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Illicit and Nonmedical Drug Use Among Older Adults: A Review

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Abstract

Objective—Substance abuse among older adults is a looming public health concern. The number of Americans aged 50+ years with a substance use disorder is projected to double from 2.8 million in 2002–2006 to 5.7 million in 2020. The authors provide a review of epidemiological findings for this understudied area of research by focusing on illicit drug use disorders and nonmedical use of prescription drugs among adults aged 50+ years.

Method—MEDLINE and PsychInfo were searched using keywords *drug use*, *drug abuse*, *drug misuse*, *substance use disorder*, and *prescription drug abuse*. Using the *relatedarticles* link, additional articles were screened for inclusion. This review included articles published between 1990 and 2010.

Result—Results from multiple sources indicated a much higher rate of illicit drug use and nonmedical use of prescription drugs and drug-related treatment admissions for persons 50 to 64 years of age compared with adults 65+ years of age. Rates of treatment admissions involving primary use of illicit and misuse of prescription drugs have increased, while rates involving primary use of alcohol only have decreased. Alcohol, opioids/heroin, and cocaine were more likely than other substances to be associated with treatment use. Limited research data suggested the effectiveness of treatments, especially for women. Furthermore, older adults appeared to be less likely than younger adults to perceive substance use as problematic or to use treatment services.

Discussion—There is robust evidence showing that an increased number of older adults will need substance abuse care in the coming decades. Increasing demands on the substance abuse treatment system will require expansion of treatment facilities and development of effective service programs to address emerging needs of the aging drug-using population.

Keywords

alcohol; epidemiology; health behaviors; drug abuse; illicit drug use; prescription drug abuse

Introduction

In this article, we review the extent of and comorbid conditions associated with psychoactive drug use and disorders among adults aged 50+ years. Adults aged 50 to 64 years are included so that the impact of the “baby-boom” population (i.e., persons born in

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the post–World War II period, 1946–1964) can be compared with elders aged 65+ years. This review focuses on an understudied area of research: (a) psychoactive drug use defined as illicit drug use or nonmedical use of prescription psychotherapeutic drugs and (b) *DSM-IV* drug abuse or dependence (American Psychiatric Association [APA], 2000). Issues associated with assessment, diagnosis, and treatment also are discussed; suggestions for future research are summarized. Alcohol abuse and dependence are excluded from the review because of an attempt to focus on the "hidden" emerging problems of drug use as opposed to alcohol-related problems.

Older Adults as a Growing At-Risk Population

Older adults constitute a unique, at-risk population for psychoactive drug use. As middle-aged cohorts enter later life, aging-related health and psychosocial conditions can complicate drug use, and medical exposures to psychoactive medications can increase. The number of Americans aged 50+ years is increasing as large numbers of baby boomers reach age 50 years or older, and this cohort uses more psychoactive drugs than older cohorts (Gossop & Moos, 2008; Han, Gfroerer, & Colliver, 2009a). Between 1980 and 2007, the number of Americans aged 45 to 64 years increased from 20% to 25%, while the population under 18 years fell from 28% to 25% (Center for Disease Control and Prevention [CDC], 2010). This trend will continue as life expectancy increases and baby boomers continue to age unless a dramatic period effect emerges to reduce substance use.

In addition, aging-related physiological changes may increase sensitivity to the effects of substance use, medication use can interact with more frequent use of psychoactive drugs by older adults, and chronic medical or psychological conditions can be triggered or worsened by drug use (Dowling, Weiss, & Condon, 2008; Gossop & Moos, 2008). For example, because all drugs of abuse act by altering neurotransmission in the brain (predominantly dopaminergic, serotonergic, and glutamatergic systems), aging-related changes to the brain, drug metabolism, and pharmacokinetics (i.e., the process by which a drug is absorbed, metabolized, and eliminated from the body) can place older drug users or abusers at elevated risk for severe neurotoxicity and drug-related adverse consequences (Dowling et al., 2008).

Prescriptions of psychoactive medications also may increase the user's risk for nonmedical use, abuse, or dependence (Culberson & Ziska, 2008; Voyer, Préville, Cohen, Berbiche, & Béland, 2010). At least one in four older adults has used psychoactive medications with abuse potential and such use is likely to grow as the population ages (Simoni-Wastila & Yang, 2006). Unfortunately, nonmedical prescription drug use and abuse have become a major health concern in the United States as shown in rising trends in prescription drug poisoning deaths and emergency department visits (Manchikanti, 2007). Moreover, the increased supply and availability of controlled substances, either from therapeutic use, prescriptions, or unregulated Internet pharmacies (Manchikanti, 2006, 2007), suggest that older adults are at further risk for exposure to psychoactive drugs.

Taken together, the need for substance abuse care among older adults is expected to increase with time. Older adults who suffer from chronic conditions and seek medical care associated with aging are likely to be affected by drug use–related problems, which may further augment the risk and necessitate unique consideration for treatment (CDC, 2010; Dowling et al., 2008). Psychoactive drug use and disorders among older adults, however, remain a neglected area of research (Dowling et al., 2008; Gossop & Moos, 2008). Existing studies have focused mainly on alcohol use disorders, and there are few comparable empirical data on psychoactive drug use and disorders (Simoni-Wastila & Yang, 2006). The American Geriatrics Society has published clinical guidelines for alcohol use disorders in older adults (American Geriatrics Society, 2003). However, similar guidelines are not available for psychoactive drug abuse. A better understanding of the extent and correlates of psychoactive

drug use and abuse can improve early case identification and timely intervention for this vulnerable population. These issues are reviewed and discussed below.

