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Prescription Use Disorders in Older Adults

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Abstract

The number of older adults needing substance abuse treatment is projected to rise significantly in the next few decades. This article will focus on the epidemic of prescription use disorders in older adults. Particular vulnerabilities of older adults to addiction will be considered. Specifically, the prevalence and patterns of use of opioids, stimulants, and benzodiazepines will be explored, including the effects of these substances on morbidity and mortality. Treatment intervention strategies will be briefly discussed, and areas for future research are suggested.

Keywords

prescription; abuse; older; geriatric

Aging Population

When the “baby boomers” start turning 65 in 2011, 10,000 people will turn 65 every day and will continue to do so for the next 20 years¹. All of the baby boomers will be 50 and older in 2020^{2,3} and 65 and older in 2030, when nearly one in five U.S. residents is expected to be 65 and older¹. The 65 and older age group is projected to increase to 88.5 million in 2050, more than doubling the number in 2008 (38.7 million). The 85 and older population is expected to more than triple, from 5.4 million to 19 million between 2008 and 2050⁴. Such projected numbers of older adults will likely have a significant impact on the healthcare workforce required in the future^{5,6}.

Unique Features of Older Adults

Older adults, generally defined in most developed countries as adults age 65 and older⁷, have unique features that recommend particular focus on the study of medical and psychiatric disorders in this population. Older adults are distinct from younger adults in at least 4 domains: cognitive function, biological factors, psychological factors, and social factors.

Cognitively, older adults often have a loss in speed and efficiency of information processing, show decreases on tests of visuospatial, visuospatial, and constructional functions, and

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show decreases on motor speed and response time^{8,9}. Neuropathological changes consistent with early stage Alzheimer's disease, such as neuritic plaques and neurofibrillary tangles, can be seen in cognitively normal older adults¹⁰. Biologically, older adults generally have a decreased volume of distribution, are more pharmacodynamically sensitive to medications, and can have a higher prevalence of chronic medical comorbidities that overload the aging body⁸. Psychologically, older adults may use different coping strategies to resolve problems, such as using reminiscence, looking more inward, or taking mortality into consideration¹¹. Socially, older adults tend to experience a decrease in the size and change in composition of social networks¹², are more likely to experience widowhood and deaths of family members/friends, and can have losses in occupational domains¹³. Also, older adults often have a sense of fewer responsibilities due to freedom from children and a career, which may decrease previous self-imposed controls¹⁴. Such features particular to later life can potentially impact the etiology, presentation, course, treatment outcomes, and prevention strategies for substance use disorders in older adults.

Defining an Older Adult with a Substance Use Disorder

Among individuals with substance use disorders, defining an older adult is problematic. Chronologic age may not reflect biologic age, which depends on the cumulative illness burden^{15,16}. With respect to substance use disorders, it may be reasonable to define an older adult as an adult age 50 and older, since the overall health condition of a 50-year-old adult with a substance use disorder may be more similar to that of an adult in his or her 60s without a substance use disorder¹⁷. For example, individuals with substance abuse have higher mortality rates than age-matched individuals without substance abuse^{18–20}, reflecting more rapid biologic aging. Older patients in methadone maintenance treatment have worse general health and poorer physical and social functioning, compared with age- and sex-matched population norms^{17,21}. Substance abuse can also exacerbate neurological, respiratory, and other age-associated diseases^{22,23}. Patients with substance abuse have elevated rates of blood-borne diseases such as hepatitis and C and HIV, and a higher medical burden can be present in older adults^{24,25}. Overall, there is considerable evidence that older patients with drug dependence have higher rates of medical morbidity than younger patients with drug dependence^{17,21,26,27}.

Thus, given the accelerated rate of biologic aging among individuals with substance use disorders, for purposes of this review we have defined an older adult with a substance use disorder as an adult age 50 and older. This definition is consistent with definitions employed by other researchers who have conducted studies among older adults with substance use disorders^{3,21,28,29}.

