

Current Prospective in Behavioural Health Sciences: Psychological and Neurological Interventions in Healthy Ageing

Dr. Pramod Kumar^{1*}, Prof. Nisha Mani Pandey², Prof. Ramji Lal³

ABSTRACT

Psychological science is now defined as the scientific study of behaviour in relation with biological Determinants. The neurology faces the multiple challenges with increasing ageing. The healthy aging pattern increases as the older population in the current scenario. As the ages advances differently neurobehavioural changes appear with decreasing cognitive functions. Now the role of behavioural Psychologist, cater to the older population. The psychological tools are very effective in maintaining the conditions and the need to adapt to rapid advances in technology and neurological treatment. The challenges and opportunities are very much dependent on the research in elders, that is more important in presenting opportunities for innovation in diagnosis, treatment, and preventative care. Opportunities would be developed in the area of early diagnosis and prevention and provide treatment accordingly. Advances in neuroimaging, biomarkers, and genetic testing offer opportunities for elders are more important in earlier diagnosis. Subjective symptom detection of neurological diseases are very important in timely interventions. Development of Novel Therapies, neuroscientific studies and research into stem cell therapy, gene therapy, and other innovative opportunities offers hope in elders for futuristic, treatments for neurological disorders. Artificial Intelligence, can assist with the pattern of subjective symptoms diagnosis, treatment planning, and elders health monitoring, the way neurological care is delivered as early as possible.

Keywords: *Neurobehavioural, neuroscience, elders health care, neurological assessment, healthy aging*

Psychological and neurological biological determinants are now intervened and defined as the scientific study of brain and behaviour. The neurological aspects of deformities face the multiple challenges with increasing ageing. The follow ups of healthy aging patterns of life in the older population are very much common in the current scenario. As the ages advance different biological changes appear along with decreasing cognitive and neurological functions.

¹Ph.D., PGD Guidance Psychologist. Formal research officer of IITR, Lucknow (a CSIR lab)

²Geriatric department, K.G.M.C., Lucknow.

³Ex. Head Psychology Department, Purvanchal University, Jaunpur.

*Corresponding Author

Received: March 11, 2026; Revision Received: June 07, 2026; Accepted: June 11, 2026

Current Prospective in Behavioural Health Sciences: Psychological and Neurological Interventions in Healthy Ageing

Neurobehavioural changes are an important aspect of deformities, as functional disorders are early indicators and if these are monitored in time, it doesn't develop permanent damage. Adapting new technologies and neurological intervention make opportunities evolve to maintain healthy aging. In healthy aging subjective symptoms and neurological opportunities as a diagnostic tool, that may be effective in maintaining healthy aging in the elders community. (1)

International collaboration and knowledge in the area of Geriatric care researches sharing globally may accelerate challenges in neurological research and improve elders health care worldwide. Promoting brain health and other biological determinants as cognitive functions based on the central nervous system are the best indicators. (2)

The new challenges in elders lifestyle interventions and public health initiatives can help to prevent or delay the onset of neurological disorders.

Healthy aging opportunity in elders!

Opportunities exist in studying elder behavior to enhance quality of life, social connection with combat loneliness.

The technology adoption for cognitive engagement and healthy aging behaviors including, diet, exercise and meditation are mandatory. There is also a need for research into how technology can monitor early behavioral changes, especially how to develop neurological impairments and application of applied research. (3)

The objective would be to improve mental well-being through neurobehavioural studies and positive psychology methods. The concept of healthy aging in respect to neurological aspects has a different range of changes in the brain and nervous system. Some neurological deviations are common and occur naturally with age, as well as along with health dimensions.

The health challenges in elders may be multidimensional including medicare, caring and nutritional status. (4)

These challenges can be more effective when a joint team of professionals is working on the same problem, along with cognitive function, motor skills, sensory perception, and sleep patterns. The main core factors to understand the situation like COVID studies. (5) The neurobehavioural changes are the predictive aspect and very helpful in promoting healthy aging and managing age-related neurological conditions in the early stage. Neurobehavioural assessment tools act in a better way to understand the current affairs of healthy aging, as "prevention is always better than cure".