Projected Drug Use Trends Among Older Adults

Because of the concern that the aging baby-boom population will place increasing demands on the substance abuse treatment system in the next few decades, Gfroerer and Epstein (1999) used data from marijuana users in the 1995–1996 National Household Survey on Drug Abuse (NHSDA) to generate the first estimates of the number of illicit dug users who will need drug abuse treatment for the years 2000 through 2020. Because the baby-boom cohort uses more drugs than previous cohorts, the proportion of adults aged 50+ years who will need substance abuse treatment is projected to increase from 4% in 1995 to 17% to 34% by 2020. Although Blacks generally have a low rate of lifetime marijuana use, the national data suggest that older black adults will have a higher probability of needing substance abuse treatment than their White counterparts (Gfroerer & Epstein, 1999).

Subsequently, Colliver, Compton, Gfroerer, and Condon (2006) used data from the 1999–2001 NHSDA to estimate the number of past-year illicit/nonmedical drug users aged 50+ years of age in 2020. Past-year marijuana use among adults aged 50+ years is estimated to increase from 1.0% (719,000 users) in 1999–2000 to 2.9% (3.3 million) in 2020. This increase is considered a combined effect of the increase in rate of use and a projected 51.8% increase in the civilian noninstitutionalized population in this age group. In addition, use of any illicit drug is estimated to increase from 2.2% (1.6 million) to 3.1% (3.5 million), and nonmedical use of prescription drugs (opioids, sedatives, tranquilizers, and stimulants) is projected to increase from 1.2% (911,000) to 2.4% (2.7 million). The majority of past-year users of marijuana (87%) or prescription drugs (77%) in 2020 will be White; older Blacks will be as likely as older Hispanic to use marijuana (6% vs. 5%) or prescription drugs (9% vs. 10%); there will be no gender differences in use of these drugs.

More recently, Han, Gfroerer, Colliver, and Penne (2009b) estimated the number of adults aged 50+ years with a past-year substance use disorder (alcohol/drug abuse or dependence) in 2020. By using more current data from the 2002–2006 National Surveys on Drug Use and Health (NSDUH), the number of adults aged 50+ years with a substance use disorder (alcohol or drugs) is projected to double from 2.8 million (annual average) in 2002–2006 to 5.7 million in 2020. Increases are projected for all examined gender, racial/ethnic, and age groups. The majority of individuals with a substance use disorder is projected to be male (71%) and White (76%); Blacks (10.5%) and Hispanics (10%) will have similar numbers of persons with a substance use disorder. Such increases are reported to be a combined effect of a 39% population increase and a 44% increase in the rate of past-year substance use disorders. However, the number of adults aged 50+ years with a substance use disorder may exceed the estimated 5.7 million because these estimates don’t include potentially high-risk older adults who reside in institutions, and the data used to derive the estimates are based on self-reports, which may be influenced by respondents’ underreporting (Gfroerer, Penne, Pemberton, & Folsom, 2003; Han et al., 2009b).

In summary, the only national study of projections for substance use disorders reveals that the number of individuals with a substance use disorder among adults aged 50+ years is expected to increase for all gender and racial/ethnic groups (Whites, Hispanics, Blacks, and others) in the next decade (Han et al., 2009b). Overall, older men are more likely than older women to have a substance use disorder. However, due to a lack of distinction between illicit and prescription drug use disorders, gender and racial/ethnic differences in specific drug use disorders remain unclear.

Surveys of the General Population

Adults aged 50 to 64 years use more psychoactive drugs than older groups (Blazer & Wu, 2009a, 2009b). Han and colleagues (2009a) examined the national trends of drug use among adults aged 50 to 59 years in the 2002–2007 NSDUH to clarify their patterns of drug use. Between 2002 and 2007, the rate of past-year use increased from 3.1 % to 5.7% for marijuana and 2.2% to 4.4% for nonmedical prescription drug use. Overall, 9.4% of adults aged 50 to 59 years in 2007 used an illicit or nonmedical drug in the past year. Their analyses also confirmed that the increase in drug use between 2002 and 2007 was driven primarily by the aging of the baby-boom cohort. Characteristics associated with continued drug use in this age group include male gender, unmarried status, early onset of drug use, residence in the western region, less education, low-income status, unemployment due to disability, recent alcohol or tobacco use, having a major depressive episode in the past year, and rare attendance of religious services (Han et al., 2009a).

In addition, by comparing the data from the 1991–1992 National Longitudinal Alcohol Epidemiologic Survey (NLAES) and the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), Compton, Grant, Colliver, Glantz, and Stinson (2004) found that the rate of past-year marijuana use between 1991–1992 and 2001–2002 had increased in the 45 to 64 age group for women (from 0.3% to 0.7%), men (from 0.8% to 2.5%), Whites (0.5% to 1.6%), and Blacks (1% to 1.9%). Of all past-year marijuana users aged 18+ years, there was an increase in past-year marijuana use disorders among Blacks (from 21.2% to 38.6%) and Hispanics (from 23.7% to 37.1%). Owing to the sample size of the 65+ age group, detailed comparisons for this group are precluded.