Substance Use Disorders in Older Adults

The number of older adults (age 50 and older) in need of substance abuse treatment has been estimated to be increasing from 1.7 million in 2000/2001 to 4.4 million in 2020, due to a 50% increase in the number of older adults and a 70% increase in the rate of treatment need among older adults³. Table 1 shows the increasing admission rate from 2005–07^{30–32} for older adults in the Treatment Episode Data Set, which tracks federal and state funded substance abuse treatment admissions. Local mortality data in the New York/New Jersey/Pennsylvania area from the Drug Abuse Warning Network also show an overall increase in the drug-related death rate among adults age 55 and over, from 49.5/1,000,000 population in 2003³³ to 66/1,000,000 population in 2007³⁴. Such data provide examples of the significant impact of substance abuse in older adults.

The aging process itself can potentially affect the underlying neurobiological systems involved in substance use disorders²². The neurotransmitter systems and neural circuits

involved in the reward system can be affected by aging, but the consequences of these effects have not been well characterized²². For example, during reward anticipation, young adults (age 25 $\pm$ 3.7 years) reportedly recruit the ventral striatum, the anterior cingulate cortex, and the left intraparietal region, compared to only the left intraparietal region in older adults (age 65 $\pm$ 5 years)³⁵. An age-related change in the direction of the relationship between midbrain dopamine synthesis and prefrontal cortex activity has been noted³⁵. Dopamine transporter binding has been found to decrease with age (range 21–63 years)³⁶. Dopaminergic (range 24–86 years) and serotonergic (range 21–49 years) receptor loss within the prefrontal cortex and striatum have been observed during aging^{37–39}. N-methyl-D-aspartate (NMDA) glutamate receptor density and function have shown age-related decreases in the cortex, striatum, and hippocampus^{22, 40–42}. Implications of these changes warrant further investigation and suggest a possible role for age-specific treatment interventions. The clinical picture may be further confounded by an older adult's past substance abuse history²².

Hence, epidemiological data have suggested the growing scope of substance use disorders in older adults, but additional clinical research is needed to elucidate the specific features of illness presentation and course of substance use disorders in older adults. Such research efforts would permit the development of more targeted treatment interventions for this population.

Prescription Use Disorders

One area of particular clinical concern in older adults is the abuse of prescription drugs, which is part of an “invisible epidemic” of alcohol, prescription, and over-the-counter drug abuse^{43, 44}. Polypharmacy can be common in older adults (age 65 and older) who have multiple underlying medical disorders⁴⁵, and approximately one third of all prescription drugs in the U.S. are used by older adults (age 65 and older)⁴⁶. Various classes of prescription drugs are subject to abuse and dependence by older adults (age 50 and older), including opioids, stimulants, and benzodiazepines⁴⁷. As the availability and accessibility of prescription drugs continue to increase, and as the “baby boom” cohort ages, it appears likely that the proportion of older adults using these drugs and experiencing substance abuse associated problems will also increase^{18, 22}. Some data suggest that patterns of prescription drug abuse may differ by gender in older adults. For example, older women have been found to be at greater risk for prescription drug abuse than older men or younger women^{47–49}. Possible explanations for this finding include the higher rate of psychoactive drug use among older women than older men⁴⁷, psychoactive drug use associated with recent divorce and widowhood among older women⁴⁷, and men's preference for alcohol⁴⁷.

1. Opioids

The overall societal cost of prescription opioid abuse in the U.S. has been estimated at \$9.5 billion in 2005⁵⁰. The prevalence of prescription opioid use disorders in older adults should not be underestimated. In an analysis of the Treatment Episode Data Set, the percentage of admissions in 1992 for prescription opioids was 0.7% for ages 50–54 and 55 and older, compared to 3.2% for ages 50–54 and 2.8% for age 55 and older in 2005¹⁷. Codeine was the second highest abused prescription drug in a program targeting high-risk, community-based elderly individuals through the Elderly Services for Spokane⁵¹.

