Psychiatric Disorders Late in Life

A Comprehensive Review

Rajesh R. Tampi
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Editors
Rajesh R. Tampi, MD, MS, DFAPA
Professor of Psychiatry
Case Western Reserve University School of Medicine, Vice Chairman for Education and Faculty Development
Residency Program Director and Chief of Geriatric Psychiatry, MetroHealth
Cleveland, OH
USA

Associate Clinical Professor of Psychiatry
Yale School of Medicine
New Haven, CT
USA

Deena J. Tampi, MSN, MBA-HCA, RN
Executive Vice President
Clinical Services, Diamond Healthcare
Richmond, VA
USA

Lisa L. Boyle, MD, MPH
Associate Clinical Professor of Psychiatry, University of Wisconsin School of Medicine and Public Health
Program Director
Geriatric Psychiatry Fellowship
Madison, WI
USA

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Contributors

Vimal M. Aga, M.D., F.A.P.A. Department of Neurology, Oregon Health and Science University, Portland, OR, USA

Poorvanshi Alag, M.D. Case Western Reserve University School of Medicine and Metrohealth, Cleveland, OH, USA

Ali Ahsan Ali, M.D. Ican School of Medicine at Mount Sinai (Elmhurst), Queens, NY, USA

Ali Abbas Asghar-Ali, M.D. Department of Psychiatry and Behavioral Sciences, Baylor College of Medicine, Michael E. DeBakey VA Medical Center, Houston, TX, USA

Sarah J. De Asis, M.D. Department of Psychiatry, Yale University, New Haven, CT, USA

Jimmy Avari, M.D. Department of Psychiatry, Weill Cornell Medical College, White Plains, NY, USA

Gayle Ayers, D.O. Department of Psychiatry, Dell Medical School — The University of Texas at Austin, Seton Healthcare Family, Austin, TX, USA

Silpa Balachandran, M.D. Case Western Reserve University School of Medicine and Metrohealth, Cleveland, OH, USA

Meera Balasubramaniam, M.D., M.P.H. Department of Psychiatry, New York University School of Medicine, New York, NY, USA

Ashmita Banerjee, M.D. Case Western Reserve University School of Medicine and Metrohealth, Cleveland, OH, USA

Azziza Oluwakemi Bankole, M.D. Department of Psychiatry and Behavioral Medicine, Virginia Tech Carilion School of Medicine, Roanoke, VA, USA

Laurel J. Bessey, M.D. Department of Psychiatry, University of Wisconsin School of Medicine and Public Health, Madison, WI, USA

Lisa L. Boyle, M.D., M.P.H. Department of Psychiatry, University of Wisconsin School of Medicine and Public Health, Madison, WI, USA

William S. Middleton Memorial Veterans Hospital, Madison, WI, USA

Cheryl Bradas, PhDc, APRN, CHPN, CNRN Department of Nursing, The MetroHealth System, Cleveland, OH, USA

Wynnelena C. Canio, M.D. Semel Institute for Neuroscience and Human Behavior, UCLA School of Medicine, Los Angeles, CA, USA

Evan N. Caporaso, M.D. Directorate for Mental Health, Naval Medical Center San Diego, San Diego, CA, USA

Suneela Cherlopalle, M.D. Case Western Reserve University School of Medicine and Metrohealth, Cleveland, OH, USA

Ravi Chivukula, M.D., M.P.H. West Virginia University School of Medicine, Morgantown, WV, USA

Carl Cohen, M.D. SUNY Downstate Medical Center, Brooklyn, NY, USA

Dhweeja Dasarathy Harvard University, Cambridge, MA, USA

Joel P. Dey, M.D. Metrohealth, Cleveland, OH, USA

Nery A. Diaz, D.O. Washington Heights Community Services of the New York State Psychiatric Institute, Columbia University Medical Center, New York, NY, USA

Erica C. Garcia-Pittman, M.D. Department of Psychiatry, Dell Medical School — The University of Texas at Austin, Seton Healthcare Family, Austin, TX, USA

Garima Garg, M.D. Case Western Reserve University School of Medicine, Cleveland, OH, USA

Metrohealth, Cleveland, OH, USA

Dina Ghoneim, M.D. SUNY Downstate Medical Center, Brooklyn, NY, USA

Katherine Rice Goettsche, M.D. Department of Psychiatry, Weill Cornell Medical College, New York, NY, USA

Aarti Gupta, M.D. Department of Psychiatry, Connecticut Valley Hospital, Middletown, CT, USA

Department of Psychiatry, Yale Univeristy School of Medicine, New Haven, CT, USA

Michael C. Hann, M.D., M.B.A., M.S. Directorate for Mental Health, Naval Medical Center San Diego, San Diego, CA, USA

Bronwyn Huggins, M.D. SUNY Downstate Medical Center, Brooklyn, NY, USA

Jennifer Jacobson, M.D. Department of Psychiatry, Dell Medical School — The University of Texas at Austin, Seton Healthcare Family, Austin, TX, USA

Pallavi Joshi, D.O., M.A. Hofstra-Northwell School of Medicine-Staten Island University Hospital, Staten Island, NY, USA

Karin Kerfoot, M.D., F.R.C.P.C. Department of Psychiatry, Western University, London, ON, Canada

Thomas Wolfgang Klotz, M.D. Directorate for Mental Health, Naval Medical Center San Diego, San Diego, CA, USA

Jessica Koenig, M.D. Department of Psychiatry, Dell Medical School — The University of Texas at Austin, Seton Healthcare Family, Austin, TX, USA

Ashley Trust, M.D. Department of Psychiatry, Dell Medical School — The University of Texas at Austin, Seton Healthcare Family, Austin, TX, USA

Mallika Lavakumar, M.D. Case Western Reserve University School of Medicine and Metrohealth, Cleveland, OH, USA

Joanna C. Lim, M.D. Veterans Affairs Medical Center, Washington, DC, USA

Anup Mani, D.O. SUNY Downstate Medical Center, Brooklyn, NY, USA

Geetha Manikkara, M.D. Metrohealth, Cleveland, OH, USA

Rachel D. Maree, M.D., M.P.H. Department of Psychiatry, University of Pittsburgh School of Medicine, Western Psychiatric Institute and Clinic, Pittsburgh, PA, USA

Raman Marwaha, M.D. Case Western Reserve University School of Medicine, MetroHealth Medical Center, Cleveland, OH, USA

Nisha Mehta-Naik, M.D. Department of Psychiatry, New York Presbyterian-Weill Cornell Medical College, New York, NY, USA

Aaron Meyer, M.D. Department of Psychiatry, University of California, San Diego, San Diego, CA, USA