Because of few empirical estimates for specific type of drug use among adults aged 50+ years, Blazer and Wu (2009a, 2009b) examined the prevalence of past-year use and disorders for specific drugs by analyzing the pooled data from the 2005–2006 NSDUH. The investigators found that adults aged 50 to 64 years were more likely than those aged 65+ years to use marijuana (3.9% vs. 0.7%) and cocaine (0.7% vs. 0.04%) in the past year and that the rates of past-year use of inhalants, hallucinogens, methamphetamine, and heroin were very low (<0.2%) among noninstitutionalized adults aged 50+ years. Adjusted logistic regression found that age 50 to 64 years, male gender, separated/divorced/widowed status, never-married status, and past-year major depression increased odds of marijuana use; age 50 to 64 years, male gender, native American status, Black race, not employed status, separated/divorced/widowed status, never-married status, and past-year major depression increased odds of cocaine use. Overall, 11.7% of past-year drug users (marijuana, cocaine, inhalants, hallucinogens, methamphetamine, and heroin) aged 50+ years met *DSM-IV* criteria for a past-year drug use disorder. Among past-year marijuana users aged 50+ years, 4.5% met criteria for a past-year marijuana use disorder; among past-year cocaine users aged 50+ years, 43.9% met criteria for a past-year cocaine use disorder. It is important to note that these estimates cannot be applied to institutionalized older adults as they are not included in the national surveys (Blazer & Wu, 2009a).

Using the data from the 2005–2006 NSDUH, Blazer and Wu (2009b) also examined nonmedical prescription drug use among adults aged 50+ years. In a national sample of civilian noninstitutionalized adults, past-year nonmedical use of prescription opioids (1.4% in adults aged 50+ years) was more prevalent than nonmedical use of prescription sedatives (0.14%), tranquilizers (0.46%), and stimulants (0.16%). Several groups showed elevated odds for nonmedical opioid use, including adults aged 50 to 64 years (1.9 %), men (1.7%), American Indians/Alaska natives (9.0%), alcohol users (1.7%), marijuana users (10.7%), and adults with past-year major depression (2.9%). Propoxyphene, hydrocodone, oxycodone, and codeine products were the opioid products commonly used for nonmedical reasons. The majority (88%) of nonmedical opioid users reported that their first nonmedical

opioid use occurred in adulthood (51% at age 18–39 years; 16% at age 40–49 years; 21% at age 50+ years); 50% of all users reported using nonmedical opioids on 12+ days in the past year (*M* = 34.84 days). Although the overall past-year prevalence of prescription opioid use disorders among all adults aged 50+ years was low (0.13%), the risk of prescription opioid dependence was comparatively high (one in 13 users; 7.6%) compared with the risk for abuse (1.7%) among nonmedical opioid users.

In addition to prescription opioids, benzodiazepines have received more research attention than other prescription psychoactive drugs (Culberson & Ziska, 2008). Benzodiazepines are among the most prescribed psychiatric medications (Grohol, 2010). Approximately 9% to 54% (*M* = 32%) of elderly adults have used benzodiazepines in a given year (Llorente, David, Golden, & Silverman, 2000). Despite the high prevalence of use, existing studies have focused primarily on factors and adverse effects associated with their prescription use. There is a paucity of information on nonmedical benzodiazepine use and abuse/dependence in the elderly (Llorente et al., 2000). Research findings from benzodiazepine-using outpatients (*N* = 599) have shown that a longer duration or higher dose of benzodiazepine use increases the odds for developing benzodiazepine dependence (Kan, Hilberink, & Breteler, 2004). In a recent survey of community-dwelling elderly adults aged 65+ years in Canada (*n* = 2,798), 3.3% of women and 0.8% of men met *DSM-IV* criteria for past-year benzodiazepine dependence (Préville et al., 2008). Of the subsample of benzodiazepine users aged 65+ years, about 1 in 10 (9.5%) met criteria for benzodiazepine dependence (Voyer, Préville, Roussel, Berbiche, & Beland, 2009). Women and those who had cognitive impairment, panic disorders, or suicidal ideations had elevated odds of developing dependence on benzodiazepines (Voyer et al., 2009).

Last, cross-national studies provide some evidence that adult Americans use more illicit drugs than adults in other countries. Recent analyses of selfreported drug use data from the 54,068 respondents in the World Health Organization (WHO) World Mental Health Surveys (WMH) showed that, except for one country (New Zealand) that suggested a similar high rate of drug use, illicit drug use generally was more prevalent in the United States than in the other countries (Degenhardt et al., 2010). In the overall 18+ age group, 40.9% of Americans used marijuana and 18.7% used other illicit drugs by age 29 years, while the corresponding rate for adults in other countries (excluding New Zealand) was 0.3% to 18.4% and 0.2% to 4.9%, respectively. In the 45 to 59 age group, 40.7% of Americans used marijuana and 15.7% used other illicit drugs by age 29 years, while the corresponding rate for adults in other countries (excluding New Zealand) was 0% to 13.0% and 0% to 2.4%, respectively.