One study examining the course of prescription opioid use disorders during an older adult's lifetime found that in 92% of subjects, the duration of prescription opioid abuse was greater than 5 years⁵¹. Regarding risk factors for prescription opioid abuse in older adults, the risk of addiction to prescription opioids appears to be minimal in individuals without a previous substance abuse history⁵². Several studies (mean age range 51–62) have also failed to find a

relation between previous substance abuse history and the risk of current prescription opioid abuse in older adults (studies had mean age ranges from 51 to 62) ^{53–55}.

Regarding the actual source of opioids, in a center for individuals seeking opioid detoxification, physician prescriptions were the primary source of prescription opioids, particularly for older patients (age group of 55 and older greater than all younger age groups) ⁵⁶. An important note is the potential for drug diversion among older adults. In a study of prescription drug diversion in Wilmington, Delaware, many older adults engaged in deceiving their physician by using pain complaints to obtain desired opioid prescriptions. Although older adults did not self-identify as drug dealers, some reported filling their prescriptions and selling some or all to a few abusers known to them, as well as to dealers or pill brokers for much less than the street value of the drugs ⁵⁷.

However, it is equally important to emphasize that persistent pain can have significant consequences on an older adult's quality of life ⁵⁸, such as depression, anxiety, and falls ^{59, 60}. The aging process affects neurotransmitter systems and neural circuits not only involved in the reward system, but also in pain processing pathways. Examples include a decreasing density of myelinated and unmyelinated peripheral fibers and a loss of serotonergic and noradrenergic neurons in the dorsal horn ⁶¹. Yet, opioid analgesics can serve an important role in the management of persistent pain in older adults ^{62, 63}, and clinicians need to distinguish pseudoaddiction (drug-seeking due to poorly managed persistent pain) from true prescription opioid abuse ⁴⁹. An inappropriate "opiophobia" ⁵⁹ in the clinician does not legitimize inadequate management of an older adult's persistent pain. Systematic strategies to evaluate for prescription opioid abuse include monitoring requests for early refills and asking about opioid prescriptions from other clinicians ^{59, 60}. Screening tools ^{64–68} that can be valuable in the assessment of opioid abuse in patients with persistent pain are included in Table 2. A written "medication agreement" can also be a valuable tool during the management of persistent pain ^{59, 60}. Nonpharmacological interventions, such as biofeedback, relaxation techniques, and acupuncture, may need to be concomitantly used to achieve effective pain control ⁶⁹. The American Geriatrics Society has an entire panel dedicated to improving the pharmacological management of persistent pain in older adults ^{59, 60}.

2. Stimulants

Some data on prescription stimulant use disorders exist in older adults, although stimulants are generally abused by younger individuals ⁷⁰. Data are beginning to emerge in the older adult age group (age 50 and older) ^{3, 71}. NSDUH data from 2000–01 revealed that among the estimated 244,000 older adults (age 50 and older) abusing or dependent on illicit drugs, the prevalence of stimulants was 18% ³. In 2007, an analysis of the Treatment Episode Data Set found that methamphetamine/amphetamine was the primary substances for 7.87% (142,832 admissions) of all admissions, of which 2.7% were age 50–54, 0.8% age 55–59, 0.2% age 60–64, and less than 0.05% age 65 and older. Other stimulants were the primary substances for 896 admissions, of which 4.4% were age 50–54, 2.6% age 55–59, 0.7% age 60–64, and 0.7% age 65 and older ³⁰. In a prospective cross-sectional study that assessed the pattern of drugs of abuse among patients admitted for acute poisoning over a 1-year period in a Medicine department, 8% of patients (age 50 and older) had positive amphetamine samples ⁷². In a prospective 4-year study of older Medicare patients with substance use disorders (mean age 72.9 years), 9% of the drug-related diagnoses by clinicians specified barbiturate, sedative, or stimulant abuse/dependence ⁷³. Thus, while not as prevalent as alcohol abuse or perhaps even benzodiazepine abuse, stimulant abuse is present in a significant minority of older patients, and may complicate medical diagnosis and treatment.

