia. Disparities in education, income, and access to healthcare contribute to increased vulnerability among certain populations. Research indicates that lower socioeconomic status is associated with a higher risk of developing dementia, particularly among those with limited access to education and healthcare resources(3). Individuals from lower-income backgrounds often have higher rates of modifiable risk factors such as hypertension and diabetes, which are linked to dementia(45). Moreover, the burden of dementia disproportionately affects women, especially in lower socio-economic groups, where traditional caregiving roles lead to increased physical and emotional stress(46). This disparity underscores the importance of addressing socio-economic factors when developing strategies for dementia prevention and care.

Identifying and addressing modifiable risk factors is crucial for reducing the incidence of dementia. Key risk factors, including hypertension, diabetes, obesity, and physical inactivity, present opportunities for preventive interventions. Community health initiatives aimed at promoting healthy lifestyles, regular physical activity, and chronic disease management can significantly impact dementia rates. Public health campaigns promoting dietary changes and increased physical activity could help mitigate the risks associated with dementia. Evidence from global studies suggests that lifestyle modifications can reduce the risk of cognitive decline by up to 30% (17). Therefore, integrating these preventive strategies into India's healthcare system is essential for addressing the dementia crisis effectively.

Despite the pressing need for action, India's healthcare infrastructure is ill-equipped to handle the growing demands of dementia care. The existing system primarily focuses on acute care rather than chronic conditions like dementia, resulting in a lack of specialized services for early diagnosis and management(47). Furthermore, the shortage of trained healthcare professionals in geriatric care poses significant challenges to effective dementia management in primary healthcare settings. Integrating cognitive screening tools into primary healthcare services can facilitate early detection and intervention. The implementation of validated screening instruments, that are appropriate for the Indian population can empower primary care providers to identify cognitive impairment early and refer patients for further evaluation and treatment (48).

Community-based care models have emerged as promising solutions to address the challenges of dementia care in India. One notable example is Kerala's palliative care initiative, which emphasizes home-based care and the involvement of healthcare workers and volunteers(49). This model leverages local resources and empowers families to provide care in a familiar environment, reducing the burden on healthcare facilities. Such initiatives highlight the importance of integrating community resources into dementia care, enabling caregivers to

receive training and support while ensuring that individuals with dementia can remain in their homes longer.

Addressing dementia effectively requires a comprehensive policy framework that incorporates dementia care into existing national health programs. While India's National Mental Health Programme (NMHP) acknowledges mental health issues, it does not specifically address the unique needs of individuals with dementia. Policy measures should include increased funding for dementia research and services, training for healthcare professionals, public awareness campaigns, integration of dementia care into primary health systems, and support for caregivers(50).

Limitations

This narrative review acknowledges several limitations. Firstly, the focus on dementia may overlook other related cognitive disorders prevalent in India, limiting the analysis's comprehensiveness. Additionally, many referenced studies concentrate on urban settings, failing to address unique challenges faced in rural areas regarding healthcare accessibility and cultural perceptions surrounding dementia.

The paper touches on stigma but may not fully explore how cultural beliefs shape perceptions of dementia, significantly influencing help-seeking behaviors (Rao et al., 2021). Furthermore, many studies are cross-sectional, restricting the ability to establish causal relationships or understand the progression of dementia over time. Longitudinal studies could provide more insights into how dementia develops and its effects on both individuals and caregivers (Kumar et al., 2020).

Conclusion

In conclusion, this narrative review highlights that dementia represents a critical public health issue in India, exacerbated by an ageing population, socio-economic disparities, and challenges within the healthcare system. As the prevalence of dementia is projected to rise significantly, coordinated efforts across healthcare, policy, and community sectors are urgently needed. Early diagnosis and management are essential, yet the current infrastructure is inadequately equipped to address these needs. By focusing on modifiable risk factors, enhancing community-based care models, and advocating for robust national policies, India can develop a comprehensive strategy to manage dementia effectively.

Author Contributions:

- **Jeevitha Ramesh:** Contributed to the conceptualization, literature review, and synthesis of findings. Led the writing of the manuscript and revised drafts for clarity and coherence. Coordinated the overall structure and finalization of the manuscript.
- **Anish Mehta:** Assisted with the review of clinical and medical literature, contributed to the analysis of key findings, and helped revise the manuscript for scientific accuracy and depth.
- **Krishnamurthy Jayanna:** Provided critical feedback on the manuscript's structure and content, particularly regarding the clinical implications and recommendations based on the reviewed studies. Assisted in refining the discussion and conclusion sections.