Taken together, in the civilian noninstitutionalized older population, adults aged 50 to 59 years (the baby-boom cohort) use more illicit or nonmedical drugs than older groups; marijuana and cocaine are the most commonly used illicit drugs, and opioid analgesics are the prescription medications most commonly used for nonmedical reasons. Among older past-year illicit drug users, close to 12% develop a *DSM-IV* drug use disorder; among older past-year nonmedical prescription opioid users, 9% to 10% develop a *DSM-IV* prescription opioid use disorder (Blazer & Wu, 2009a, 2009b).

Admissions to Substance Abuse Treatment Facilities

Admission data from the Treatment Episode Data Set (TEDS) can be used to monitor characteristics of older adults who seek treatment for substance abuse (Substance Abuse and Mental Health Services Administration [SAMHSA], 2008). TEDS provides an annual compilation of admission (rather than individual-level) data on demographics and substance abuse problems of people admitted to substance abuse treatment facilities receiving some public funding. In 2005, admissions for adults aged 50+ years accounted for about 10% of the 1.8 million treatment admissions for substance abuse reported to TEDS (SAMHSA,

2007a). In line with study results from national surveys of the general population (Blazer & Wu, 2009a, 2009b; Han et al., 2009a), adults aged 50 to 59 years are more likely than adults 60+ years of age to use substance abuse treatment. Adults aged 50 to 59 years accounted for 83% of all admissions aged 50+ years. There are also important race/ethnicity-by-age differences in admissions: the proportion of admissions among Whites increased gradually with age strata (55% in the 50–54 age group vs. 66% in the 70+ age group), whereas the proportion of admissions among Blacks decreased with age strata (30% in the 50–54 age group vs. 14% in the 70+ age group). Alcohol, opioids/heroin, and cocaine are the most commonly reported primary substances of use in the 50 to 59 age group; they accounted for 55% to 62%, 19% to 22%, and 10% to 13% of all admissions, respectively. More adults aged 50+ years received substance abuse care in an ambulatory setting (55% to 63%) than in a detoxification (27% to 32%) or rehabilitation/residential (10% to 15%) setting.

Trend data from TEDS not only suggest a changing profile of substances used but also confirm an increased trend in drug abuse among older adults. Admission data for adults aged 65+ years showed that, between 1995 and 2005, the proportion of admissions for alcohol as the primary substance of use had decreased from 84.7% to 75.9%, whereas the proportions of admissions had increased significantly for opioids/heroin (from 6.6% to 10.5%), cocaine (2.1% to 4.4%), and sedatives (0.5% to 1.3%; SAMHSA, 2007b). Similarly, Lofwall, Schuster, and Strain (2008) found that admissions to substance abuse treatment facilities among adults aged 50+ years had increased significantly between 1992 and 2005; in 2005, 61% of admissions in the 50–54 age group and 45% of admissions in the 55+ age group reported illicit drug use (mainly heroin and cocaine). The increase in drug use also paralleled higher rates of admissions for combined alcohol and drug use, for drug use only, and for use of multiple substances over time; there was a decreased trend in admissions for use of alcohol only. Specifically, increased rates of admissions for drug use-related admissions were noted among Blacks aged 55+ years, Whites aged 50+ years, older adults (50+ years) with 12+ years of education, or those whose admissions involved criminal justice referrals (Lofwall et al., 2008).

Data from TEDS also showed important differences and similarities between the characteristics of older (55+ years) versus younger (30–54 years) admissions (Arndt, Gunter, Acion, 2005). Compared with younger admissions, a higher proportion of older admissions reported alcohol as the primary substance of use (76.3% vs. 50.5%), had no prior treatment episodes (43.2% vs. 36.9%), and used only one substance at admission (77.1% vs. 46.0%); a lower proportion reported using opioids/heroin (14.3% vs. 21.1%) and cocaine/crack (5.4% vs. 16.8%). However, older admissions were similar to younger admissions in daily use of primary substance of use (55.6% vs. 51.4%) and criminal justice referrals to treatment (25.4% vs. 28.0%). Both groups also were most likely to report opioids/heroin and cocaine/crack as their primary illicit drugs of use. There are also gender differences among older admissions. Compared with older male admissions, a higher proportion of female admissions attended college, were White, identified alcohol as the primary substance of use, and initiated substance use at a later age (Arndt et al., 2005).

In summary, consistent with study results from surveys of the noninstitutionalized population, findings from treatment-seeking populations indicate an increasing trend of drug use/abuse. Older admissions associated with combined alcohol and drug use and with drug use alone have increased, while older admissions associated with alcohol use alone have decreased. Alcohol, opioids/heroin, and cocaine are the primary substances most commonly used by older adults in substance abuse treatment.

Other High-Risk Populations

Methadone maintenance patients—A few studies have documented the characteristics of older opioid-dependent patients. Lofwall, Brooner, Bigelow, Kindbom, and Strain (2005) compared clinical profiles of 41 older methadone maintenance patients (aged 50–66 years) with those of 26 younger patients (aged 25–34 years). The older group resembled the younger group in the rate of lifetime substance use disorders. However, the older group not only reported a higher number of years in substance abuse treatment (M = 4.2 vs. 1.3 years) and incarceration (M = 4.2 vs. 1.4 years) but also had more medical problems and worse general health than the younger group. These results suggest a severe pattern of drug abuse and medical problems among the older methadone maintenance patients; their generalizability, however, is constrained by a small sample of older treatment-seeking patients.