Tessa Murante, D.O. SUNY Downstate Medical Center, Brooklyn, NY, USA

Aurora Osteen, M.D. Department of Psychiatry, Dell Medical School — The University of Texas at Austin, Seton Healthcare Family, Austin, TX, USA

Rosanne M. Radziewicz, MSN, APRN-CNS Department of Nursing, The MetroHealth System, Cleveland, OH, USA

Michael Reinhardt, M.D. SUNY Downstate Medical Center, Brooklyn, NY, USA

Craig A. Riccelli, M.D. Department of Psychiatry, University of Pittsburgh School of Medicine, Western Psychiatric Institute and Clinic, Pittsburgh, PA, USA

Mamta Sapra, M.D. Department of Psychiatry and Behavioral Medicine, Virginia Tech Carilion School of Medicine, Roanoke, VA, USA

Salem Veteran Affairs Medical Center, Salem, VA, USA

Caitlin Snow, M.D., M.B.A. Department of Psychiatry, Weill Cornell Medical College, New York, NY, USA

Deena J. Tampi, M.S.N., M.B.A.-H.C.A., R.N. Diamond Healthcare, Richmond, VA, USA

Rajesh R. Tampi, M.D., M.S., D.F.A.P.A. Case Western Reserve University School of Medicine and Metrohealth, Cleveland, OH, USA

Amit Thour, M.B.B.S. Primary Health Center, Rampur, Himachal Pradesh, India

Kalya Vardi, M.D. Department of Psychiatry, University of California, San Diego (UCSD), San Diego, CA, USA

M. Ingre Walters, M.D. Lewis Katz School of Medicine at Temple University, Philadelphia, PA, USA

Sophia Wang, M.D. Department of Psychiatry, Indiana University School of Medicine, Indianapolis, IN, USA

Brandon C. Yarns, M.D. Division of General Internal Medicine, Department of Medicine, University of California, Los Angeles, CA, USA

Department of Psychiatry/Mental Health, VA Greater Los Angeles Healthcare System, Los Angeles, CA, USA

Part I

Developmental, Psychological and Social Aspects of Aging

1 Life Course: Developmental and Transitional Events

Nisha Mehta-Naik

Introduction

A life transition is defined by a significant shift in social circumstances, which is often accompanied by a period of emotional and social instability as one moves from one life stage to another [1]. Although life transitions can often be perceived as planned events that carry a positive connotation, such as marriage and joining the workforce, many life transitions are marked by unpredictability and upheaval. Nonetheless, all life transitions can result in a disruption of social networks, coping skills, finances, and health [1]. As a result, success in life transitions requires individuals to demonstrate resilience by cultivating new coping skills, utilizing different social supports and accepting a change in identity [1]. Some research suggests that such transitions could be risk factors for depression in older adults [2]. Although each older adult has a unique experience of aging, as a group, the geriatric population shares several life transitions such as retirement, bereavement, relocation, changes in the caregiver role, and changes in medical health. Some of these topics—including caregiver stress and psychological factors affecting medical conditions—will be featured in subsequent chapters. This section will highlight two key geriatric life transitions: retirement and bereavement.

Retirement

Retirement has been defined in multiple ways. Feldman defines retirement as the "exit from labor force taken by individuals after middle age and taken with the intention of reduced psychological commitment to work thereafter [3]." This definition indicates that retirement is an individual and a deliberate decision. Sociologist Angela M. O'Rand states that retirement is an "age-related and permanent transition from an income status based on employment to one based on transfers and assets at the end of the work career" which highlights a shift from depending on individual income to larger economic institutions [4]. Such definitions of retirement suggest that this life transition is abrupt, marked by the single decision to retire from the workforce. Organizational psychologists Wang and Shultz suggest that retirement can also be a dynamic process often involving multiple, stepwise decisions resulting in a gradual transition out of the workforce through part-time work and alternate work opportunities [5]. Strict definitions of retirement often do not capture the conditions surrounding retirement—namely, if retirement was voluntary, involuntary, or regulatory/statutory—retirement that is mandated at a set age [6]. The lack of standard definitions of retirement highlights that there are key differences in how individuals

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experience retirement, the retirement decision-making process, and how retirement is studied by different professional groups.

Despite the significance of this life transition, there is little conclusive data regarding impact of retirement on one's emotional and physical well-being [6]. Limitations of research include lack of universal definitions regarding retirement, as well as a difference in conditions surrounding retirement. A population's outlook on retirement may be impacted by national policies on retirement, insurance, and pension, thus making it difficult to generalize results to an international population [7]. As women historically comprised of a lower portion of the labor force, there is limited data regarding women's experience of retirement, as well as that of dual-income households [8].

In this section, trends in American retirement, data regarding impact of retirement on health, as well as psychosocial interventions to improve retirement experiences will be reviewed.

Trends in American Retirement

Older adult participation in the American labor force (including full-time and part-time employment) notably decreases between ages 60 and 70. Per 2010 US Census data, 60% of men in the 60–64 age group are engaged in the workforce, though only 36.5% of older men in the 65–69 age group are employed [9]. Similarly, female participation decreases from 50.7% in the 60–64 age group to 27% in the 65–69 age group. Following age 69 years, the workforce participation decreases by approximately 10–12% every 5 years [9].

Patterns of retirement behavior have changed significantly over the course of the twentieth and twenty-first centuries. While approximately 10% of women over age 65 maintained employment from 1950 to 1990, older male rates of employment steadily decreased over the majority of the twentieth century [9]. Approximately 45.8% of American men over age 65 maintained employment in 1950, but only 15% of older men remained active in the workforce by 1993 [9]. The development of Social Security, as well as the strengthening of pension programs, has contributed to increased older adult retirement in the twentieth century.

The twenty-first century was marked by a rebound in older adult engagement in the workforce—with 22.1% of men and 13.8% of women over the age of 65 maintaining employment in 2010 [9]. Multiple hypotheses have been offered to explain why older adults are remaining in the workforce at increasing rates, namely, decreased financial security in light of the 2007–2009 economic recession [10], as well as the decreased quality and availability of pension programs [11], rising age of Social Security eligibility [11], and increased life expectancy [11].

Retirement and Health

Different studies have investigated the relationship between retirement and health, and the available data is varied. We will review some of the key international studies that shed light on this topic in the next few paragraphs.