References

1. 2021 Alzheimer's disease facts and figures - 2021 - Alzheimer's & Dementia - Wiley Online Library [Internet]. [cited 2024 Oct 14]. Available from: <https://alz-journals.onlinelibrary.wiley.com/doi/10.1002/alz.12328>
2. Preventing dementia by preventing stroke: The Berlin Manifesto - PubMed [Internet]. [cited 2024 Oct 14]. Available from: <https://pubmed.ncbi.nlm.nih.gov/31327392/>
3. 5. Sreenivasa Kumar, P., & Sinha. (2020). Changing lifestyles and increasing prevalence of non-communicable diseases in India: A concern for dementia. *Indian Journal of Public Health*, 64(Supplement), S 94-99. https://doi.org/10.4103/ijph.IJPH_662_19. - Google Search [Internet]. [cited 2024 Oct 14]. Available from: [https://www.google.com/search?sca_esv=9c1db43462cf1df4&rlz=1C1UEAD_enIN974IN974&sxsrf=ADLYWIJWYC5Op3P8IusxhKwYaqMEHJS7Ww:1728902076962&q=5.+Sreenivasa+Kumar,+P.,+%26+Sinha.+\(2020\).+Changing+lifestyles+and+increasing+prevalence+of+non-communicable+diseases+in+India:+A+concern+for+dementia.+Indian+Journal+of+Public+Health,+64\(Supplement\),+S+94-99.+https://doi.org/10.4103/ijph.IJPH_662_19.&sa=X&ved=2ahUKEwj2hpiR1o2JAXe d2wGHdwSDP0QgwN6BAgLEAE&biw=1280&bih=551&dpr=1.5](https://www.google.com/search?sca_esv=9c1db43462cf1df4&rlz=1C1UEAD_enIN974IN974&sxsrf=ADLYWIJWYC5Op3P8IusxhKwYaqMEHJS7Ww:1728902076962&q=5.+Sreenivasa+Kumar,+P.,+%26+Sinha.+(2020).+Changing+lifestyles+and+increasing+prevalence+of+non-communicable+diseases+in+India:+A+concern+for+dementia.+Indian+Journal+of+Public+Health,+64(Supplement),+S+94-99.+https://doi.org/10.4103/ijph.IJPH_662_19.&sa=X&ved=2ahUKEwj2hpiR1o2JAXe d2wGHdwSDP0QgwN6BAgLEAE&biw=1280&bih=551&dpr=1.5)
4. 4. Nichols, E., et al. (2022). "Global, regional, and national prevalence of dementia and its burden." *The Lancet Neurology*, 21(1), 3-18. [https://doi.org/10.1016/S1474-4422\(21\)00201-6](https://doi.org/10.1016/S1474-4422(21)00201-6). - Google Search [Internet]. [cited 2024 Oct 14]. Available from: [https://www.google.com/search?q=4.+Nichols%2C+E.%2C+et+al.+\(2022\).+%22Global%2C+regional%2C+and+national+prevalence+of+dementia+and+its+burden.%22+The+Lancet+Neurology%2C+21\(1\)%2C+3-18.+https%3A%2F%2Fdoi.org%2F10.1016%2FS1474-4422\(21\)00201-6.&rlz=1C1UEAD_enIN974IN974&oq=4.%09Nichols%2C+E.%2C+et+al.+\(2022\).+%22Global%2C+regional%2C+and+national+prevalence+of+dementia+and+its+burden.%22+The+Lancet+Neurology%2C+21\(1\)%2C+3-18.+https%3A%2F%2Fdoi.org%2F10.1016%2FS1474-4422\(21\)00201-6.&gs_lcrp=EgZjaHJvbWUyBggAEEUYOdIBBzg3M2owajmoAgCwAgE&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=4.+Nichols%2C+E.%2C+et+al.+(2022).+%22Global%2C+regional%2C+and+national+prevalence+of+dementia+and+its+burden.%22+The+Lancet+Neurology%2C+21(1)%2C+3-18.+https%3A%2F%2Fdoi.org%2F10.1016%2FS1474-4422(21)00201-6.&rlz=1C1UEAD_enIN974IN974&oq=4.%09Nichols%2C+E.%2C+et+al.+(2022).+%22Global%2C+regional%2C+and+national+prevalence+of+dementia+and+its+burden.%22+The+Lancet+Neurology%2C+21(1)%2C+3-18.+https%3A%2F%2Fdoi.org%2F10.1016%2FS1474-4422(21)00201-6.&gs_lcrp=EgZjaHJvbWUyBggAEEUYOdIBBzg3M2owajmoAgCwAgE&sourceid=chrome&ie=UTF-8)
5. 3. Livingston, G., et al. (2020). Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. *The Lancet*, 396(10248), 413-446. [https://doi.org/10.1016/S0140-6736\(20\)30367-3](https://doi.org/10.1016/S0140-6736(20)30367-3). - Google Search [Internet]. [cited 2024 Oct 14]. Available from: [https://www.google.com/search?sca_esv=9c1db43462cf1df4&rlz=1C1UEAD_enIN974IN974&sxsrf=ADLYWIJSQmRH_NrrN3H9Xa7TYczAN9u9JQ:1728902016979&q=3.+Livingston,+G.,+et+al.+\(2020\).+Dementia+prevention,+intervention,+and+care:+2020+report+of+the+Lancet+Commission.+The+Lancet,+396\(10248\),+413-446.+https://doi.org/10.1016/S0140-6736\(20\)30367-3.&sa=X&ved=2ahUKEwiYhsv01Y2JAXUAcGwGHTdlH28QgwN6BAgSEAE&biw=1280&bih=551&dpr=1.5](https://www.google.com/search?sca_esv=9c1db43462cf1df4&rlz=1C1UEAD_enIN974IN974&sxsrf=ADLYWIJSQmRH_NrrN3H9Xa7TYczAN9u9JQ:1728902016979&q=3.+Livingston,+G.,+et+al.+(2020).+Dementia+prevention,+intervention,+and+care:+2020+report+of+the+Lancet+Commission.+The+Lancet,+396(10248),+413-446.+https://doi.org/10.1016/S0140-6736(20)30367-3.&sa=X&ved=2ahUKEwiYhsv01Y2JAXUAcGwGHTdlH28QgwN6BAgSEAE&biw=1280&bih=551&dpr=1.5)