Firoz and Carlson (2004) examined 759 methadone maintenance patients. Contrary to the findings of Lofwall et al. (2005), there were no differences in psychiatric and medical problems between the older group (55+ years; n = 54) and the younger group (<55 years; n = 705). Instead, the older group was more likely than the younger group to be married and have better treatment outcomes. The investigators suggested that frail older adults may have stopped using heroin, died, switched to prescription drugs, or engaged in less drug use, thus leaving methadone programs with healthier patients.

More recently, Rosen, Smith, and Reynolds (2008) examined 140 methadone patients aged 50+ years. Their findings revealed a high rate (57%) of past-year mental disorders among older methadone patients (major depressive episode, 33%; post-traumatic stress disorder, 28%; generalized anxiety disorder, 30%). Older patients also exhibited high rates of health problems in the past year (arthritis, 54%; hypertension, 45%; hepatitis, 49%) and fair-topoor physical health (58%). In addition, women were more likely than men to have a major depressive episode (44% vs. 27%), agoraphobia (21% vs. 10%), and panic disorder (23% vs. 12%), while men were more likely to have hypertension (52% vs. 29%) and diabetes (16% vs. 2%). These findings document important gender differences in comorbid conditions among older methadone patients and suggest differential needs for treatment.

Similarly, Rajaratnam, Sivesind, Todman, Roane, and Seewald (2009) compared 45 methadone patients aged 55+ years to 111 methadone patients aged 24–54 years. Compared with younger patients, older patients were more likely to have longer periods of treatment, a history of alcohol misuse, more chronic medical problems, and greater use of medications for medical problems, but were less likely to report current illicit drug use. Despite numerous medical and psychiatric complaints and age-related declines in health, only 7% of older patients had regular contact with a primary care physician. These findings suggest that additional efforts are needed to improve use of health services for aging methadone patients (Rajaratnam et al., 2009).

Emergency services—In a study of 3,415 adults aged 50+ years in an inner city who presented to an emergency department over a 10-month period, 3% (n = 107) were identified to be positive for using psychoactive drugs (Schlaerth, Splawn, Ong, & Smith, 2004). Of the 107 drug users, 50% were current cigarette users, and 42% were current alcohol users. Cocaine (63%) was the most commonly used illicit drug identified, followed by opioids (16%), marijuana (14%), and barbiturates (7%). The study also showed that cigarettesmoking drug users had a higher rate of cardiovascular (74% vs. 44%) and pulmonary (38% vs. 13%) diseases than non-cigarette-smoking drug users. Study results suggest that older drug users who also smoke cigarettes might have considerable health concerns (Schlaerth et al., 2004).

Data from the U.S. Drug Abuse Warning Network (DAWN) indicate that there were more than a half million visits to emergency departments involving nonmedical use of pharmaceuticals in 2004 (SAMHSA, 2009). Opioids and benzodiazepines were the two most cited medications among all visits (32% and 27%, respectively) and among adults aged 55+ years (33% and 21%, respectively). Most of the visits involved use of other substances (mainly alcohol): 65% of visits for opioids and 76% of visits for benzodiazepines.

Urine toxicology screens were used to determine the prevalence of drug use (barbiturate, benzodiazepine, cocaine, opiate, phencyclidine, and amphetamine) among patients aged 65+ years (n = 104) in psychiatric emergency services (Woo & Chen, 2010). More than 1 in 4 elderly patients (27%) showed positive urine toxicology. The vast majority (93%) also had a psychiatric diagnosis (psychosis, depression, substance use disorder), suggesting that psychoactive drug use may be highly prevalent among treatment-seeking elderly psychiatric patients who, thus, should be routinely screened for adverse effects from psychoactive drug use.

Prison inmates—To understand mental health and substance abuse treatment needs of older prisoners, Arndt, Turvey, and Flaum (2002) examined substance abuse history among 10,952 offenders. Offenders aged 55+ years (n = 180) were compared with middle-aged (30–54 years; n = 5,481) and young (under 30 years; n = 5,291) offenders. The three groups did not differ in psychiatric problems (22%–23%), and the majority of older (71%), middle-aged (94%), and young (91%) offenders reported a substance abuse problem. Compared with the younger groups, older offenders were more likely to abuse alcohol only and to report cocaine as the primary illicit drug of use, while younger offenders were more likely to report marijuana and methamphetamine as their primary illicit drugs of use. Although there were few differences in age of first substance use (14–17 years), older offenders with substance abuse problems had more years of substance use (42.7 years) than middle-aged (23.0 years) or young (8.8 years) offenders. Overall, the findings suggest that older prisoners are chronic substance abusers, and yet more than one third had never received treatment.

In summary, while results from treatment-seeking samples and inmates are limited in their generalizability (e.g., a small sample size of older adults and selection bias), they nonetheless suggest that older drug users who were methadone patients, psychiatric patients, or inmates constitute severe subsets affected by comorbid psychiatric or medical problems. Opioids/heroin and cocaine are the two drug classes most commonly used by these groups. Given the increased rate of use among the older population and the relatively low rate of their treatment use (Arndt et al., 2002; Rajaratnam et al., 2009), there is a clear need to increase research efforts for this high-risk group to develop effective substance abuse care addressing the wide range of their medical and mental health problems (Lofwall et al., 2005; Rosen et al., 2008).

