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Ellen Tuchman[a]
[a] Silver School of Social Work, New York University, New York, New York

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Women and Addiction: The Importance of Gender Issues in Substance Abuse Research

Ellen Tuchman, PhD

ABSTRACT. Substance use was considered to be primarily a male problem, and many substance abuse studies are conducted with a predominance of male participants. However, recent substance abuse research indicates significant gender differences in the substance-related epidemiology, social factors and characteristics, biological responses, progressions to dependence, medical consequences, co-occurring psychiatric disorders, and barriers to treatment entry, retention, and completion. The epidemiology of women's drug use presents challenges separate from those raised by men's drug use. A convergence of evidence suggests that women with substance use disorders are more likely than men to face multiple barriers affecting access and entry to substance abuse treatment. Gender-specific medical problems as a result of the interplay of gender-specific drug use patterns and sex-related risk behaviors create an environment in which women are more vulnerable than men to human immunodeficiency virus. Individual characteristics and treatment approaches can differentially affect outcomes by gender. All of these differences have important clinical, treatment, and research implications.

KEYWORDS. Gender, women, substance abuse, treatment entry, retention, completion

INTRODUCTION

Historically, in substance abuse research, as in other fields of public health research, participants have largely been male. Emerging evidence in the past few years, however, is clearly establishing the importance of studying issues specific to women and studying male-female differences in all areas of substance abuse research. Studying outcomes separately in males and females expands our knowledge regarding women and drug abuse to include all areas of drug abuse and not just issues specific to women.[1] Accumulating epidemiological and clinical research indicates that the predictors for and progression to drug abuse and dependence are often gender-specific or are gender-sensitive.

Reasons for gender differences in drug abuse are not yet clear but could have important implications for the development of substance abuse treatment interventions and programs. The recent prevalence rates indicate that the number of female drug abusers is increasing, and the number of clinical studies in which sex and gender differences in drug abuse are investigated is steadily increasing.[2] Evidence presented in this article shows that there are noteworthy differences between men and women in the epidemiology of substance abuse, biological and subjective responses to drugs, patterns of use, progression

Ellen Tuchman is affiliated with the Silver School of Social Work, New York University, New York, New York.

Address correspondence to: Ellen Tuchman, PhD, Silver School of Social Work, New York University, 1 Washington Square North, New York, NY 10003 (E-mail: ellen.tuchman@nyu.edu).

from use to dependence, gender differences in medical consequences, co-occurring psychiatric disorders and substance abuse, women's history of victimization and violence, midlife and older women, specific barriers to treatment entry, retention, and completion for women.

EPIDEMIOLOGIC DATA

Epidemiologic data on substance abuse can provide an important basis for understanding the implications of drug abuse for women. Differences in patterns between women's and men's drug abuse are revealed through epidemiological data. The National Survey on Drug Use and Health is a yearly survey conducted through the Substance Abuse and Mental Health Services Office of Applied Studies. The most recent data report that an estimated 20.4 million people are currently using illicit drugs. Additionally, the number of people with substance dependence is 22.6 million in 2006.[3] Adult men are more likely than adult women to be current illicit substance abusers (10.5% vs. 6.2%, except prescription medications), alcohol users (65.9% vs. 57.9%), and tobacco users (36.4% vs. 23.3%).[3] However, men and women had similar rates of past month use of stimulants (0.5% for both), Ecstasy (0.2% for both), sedatives (0.1 and 0.2%, respectively), OxyContin (0.1% for both), LSD (0.1 and less than 0.1%, respectively), and PCP (less than 0.1% for both).