Neuroimaging studies have suggested a possible underlying reason for low rates of prescription stimulant use disorders. An investigation of reinforcing effects of amphetamine in stimulant-naïve healthy volunteers (age range 19 to 53) found that increasing age was associated with decreased potency of dopamine to elicit positive reinforcing effects ⁷⁴. Studies on the subjective effects of amphetamines in older patients ^{75–77} (mean age 78.4⁷⁷) have also found that increasing age is associated with reduced euphoric effects; this may be related to age-related cortical gray matter volume reductions ⁷⁶, possibly reflecting a reduction in cortical dopamine levels ^{76,78}. These findings suggest that older adults may be relatively protected from developing new onset stimulant use disorders. A small case series has shown that those older adults who already have a long history of prescription stimulant use disorders may have significant morbidity, such as severe withdrawal symptoms ⁷⁹. Older adults (age range 57 to 66) with chronic methamphetamine abuse often display a number of psychiatric symptoms, such as depressed mood, psychomotor slowing, loss of interest and suicidal ideations, as well as resistance to antidepressant medications ⁸⁰. In spite of these sequelae of stimulant use disorders, it is important to remember that stimulants may have an appropriate therapeutic role in the treatment of depression in older adults ^{81, 82}.

Prescription stimulant use disorders can lead to medical morbidity in older adults. Pulmonary emphysema ⁸³ and pulmonary talcosis (resulting in lower lobe panacinar emphysema) ⁸⁴ have been reported in adults over the age of 50 intravenously injecting methylphenidate. In older adults presenting with symptoms of heart failure, stimulant abuse may have an etiologic role ⁸⁵. Amphetamine abuse may even accelerate skin wrinkling, a hallmark of aging ⁸⁶. Thus, the medical history and physical examination may offer clues to stimulant abuse not reported by the older patient.

3. Benzodiazepines

Many older adults fear becoming addicted to benzodiazepines, even when they have no personal history of past addiction problems ⁸⁷. The prevalence of prescription benzodiazepine use disorders can be significant. The 2007 Treatment Episode Data Set found that sedatives were the primary substances for 4,197 admissions, of which 6.4% were age 50–54, 3.1% were age 55–59, 1.7% were age 60–64, and 3.5% were age 65 and older ³⁰. Among older patients admitted to the Mayo Inpatient Addiction Program in 1974–93, prescription drugs accounted for 16% of annual admissions, the most frequent being sedatives/hypnotics ⁸⁸. In a retrospective analysis of older patients (age 60 and older) presenting to an outpatient geriatric psychiatry clinic, the prevalence of benzodiazepine dependence was 11.4% ⁸⁹. Diazepam was the most commonly abused prescription drug in the Elderly Services of Spokane study, whereas flurazepam ranked fourth ⁵¹. Underdiagnosis of benzodiazepine abuse in older adults is still a concern, even though the prevalence may be lower than the prevalence in younger age groups ⁹⁰.

Some risk factors for prescription benzodiazepine abuse in older adults have been identified: increasing age, medical disorders where multiple medications are used, and comorbid depression and alcohol dependence ^{91, 92}. In a retrospective chart review of psychiatrically hospitalized older adults (age 65 and older), the abuse of benzodiazepines was more frequently unrecognized among older women than older men ⁹³. In the study of older patients admitted to the Mayo Inpatient Addiction Program in 1974–93, female gender appeared to be a risk factor for prescription drug dependence ⁸⁸. Persistent pain, depression, and isolation can predispose older adults to benzodiazepine use and dependence ^{94, 95}. Benzodiazepine dependence can be a complication among older adults with alcohol dependence ⁹¹. Benzodiazepine abuse is rarely an isolated practice and more generally occurs with alcohol or other substances ⁴⁹.