Summary of Correlates of Nonmedical or Illicit Drug Use

A summary of correlates of nonmedical or illicit drug use among older adults are presented in Tables 1 to 4.

Screening, Assessment, and Diagnosis

Screening and Assessment

Substance abuse among older adults has been described as an *invisible epidemic* because problematic substance use and disorders tend to be underrecognized, underdiagnosed, or undertreated (Center for Substance Abuse Treatment [CSAT], 1998). Potential barriers to early identification or treatment may include insufficient knowledge, denial of substance

problems, limited research data, hurried office visits, stigma or shame about substance use, a general reluctance to seek professional help, lack of financial resources or transportation, comorbid conditions that complicate diagnosis or treatment (e.g., cognitive impairment), and shrinking social support network (CSAT, 1998). Compared with younger adults, older adults are less likely to report or perceive their alcohol/drug use as excessive or problematic (Nemes et al., 2004). The Consensus Panel of the Treatment Improvement Protocol (TIP) recommends that adults aged 60+ years should be screened for alcohol and prescription drug abuse as part of a regular physical examination (CSAT, 1998, 1999).

Because older adults often see primary care physicians for medical concerns, these visits provide an excellent opportunity to screen for substance use problems and to refer patients to appropriate counseling and treatment as necessary (Nemes et al., 2004). Recent findings from a screening and brief intervention project for substance misuse among older adults (the Florida Brief Intervention and Treatment for Elders [BRITE] project) have suggested that BRITE not only has increased the number of older substance users being screened, identified, and then treated but also has improved substance use behaviors in this population (Schonfeld et al., 2010).

However, the challenge in recognizing substance abuse among older adults is compounded by the dearth of screening instruments designed specifically for this age group (Dowling et al., 2008). The CAGE, a screening instrument for alcohol abuse and dependence, has been modified to include drug abuse to reflect both alcohol and drug consumption (e.g., “Have you ever felt you should cut down on your drinking or *drug use?*”) and examined in a sample of adults aged 60+ years (Hinkin et al., 2001). Study results for the CAGE have shown an excellent level of sensitivity but a poor level of specificity (Hinkin et al., 2001). While the initial data suggest the utility of the modified CAGE for identifying drug and alcohol abuse, additional research is needed to further test its validity in older adults.

More recently, a computerized screening system (the Drug and Alcohol Problem Assessment for Primary Care or DAPA-PC) has been developed and tested for quickly identifying and addressing substance abuse and related problems in a primary care setting (Holtz, Landis, Nemes, & Hoffman, 2001; Nemes et al., 2004). DAPA-PC is a self-administered, Internet-based screening instrument that features automatic scoring, generation of a patient profile for medical reference, and presentation of unique motivational messages and advice for the patient (Nemes et al., 2004). Initial research findings from adults aged 55+ years versus adults aged 18 to 54 years show some support for the use of DAPA-PC (Nemes et al., 2004). The investigators have highlighted that use of a computerized screening instrument can save clinicians’ time by allowing patients to be screened while in the waiting room, resulting in the need for the clinician to follow up with a patient only when prompted by the results of the screening. A lack of familiarity with computers, however, may pose a potential barrier to its application for older adults (Nemes et al., 2004).

In summary, screening, in combination with brief interventions, can help address some aspects of underidentification of and undertreatment for substance abuse among older adults (CSAT, 1999; Schonfeld et al., 2010). However, there are presently no validated drug abuse screening tools designed specifically for the elderly (Culberson & Ziska, 2008). Additional studies are needed to develop valid drug abuse screening instruments for older adults in various settings. Older adults often make visits to health care facilities. Health care providers thus are in a unique position to identify older adults at risk for drug abuse and can play an important role in increasing awareness of adverse effects from drug use (Nemes et al., 2004). Identifying older adults with substance use problems during health care visits also represents an opportunity to reduce barriers to treatment (Gossop & Moos, 2008). Given that

few (<12%) substance abuse treatment admissions among older adults result from general health care provider referrals (Arndt et al., 2005), there is clearly a need to increase opportunities for detection of and intervention in older substance abusers.

Assessments for Early-Onset versus Late-Onset Drug Users

To inform cost-effective treatment strategies, assessments for drug use problems should distinguish between early-onset and late-onset drug users. Early onset of substance use is associated with elevated odds for developing substance use disorders and needing treatment (Gfroerer et al., 2003; Gfroerer, Wu, & Penne, 2002; Han et al., 2009b). Using national data from adults aged 50 to 59 years, researchers have estimated that approximately 90% of drug users initiated illicit drug use by age 30 years and about 72% initiated nonmedical use of prescription drugs by that age (Han et al., 2009b). Around 3% initiated illicit drug use and 9% initiated nonmedical prescription drug use at age 50 years or older. Hence, a comparatively large proportion of early-onset drug users will be more likely than late-onset users to have a wide range of medical, psychiatric, or social problems that will require more intensive or integrated treatments and monitoring (CSAT, 1998; Gossop & Moos, 2008; King, Van Hasselt, Segal, & Hersen, 1994). This (early-onset) group of old, long-term substance abusers can be found from research on older methadone maintenance patients (Lofwall et al., 2005) and offenders (Arndt et al., 2002).