Among pregnant women aged 15 to 44 years, an estimated 11.8% reported current alcohol use, 2.9% reported binge drinking, and 0.7% reported heavy drinking. These rates were significantly lower than the rates for nonpregnant women in the same age group (53.0%, 23.6%, and 5.4%, respectively).[3]

Among those ages 50 years and older, men remain more likely than women to be dependent or abuse drugs (4.9 vs. 1.5%).[3] Alcoholism and prescription drug abuse are the top two chemical dependency issues for older women.[4] *Under the Rug: Substance Abuse and the Mature Woman* is a survey of primary care physicians and an analysis of prescriptions of psychoactive drugs for women older than 50 years (National Center on Addiction and Substance Abuse, 1998). Findings include the following: 1.8 million older women abuse or are addicted to alcohol, 2.8 million abuse or are addicted to psychoactive prescription drugs, and 4.4 million smoke cigarettes.[4] Of the 1.8 million mature women who need treatment for alcohol abuse and addiction, only 0.6%, or 11,000 women, are receiving it. Even when physicians refer midlife and older adult patients to substance abuse counseling or treatment, one-fifth say their referrals were denied because a managed care organization or insurance company would not cover the costs. In addition, the study also found that women older than 59 years are susceptible to abuse and addiction of alcohol and psychoactive prescription drugs because they get addicted faster and when using smaller amounts than any other group.

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF WOMEN

Several demographic and clinical factors that differentiate women from men with regard to substance use have been identified. Women are more likely than men to come from families where one or more members are also addicted to drugs or alcohol,[5,6] attribute the cause of substance abuse to genetic predisposition, family history, or environmental stress,[7] and attribute their drinking to a traumatic event or stressor.[8]

Additional research indicates that women who are addicted have a history of overresponsibility in their families of origin and reportedly have experienced more disruption in their families than their male counterparts.[5] Women are also more likely than men to be in relationships with drug-abusing partners or spouses who are drug abusers[5–10] and to identify relationship problems as a cause for their substance abuse.[7] In addition to interpersonal stressors, women are more likely to experience affective disorders, whereas men who are addicted are more likely to engage in sociopathic or criminal behavior. Although many women support their habits through prostitution or petty larceny, men are more likely to rely on robbery, con games, and burglary to support their substance abuse.[7]

Several differences between older male and female alcohol abusers have been reported.

Women are more likely than men to be widowed or divorced, to have had a problem drinking spouse, to have experienced depression, and to report more negative effects of alcohol.[11] Older women have later onset of alcohol problems,[12,13] more vulnerability to addiction stigma, greater use of prescribed psychoactive medications,[14] and are more likely to abuse multiple substances.[5,7,10] Women are more likely to combine their prescription drug abuse with marijuana, cocaine, or other drugs.[6,10] Investigators also find that women may view substance abuse more negatively and that the social stigma attached to the substance dependence may act as a deterrent for women, leading them to obtaining their drugs from legitimate sources such as physicians.[5,7,10] These factors may have implications for understanding the effects of gender and widowhood on the development of late-onset problem drinking.

It is well documented that women face greater medical exposure to psychotropic drugs than men, but little research examines whether women also have increased use of prescription drugs with abuse potential.[15] Data about women's abuse of or dependence on prescription medications are virtually nonexistent. This is significant considering that women, particularly midlife and older women, are the largest consumers of prescription painkillers, antidepressants, and benzodiazepines. Clinical evidence reported in the literature suggests that prescription drugs, especially benzodiazepines, sedatives, and hypnotics, are frequently prescribed for and abused by older women. Older women are prescribed benzodiazepines more than any other age group.[16] Age-related changes in drug metabolism, interactions with other prescriptions, and over-the-counter drugs and alcohol contribute to greater risks for cognitive impairment, dementia, and falls.[16]

Women incarcerated for drug-related offenses represent one of the fastest growing populations in jails and prisons. Women confined in prison increased from 7.8% in 1974 to 10.3% in 2001, and more than half of the incarcerated women surveyed by the Bureau of Justice Statistics reported that they committed their offenses under the influence of drugs or alcohol.[17]