Much of the literature suggests that retirement is associated with an improvement in both physical and mental health. Depressive symptoms, as measured by the quantity of antidepressant prescriptions distributed to a Finnish cohort, were noted to decrease following retirement [12]. Data from the Whitehall II study, a large longitudinal prospective study conducted in England, corroborated these findings. Self-report of general mental health improved for all employees following statutory retirement, though most noticeably for those of higher socioeconomic status [13]. Similar findings regarding a decrease in depressive symptoms following retirement were noted in a Canadian population study [14] as well as a Swiss population study [15]. The GAZEL project, a French longitudinal prospective cohort, demonstrated evidence of decreased sleep disturbances in the years following statutory retirement [16]. It seems that affective and anxiety symptoms surrounding retirement may peak when individuals are in the process of preparing for retirement and upon initiation of retirement itself. A series of interviews demonstrated that many individuals experienced pre-retirement anxiety in the setting of uncertainty and change, followed by post-retirement satisfaction and happiness as

they adjusted to a new phase of life [17]. In spite of a significant shift in identity during the process of retirement, a study of American individuals found that self-esteem remained steady before and after retirement [18].

Many studies also suggest that retirement is correlated with improvements in physical health. Further data from the GAZEL cohort demonstrated that the chronic disease prevalence was not impacted by retirement itself, but rather by normal aging [19]. Moreover, self-report of physical and mental fatigue decreased following retirement. GAZEL cohort data also found a decreased prevalence of headaches [20], increased physical activity [21], and decreased report of "suboptimum health" following retirement [22]. Several studies have noted that the level of somatic complaints [23] and self-report of health [24] do not change significantly for individuals following retirement when compared to age-matched adults who remained in the workforce.

Despite overwhelming data supporting improvements in mental and physical health following retirement, some data suggests that retirement is correlated with worse health outcomes. One study found that early retirement was correlated with higher prevalence of depression and anxiety [25]. Although a study of the Swiss Household Panel found that the majority of individuals experience improvements or stability in self-reported general health and mood following retirement, the study also notes that approximately 25% of individuals experience worsening of mood and anxiety following retirement [15]. Additional data from the GAZEL cohort suggested that the prevalence of heavy alcohol consumption increased around the retirement period [26]. Although many studies suggested that retirement was correlated with an increase in physical activity, one study found that the loss of physical activity related to work commutes was not compensated for by recreational physical activity in retirement [27].

Several studies emphasize that individual characteristics, and external factors which exist prior to retirement may impact one's experience of retirement. Data from the GAZEL cohort found that the presence of Type A and aggressive personality traits prior to retirement is correlated with worsened mood following retirement [28]. Results from the Whitehall II study propose that hardship faced in the workplace in the years prior to retirement including workplace satisfaction and perceived workload is correlated with symptoms of depression post-retirement [29]. Such data highlights the complexity of this life transition and the multitude of factors that influence individual retirement experiences.

Psychosocial Interventions

Although many older adults seem to thrive both physically and mentally after retirement, available data suggests that many older adults experience worsening mood and physical health correlated with retirement. Several interventions have been proposed to help older adults transition to retirement, focusing on reshaping older adults' social identities following retirement by providing new responsibilities, fostering environments that promote socialization, and helping structure time. Several initiatives encouraged older adults to serve as mentors to young adults [30] or adopted grandparents [31] (Foster Grandparent Program) to young adults and children and were noted to have positive effects.

Future Directions

Despite European studies regarding retirement demonstrating overall improvements in mental and physical health following this life transition, there is limited data regarding the American experience of retirement. As the average age of retirement rises in the United States and pension plans and benefits diminish, it is possible that Americans will experience increased stress in the setting of retirement. Further research on health outcomes following retirement in the United States would help elucidate this effect. Although retirement has commonly been perceived as a positive life transition, there remains a subset of individuals who struggle with this change. Incorporating aspects of positive psychiatry and interpersonal psychotherapy may alleviate distress related to retirement.

Bereavement

The death of a loved one and the subsequent mourning of loss is a process that impacts the geriatric population immensely. Loss is an inevitable part of life for older adults—the average life expectancy in 2009 was found to be 75 years for men and 80.9 years for women [32]. Approximately 28.1% of individuals over age 65 are widowed, and 59.6% of individuals over age 85 are widowed [32]. The prevalence of spousal loss is higher in women—39.9% of women over 65 and 72.9% of women over 85 are widows [32]. This data does not encapsulate other major losses that older adults face including but not limited to the death of parents, friends, siblings, and in rarer circumstances children.

Despite the universality of bereavement, individuals seem to have varied responses to loss ranging from exhibiting minimal psychiatric symptoms to experiencing significant dysfunction. Psychiatrists and psychologists have long discussed the range of responses to loss, often wondering where to draw the fine line between expected bereavement and a pathological response to loss. In the classic paper *Mourning and Melancholia* [33], Freud defines mourning as "the reaction to the loss of a loved person, or to the loss of some abstraction which has taken the place of one, such as one's country, liberty, an ideal and so on [33]." In this statement, Freud highlights that mourning is a process of coming to terms with object loss. He draws the distinction between mourning and melancholia, noting that "although mourning involves grave departures from the normal attitude to life, it never occurs to us to regard it as a pathological condition and to refer it to medical treatment. We rely on mourning being overcome after a certain lapse of time, and we look upon any interference with that process as useless or even harmful [33]." Psychoanalyst Otto Kernberg questioned whether the mourning process is a time-limited one as Freud proposed or a lifelong process that "may bring about a permanent alteration of psychological structures that affect various aspects of the mourning persons' lives [34]."

The dialogue regarding the course of expected bereavement and defining its pathological variants has continued in the twenty-first century with the DSM-5 and the decision to remove the bereavement exclusion from diagnostic criteria of major depressive disorder [35]. The next section will explore the complexities of categorizing pathological vs. non-pathological bereavement, biological responses to grief, and management of bereavement.

The Biology of Loss

Bereavement is not only a psychological and social process but also a physiological one. Widowhood has been correlated with increased morbidity and mortality from a broad range of health conditions—including increased risk of mortality from accidents, strokes, heart disease, and cancer [36]. Although the etiology of increased morbidity and mortality is unclear, there are known endocrine and immunologic changes associated with bereavement [37]. The acute period following spousal loss has been associated with decreased T lymphocyte activity [38], decreased NK cell reactions [39], and increased neutrophil count [40]. Widows and widowers were found to have elevations in cortisol levels 2 weeks and 6 months after loss of a spouse [41]. Research has also demonstrated that there is increased heart rate and elevated blood pressures in the period following significant loss [42]. Such neuroendocrine and immunologic changes represent a physiologic response to the stress of acute grief, which may have downstream effects [37].

Current Categorization of Bereavement

The clinical range of responses to loss has most recently been separated into three distinct categories by Zisook and Shear: uncomplicated grief, complicated grief, and grief-related major depression [43].