Likewise, admission data from TEDS have revealed that the vast majority of older admissions (aged 55+ years) indicate first substance use before age 30 years (90% in men; 70% in women) and that self-referrals and criminal justice referrals represent at least two thirds (69% in men; 66% in women) of admissions (Arndt et al., 2005). TEDS data further suggest that women tend to overrepresent the older admission group (55+ years) and are more likely than men to initiate substance use in late life. Less problematic groups of latelife onset users may benefit from more timely brief or low-intensity interventions (see CSAT, 1998).

Taken together, older early-onset drug users not only may differ from older late-onset drug users in demographic characteristics (men vs. women) but also in risk factors and health status. Screening or assessments for drug use problems among older adults should include age of first drug use. Earlyonset users require a more comprehensive assessment of substance use and psychiatric histories than late-onset users, while the latter group may need a more thorough evaluation of recent changes in personal health status and environmental factors that could trigger the onset of drug use. Clearly, research is needed to better distinguish between early-onset and late-onset substance users for older adults in order to inform early interventions and effective treatment (Gossop & Moos, 2008; King et al., 1994).

Diagnosis

Symptoms of drug abuse and dependence can be difficult to assess and diagnose in the older population. Currently available diagnostic criteria for substance use disorders, such as *DSM-IV* (APA, 2000), have been developed and validated mainly in young and middle-aged samples; they may be of limited utility for older adults and may result in biased estimation (e.g., underestimation) for prevalence rates of substance use disorders in this population (CSAT, 1998; King et al., 1994; Miller, Belkin, & Gold, 1991; Patterson & Jeste, 1999).

First, two of the seven *DSM-IV* dependence criteria are mainly physiological symptoms (*tolerance* and *withdrawal*). Aging-related changes in pharmacokinetics and physiology can alter older adults' manifestations and response to physiological symptoms by possibly increasing sensitivity to the effects of tolerance and withdrawal, which may lead to

reduction in drug use. Therefore, physiological symptoms may be more subtle or protracted. Second, declines in physical health, cognitive impairment, or severe comorbid conditions may interfere with older adults' recall or interpretations of other *DSM-IV* drug dependence symptoms, mainly compulsive drug use behaviors (*taking larger amounts or longer*, *greater amounts of time spent in using or recovering from the effects*, *reduced activities*, *inability to cut down on use*, *continued use despite resulted problems*). Due to a possible increase in sensitivity to drugs' effects, adverse response may occur with low use. Third, because of retirement, family losses, shrinking social networks, *DSM-IV*'s abuse criteria (*role interference*, *hazardous use*, *legal problems*, *relationship problems*) may be less applicable to older adults than to younger people. Given such age-related changes in these environmental domains, there is a need to evaluate the utility of revising (or lowering) the diagnostics threshold and to focus attention more on the pattern and frequency of drug use for older adults (Atkinson, 1990; King et al., 1994).

To summarize, *DSM-IV* criteria are less applicable to older adults with substance use problems. To be useful in assessing older adults, *DSM-IV* criteria must be interpreted and applied age-appropriately (CSAT, 1998). Given that the new DSM5 is expected to be released in 2013 (Schatzberg, 2010), there is clearly a need for empirical data to inform revisions of diagnostic threshold and criteria for older adults.

Treatment

Extant studies of treatments for older substance abusers have focused predominantly on alcohol use problems. Study results have suggested that treatment is effective, especially for older women, and that a longer length of stay in treatment is associated with better outcomes (Blow et al., 2000; Oslin, Slaymaker, Blow, Owen, & Colleran, 2005; Satre, Blow, Chi, & Weisner, 2007; Satre, Mertens, Areán, & Weisner, 2004). However, results from controlled studies tend to be constrained by a small sample size of older participants and potential selection bias as older adults are reported to have a low level of willingness to participate in clinical research (Blow et al., 2000).

On the other hand, the Consensus Panel of the TIP recommends that the least-intensive treatment options should be explored first with older substance abusers (CSAT, 1998). Brief intervention is the recommended first step, followed, if necessary, by intervention, motivational interviewing, or specialized treatment; intervention strategies need to be nonconfrontational and supportive. Elder-specific strategies that address age-specific psychological, social, and health concerns and contexts are recommended to incorporate into treatment plans for older substance abusers. Specifically, TIP recommends the following general approaches for treatment of older substance abusers (CSAT, 1998, 2005):

- Cognitive-behavioral approaches
- Group-based approaches
- Individual counseling
- Medical/psychiatric approaches
- Marital and family involvement/family therapy
- Case management/community-linked services and outreach

The following components are recommended to be incorporated into treatment designs to enhance treatment outcomes (CSAT, 1998, 2005):

- Emphasis on age-specific treatment (e.g., mixed 12-step programs may not be appropriate for the elderly)

- Use of supportive, nonconfrontational approaches that build self-esteem (in contrast to confrontational therapies often used with younger adults)
- Focus on cognitive-behavioral approaches (as opposed to more nondirective therapies)
- Development of skills for improving social support
- Recruitment of counselors who are trained and motivated to work with older adults
- Use of age-appropriate pace and content