GENDER DIFFERENCES IN BIOLOGICAL RESPONSE

Research suggests that men and women differ in their biological and subjective responses to abused drugs. Women initiate cocaine use sooner, take less time to become addicted to cocaine,[18] and report less euphoria and dysphoria compared to men.[19] Women and men given equal doses of cocaine experience the same cardiovascular response despite the fact that blood concentrations of cocaine did not rise as high in women as in men. In studies involving long-term cocaine users, women and men showed similar impairment in tests of concentration, memory, and academic achievement following sustained abstinence, even though women in the study had substantially greater exposure to cocaine.[20] Women cocaine users also were less likely than men to exhibit abnormalities of blood flow in the brain's frontal lobes. These findings suggest a sex-related mechanism that may protect women from some of the damage cocaine inflicts on the brain.[20]

Biological indicators point toward clear differences between men and women in the metabolism[21] and other physiological effects of alcohol.[22] Women become intoxicated after drinking smaller quantities of alcohol than men and achieve higher blood alcohol concentrations.[23] Retrospective reports from alcoholics reveal that women consume lesser amounts and are less likely than men to drink daily or to engage in binge patterns of alcohol use.[24] This may be related to the fact that women have less total body water than men of comparable size, meaning that they achieve higher blood-alcohol concentrations than men after drinking equivalent amounts of alcohol.

Important gender differences also exist in the physiologic effects of nicotine. Women and men are equally likely to become addicted to nicotine, yet women typically smoke cigarettes with lower nicotine content than those smoked by men, smoke fewer cigarettes per day, and inhale less deeply than men.[20] Females report positive mood increases to a greater extent after nicotine smoking and show a great decline in positive mood during smoking abstinence that men.[25]

PROGRESSION TO DEPENDENCE

Research is beginning to show that the progression, or developmental stages, of drug involvement is not identical for men and women. In the progression from legal drug use to illicit drug use, for example, cigarette smoking plays a relatively larger role for women than for men, and alcohol use plays a relatively larger role for men than for women.

Studies of self-quitters find that women are less likely to quit initially[26] or to remain abstinent at follow-up.[27,28] Perkins' review of cessation trials with nicotine replacements reports on 9 of 10 studies that provided sex-specific outcome results and found poorer absolute abstinence rates in women, although one study found equal outcomes at a later follow-up.[25] Possible explanations for this sex difference have been suggested, such as women's greater concern about weight gain, greater difficulty with negative mood (and higher prevalence of affective disorders), greater need for social support to quit smoking, and the effects of cigarette advertising targeted at women.[29,30]

The progression to dependence, particularly alcohol-use disorder, also seems to be different for women than for men. The interval between the age of first drinking and treatment-seeking tends to be shorter for women than for men.[31] In addition, women progress between landmarks associated with the developmental course of alcoholism (e.g., regular drinking or loss of control) sooner than men.[32] These findings have led to the theory that "telescoping" may occur in women. This theory posits that there may be a shorter timeframe for the development of medical consequences and behavioral and psychological factors characteristic of an alcohol dependence disorder.

With regard to initiation into illicit drugs, data suggest that women are more likely to begin or maintain cocaine use to develop more intimate relationships, while men are more likely to use the drug with male friends and in relation to the drug trade. Kosten et al. found that female cocaine abusers had more severe cocaine use and significantly shorter periods of time of cocaine abstinence compared to when they abstained from using cocaine, and male cocaine abusers were more likely to abuse alcohol to intoxication. However, female cocaine abusers used opiates longer, which is another example of their more severe drug use problem.[18]

Westmeyer and Boedicker compared men and women as to patterns of tobacco, caffeine, alcohol, cannabis, opiate, sedative, cocaine, inhalant, amphetamine, hallucinogen, and phencyclidine (PCP) use and found that women used each drug, except cocaine, for a shorter time period compared to men. However, rates of dependence were similar between women and men, suggesting that women take less time to progress to dependence than men.[33]

GENDER DIFFERENCES IN MEDICAL CONSEQUENCES

Women who abuse drugs have been found to get sicker more quickly and suffer higher rates of liver problems, hypertension, anemia, and gastrointestinal disorders than male drug users. Women also experience gender-specific medical problems as a result of their addiction, such as a higher risk for infertility, vaginal infections, repeat miscarriages, and premature delivery.[5,6]

