

## Review Article

# Health Care Challenges of Indian Older Adults with Special Reference to Mental Health: An Overview

**Tiwari SC\* and Pandey NM**

Department of Geriatric Mental Health, King George's Medical University, India

**\*Corresponding author:** Tiwari SC, Department of Geriatric Mental Health, King George's Medical University, UP, Lucknow, India**Received:** April 21, 2016; **Accepted:** June 07, 2016;**Published:** June 09, 2016**Abstract**

The growth rate of Indian older adults (aged 60 years and above) is comparatively faster than other parts of the World. In 1991, the population of this segment of society was 56.7 million, which doubled in 2011 i.e. 103 million and is expected to triple in the next four decades i.e., 316 million. Increased life expectancy, reduced mortality rate and longevity are definite achievements for any country but simultaneously, they become a challenge if proper health care, support and management cannot be ascertained. With advancement in age, a person faces decline in anatomical, biological and functional strength which makes them more vulnerable to the development of disease and disabilities. Moreover, changing familial and social matrices threaten their overall health, especially, psychological and mental health status. Studies report that a large segment of this population suffer from health related problems. Care of older adults has enormous challenges, including individual, familial and social trials which need to be worked out immediately. The article provides an evidence based summary regarding health care challenges and practical strategies to manage the same.

**Keywords:** Older adults; Health care; Physical and mental health; Disabilities; Challenges; Opportunities

**Background**

India, one of the largest democracies of the world with 28 States and 6 Union Territories, is the second largest populous country after China and is facing a transitional phase. The changing demographic scenario and population projections indicate that the growth rate of Indian older adults is comparatively faster than in the other regions of the World. It also indicates that the rate of mortality in India is on a decline. Currently, the population of older adults (aged 60 years and above) in the country is growing at a fast pace. Projections reveal that by 2050 this segment of population will be similar in proportion to the world older adult population. According to 2011 census older adults share 8.6% [1] of the total population. Within two decades, the population of older adults has doubled in the country i.e. from 56.7 million in 1991 to 103 million in 2011 [1] and is expected to triple in the next four decades i.e., 316 million [2].

Life expectancy at birth has risen from 49.7 (male=50.5, female=49.0) years in 1970-75 to over 63.5 (male=62.6, female=64.2) in 2002-2006 [3,4] and 67.1 in year 2012 [5], and it has expanded the absolute number and proportion of older. These changes affected the dependency ratio and it is indicated that Old Dependency Ratio (ODR) is on an increase, i.e. from 122 in 1991 to 142 in 2011 [1]. Population ageing cannot be perceived just as an achievement but also as one of the greatest challenges for the country. Adding years to life does not always as certain wellness, prosperity and quality of life. Isolation, exclusion and marginalization are also experienced by this segment of the population. Some of these usual factors, not only undermine the status of older persons in the society, but also threaten their overall health, especially mental health and quality of life. This aspect puts an excessive burden on social, economic and health care

demands in the society, especially in developing countries like India. Thus, planning, developing and promoting health care services and assuring wellness and quality of life for older adults are the prime concerns. But, before making plans, one needs to chalk out an overview on the subject so that they may be made and implemented in a righteous manner. Let us have an outline regarding psycho-social and health related issues of Indian older adults in the country.

**Psycho-Social Changes and Status of Indian Older Adults**

After independence, many changes have been observed in the Indian psycho-social milieu. Urbanization, industrialization, and many more modern establishments have come into existence. Even the villages and remote areas of the country have got influenced. Bonding at different levels of familial and social milieu have gradually been transformed, which have eroded the traditional Indian values to some extent and the country which was initially praised for its cultural values and institutions like marriage, peer group, reference group etc. became feeble. Economic values have become stronger, and it has given birth to individualism, autonomy and the desire to live independently in the younger generation. This has directly affected the living arrangements of the older adults. These psychosocial and cultural changes in India have also given rise to many other issues.