6. Clinical Practice Guidelines for Management of Dementia - PubMed [Internet]. [cited 2024 Oct 14]. Available from: <https://pubmed.ncbi.nlm.nih.gov/29535467/>
7. Ravindranath V, Sundarakumar JS. Changing demography and the challenge of dementia in India. *Nat Rev Neurol*. 2021 Dec;17(12):747–58.
8. Family caregivers of people with dementia - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3181916/>
9. Thomas T, Dasgupta J. A narrative review of community-based dementia care in India: experiences, challenges, and policy initiatives. *Curr Opin Psychiatry*. 2024 Sep 1;37(5):370–5.
10. World Alzheimer Report 2015, The Global Impact of Dementia: An analysis of prevalence, incidence, cost and trends.
11. Home | Government of India [Internet]. [cited 2024 Oct 14]. Available from: <https://censusindia.gov.in/census.website/>
12. National Mental Health Survey of India 2015–2016 - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5419008/>
13. Genetic meta-analysis of diagnosed Alzheimer’s disease identifies new risk loci and implicates A β , tau, immunity and lipid processing | Nature Genetics [Internet]. [cited 2024 Oct 14]. Available from: <https://www.nature.com/articles/s41588-019-0358-2>
14. Role of genes and environments for explaining Alzheimer disease - PubMed [Internet]. [cited 2024 Oct 14]. Available from: <https://pubmed.ncbi.nlm.nih.gov/16461860/>
15. Stern Y. Cognitive reserve in ageing and Alzheimer’s disease. *Lancet Neurol*. 2012 Nov;11(11):1006–12.
16. Shaji KS, Sivakumar PT, Rao GP, Paul N. Clinical Practice Guidelines for Management of Dementia. *Indian J Psychiatry*. 2018 Feb;60(Suppl 3):S312–28.
17. Norton S, Matthews FE, Barnes DE, Yaffe K, Brayne C. Potential for primary prevention of Alzheimer’s disease: an analysis of population-based data. *Lancet Neurol*. 2014 Aug;13(8):788–94.
18. Diet and Dementia: A Prospective Study - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8705494/>
19. Denisenko D, Ekong G, Spotts H. Dementia risk in patients with heart disease and depression. *Dement Neuropsychol*. 17:e20230024.
20. Moderate alcohol consumption as risk factor for adverse brain outcomes and cognitive decline: longitudinal cohort study | The BMJ [Internet]. [cited 2024 Oct 14]. Available from: <https://www.bmj.com/content/357/bmj.j2353>
21. Power MC, Lamichhane AP, Liao D, Xu X, Jack CR, Gottesman RF, et al. The Association of Long-Term Exposure to Particulate Matter Air Pollution with Brain MRI Findings: The ARIC Study. *Environ Health Perspect*. 2018 Feb 16;126(2):027009.
22. Siette J, Meka A, Antoniadou J. Breaking the barriers: overcoming dementia-related stigma in minority communities. *Front Psychiatry*. 2023 Dec 20;14:1278944.
23. Anxiety and Stigma in Dementia: A Threat to Aging in Place - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4032087/>
24. Auerbach S, Lopez R, Gruss V, Lorenz R. DEMENTIA BIASES AMONG INTERNATIONAL HEALTHCARE PROVIDERS: A LITERATURE REVIEW. *Innov Aging*. 2018 Nov 11;2(Suppl 1):137.