Uncomplicated grief is a fluctuating and dynamic process, which for some does not come to a complete resolution. Individuals will have varying responses to loss, ranging from minimal psychological distress to time-limited significant

dysfunction. Zisook and Shear describe that uncomplicated grief usually begins with a phase of "acute grief," during which an individual experiences heightened sadness and psychological pain and increased longing for the lost individual [43]. Symptoms of depression are often present during this acute period including low mood, anhedonia, and diminished motivation and focus although individuals do not meet full criteria for a major depressive episode. As acute grief fades, individuals face a period of "integrated grief." This phase is characterized by holding onto memories of lost loved ones and continuing to miss them without any concomitant changes in functioning [43].

Although many individuals experience depressive symptoms in the context of bereavement, most do not meet criteria for a major depressive episode. However, a subset of individuals experience "grief-related major depression"— a major depressive episode in the setting of loss and bereavement [43]. While the precise prevalence rates of bereavement-related depressive episodes are unclear, one study found that 7.7% of all depressive episodes in a population were related to bereavement [44]. Depressive episodes in the setting of bereavement when compared to general depressive episodes have been correlated with lower rates of suicidal ideations and feelings of worthlessness [44]. Individuals with bereavement-related depression often report decreased need for sleep, rather than increased need for sleep [44]. Additionally, those who experienced a grief-related depressive episode do not carry an increased risk of subsequent depressive episodes [44].

Complicated grief is defined as a syndrome of prolonged and intense grief that is associated with substantial impairment in work, health, and social functioning [43]. When compared to its normal variant, complicated grief is marked by ongoing distress, persistent guilt for finding enjoyment in the absence of deceased loved one, and inability to come to terms with the loss [43]. The prevalence of complicated grief has been estimated to be approximately 2.5 [45] to 5.0% [46] in the general population and is estimated to occur in approximately 10% [43] to 25% [46] of those grieving a loss. Complicated grief has been associated with increased comorbidity with major depressive disorder and anxiety disorders [46]. However, complicated grief can occur in the absence of comorbid major depressive episode. Ages between 75 and 84 years, the loss of a child or spouse, and female gender have been correlated with increased prevalence of complicated grief [46]. Unexpected loss, death of a loved one who passed away in an inpatient facility, and increased time spent with loved ones in the week prior to their death were also found to carry increased risk of complicated bereavement [45].

Management of Bereavement

Appropriate categorization of a patient's response to grief is critical, as specific interventions—and in some cases no intervention—have been found to be effective for uncomplicated grief, grief-related major depression, and complicated bereavement.

No intervention has been found to be helpful in managing uncomplicated grief. Although individuals may continue to miss the deceased, they are able to find enjoyment in activities and report less psychological distress within 6–18 months of a significant loss without any intervention [47].

Grief-related major depression improves with psychotherapy and antidepressants. Several small studies have demonstrated improvements in depressive and grief symptoms with the use of antidepressants [48, 49]. One study found that interpersonal psychotherapy when combined with nortriptyline was more effective than nortriptyline alone in the treatment of grief-related major depression [49].

Many interventions have been proposed for the treatment of complicated bereavement. There is little data to support the use of antidepressants or other psychiatric medications in the treatment of complicated grief [50]. Cognitive behavioral therapy [51], interpersonal psychotherapy [52], and behavioral activation [53] have all demonstrated some efficacy in treating complicated grief. However, complicated grief therapy, a therapy which incorporates strategies from exposure therapy, motivational interview-

ing, and interpersonal therapy, has been found to be the most effective in reducing symptoms of complicated grief [52]. Complicated grief therapy has specifically been found to alleviate symptoms of complicated grief among older adults [54].

Bereavement and Suicidality

Bereavement is correlated with an increased prevalence of suicidal ideations and suicide attempts. Widowed individuals had higher rates of suicidal ideations than non-widowed individuals [55]. Rates of suicidal ideations were higher in those who had high scores on the Beck Depression Inventory [55]. In another study, complicated grief was associated with passive suicidal ideations in 65% of individuals and 38% of individuals admitted to self-injurious behavior [56]. In the same study, 9% of individuals suffering from complicated bereavement had attempted suicide [56]. Given the concern for suicidality in the setting of bereavement—particularly grief-related depressive episode and complicated bereavement—psychiatrists should take more initiative in evaluating and treating the pathological variants of depression.

Summary

Bereavement is a psychological, social, and physiological process associated with changes in acute immune, cardiovascular, and endocrine function. Bereavement can be differentiated into three categories: uncomplicated grief, complicated grief, and grief-related major depression. Uncomplicated grief does not benefit from treatment. However, research suggests that complicated grief improves with psychotherapy, particularly complicated grief therapy. Furthermore, grief-related major depression can improve with antidepressant use and with psychotherapy. Appropriately diagnosing and treating pathological variants of bereavement are critical, as complicated grief and grief-related major depression are associated with increased risk for suicide.

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2
Demography and Epidemiology

Sarah J. De Asis

Introduction

Demography is defined as the analysis of the population size and its structure especially in relation to its determinants, fertility, mortality, and migration [1]. Demography also identifies many major social and policy issues including the growth of the population, the challenges of an aging population, and the implications of migration on the population.

The World Health Organization (WHO) defines epidemiology as the study of the distribution and determinants of health-related states or events (including disease) and the application of this study to the control of diseases and other health problems [2]. According to Morris, epidemiology may be further defined as the study of health and disease of populations in relation to their environment and ways of living [3]. It provides the facts about community health; it describes the nature and relative size of the problems to be dealt with, and "maps" are produced of such scales as are required or possible. The main function of epidemiology is to discover groups in the population with high or low rates of diseases, so that causes of disease and reasons for freedom from disease can be postulated.

The Aging Population

In late life, the epidemiology of psychiatric disorders is the study of the distribution of psychiatric symptoms and disorders and the variables that affect their distribution [4]. In 2010, approximately 40 million persons aged 65 years and older lived in the United States, accounting for 13% of the population. With the aging of the baby boomer cohort (those born between 1946 and 1964), the size of the elderly population is projected to reach 72.1 million by the year 2030 and 88.5 million by 2050 accounting for an estimated 20.2% of the total population [4, 5]. The current older population of the United States is predominantly female and white. In 2010, women accounted for 57% of the population aged 65 years and older and 67% of those aged 85 years and older [4].

Life expectancy in the United States was 80.9 years for women and 76.0 for men [4]. According to Blazer, life expectancy at age 65 is 15.5 years for men and 19.1 years for women, so reaching age 80 is becoming the usual rather than the exceptional event [6]. The life expectancy for people 80 years old and older is greater in the United States than in Sweden, France, England, and Japan and is increasing. It is estimated that the number of people older than 65 years with psychiatric disorders in the United States will increase from about 4 million in 1970 to 15 million in 2030 [7].