For better positions and opportunities as well as monetary benefits, the younger generation is moving away and the older adults are left behind at their ancestral places with little or no personal, personnel, emotional, economic, social support and care [6]. Indian studies have reported that individuals in nuclear families are more susceptible for developing psychological problems than those in joint families [7-9]. Moreover, in the present day society, it is evident that

**Table 1:** Prevalence of morbidities in elderly population according to their system affected.

System Disease	%	System Disease	%
Cardiovascular diseases	67.4	Gastrointestinal diseases	18.9
Musculoskeletal diseases	64.3	Genitourinary disease	13.1
Hematological diseases	57.6	Nervous system disease	9.5
Psychological diseases	38.4	Ear, Nose and Throat disease	3.7
Ophthalmological diseases	35.7	Dermatological disease	2.6
Respiratory diseases	29.1		

interpersonal relationships are developed on the basis of economic value of an individual which often affect the mental health of older adults in a negative manner. Dutifulness, care and respect for older adults are at times seen as an outdated tradition. And sometimes they suffer with the feeling of loneliness. Loneliness has been found to be a major threat for old age and may be considered as a disease [10]. The article further quotes loneliness to be more dangerous than smoking. It adversely affects the immune and cardiovascular systems [11-13].

Unfortunately, nowadays, feeling of loneliness is being generally experienced by Indian older adults. Traditionally, families have been the primary source of support for them. They have been living with their children/grandchildren in joint set ups and were positioned as the key persons in the family. The conventional Indian joint families were instrumental in safeguarding the socio-economic status of older adults. Rapid changes in the social scenario have given birth to nuclear families and thus, older adults are likely to be exposed to emotional, physical and financial insecurities. It ultimately affects their overall health and quality of life. In the name of modernization, conventional living patterns have moved out to such an extent that the Government of India has taken an initiative by introducing an act in 2007 i.e. *'The Maintenance and Welfare of Parents and Senior Citizen Act, 2007'*.

## Health Status in Indian Older Adults

Older adults often confront a variety of health related problems. Physiological, biological, anatomical, and other sensory changes apart from their respective social statuses make the elderly more susceptible to developing multiple problems. The decline associated with anatomical, biological and functional strength exposes them to disease and disabilities. Generally, they deal with multiple and chronic diseases. Problems related to major organ systems like- cardiovascular (heart and arteries), respiratory (lungs and musculoskeletal), gastrointestinal, genitourinary, endocrinological, nervous, musculoskeletal, immunological, special senses (eye, ear, nose, throat) adversely affect the health of older adults. Some of the health problems of older adults are attributed to psycho-social milieu too.

### Disability in older adults

An individual who is restricted to perform an activity in the manner which is considered normal for a human being is referred to as a disability. It may be in the form of either mental or physical disability viz. lack of ability to work in a proper manner, visual impairment, hearing, speech or movement related difficulties. There are a very few studies, which have looked into the disability patterns of Indian older adults. According to the National Sample Survey

Organization (NSSO) [14] there are five types of disabilities in older adults i) visual impairment, ii) hearing problem/impairment, iii) difficulty in walking (loco-motor problems), iv) problems in speech and v) senility. Twenty-five percent of the elderly in India suffer from visual impairment, followed by hearing difficulties (14%) and loco-motor disability and senility (each 11%). Occurrence of physical disability was found to be more in rural older adults than urban. Further, the 58<sup>th</sup> round NSSO data reveals that more than ¼<sup>th</sup> of Indian older adults are disabled and the highest disability was found to be prevalent in the oldest old (75 yrs & >=61%) followed by 70-74 years (51%), 65-70 years (42%) and 60-64 years (36%) (NSSO, 2003) [15].