Preventing tools for healthy aging:

The behavioural health sciences are the main preventing tools for any degenerative changes in the brain and body are indicative of maintaining better health in the elders community. The cognitive decline and neurological deformities are the indicators of geriatric elements. The alternative medicine and Indian traditional therapies are mostly common to treat the matter related to healthy ageing. (6)

Current Prospective in Behavioural Health Sciences: Psychological and Neurological Interventions in Healthy Ageing

Ayurveda and naturopathy are the best alternative ways to understand age related deformities. Yoga and breathing exercises, along with meditation are the best alternative ways to engage with a positive attitude and remedies in preventing cognitive functions. Nervous systems are the best indicators of early detection of long-term ageing deformities. The objective would be to understand all biological determents and its structure and functions in relation to the nervous system. (7)

NERVOUS SYSTEM:

Structural:

- Brain: The brain naturally loses nerve cells as well as weight also with age. Nerve conduction may transmit messages more slowly and Reflexes show weak response.
- Spinal cord: A spinal cord is a long, tube-like bundle of nerve tissue that extends from the brainstem down the spine, forming the central pathway for messages between the brain and the body.
- Nerves: Nerve cells in both the motor and sensory peripheral nerves may be lost, leading to decreased nerve conduction velocities, and reduced action potential amplitudes.

Deep inside your brain lies a tiny yet powerful nucleus that acts like a traffic controller, regulating whether you feel focused or fatigued. This small cluster of neurons plays a critical role in balancing alertness, attention, and energy levels, helping your brain switch between states of productivity and rest. (8)

Functional:

Sleep: Older adults often experience reduced sleep time, sleep efficiency, and changes in sleep cycles, including in frequent awakenings.

Consistent napping habits contribute to long-term cognitive resilience, potentially delaying age-related memory decline and supporting mental clarity. Older adults, students, and busy professionals alike can benefit from integrating short naps into daily routines. These brain functions depend on white matter concentration and action.(9)

Cognitive Function: (MIND) Age-related changes can affect cognitive domains like attention, executive function, memory, and processing speed.

Motor Function: Age-related changes can affect muscle movement, leading to weakness, stiffness, tremors, and difficulties with coordination and falls.

Mental health: Mental health issues are mostly related to brain structure and functional deformities. The outcome of the brain is assumed as our mind. The neuro- psychological activities are based on both mind and behaviour but mostly elders complain as a headache.(10)

Sensory Function:

Sensory changes can include vision loss, hearing loss, and changes in taste and intensity of smell. Recent research has revealed that losing your sense of smell may be one of the earliest indicators of Alzheimer's disease. While memory loss and confusion are commonly associated with the condition, subtle changes in smell can appear years before more obvious symptoms emerge.

Loneliness

Long-term social isolation isn't just emotionally painful but it physically changes your brain. Neuroscientists have found that people who lack meaningful social contact show reduced cognitive abilities like memory, learning, and decision-making. Over time, this isolation raises the risk of dementia and other forms of cognitive decline.

Brain imaging studies reveal that loneliness can shrink gray and white matter in regions critical for thought and emotion. Isolation doesn't only alter brain structure, it affects brain chemistry too. It activates the stress response system, increasing inflammation and fueling anxiety and depression.(11)

Biological Determents:

The central nervous system are an important part of our behaviour system. Early diagnosis and treatment of neurological conditions are crucial for managing the progression of the disease and improving outcomes of our sense organs.

Neurobehavioural studies of older people have shown a high prevalence of certain neurological signs, including diminished ankle jerks, up-going plantar responses, and reduced distal vibration sense. (a details protocol is used by the Neurologist)

Stem cells have the unique ability to develop into different types of cells, allowing them to replace damaged neurons and support brain recovery.

In early clinical studies, patients showed significant improvements in movement, speech, and cognitive abilities after receiving the therapy.

As we grow older, immune cells gradually lose efficiency, making the body more vulnerable to infections, chronic inflammation, and diseases such as cancer. Researchers discovered that changes in this enzyme activity directly affect the energy supply and functionality of immune cells. When the enzyme is less active, immune cells become weaker and less responsive, accelerating immune aging.

The findings suggest that stem cells could not only repair the physical damage caused by strokes but also improve overall brain function and quality of life.

METHODOLOGY

Clinical neuropsychologists assess, diagnose and treat patients with conditions impacting their brain. Psychologists can help elders whether to pursue the matter of neurological and behavioural deformities.

Neuropsychologists are the professionals who specialise in helping elders with issues due to brain conditions, such as traumatic brain injuries, dementia, strokes and multiple degenerative changes.