Psychiatric Disorders Among Older Adults

The National Institute of Mental Health (NIMH) Epidemiologic Catchment Area (ECA) study used the Diagnostic Interview Schedule (DIS) based on DSM-III as the case-identification

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instrument to report on the 1-month prevalence rates of mental disorders from five sites across the United States [8]. The investigators found that for individuals aged ≥65 years, the prevalence of psychiatric according to the DIS was 12.3%. Jeste and colleagues consider this as underestimation of the prevalence of psychiatric disorders among older adults secondary to factors such as misattribution of psychiatric symptoms to cognitive impairment, physical disorders, or normal aging, lack of age-appropriate diagnostic criteria, and the underreporting due to forgetfulness and social stigma [7]. They opined that the "real" prevalence of psychiatric disorders other than dementia in elderly persons to be at least 25% higher than what is reported in the ECA study.

The ECA study found that the prevalence of alcohol abuse/dependence was 0.9% among older adults with it being more common among men (1.8%) than among women (0.3%) [8]. The prevalence of schizophrenia was found to be 0.1% for both sexes, and the prevalence of schizophreniform disorder was 0.0%. The prevalence of affective disorders was 2.5%; 3.3% in women and 1.4% in men. Dysthymia was found to be more common (1.8%) than major depressive episode (0.7%) and manic episode at (0.0%). Anxiety disorders were the most prevalent disorders at 5.5%; 6.8% and 3.6% in women and men, respectively. The prevalence of phobia was 4.8%, obsessive-compulsive disorder was 0.8%, and panic disorder was 0.1% in both sexes. The prevalence of somatization disorder was 0.1% and antisocial personality 0.0%. Cognitive impairment increased with age; it was seen in 2.9% of individuals 65–74 years in age, 6.8% of individuals 75–84 years in age, and 15.8% of individuals ≥85 years in age. Higher rates of almost all psychiatric disorders were found in younger age group individuals with the exception of severe cognitive impairment. Excess mortality (from suicide or physical comorbidity) in early life among individuals with schizophrenia, depression, substance dependence, and other psychiatric disorders was thought to be an important reason for the lower prevalence of serious mental illness among older adults when compared to younger adults [7].

Shapiro et al. reported that the most common diagnoses for women were phobias and affective disorders, whereas for men the predominant disorder was substance abuse and/or dependence [9]. The total rates of psychiatric disorders drop after the age of 45 years and particularly so after age 65 years with the exception of cognitive impairment.

The Australian National Mental Health and Well-Being Survey by Trollor et al. described the 1–12-month prevalence of mental disorders, their demographic correlates, and their impact on service utilization and disability among individuals ≥65 years [10]. The Composite International Diagnostic Interview (CIDI) was used to determine the presence of mental disorders using the International Classification of Diseases (ICD-10) and the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) diagnostic criteria. About 12.9% of the individuals met the criteria for a psychiatric disorder in the past 1 month, and 15.8% of the respondents met the criteria for a psychiatric disorder in the past 12 months. The most prevalent diagnostic category was cognitive impairment, followed by anxiety disorders and personality disorders. Major depression and generalized anxiety disorder (GAD) were the two most common individual ICD-10 defined 12-month diagnoses. Older women were more than twice as likely as older men to have experienced ICD-10 major depression and GAD in the preceding 12 months. The 12-month prevalence for major depression was (ICD-10, 2.4%; DSM-IV, 2.2%). The reported prevalence rate of cognitive impairment (7.4%) was based on the mini-mental state examination (MMSE) score and was greater than the 1-month prevalence data from the ECA study (4.9%). An association was noted between cognitive impairment and a higher prevalence of affective disorders. After cognitive impairment, anxiety disorders were the most prevalent diagnostic group in this survey. There were no significant differences in the overall rates of mental health disorders between males and females. However, there were specific sex differences in the rates for certain diagnostic groups like affective disorders where major depression was twice as prevalent among elderly females when compared to elderly males. There was also a marked female predomi-

nance for GAD. Male predominance was noted for substance use disorders, particularly alcohol abuse and dependence. Marital status was associated with affective disorders with those individuals who had never married being twice as likely to experience an affective disorder. In addition, those individuals with a physical health disorder were more than twice as likely to experience a mental health disorder. Lastly, among those individuals experiencing a mental health disorder within the past 12 months, only one-quarter had consulted a mental health professional. Even among those with multiple disorders, only about one-third had consulted a mental health professional.

Nationally representative data for community-dwelling older Americans had been limited until the ECA study from the 1980s comprehensively investigated rates of psychiatric disorders among a representative sample of older Americans from multiple communities [8]. The National Comorbidity Study Replication (NCS-R) is the most current nationally representative study of the epidemiology of psychiatric disorders in the United States [11]. Among the NCS-R respondents, there were 1461 individuals who were ≥65 years in age. The mean age of the participants was 74 years. Approximately 58% of the participants were women, 70.5% had 12 or more years of education, 54.3% were married, and 82.8% were non-Latino White. A total of 22.8% of all respondents received a diagnosis of at least one DSM-IV disorder. Among older adults, 8.5% of the individuals met the criteria for a psychiatric disorder. The 12-month prevalence was 7.0% for anxiety disorder, 2.6% for mood disorders, and 0% for any substance abuse disorder. Specific phobia was the most common diagnosis for the whole sample (8.7%), and for those individuals ≥ 65 years in age, the rate was 4.7%. Regardless of age, women had a higher rate of any psychiatric diagnoses. Among older adults, women were four times more likely to have a psychiatric diagnosis than men (12.6% vs. 2.9%). The lifetime prevalence for any DSM-IV disorder among older adults was 20.9%. The most prevalent diagnosis across all age groups was MDD (16.6%), with 9.3% for older adults meeting the criteria for MDD. Respondents aged 75 years and older were less likely than those aged 65–69 years to be diagnosed with a lifetime anxiety disorder, with no significant difference in those aged between 70–74 and 65–69 years. Individuals aged 65 years and older had lower rates of 12-month and lifetime mood, anxiety, and substance use disorder diagnoses when compared with that of younger and middle-aged adults. Those aged 75 years and older had the lowest prevalence particularly for lifetime psychiatric disorders. Within the last 12 months, 8.5% of older adults were diagnosed with at least one psychiatric disorder. Specific phobia was the most prevalent 12-month diagnosis (4.7%), followed by social phobia (2.3%) and MDD (2.3%).

The study by Rovner found that among nursing home residents, the prevalence of psychiatric disorders was approximately 75% [12]. Primary degenerative dementia accounted for 56% of the cases followed by vascular dementia (18%) and Parkinson's dementia (4%).