### Physical health problems in older adults

In old age, gradual decline in functional reserves of different organs, immune system and harmful impacts of noxious environment etc. as well as physiological and biological limitations make the older adults more susceptible for developing physical illnesses. National Sample Survey Organization (NSSO), 2006 [16] clearly indicates that this segment of the population experiences a greater burden of ailments than the younger population. The older adults often suffer from cardiovascular illness, circulatory diseases, and cancers, while the non-elderly face a higher risk of mortality from infectious and parasitic diseases [17-19]. Realizing the need for collecting data in relation to comprehensive morbidity profile of elderly WHO and Govt. carried out a multi centric survey at 10 centres of India during 2002-03 and revealed high prevalence of physical morbidity [20]. According to this report hypertension, cataract, osteoarthritis, chronic obstructive pulmonary disease, Ischemic Heart Disease (IHD), diabetes mellitus, benign prostatic hypertrophy, upper and lower gastrointestinal dyspepsia/ and constipation, depression were the common diseases amongst elderly. The overall prevalence of various morbidities is shown in Table 1.

A cross sectional study from south India reports very high prevalence of various health problems - anemia 86.0%, visual impairment 68.2% hypertension 47.7%, and diabetes mellitus 43.0%. Authors are also carrying out a longitudinal study titled 'Lucknow Elderly Study (LES) in aging and geriatric mental health' on individuals aged 45 years and above by adopting a meticulous methodology since September, 2015. It aims to study various variables like bio-psycho-social aspects, personality traits and life styles, etc. of the healthy and ill ageing individuals (45 years and above). The study started from a rural area of Lucknow. Till date a total of 3988 people have screened, of these 746 (18.7%) were identified as 45 years and above and a total of 189 subjects were studied in detail. The preliminary findings reveal that more than 90% of the subjects were diagnosed with one or the other type of Non-Communicable Disease(s) (NCDs) like vision problems, mental illness, substance use disorder, hypertension, osteoarthritis, diabetes mellitus, and auditory problems. NCDs were found to be more in elderly (60 and >) 63.95% (n=86) than the pre-elderly (45-59 years) group 55.33% (n=103).

### Mental health problems in older adults

Studies reported that a lack of family support, low socio-economic status, disturbances in families, loneliness and feelings of negligence etc. often leads to psycho-social problems and is clearly associated with increase in psychiatric morbidity in older adults [21-24]. Low

literacy rate and dependency on others also have an adverse effect on health [25].

Mental health problems in Indian older adults are reported to be variable i.e. 17.3 to 43.3% [6,23,25-31]. A recent article reveals mental health morbidity in older adults to be 20.5% [6]; 21.16 million are suffering from one or the other mental health problems. This is indeed a frightening figure. It indicates the magnitude and burden of the mental health problems on older adults of the country. LES preliminary findings are also revealing a higher prevalence of mental illnesses i.e. 23.2%. In a pre-elderly group (45-59 yrs) 22.2% of individuals are suffering with mental health problems whereas in elderly group (60 and above years) 24.6% are having one or the other type of mental illness. The findings also show that depressive and substance abuse disorders are equally present in both groups of individuals.

### Multiple morbidity/disabilities

Older Adults often face multiple co-existing morbidities [32-34]. With advancement in age, many chronic illnesses, such as cardiovascular diseases, arthritis and diabetes along with disabilities like problems related to audio-visual, physical motor impairment associated with depressive/ cognitive disorders or problems related to their psycho-social milieu are on a rise [22,25]. Prevalence studies related to multiple morbidities or disabilities are hardly available. National Sample Surveys (NSS) are being organized from time to time, exclusively providing an understanding regarding the magnitude and pattern of various health related profile of older adults. LES preliminary findings reveal that a number of co-morbidities increase with age, among NCDs (n=171) 38 of them (22.22%) had concurrent illness of two or more conditions.

## Health and Care of Indian Older Adults: The Challenges

Preceding paragraphs demonstrate the terrible health conditions of Indian older adults. They not only deal with various changes in psycho-social milieu but also have enormous physical, mental health and disability related challenges. Care of older adults has massive challenges to meet the health burden of the country. The current demographic trends, vast health related problems, increasing health care costs, financial issues and available services for care of older adults are some of the significant challenges in the way of promoting health care of Indian older adults. In spite of it; individual, familial and social challenges also affect the health and care of elderly.