Summary and Future Directions

Summary

This article reviews recent empirical evidence on the prevalence and correlates of drug use and disorder as well as screening, assessment, diagnosis, and intervention for these problems in the population aged 50+ years. Study findings from multiple indicators and sources indicate the following:

- The baby-boom cohort, especially adults aged 50 to 64 years, uses more illicit or nonmedical drugs than older cohorts. Because of projected increases in the growth of the population size and the use of substances, the number of older adults with a substance use disorder (predominantly men and Whites) will at least double by 2020.
- Opioids/heroin, cocaine, and marijuana are the drugs most commonly used by older adults, and the majority of users also use alcohol. However, alcohol, opioids/heroin, and cocaine are the substances most often associated with treatment seeking.
- A changing and disturbing pattern of substance abuse is evident from increasing numbers of older adults seeking treatment for combined alcohol and drug use or for drug use only.
- The vast majority of older drug users seeking treatment initiated substance use before age 30 years, and many are referred from the criminal justice system, suggesting a chronic course of substance abuse.
- Older drug users who are methadone patients, psychiatric patients, or inmates represent a particularly severe subset affected by multiple comorbid psychiatric or medical problems.
- The criteria listed in the official diagnostic manual for substance use disorders in the United States (the *DSM-IV*) appear to be inadequate and less applicable to older substance users as compared with younger adults.
- Early screening of and intervention for substance use can improve some aspects of underidentification of and undertreatment for substance abuse.
- Older substance abusers appear to have particularly low rates of formal aftercare use or substance abuse care as compared with younger adults.
- Older substance abusers are more likely to receive treatment through self-referrals or the criminal justice system than through general health care providers.

Future Directions

This review also identifies several areas for future research:

- Older Americans have been exposed to a society in which substance use is much more prevalent than in the other societies. Given the increased trend in drug use and availability of prescription psychoactive drugs, there is a continued need to monitor trends (especially nonmedical use and abuse of prescription opioids), key demographic characteristics, and health conditions associated with drug use among older adults.
- To inform effective prevention and treatment efforts, research is needed to elucidate risk factors and psychiatric characteristics of different groups of substance users by type of substance use (licit vs. illicit) and onset of use (early-onset vs. late-onset).
- The high prevalence of prescription use of benzodiazepines, antidepressants, and opioid analgesics among older adults, coupled with relatively limited empirical data on their nonmedical use and abuse/dependence, provide a good rationale for further research on evaluating the extent, correlates, and consequences of these gaps for older adults.
- Limited data suggest that older adults are less likely to perceive their substance use as being excessive or problematic, to use formal substance abuse care, or to participate in addiction research. These issues warrant research in order to inform assessments and treatment services for this group.
- To improve early identification and treatment for the older population, there is a clear need to develop and test screening instruments specifically for this population as well to improve official diagnostic criteria and thresholds for substance use disorders among older adults.
- Controlled treatment studies among older adults focus mainly on alcohol use disorder, are often based on small sample sizes of participants, and include a limited period of follow-up. Research is needed to include more diverse racial/ethnic groups, evaluate long-term outcomes, and examine effectiveness of treatments for older adults with drug use problems.

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Table 1

Potential Correlates of Drug Use in General

Male gender[a,b,c]	**Less education**[c]
Age 50–64 years (compared to age 65+)[a,b,c]	Low-income status[c]
Native American or Alaska native status[a,b]	Living in the western region[c]
Black race (specifically cocaine use)[a]	Recent alcohol or tobacco use[b,c]
Never-married status[c]	Mental health problems or distress[a,b,c]
Separated, divorced, or widowed status[a]	Involvement with the criminal justice system[d]
Not employed[a,c]	History of incarceration[d]

[a] Blazer and Wu (2009a).

[b] Blazer and Wu (2009b).

[c] Han et al. (2009a).

[d] Arndt et al. (2002).

Table 2

Potential Factors That Protect Against Drug Use

Being married[a,c]
Never using alcohol or tobacco[b,c]
Attending religious services regularly[c]

[a] Blazer and Wu (2009a).

[b] Blazer and Wu (2009b).

[c] Han et al. (2009a).

Table 3

Potential Correlates of Nonmedical Prescription Drug Use

Age 50–64 years (compared to age 65+)[a]
Recent or active alcohol or illicit drug use[a]
Psychiatric distress, depression, or mental diagnosis[a,c,d]
Chronic or long-term use of psychiatric medications[b]
Cognitive impairment[d]
Suicidal ideation[d]

[a] Blazer and Wu (2009b).

[b] Kan et al. (2004).

[c] Préville et al. (2008).

[d] Voyer et al. (2009).

Table 4

Likely Comorbid Conditions With Drug Use or Disorders

Alcohol abuse or dependence[b]
Depression (particular among women)[a,d]
Anxiety disorders (particular among women)[c,d,e]
Chronic medical conditions or diseases (particular among men)[d]

[a] Blazer and Wu (2009b).

[b] Lofwall et al. (2008).

[c] Préville et al. (2008).

[d] Rosen et al. (2008).

[e] Voyer et al. (2009).