25. Diagnosis and Management of Dementia: A Review - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7462122/>
26. Creating Cultural and Lifestyle Awareness About Dementia and Co-morbidities - IOS Press [Internet]. [cited 2024 Oct 14]. Available from: <https://content.iospress.com/articles/journal-of-alzheimers-disease-reports/adr240043>
27. Missed and Delayed Diagnosis of Dementia in Primary Care: Prevalence and Contributing Factors - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2787842/>
28. Calil V, Elliott E, Borelli WV, Barbosa BJA, Bram J, Silva F de O, et al. Challenges in the diagnosis of dementia: insights from the United Kingdom-Brazil Dementia Workshop. *Dement Neuropsychol.* 2020;14(3):201–8.
29. Changing demography and the challenge of dementia in India - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8522537/>
30. Mattke S, Batie D, Chodosh J, Felten K, Flaherty E, Fowler NR, et al. Expanding the use of brief cognitive assessments to detect suspected early-stage cognitive impairment in primary care. *Alzheimers Dement.* 2023;19(9):4252–9.
31. Coombs NC, Campbell DG, Caringi J. A qualitative study of rural healthcare providers' views of social, cultural, and programmatic barriers to healthcare access. *BMC Health Serv Res.* 2022 Apr 2;22:438.
32. Sathianathan R, Kantipudi SJ. The dementia epidemic: Impact, prevention, and challenges for India. *Indian J Psychiatry.* 2018;60(2):165–7.
33. Assessment of Dementia Under Prevailing Indian Laws and Its Implications - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8543616/>
34. Experiences of people with dementia and their caregivers during the COVID-19 pandemic in India: A mixed-methods study - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8685595/>
35. Issues in Dementia Caregiving: Effects on Mental and Physical Health, Intervention Strategies, and Research Needs - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3774150/>
36. Facilitators and Barriers to Dementia Assessment and Diagnosis: Perspectives From Dementia Experts Within a Global Health Context - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8997042/>
37. Rural Indian| National Portal of India [Internet]. [cited 2024 Oct 14]. Available from: <https://www.india.gov.in/content/rural-indian>
38. Depression among caregivers of patients with dementia: Associative factors and management approaches - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8783169/>
39. Stjernswärd S, Hansson L. A Qualitative Study of Caregivers' Experiences, Motivation and Challenges Using a Web-Based Mindfulness Intervention. *Community Ment Health J.* 2020;56(3):416–25.
40. Schulz R, Eden J, Adults C on FC for O, Services B on HC, Division H and M, National Academies of Sciences E. Economic Impact of Family Caregiving. In: *Families Caring for*

- an Aging America [Internet]. National Academies Press (US); 2016 [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK396402/>
41. Family Caregiving Roles and Impacts - Families Caring for an Aging America - NCBI Bookshelf [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK396398/>
 42. Alzheimer's & Related Disorders Society of India (ARDSI) | Alzheimer's Disease International (ADI) [Internet]. [cited 2024 Oct 14]. Available from: <https://www.alzint.org/member/alzheimers-related-disorders-society-of-india-ardsi/>
 43. Caregiver Respite: An Essential Component of Home & Community-Based Long-Term Care - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9052870/>
 44. Prioritizing the Mental Health and Well-Being of Healthcare Workers: An Urgent Global Public Health Priority - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8137852/>
 45. Deckers K, Cadar D, van Boxtel MPJ, Verhey FRJ, Steptoe A, Köhler S. Modifiable Risk Factors Explain Socioeconomic Inequalities in Dementia Risk: Evidence from a Population-Based Prospective Cohort Study. *J Alzheimers Dis.* 71(2):549–57.
 46. Changing demography and the challenge of dementia in India - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8522537/>
 47. The Transformation of The Indian Healthcare System - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10292032/>
 48. Cognitive Screening Tools for Adults in Indian Setting: A Commentary - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10645264/>
 49. Is the Kerala Model of Community-Based Palliative Care Operations Sustainable? Evidence from the Field - PMC [Internet]. [cited 2024 Oct 14]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8121230/>
 50. van Corven CTM, Bielderma A, Diaz Ponce A, Gove D, Georges J, Graff MJL, et al. Empowering interventions for people living with dementia: A European survey. *J Adv Nurs.* 2022 Dec;78(12):4104–12.