### Individual challenges

Older adults are aware of their declining physical abilities when their health problems start. However, majority of them do not report it at the initial stage due to one or the other reasons and are sometimes reluctant to discuss it with their family members too. Further, fatalistic views lead to the acceptance of their conditions as such and they believe such situations to be a part of the natural order of things. They also develop a negative attitude towards health, personal needs and life in general. In many interviews they don't even wish to discuss their physical, cognitive or emotional problems and pronounce it as the effect of old age. Some react by asserting that 'death is the end result, I have reached the end of my sufferings, there is nothing to be done as this body has to perish' or 'why waste money

on this old decaying body'. Even when they are really sick, they do not take proper rest or follow the medication schedule.

At times due to changes in psychological milieu older adults have to handle many emotional sufferings. Generally, financially dependent or lonely older adults feel emotional and psychological insecurity. A large proportion of Indian older adults are illiterate, and thus, many of them are unable to handle financial matters and they often remain worried or suspicious about their care givers or helpers and ultimately develop fear or threat for their life. Sometimes older adults feel that they are not getting proper attention and are ignored. They start feeling depressed or anxious and their life becomes harsh. Older adults, being the vital part of the family initially, if become dependent upon that selfsame family, may feel negligence and develop depression. They also may have the feeling of being abused.

### Familial challenges

In the present scenario the familial bonding is changing in a rapid way. Day by day, the size of the family is becoming smaller and smaller. People prefer and enjoy living alone or with their partners without any interference; society is now preferring individualistic approaches, DINK (Double Income No Kids) culture is also starting to develop as well. Members of families hardly have time to spare for their elders; everybody is behind gaining economic and social status. Now a day's, majority of youngsters are moving away to satisfy their economic needs and social status. It adversely affects the interpersonal relationships and care of older adults in an unfavorable manner. Modernization and emergence of nuclear families is gradually eroding the traditional living patterns of the country. Such changes in the family milieu turn out to be one of the big challenges in care and health management of older adults.

### Social challenges

The usual Indian culture and society was value based. The Joint family set ups and agrarian economy were the base of our society. People were happy in sharing responsibilities, financial gains, social obligations etc. and older adults were worshipped by their younger generation not only in the family but in the society too. Since the last 50 years, economic and technological changes have speeded up in such a way that the society as a whole was forced to change to suit rapid urbanization, industrialization and developments in information and communication technology. Older adults often feel uncomfortable and aggrieved with such changes. Majority of older adults are unable to cope with the dressing style, social interaction, women participation in workforce, parent child relationships etc. They compare the values of their youth with present trends and become over concerned. And thus, they feel isolated from the society.

The evident facts about psychosocial issues, health status and wellbeing challenges related to Indian older adults need to be recognized, analyzed and considered thoroughly to provide optimum health care in order to work out the actual costs.

## Possible Ways to Reduce Mental Health Challenges and Promote Health and Care of Older Adults

It is widely acknowledged that unhealthy ageing is a risk for developing mental illnesses in older adults. Health problems of older adults as well as other associated challenges generate the need to



develop specialized health care services, initiate proper evaluation, assessment and pharmacological and non pharmacological interventions to reduce the burden of illnesses and co-morbid medical conditions. Subsequently, expansion in national research capacity, providing a place to research findings into policy and practice, and encouraging health promotion and protection activities will be necessary to ensure human rights and sustainable care and management of older adults.