The psychologists are responsible to conduct different psychological tests along with Neurobehavioural Test Battery along with evaluation of subjective symptoms and also provide support for lifestyle adjustment. A clinical neurologist or medical professional who can help patients with neurological issues caused by brain conditions. They help the patients

Current Prospective in Behavioural Health Sciences: Psychological and Neurological Interventions in Healthy Ageing

and their families to understand and manage the issues related to degenerative brain functions. (12)

The palliative care unit is also monitored by the team of medical specialists in helping elders with different ways to understand and manage their conditions. They may also help family members to understand more about conditions related to all round medical status and management.

The evaluation of NCTB. (WHO)

The National Core Test Battery,

Most commonly refers to the World Health Organization (WHO) Neurobehavioral Core Test Battery (NCTB), a set of tests designed to assess neurotoxic effects in the human nervous system. Evaluating a person's cognitive and behavioral functions, such as reaction time, memory, and attention are the objective of the study.

The subjective questions are also included to ask the patients and attendants to learn more about their challenges and the way their brains work. Neurobehavioural test battery is also useful to assess the different grades of cognitive deterioration due to early changes in the nervous system.

Once neuropsychologists diagnose a neuro and psychological issues, and create clear treatment plans to help patients overcome their challenges or reduce their impact. (13)

Counselling of the patients and their families, can be challenging for health care providers along with clinical help to the patients and their families.

Table -1 (Psychological Test battery)*

Tests	Measured functions
Symbol digit.	Speed, /attention
Finger tapping.	Speed / coordination
Digit span.	Memory and attention Vigilance Test. Attention/ coordination
Benten visual.	Visual memory
Digit span	auditory memory
Reaction time.	Selective attention
Santa Ana pegboard.	Dexterity/ Hand-eye coordination

*NCTB.(National Core Test Battery)

Type of brain related deformities:

- Neurodegenerative Diseases: Alzheimer's, Parkinson's disease, stroke and other related disorders are more prevalent in older adults.
- Stroke: Stroke is a significant neurological condition that can impact cognitive and motor functions.
- Epilepsy: Epilepsy is also more common in older adults and can affect their quality of life.
- Neuropathy: Nerve damage can cause numbness, tingling, pain, and weakness.
- Balance and Gait Disorders: Age-related changes and neurological conditions can affect balance and gait, increasing the risk of falls.

Current Prospective in Behavioural Health Sciences: Psychological and Neurological Interventions in Healthy Ageing

Managing Neurological Aspects of Aging:

- Lifestyle Factors: Maintaining a healthy lifestyle, including regular physical activity, a balanced diet, and social engagement, can help promote brain health and overall well-being.
- Cognitive Stimulation: Engaging in mentally stimulating activities like reading, puzzles, and social interaction can help maintain cognitive function.
- Regular medical Checkups: Regular neurological checkups and screenings can help detect and manage neurological conditions early.
- Special care: Specialized neurological care, including physical and occupational therapy, can help manage symptoms and improve quality of life.
- Fall Prevention: Strategies to prevent falls, such as improving balance and gait, modifying the home environment, and using assistive devices, are crucial for older adults.

RESULT AND DISCUSSION

Cognitive functions are mental domains that enable us to receive, process, and elaborate information. These functions include complex attention, executive function, language, learning and memory, perceptual-motor function, and social cognition. There is continuous coordination and switching between memory, attention, and executive function sub-processes. Cognitive dysfunction can be defined as a disruption or lack of equilibrium within the brain's structural and functional pattern.

The molecular/cellular level, the level of local circuits, and the level of large-scale networks that involve neural interactions and protein vs protein interaction networks. Maintaining optimal cognitive function is essential for daily functioning, learning, work performance, and overall quality of life. As people live longer, cognitive impairment is becoming more prevalent, posing a significant public health challenge.

The healthy aging studies reveal that the prevalence of cognitive impairment is estimated to be; as suffering from Alzheimer's. (14)

For example, the rate of new diagnoses, between the 65-75 and 76-85 age groups, and triples again for those 85 and older.

- 19% for those up to 75 years old.
- 30% for those over 76- 85 years.

Study suggests that with the rise in the number of older adults, these numbers are expected to increase.

There are a lot of studies evident that oxidative damage contributes to age-related cognitive decline among the leading causes the increase in oxidative stress in the aging brain is widely documented in humans.