In the next section of the chapter, we describe the epidemiology of some common psychiatric disorders among older adults in greater detail.

Cognitive Disorders

The H70 study or the Longitudinal Gerontological and Geriatric Population Study in Göthenburg, Sweden, was a comprehensive population study that was started in 1971 [13]. This study found the prevalence of dementia at age 70 to be 6.6% in men and 3.1% in women. The prevalence of severe dementia increased from 1% at age 70 years to 2% at age 75 years and 7% at age 79 years. The prevalence of mild to moderate dementia increased from 2% to 4% and 9%, respectively. Almost one-third of the 85-year-olds had dementia (30%), and the prevalence rates were similar between men and women. The prevalence of dementia increased in women but not in men from age 85 to 88 years. The increase was attributed to higher rates of new cases in women. Individuals with Alzheimer's disease (AD) and vascular dementia (VD) had a higher prevalence of white matter lesions than did non-demented subjects. The 7-year survival rate in 85-year-olds was higher in women (35%) than in men (20%).

One community-based study showed that the estimated annual incidence of AD in the popula-

tion was 0.6% for persons aged 65–69 years, 1.0% for persons aged 70–74 years, 2.0% for persons aged 75–79 years, 3.3% for persons aged 80–84 years, and 8.4% for persons aged 85 years and older [14]. This incidence is approximately 14 times higher among persons older than 85 years of age when compared with those between 65 and 69 years of age.

It is estimated that 5.4 million people or 22.2% of the population of the United States in 2002 aged 71 years or older have cognitive impairment without dementia [15]. Prominent subtypes included prodromal AD (8.2%) and cerebrovascular disease (5.7%). Among participants who completed follow-up assessments, 11.7% of individuals with cognitive impairment but without dementia progressed to dementia annually, whereas those with subtypes of prodromal AD and stroke progressed at annual rates of 17 to 20%. The prevalence of dementia in the United States among individuals aged 71 and older was 13.9%. Dementia prevalence increased with age from 5.0% among those aged 71 to 79 years to 37.4% of those aged 90 and older.

Evans et al. sampled 467 residents 65 years of age and older of a defined community. Of those with probable AD, 26% had severe cognitive impairment, 51% moderate cognitive impairment, and 23% mild cognitive impairment [16]. Among those 65–74 years old, the prevalence rate of probable AD was 3.0%. For those 75–84 years of age, the prevalence rate of probable AD was 18.7% and among those 85 years or older, it was 47.2%. Conditions other than AD that caused moderate to severe cognitive impairment including multiple cerebral infarcts, alcohol-induced dementia, Parkinsonian dementia, depression, psychosis, mental retardation, and subacute combined degeneration, were uncommon in this community sample. Of the 113 persons with moderate to severe cognitive impairment and a probable diagnosis, 84.1% had AD alone. Approximately 8.8% had only a cause of dementia other than AD, and 7.1% had both AD and another cause of dementia. The overall estimate of AD prevalence of 10.3% among those over the age of 65 years in this study was somewhat higher than reported in previous reports.

Prevalence and incidence rates of mild cognitive impairment (MCI) vary as a result of different diagnostic criteria as well as different sampling and assessment procedures [17]. The results of the Leipzig Longitudinal Study of the Aged (LEILA 75+) showed that the prevalence rates of MCI ranged from 3 to 20%. Rates of conversion to dementia over 2.6 years ranged from 23% to 47%. The study stated that people with MCI develop dementia at a rate of 10–15% per year, while the rate of healthy controls is 1–2% per year. The pre-dementia syndrome identifies conditions with age-related deficits in cognitive functioning. There are age-associated memory impairment (AAMI), aging-associated cognitive decline (AACD), age-related cognitive decline (ARCD), and mild cognitive impairment (MCI). The prevalence of AAMI among people aged 65 and older ranges from 7% to 38.4% [18]. People who meet AACD criteria show more extensive cognitive impairment. In another study, the prevalence of AACD was 26.6% in people aged 60 and older [19]. The incidence rate of pre-dementia syndromes appear to be increasing with age and is higher in subjects with less education. MCI is a prodromal phase of dementia, particularly AD type. Annual conversion rates of dementia for subjects classified according to the AAMI criteria vary from 3% to 24%. The individuals who meet the AACD criteria are more homogenous than those characterized by the MCI criteria and progressed to dementia at a rate of 28.6% over a 3-year follow-up period, contrary to the idea that AACD is a stable, non-pathologic entity. Approximately 28% of subjects with ARCD developed dementia after 2 years. Furthermore, 15% of subjects aged 65 years and older in age and 15 to 25% of subjects 75 years and older in age who are classified as having minimal dementia developed clinical dementia after 1 year. Annual conversion rates for pre-dementia syndromes to dementia vary between 4% and 40%. The annual conversion rates for MCI to AD vary between 10% and 15% per year.

An epidemiologic study by Ganguli et al. showed that among individuals with a diagnosis of MCI, 27% developed dementia over the next 10 years [20]. Over each 2-year interval, MCI persons showed increased risk for dementia:

11.1–16.7% progressed to Alzheimer disease, and 0–5.0% progressed to other dementias. Over the same time intervals, 11.1–21.2% of those with MCI remained at the MCI stage, and 33.3–55.6% no longer had MCI.

Anxiety Disorders

Anxiety disorders are one of the most common psychiatric disorders in the elderly, yet there are very few studies about epidemiology of these disorders. Smalbrugge et al. found that the prevalence of anxiety disorders among nursing home residents varied between 0% and 20% [21]. A Dutch community-based study found the overall prevalence of anxiety disorders among elderly to be 10.2%. Female sex, living without a partner, low level of education, somatic comorbidity, functional impairments, psychiatric comorbidity, and loneliness were found to be associated with anxiety disorders among the community-dwelling older adults. Phobias were the most prevalent anxiety disorder at 3.6%, followed by panic disorder at 1.5%, and generalized anxiety disorder at 1.2%. Approximately 29.7% of the individuals had one or more anxiety symptoms. A mini-mental state examination score of greater than 23, depression, stroke, more than 6-year education, impaired vision, pain, negative life events in the past year, serious functional impairments, loneliness, and perceived inadequacy of care were significantly associated with anxiety symptoms [21].