### Develop specialized health care services

Older adults need specialized care and treatment therefore; a fool proof plan for providing specialized health services to older adults is the need of the hour. The model of optimal mix services as advocated by WHO [36] may be adopted to provide proper mental health care services to older adults. According to this model self-care management is to be given first priority either by self or with support of family members. In case it is unmanageable, informal community care system may be taken in consideration. These informal community mental health care services may be provided by the trained primary health care providers (trained in GMH), followed by trained psychiatrists having experience in geriatric mental health based in general hospitals and formal community mental health services, and lastly by specialist geriatric mental health services. The emphasis laid on providing mental health care and management through services based in general hospitals or community mental health services, should be determined by the strengths of the current geriatric mental health or general health system. However, planning should be done considering the socio-demographic variables like- population of older adults, socio-economic strength of the population, resources etc. [6]. Further, trained mental health professionals will also be needed to cater to the mental health needs of older adults.

### Proper assessment and management of older adults

Clinical assessments of older adults need a careful, multidimensional and multidisciplinary approach. Aged patients often have some sensory impairment and co-morbid conditions that need to be ruled out; otherwise chances of misdiagnosis would be more. Appraisal of clinical indications for assessment provides better results. A latest article by Tiwari et al. [36] provides a thorough review regarding the issue. Proper assessments provide a suitable care pathway for pharmacological and/ non-pharmacological management which preferably decrease the problems of older adults [37].

### Expansion in national research capacity

Old age provides fertile base for illnesses to grow. Besides a number of personal, psycho-social, legal, financial and quality of life related issues, one of the significant challenges of the changing demographic pyramid is health related issues in older adults. These issues have been/ are being explored systematically in the Western and European world with objectives to provide a better quality of life and wellbeing to older adults. However, in India, limited work has been/ is being carried out. The research contribution of India, in geriatric research is less than 1% in world scientific literature. Extensive research on geriatric mental health using social, biochemical, genetics and molecular aspects is available from other parts of the world [38]. The Indian government is spending less than 0.1% of GDP on geriatric health research and care and this in itself is

testimony to the fact that geriatric physical and mental health services are hardly available in the country [6]. Thus, developing the national research capacity in the field will also provide ways to handle the care and management of older adults in the country.

### Promote healthy and active ageing

The National Programme for Health Care of the Elderly (NPHCE) advocates healthy and active ageing through which aspects of prevention, promotion, cure and rehabilitation could also be achieved. Healthy and active aging denotes- i) freedom from disease, ii) optimal functional status, iii) adequate familial and social support, iv) usual personal growth and improvement. If one follows the initial two levels of preventive aspects of health care – primordial prevention and primary prevention, they may be able to improve the quality of life and wellbeing in old age. According to World Health Organization, 1986 health promotion '*Is the process of enabling people to increase control over and to improve their health*'. To maintain health and remain active in old age one needs to adopt health promotion activities and strategies which maintain wellbeing and quality of life. These activities and strategies provides proper health education to stay healthy in old age by minimizing disease, supporting cognitive, behaviour and motor abilities, provide clues for healthy life style and strengthen psycho-social support.

### Training provisions for older adults for their welfare and well being

For betterment of old age, due importance has to be given in developing plans and policies for older adults. The constitution of India also supports well being of older persons and has mandated it. There are so many plans and policies for welfare of older adults. However, majority of older people are unaware about their rights and protections, thus, there is a need to develop and launch community based training program to sensitize the society about older people's specific requirements. Awareness programs related to rights of older persons and strengthening community-based responses to their protection risks to achieve sustainable and inclusive actions are the need of the hour. The protection of the older persons is a shared concern for all, including- academicians, researchers, policy makers, states, intergovernmental and nongovernmental organizations. Thus, the aim should be to support older persons and their families and for the communities to find solutions within the framework.

### Concluding Remarks

- The first step towards the improvement of any situation is to create awareness about its existence. Hence, drives to aware the society about the problems regarding the older adult's needs to be institutionalized. Apart from that, health awareness programs should include regular check-up and timely detection and treatment of illness. This needs a concerted effort and the full co-operation of the older and the younger members of the society.
- The traditional family setup is segregating. Hence, mutual understanding between the elder members and the younger co-habitants has to be nurtured and each one has to develop respect for the other's position in the family. Children should be taught to speak politely and with due respect to the older members. The son/ daughter/daughter-in-law can make it a point to include the older member/s of the family in the discussions on common matters and

seek their advice, so that they do not feel ignored and will get a feeling of participation and purpose. They can be asked to do small chores, without involving heavy work.