Prescription benzodiazepine use disorders can lead to neuropsychiatric and medical morbidity in older adults. The cognitive effects of benzodiazepines are well known⁹⁶, such as anterograde amnesia, diminished short-term recall, increased forgetfulness⁹⁵, confusion⁹⁷, and deficits in visuospatial learning, processing speed, and verbal learning⁹⁶. Benzodiazepine dependence can lead to dementia, depression, and anxiety^{94,95}. Symptoms such as agitation, anxiety, confusion, delirium, and seizures can occur during withdrawal after a sudden cessation or decrease in dosage among patients with benzodiazepine dependence⁹⁵. Thus, either acute/chronic intoxicating effects or withdrawal symptoms from benzodiazepine use disorders may complicate medical and psychiatric assessment in older adults.

Intervention Strategies

The above findings highlight the need to develop intervention strategies aimed at older adults with prescription use disorders. Table 3 summarizes strategies for the screening, evaluation, and management of prescription abuse in this population. Barriers to effective substance abuse screening include limitations imposed by the clinician (lack of time, lack of knowledge, discomfort discussing the problem) and the patient (denial, discomfort discussing the problem)⁹⁸. For example, in a medical setting, the Severity of Dependence Scale may be a useful screen for identifying benzodiazepine dependence in current benzodiazepine users^{49,99}, although further evidence specifically in older adults is needed⁹⁴. In the context of a psychiatric setting, it is important for clinicians to be aware that the DSM-IV-TR criteria for substance abuse/dependence may suffer from lower diagnostic sensitivity in older adults¹⁰⁰. For example, as we have seen, a sense of fewer responsibilities due to freedom from children and a career¹⁴, may mean that older adults may not meet the criterion of a failure to fulfill major role obligations at work or home, as listed in the DSM-IV-TR¹⁰⁰.

Medical illnesses such as pneumonia, congestive heart failure, and transient ischemic attacks, can present atypically or nonspecifically in older adults, and substance abuse must be considered in the differential diagnosis of such presentations¹⁰¹. Recognizing the possibility of occult prescription use disorders in any setting is also important. For example, institutionalized older adults in skilled nursing facilities can have substance use disorders¹⁰¹, and the “visitor supplier” should not be missed¹⁰¹. Urine toxicology screening can also be helpful as a screening tool and as a confirmation of self-report¹³.

Treatment interventions for the prescription substance use disorder(s) should take place within the context of a biopsychosocial treatment plan. Comorbid psychiatric and medical illnesses and age-related functional limitations, such as vision or hearing loss, should be considered when designing a treatment plan¹⁰¹, and treatment of such illnesses should be optimized. Pharmacological interventions can include a gradual tapering strategy, which may be appropriate for benzodiazepines, to prevent acute withdrawal symptoms^{95,102}. In the case of opioids or benzodiazepines, physiological dependence may require a medical management of withdrawal symptoms¹³, and the threshold for choosing an inpatient setting should be lower in older adults because of safety concerns. Psychotherapeutic interventions can include individual, family, and group therapies¹⁰⁰. Self-help groups such as the 12-Step peer support model can also be beneficial¹³. The comprehensive SBIRT model (Screening, Brief Intervention, Referral to Treatment) has been developed for use in medical settings¹⁰⁰. The “Screening” component involves assessing the severity of substance use and identifying the appropriate level of intervention/treatment¹⁰⁰. The “Brief Intervention” component involves a focus on increasing insight and awareness of substance use and motivation for behavioral change¹⁰⁰. The “Referral to Treatment” component involves

providing patients identified as needing more treatment access to specialized care as necessary¹⁰⁰.