Slower psychomotor speed may serve as a biomarker of risk of clinical disorders of cognition, mobility and mood. While in part attributes to neurological disease. Further studying the causes of psychomotor action slowing with ageing might provide novel insights into healthy aging and neurological disorders. (15)

Current Prospective in Behavioural Health Sciences: Psychological and Neurological Interventions in Healthy Ageing

Research study reveals that Digit Symbol Substitution test and future clinical and subclinical disorders of cognition may be significantly affected in two groups of elders studied (16)

Mini-Mental State Examination (MMSE) an extensive neuro- psychological evaluation by an geriatric expert and Neurologist found a positive direction towards the final diagnosis of dementia.

The knowledge and research findings of neurobehavioural assessments are in a group of older person reveals, that physical signs are more likely to be indicators of the coming symptoms of age related brain degeneration disorders.(16)

Japanese scientists have developed a revolutionary smart brain patch capable of healing damaged neurons without surgery or the use of drugs. This innovative device uses advanced bio electronic technology to stimulate neural repair, offering hope for patients with neurodegenerative conditions or brain injuries.

This breakthrough highlights the growing intersection of technology and medicine, showing how bioengineering can offer new solutions to complex neurological problems. While still in experimental stages, the smart brain patch represents a significant step toward non-invasive therapies that could transform brain health care in the near future.

There is good evidence that older people with more than three abnormal neurological signs have indicated towards neuro degenerative changes. These more than three changes, in the brain may be the indicative of mortality over the next 10 years.

Recommendations

Neuropsychological Practices:

There are many community resources available to assist caregivers and provide services for common neurological disorders in elderly. Local support groups and day care programs, gaeareiatric care services, and educational workshops can offer valuable support and information.

Online platforms, such as forums and websites dedicated to specific neurological disorders, can also provide a wealth of knowledge and a sense of community for caregivers and individuals.

Neuropsychological disorders in older adults can have a significant impact on their daily lives. Understanding the common neurological disorders in elderly, their causes, and available treatment approaches are crucial for effectively managing these conditions.

The concept of gaeareiatric department of medical support system, where life moves at a fast pace, it's reassuring to know that individuals facing cognitive and neurological disorders have access to the expertise of the best neurologist doctors and the support of a caring community. (17)

Indian traditional therapies:

Ayurveda, an ancient system of medicine that is indigenous to India, is believed to be the world's oldest health-care system. AYUSH is now the most recognized and widely combined discipline that is practiced as an alternative medication in the world.

Current Prospective in Behavioural Health Sciences: Psychological and Neurological Interventions in Healthy Ageing

Medicinal herbs have been in use for treating diseases since ancient times in India. Ayurvedic therapies with medicinal herbs and mineral products generally provide relief without much adverse effects even after prolonged administration.

Neurodegenerative disorders are a major cause of mortality and disability in elders and increasing life spans represent one of the key challenges of medical research. Ayurvedic medicine describes most neurodegenerative diseases and has defined a number of plants with therapeutic benefits for the treatment of neurological diseases having antioxidant activities.

Ayurvedic medicinal plants, viz., ashwagandha, brahmi, Hoti kola (*Centella asiatica*) and *Mucuna pruriens* (velvet bean), on neurodegenerative diseases are studied and found very effective.

The research on ashwagandha reveals that it is very effective in maintaining memory, anxiety and using for better sleep as antioxidants work on cognitive functions.

Brahmi may be useful in managing age-related memory loss due to the presence of antioxidants. It may reduce the damage caused because of free radicals and enhance learning and retaining potential in older people.

Brahmi may also be useful in reducing the accumulation of a protein responsible for Alzheimer's disease.

CONCLUSION

A healthy aging and healthy lifestyle involves developing and maintaining functional ability, happiness, and well-being. These lifestyle factors and positive attitude underlying biological processes. The biological determinants include the accumulation of molecular and cellular damage over time, while lifestyle factors like diet, physical activity, and avoiding drug addiction and heavy drinking significantly influence these biological changes. Other determinants include cognitive function, social support, and emotional vitality including family members support are significant factors in increasing the healthy aging. The cognitive functions assessment are the main indicators are early indicators of brain degeneration mental disorders.