Two studies by Grant et al. showed that the prevalence of social anxiety disorder (SAD) in national and international epidemiologic surveys conducted since the early 1980s have varied widely [22, 23]. Overall, the 12-month and lifetime prevalence of SAD among all age groups were noted to be 2.8 and 5.0%, respectively. For ages ≥ 65 years, the 12-month and lifetime prevalence of SAD were 1.6 and 3.0%, respectively. The onset of SAD was typically during childhood and adolescence, and the onset after the age of 24 years was relatively uncommon. Among those individuals with SAD, in the prior 12 months, 13.1% had an alcohol use disorder, 5.5% had a drug use disorder, and 27.1% had nicotine dependence. Among those with lifetime history of SAD, 48.2% had an alcohol use disorder, 22.3% had a drug use disorder, 33.0% had nicotine dependence, 54.1% had any other anxiety disorders, 56.3% had a mood disorder, and 55.4% had a personality disorder. Bipolar I disorder was more strongly associated with SAD than either major depressive disorder, bipolar II, or persistent depressive disorder. The association of 12-month SAD with GAD was somewhat greater than with panic disorder and specific phobia. Avoidant personality disorder was more strongly related with SAD than any other personality disorder. Over 80% of individuals with SAD received no treatment [22, 23].

Depressive Disorders

Depression is a common and disabling psychiatric disorder in later life [24]. Results from the National Epidemiologic Survey on alcoholism and related conditions showed that being female, Native American, middle-aged, widowed, separated, divorced, and of low-income group increased the risk of becoming depressed [25]. Being of Asian, Hispanic, or Black race decreased the risk for being depressed. The Australian Longitudinal Study of Ageing by Anstey et al. showed that the prevalence of depression in residential care facilities was 32% when compared to 14.4% in the community [26]. Functional impairment and cognitive decline were associated with increasing risk of depression in late life. Blazer et al. reported that the prevalence of major depression in the community-dwelling elderly to be less than 5% [27]. The prevalence of primary depressive disorder was reported at 1.8% and of secondary depressive disorder at 1.9%.

Approximately 13.5% of older adults followed by a traditional visiting nurse agency were diagnosed with major depression [28]. Of these, 71% of the individuals were experiencing their first episode of depression, and the episode had lasted for more than 2 months in 78% of the individuals. Approximately 22% of the depressed individuals were receiving antidepressant treatment, but none were receiving psychotherapy. Approximately 31% of individuals receiving antidepressants were prescribed subtherapeutic doses, and 18% who were prescribed appropriate doses reported not complying with their antide-

pressant treatment. Teresi et al. found that 14.4% of nursing home residents met the criteria for probable and or definite major depressive disorder [29]. The estimate for significant depressive symptomatology among these individuals was 44.2%.

The AGED (Amsterdam Groningen Elderly Depression) study showed prevalence of major depression among elderly nursing home residents to be 8.1% and the prevalence of minor depression to be at 14.1% [24]. Approximately 24% of the individuals suffered from subclinical depression. Risk indicators for major depression were found to be pain, functional limitations, visual impairment, stroke, being lonely, the lack of social support, negative life events, and perceived inadequacy of care [24]. Another study found that 40% of institutionalized older adults met the criteria for depression [30]. Approximately 12% of these individuals met the DSM-III-R criteria for major depression, and almost half of them suffered significant cognitive deficits [30].

Data from the West Friesland Study showed that the prevalence of major depression among older adults consulting their general practitioner in the Netherlands was 13.7%, and the prevalence for minor depression was 10.2% [31]. Patients with major depression were younger and more often female than those with minor depression. Only 22.9% of the individuals with major depression were treated with antidepressants. In the Aging, Demographics, and Memory Study (ADAMS) where the participants were aged ≥71 years, the overall prevalence for depression was 11.19% [32]. The prevalence of depression was similar for men and women. Whites and Hispanics had nearly three times the prevalence of depression when compared to African-Americans. Dementia diagnosis and pain severity were associated with increased depression prevalence, while black race was associated with lower rates of depression. The H70 study found that the prevalence of depression among 70- to 74-year-old women was 12% when individuals with dementia were included in the denominator and 13% when they were excluded [13]. Among the 85-year-old women, the prevalence of depression was 13% when individuals with dementia were included in the denominator and 19% when demented were excluded.

Depression in old age may also be a symptom of incipient dementia [13]. The elderly have a disproportionally high rate of suicide worldwide, with a peak above the age of 80 [13]. There is also a greater degree of lethal intent. Among mentally healthy 85-year-olds, only 4% had thought during the last month that life is not worth living, 4% had death wishes, and 1% had thought about taking their lives. None had seriously considered suicide. Among those individuals with mental disorders 29% had thought that life is not worth living, 28% had death wishes, 9% had thought about taking their lives, and 2% had seriously considered suicide [13].

Substance Use Disorders

Large-scale US and international surveys conducted in the early 1980s using the DSM-III criteria showed that among individuals 65 years older, the 12-month prevalence of alcohol abuse was 1.2%, and alcohol dependence was 0.2% [33]. The 12-month prevalence for any alcohol use disorder in this age group was 1.5%. The lifetime prevalence of alcohol abuse and dependence among individuals 65 years older was 12.7% and 3.4%, respectively; for any alcohol use disorder, it was 16.1%. The 12-month alcohol abuse remained strongly and significantly associated with substance use disorders (OR ≥ 1.8). The 12-month alcohol dependence remained strongly associated with substance use disorders, specific phobias, and bipolar disorders but with lower ORs and was significantly associated with histrionic and antisocial personality disorders. Mean ages for onset of alcohol abuse and dependence were 22.5 and 21.9 years, respectively. Hazard rates for onset of both disorders peaked at 19 years and decreased thereafter. The duration of alcohol use disorder was often chronic with a mean of nearly 4 years for alcohol dependence. Men were at greater risk of alcohol use disorder than women. African-Americans and Asians were at lower risk than Caucasians for alcohol abuse and dependence.

Blazer and Wu in their two studies evaluated the epidemiology of substance use disorders among middle-aged and older adults [34, 35]. In the first study, they reported that the number of older adults needing treatment for SUD is esti-

mated to increase from 1.7 million in 2000–2001 to 4.4 million in 2020 [34]. In the two large surveys, Epidemiologic Catchment Area (ECA study) and the National Comorbidity Study Replication (NCS-R), the prevalence of drug use was very low among middle-aged and older adults. In the ECA study, 7% of individuals 45–64 years and 1.6% of individuals ≥65 years in age had a lifetime prevalence of illegal drug use. Active use of illegal drugs occurred in 0.8% of subjects 45–64 years and 0.1% of individuals ≥ 65 years in age. In another study of older adults who were referred to a hospital substance abuse consultation service, older adults when compared to younger adults were more likely to use alcohol and less likely to be injection drug users and users of heroin, cocaine, or multiple substances. Nearly 60% of subjects used alcohol during the past year, 2.6% used marijuana, and 0.41% used cocaine. Both alcohol and drug use were far more frequent in subjects 50 to 64 years in age and among men. Drug use in contrast to alcohol use was not associated with the level of education but was more common among those who were not married and among those with major depression. The prevalence of drug abuse or dependence in the ≥50 age group was very low at only 0.33% for any abuse or dependence, 0.12% for marijuana abuse or dependence, and 0.18% for cocaine abuse or dependence, respectively. Nevertheless, the use of marijuana approached 4% in the 50–64 age groups in comparison to 0.7% in the ≥65 age group.