- Grandchildren may be encouraged to spend time with the grandparents/ granduncles every day by involving them in one or other kind of activity of their interest.

- It is natural that people who have been brought up in a traditional society will be subjected to cultural shock when shifted to the modern society/urban settings, with changing values. It is the duty of family members to try making the transitions as smooth as possible so that a harmonious existence can be made possible.

- It is necessary to develop a positive attitude towards aging and accept facts about the changes associated with the process, and willingness to accept and adjust to the changing trends in the society. Developing a healthy attitude can reduce the negative impacts and help in adjusting to the physical changes. They may also join in community programs like religious activities, charity and fund-raising for social causes, community kitchens for deprived children, etc. that may also help with dealing with their free time post retirement.

- The older adults are a valued asset for the society. This section of the population is grossly undermined and that has to change. They should be seen as a positive feature they are. When we start seeing them as that and not a burden, they would also step up to fill up the eminent roles they are supposed to hold.

## References

- Chandramouli C. Census of India 2011 Registrar General & Census Commissioner, India. Ministry of Home Affairs. 2013.
- James KS, Sathyanarayana KM. Demographic change, age structure transition and ageing in India: Issues and challenges. *Yojana - A development monthly*. 2011; 55: 28-31.
- Das. Situation Analysis of the Elderly in India June. 2011.
- Nath SK. Elderly in India-Profile and Programmes 2006 (Second Issue): Central Statistical Organisation, Ministry of Statistics and Programme Implementation, Government of India. 2006.
- India Demographics Profile. 2013.
- Tiwari SC, Pandey NM. Status and requirements of geriatric mental health services in India: an evidence-based commentary. *Indian J Psychiatry*. 2012; 54: 8-14.
- Seth BB, Gupta SC, Kumar R. Three hundred urban families - a psychiatric study. *Indian J Psychiatry*. 1967; 9: 280.
- Sethi BB, Gupta SC, Mahendru RK, Kumari P. A Psychiatric survey of 500 rural families. *Indian Journal of Psychiatry*. 1972; 14: 183.
- Sethi BB, Gupta SC, Mahendru RK, Kumari P. Mental health and urban life: a study of 850 families. *Br J Psychiatry*. 1974; 124: 243-246.
- Tiwari SC. Loneliness: A disease? *Indian J Psychiatry*. 2013; 55: 320-322.
- Nausheen B, Gidron Y, Gregg A, Tissarchondou HS, Peveler R. Loneliness, social support and cardiovascular reactivity to laboratory stress. *Stress*. 2007; 10: 37-44.
- Cacioppo JT, Burleson MH, Poehlmann KM, Malarkey WB, Kiecolt-Glaser JK, Berntson GG, et al. Autonomic and neuroendocrine responses to mild psychological stressors: Effects of chronic stress on older women. *Ann Behav Med*. 2000; 22: 140-148.
- Petite T, Mallow J, Barnes E, Petrone A, Barr T, Theeke L. A Systematic Review of Loneliness and Common Chronic Physical Conditions in Adults. *The Open Psychology Journal*, 2015: 113-132.
- NSSO. Socioeconomic profile of aging persons. Sarvakshana. 1991; 15: 1-2.
- NSSO. Disabled persons in India, National Sample Survey. 58<sup>th</sup> round, Ministry of Statistics and Programme Implementation, Government of India. 2002.
- NSSO. Morbidity, Health Care and the Condition of the Aged, National Sample Survey. 60<sup>th</sup> Round, New Delhi: Ministry of Statistics and Programme Implementation. Government of India. 2006.