REFERENCES

- (1) Robinson, M. (2015) Encyclopedia of Quality of Life and Well-being Research. Ref. Rev. 29, 22.
- (2) Birle, C.; Slavoaca, D.; Balea, M.; Livint Popa, L.; Muresanu, I.; Stefanescu, E.; Vacaras, V.; Dina, C.; Strilciuc, S.; Popescu, B.O.; et al. (2021) Cognitive function: Hierarchy or holacracy? *Neurol. Sci*, 42, 89–99.
- (3) Williams, A.M.; Ford, P.R.; Eccles, D.W.; Ward, P. (2011) Perceptual-cognitive expertise in sport and its acquisition: Implications for applied cognitive psychology. *Appl. Cogn. Psychol*, 25, 432–442.
- (4) Pais, R.; Ruano, L.; Carvalho, O.P.; Barros, H. (2020) Global cognitive impairment prevalence and incidence in community dwelling older adults A systematic review. *Geriatrics*, 5, 84.
- (5) Guo, P.; Benito Ballesteros, A.; Yeung, S.P.; Liu, R.; Saha, A.; Curtis, L.; Cheke, L.G. COVCOG (2022): Factors Predicting Physical, Neurological and Cognitive Symptoms in Long COVID in a Community Sample. A First Publication from the COVID and Cognition Study. *Front. Aging Neurosci*. 14, 804-922.

Current Prospective in Behavioural Health Sciences: Psychological and Neurological Interventions in Healthy Ageing

- (6) Inzitari M, Pozzi C, Ferrucci L, et al. (2008) Subtle neurological abnormalities as risk factors for cognitive and functional decline, cerebrovascular events, and mortality in older community-dwelling adults. *Arch Intern Med.*168:1270–6.
- (7) Ferrucci L, Bandinelli S, Cavazzini C, et al. (2004) Neurological examination findings predict limitations in mobility and fall in older persons without a history of neurological disease. *Am J Med.* ;116, 807–15.
- (8) Kandlur, A.; Satyamoorthy, K.; Gangadharan, G. Oxidative Stress in Cognitive and Epigenetic Aging: A Retrospective Glance. *Front. Mol. Neurosci.* 2020, 13, 41.
- (9) Kuo, HK Lipsitz, LA, (2004) Cerebral white matter changes and geriatric syndromes: is there a link? *J Gerontol A Biol Sci Med Sci*, 59 (8) 818- 826
- (10) Walker RA, Wadman MC. (2007) Headache in the elderly. *Clin Geriatr Med.* 23:291–305.
- (11) Read UM, Jilka S, Singh SP (2023) Collaborating with traditional and faith healers in mental health: a public health approach. *World Social Psychiatry* 5:144–148.
- (12) Kardan, O., Stier, A. J., Layden, E. A., Choe, K. W., Lyu, M., Zhang, X., Beilock, S. L., Rosenberg, M. D., & Berman, M. G. (2023). Improvements in task performance after practice are associated with scale-free dynamics of brain activity. *Network Neuroscience*, 7(3), 1129–1152.
- (13) Inzitari M, Pozzi C, Ferrucci L, et al. (2008), Subtle Neurological Abnormalities as Risk Factors for Cognitive and Functional Decline, Cerebrovascular Events, and Mortality in Older Community-Dwelling Adults. *Arch Intern Med.* 168(12) 1270 – 1276.
- (14) Inzitari M, Pérez LM, Enfedaque MB, Soto L, Díaz F, Gual N, Martín E, Orfila F, Mulero P, Ruiz R, Cesari M. (2018) Integrated primary and geriatric care for frail older adults in the community: Implementation of a complex intervention into real life. *Eur J Intern Med.* 56:57-63.
- (15) Folstein, MF Robins, LN Helzer, JE (1983) The Mini-Mental State Examination. *Arch Gen Psychiatry*;40 (7) 812.
- (16) Guerrero-Berroa E, Luo X, Schmeidler J, et al. (2009). "The MMSE orientation for time domain is a strong predictor of subsequent cognitive decline in the elderly". *Int J Geriatr. Psychiatry.* 24 (12): 1429–37.
- (17) Caterina Rosano, Subashan Perera, Marco Inzitari, Anne B. Newman, William T. Longstreth, Stephanie Studenski, (2016) Digits Symbol Substitution test and future clinical and subclinical disorders of cognition, mobility and mood in older adults, *Age and Ageing*, 45 (5) 688–695

Acknowledgment

The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest

The author(s) declared no conflict of interest.

How to cite this article: Kumar, P., Pandey, N.M. & Lal, R. (2026). Current Prospective in Behavioural Health Sciences: Psychological and Neurological Interventions in Healthy Ageing. *International Journal of Indian Psychology*, 14(2), 2079-2087. DIP:18.01.190.20261402, DOI:10.25215/1402.190