Psychotic Disorders

Psychotic symptoms are reported to be uncommon among older adults, although they are substantially more common among individuals with dementia [13]. The prevalence of schizophrenic and paranoid syndromes are 0.5, 1.7, and 2.5% at 70, 75, and 79 years, respectively. It was noted that 10% of non-demented 85-year-olds had psychotic symptoms, and 7% had paranoid ideation during the preceding year. Hallucinations were found in 7% and delusions in 6%. Hallucinations, delusions, and paranoid ideation at age 85 were each related to an increased incidence of dementia from 85 to 88 years, but only a minority of those individuals with these symptoms developed dementia.

There are only a limited number of studies about epidemiology of psychosis among the elderly. In a study done by Christenson et al. in a community sample of elderly individuals in San Francisco, the investigators found that 17% of those rated as psychiatrically impaired had symptoms of suspiciousness and 13% had delusions [36]. When the entire sample was considered, 2.5% showed suspiciousness, and 2% had paranoid delusions. In the community-based elderly population, the prevalence of generalized persecutory ideation was 4%. There were no significant differences in age, sex, race, or education between individuals who exhibited persecutory ideations versus those who did not exhibit these symptoms. Sensory and cognitive impairments appeared to be significant risk factors for developing persecutory ideations in this study.

According to Meesters et al., the estimated proportion of individuals developing schizophrenia after the age of 40 years is thought to be 23.5% [37]. On a lifetime basis, the risk of developing schizophrenia for men relative to women is estimated to be 1.32. In this study, the estimated 1-year prevalence of all disorders (schizophrenia, schizoaffective disorder, or delusional disorder) was 0.71%. The prevalence was 0.55% for schizophrenia, 0.14% for schizoaffective disorder, and 0.03% for delusional disorder. Estimated prevalence of schizophrenia in women aged 60–79 years was higher than in women aged 80 years and older. Estimated prevalence of schizophrenia was higher in women than in men for age groups 60–69 years and 70–79 years. Delusional disorder was found only in women aged 70 years and older. With regards to age of onset, the estimated 1-year prevalence of late-onset schizophrenia (LOS) was 0.14% and that of very late-onset schizophrenia (VLS) was 0.05%. Among individuals aged 40 years or older who developed schizophrenia, 76.5% were women. This figure rose to 92.9% for those individuals who developed symptoms of schizophrenia after 60 years of age. Delusional disorder was found only in women aged 40 years or older at onset. Individuals with LOS have better premorbid social functioning and display less executive impairment and higher levels of everyday functioning. Also, affective flattening and social withdrawal were reported to be less prominent in LOS individuals.

A study by Östling and Skoog reported that the prevalence of psychotic symptoms in the elderly might be underrated because of reluctance to report psychotic symptoms [38]. In a study of non-demented individuals aged 85 years living in a community or in institutions in Göthenburg, Sweden, psychotic symptoms were identified in 10.1% of the individuals. Hallucinations were seen in 6.9% of the participants, delusions in 5.5%, and paranoid ideations in 6.9%. Individuals with hallucinations had an increased frequency of depressed mood, anxiety, irritability, suicidal ideation, and paranoid personality traits. These symptoms were often associated with major depressive syndrome, disability in daily life, and visual deficits. Individuals with delusions had an increased frequency of depressed mood, blunted affect, and paranoid personality traits and were associated with disability in life. Individuals with paranoid ideation had an increased frequency of depressed mood, irritability, and paranoid personality traits and were associated with visual deficits and myocardial infarction. Among individuals with hallucinations or delusions, 20.0% were prescribed neuroleptics, 17.1% antidepressants, 22.9% anxiolytics or sedatives, and 37.1% any psychotropic drug. No individuals with paranoid ideation without concomitant hallucinations or delusions were prescribed neuroleptics. The 3-year mortality rate was increased in women with hallucinations (40.0%) and paranoid ideations (36.8%) when compared to women without these symptoms. Hallucinations, delusions, and paranoid ideation were not associated with mortality in men. In addition, hallucinations, delusions, and paranoid ideation were each related to an increased 3-year incidence of dementia from 85 to 88 years. Sensory impairments were associated with late life psychosis and paranoid symptoms.

The study by Östling et al. on cognitively intact individuals aged 70 and above found that the cumulative incidence of psychotic symptoms during the 3.6-year follow-up period was 4.8% [39]. The incidence rate for schizophrenia was 0.03/1000 person-years and for delusional disorder was 0.16/1000 person-years. The investigators found a double mortality risk in individuals aged above 70 years with psychotic symptoms at baseline during the 3.6-year follow-up period. In this study 8% of non-demented 70-year-olds developed first-onset psychotic symptoms during a 20-year follow-up period. There were no significant sex differences in the incidence of first-onset psychotic symptoms in the study. The cumulative incidence for hallucinations and delusions among individuals with probable Alzheimer's disease was 51% in 4 years. Hallucinations were in most cases visual. Delusions were related to an increased risk for developing dementia at a later time period. Approximately 60% of individuals with hallucinations, 30% with delusions, and 45% of those with any psychotic symptom developed dementia.

Conclusions

Epidemiology of psychiatric disorders in late life indicates that with the exception of cognitive disorders, these disorders are more common among younger adults. Cognitive impairment is the most prevalent diagnostic category followed by anxiety disorders among older adults. The prevalence of dementia is noted to increase with age. Alzheimer's disease is the most common form of dementia. The rate of conversion of mild cognitive impairment to dementia is approximately 10–15% per year. Phobias and affective disorders are more common among elderly women, and substance use disorders are more common among elderly men. Phobia is the most common anxiety disorder among older adults. Depression is a common psychiatric disorder in late life, and it is more prevalent among females and Caucasian and Hispanic races. Psychotic symptoms are uncommon among the elderly but are often seen in individuals with dementia especially women. The most common psychotic symptoms are visual hallucinations and persecutory delusions. Alcohol use disorders are more common in elderly men, and its rate of onset decreases with age. Illicit drug use appears to be rare among the elderly. The elderly also have higher rates of suicides especially among older Caucasian men. Knowledge of epidemiologic data regarding psychiatric illness among the elderly can aid in the appropriate planning and treatment of these disorders.

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