- Alam M. Ageing in India: A country profile. *Bold*. 2000; 10: 5-22.
- Shrestha LB. Population aging in developing countries. *Health Aff (Millwood)*. 2000; 19: 204-212.
- Kosuke I, Samir S. On the estimation of disability-free life expectancy: Sullivan's method and its extension. *Journal of the American Statistical Association*. 2004; 102: 199-211.
- Mathur A. Contemporary Issues in the health of the elderly. *Medicine Update*. 38-43
- Kakkar S. *The Inner World: a psycho-analytic study of childhood and society in India*. 2<sup>nd</sup> edition, Delhi. Oxford University Press; 1981.
- Rao AV. Family jointness, family and social integration among the elderly. *Indian Journal of Social Psychiatry*. 1987; 3: 81-103.
- Tiwari SC. Geriatric Psychiatric Morbidity in Rural Northern India: Implications for the Future. *International Psychogeriatrics*. 2000; 12: 35-48.
- Prakash R, Chaudary SK, Singh U. A study of morbidity pattern among geriatric population in the urban area of Udaipur, Rajasthan. *Indian Journal of Community Medicine*. 2004; 119: 35-40.
- Tiwari SC, Pandey NM, Singh N. Mental Health Morbidity in North Indian Rural Elderly: Issues and Challenges. *Indian Journal of Geriatric Mental Health*. 2011; 7: 68-82.
- Dube KC. A study of prevalence and biosocial variation in mental illness in a rural and urban community in Uttar Pradesh, India. *Acta Psychiatr. Scand*. 1970; 46: 327.
- Nandi DN, Ajmani S, Ganguli A, Banerji G, Boral GC, Ghosh A, et al. Psychiatric Disorders in a village community in West Bengal. *Indian Journal of Psychiatry*. 1975; 17: 87.
- Ramchandran V, Sarda Menon M, Ram Murthy B. Psychiatric Disorders in subjects aged over fifty. *Indian Journal of Psychiatry*. 1979; 22: 193-198.
- Premarajan KC, Danabalan M, Chandrasekar R, Srinivasa DK. Prevalence of psychiatry morbidity in an urban community of pondicherry. *Indian J Psychiatry*. 1993; 35: 99-102.
- Tiwari SC, Kar AM, Singh R, Kohli VK, Agarwal GG. An epidemiological study of prevalence of neuro-psychiatric disorders with special reference to cognitive disorders, amongst (urban) elderly- Lucknow study. *ICMR Report*. New Delhi. 2009.
- Tiwari SC, Kar AM, Singh R, Kohli VK, Agarwal GG. An epidemiological study of prevalence of neuro-psychiatric disorders with special reference to cognitive disorders, amongst (rural) elderly- Lucknow study. *ICMR Report*. New Delhi. 2010.
- Israel RA, Rosenberg HM, Curtin LR. Analytical potential for multiple cause-of-death data. *Am J Epidemiol*. 1986; 124: 161-179.
- Hoyert DL, Kung HC, Smith BL. Deaths: preliminary data for 2003. *Natl Vital Stat Rep*. 2005; 53: 1-48.
- Wall MM, Huang J, Oswald J, McCullen D. Factors associated with reporting multiple causes of death. *BMC Med Res Methodol*. 2005; 5: 4.
- World Health Organization. Organization of services for mental health, Mental health policy and service guidance package, Geneva. 2003.
- Tiwari S, Pandey NM, Singh P, Tiwari SC. Neuropsychological assessment of cognitively impaired Indian elderly: Challenges and implications. *J Geriatr Ment Health*. 2016; 3: 29-35.

37. Pandey NM, Singh VK, Tiwari SC. Epidemiology of neurocognitive disorders in elderly and its management with special reference to dementia: An overview. *J Geriatr Ment Health* 2016; 3: 6-9.
38. Rao TSS, Praveena B, Rao J. Geriatric Mental Health: recent trends in molecular neuroscience. *Indian Journal of Psychiatry* 2010; 52, 3-5.