Future Directions

Prescription use disorders are prevalent in older adults and lead to significant neuropsychiatric and medical morbidity. Yet, in many clinical settings, these substance use disorders are inadequately assessed. Structured screening tools represent an important strategy to enhance clinical detection of such disorders in this age group. Guidelines for appropriate use of structured clinical instruments to detect prescription use disorders might lead to revised estimates of the prevalence of these disorders in clinical settings such as primary care, pain, and psychiatric clinics. Such revised population-based and clinic-based estimates could further inform efforts to develop targeted treatment strategies for prescription use disorders in older adults.

We have reviewed a number of studies which have identified risk factors and consequences of prescription opioid and benzodiazepine use disorders in older adults. Comparable data on such features for prescription stimulant use disorders in this older population are largely lacking, warranting further study.

Future areas of focus for prescription stimulant use disorders in older adults include further delineation of the course and pattern of use during an older adult's lifetime, careful characterization of comorbid neuropsychiatric and medical disorders, and age-specific pharmacological and nonpharmacological interventions. For example, diagnoses such as attention-deficit/hyperactivity disorder (ADHD) are prevalent in adults and may warrant the use of stimulant medications¹⁰³. To date, there are quite limited data on ADHD in older adults; the question of whether this diagnosis represents a risk factor for stimulant abuse in older age remains to be explored. Older adults continue to undergo hormonal changes, such as a decrease in total and free testosterone, and an increase in parathyroid hormone¹⁰⁴; whether hormonal changes have any role in stimulant use disorders in older adults is not fully known. Various cognitive deficits occur with stimulant use disorders¹⁰⁵. Given the importance of cognitive function in older adults, it is not fully known whether pharmacological and/or nonpharmacological interventions specific to older adults are necessary to remediate such cognitive deficits.

The projected numbers of older adults in the U.S. will likely have a significant impact on the healthcare workforce in the future, and the number of older adults in need of substance abuse treatment has been estimated to be increasing. Symptoms of substance abuse/dependence may be less evident in older adults due to the decreased demands for functional role performance, and it is important for clinicians and researchers to be alert for the presence of substance abuse in older adults. Commitment to including older adults in substance abuse treatment and non-treatment research trials can help in generating evidence-based guidelines for the growing problem of substance use disorders in older adults.

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Table 1

Admission Rates for Older Adults in the Treatment Episode Data Set (TEDS) by Year.

Age Group	2005 ³²	2006 ³¹	2007 ³⁰
50–54	5.9%	6.2%	6.7%
55–59	2.5%	2.8%	3.0%
60–64	1.0%	1.0%	1.1%

Table 2

Examples of Screening Tools in the Assessment of Opioid Abuse in Patients with Persistent Pain.

Pain Assessment and Documentation Tool (PADT) ⁶⁴
Prescription Drug Use Questionnaire (PDUQ) ⁶⁵ –age 20 to 66
Screening and Opioid Assessment for Patients with Pain (SOAPP) ⁶⁶ –age 18 to 88
Current Opioid Misuse Measure (COMM) ⁶⁷ –age 21 to 89
Opioid Risk Tool (ORT) ⁶⁸ –age 17 to 82

Table 3

Intervention Strategies for Older Adults with Prescription Use Disorders.

1. Be aware that barriers to effective substance abuse screening include limitations imposed by the clinician and the patient ⁹⁸ .
2. Be aware that the DSM-IV-TR criteria for substance abuse/dependence may have lower sensitivity in older adults ¹⁰⁰ .
3. For atypical or nonspecific presentations of medical illnesses, consider substance abuse in the differential diagnosis ¹⁰¹ .
4. Urine toxicology screening can be helpful as a screening tool and as a confirmation of self- report ¹³ .
5. Optimize treatment of comorbid psychiatric and medical illnesses and age-related functional limitations ¹⁰¹ .
6. Detoxification management may be needed in a safe inpatient medical setting ¹³ , for which the threshold should be lower in older adults due to safety concerns.
7. Psychotherapeutic interventions can include individual, family, and group therapies, and the comprehensive SBIRT model (Screening, Brief Intervention, Referral to Treatment) has been developed for use in medical settings ¹⁰⁰ .