Despite lower levels of alcohol intake and shorter periods of drinking, women suffer more severe medial consequences than men, including liver cirrhosis.[34] Postmenopausal women who drink moderate to heavy amounts of alcohol also have other health problems, including breast cancer. They are at higher risk for breast cancer and heart disease even if the amount they drink is less than that of their male counterparts.[35–37] Women who chronically abuse alcohol have death rates 50% to 100% higher than men who have the same alcohol use patterns.[38]

Some research suggests that the impact of a given amount of smoking on lung cancer risk may be greater among women than men, and that exposure to environmental tobacco smoke may be associated with increased risk for breast cancer.[39] Particularly alarming is that women may be at even greater risk than men for smoking-related diseases, including lung cancer[40,41] and myocardial infarction.[42] Men have higher prevalence rates of chronic obstructive pulmonary disease than women, which has

been attributed tothe historically higher rates of cigarette smoking in men. However, the increased rates of cigarette smoking in women within the past several decades have been associated with steadily increasingrates of chronic obstructive pulmonary disease in women.[43]

The interplay of gender-specific drug use patterns and sex-related risk behaviors creates an environment in which women are more vulnerable than men to infection with the human immunodeficiency virus (HIV).[44,45] Women using intravenous drugs are at higher risk than men for acquiring HIV.[46] Women are more likely than men to inject drugs, use drugs with many partners, share paraphernalia with an injection partner, exchange sex for money or drugs, and have difficulty negotiating condom use with their sex partners.[44] Women account for 26% of all reported adult AIDS cases in the United States, which represents a doubling over the past decade. High-risk heterosexual contact was the source of 80% of newly diagnosed infections. However, an estimated one in five new HIV diagnoses for women are related to injection drug use.[46]

CO-OCCURRING PSYCHIATRIC DISORDERS AND SUBSTANCE ABUSE

It is well established that women with substance abuse disorders present for treatment with significant psychiatric co-morbidity. Women show higher rates of certain co-occurring psychiatric disorders compared to men, such as major depression, social phobia, post-traumatic stress disorders, and eating disorders.[47–54]Gender differences in depression are generally thought to be related to the interaction of biological and psychosocial factors. Higher rates of depression occur among women who are poor, less educated, welfare-dependent, and unemployed.[54] Although depression is common among women with drug abuse problems, it often goes undetected in this population.

Gender differences in the relationships between depressive symptoms and drinking behavior have been reported in problem drinkers, indicating that depression can play a dual role, at least for women.[55] More specifically, if men and women are motivated to stop drinking, depression can trigger a change in the beginning of treatment of both genders. However, following treatment, depression seems to be associated with relapse, primarily in women.

Studies of comorbid psychiatric disorders in opiate[56] and cocaine[57] abusers have shown higher percentages of affective and anxiety disorders in women than in men. In a recent study of treatment-seeking opiate abusers, lifetime psychiatric comorbidity was more than twice as common in women compared with men.[56]

Women dependent on methamphetamine are more likely to report depression, suicidal ideation, and a need for psychiatric assistance than men. Increased risk for depressive symptoms was observed for both women and men reporting methamphetamine dependence compared to those not reporting dependence. Furthermore, women, but not men, reporting methamphetamine dependence were more likely than those not reporting methamphetamine dependence to report suicidal ideation and a need for psychiatric care.[58]

HISTORY OF VICTIMIZATION AND VIOLENCE

Another area of particular importance for women is substance abuse and victimization and violence. Prevalence rates of intimate partner violence among women in drug treatment have been found to range between 25% and 57%.[59] These rates of intimate partner violence are substantially higher than the range of 1.5% to 16% prevalence rates found in epidemiological surveys of community-based samples of non-drug using women.[60,61] Furthermore, a growing body of evidence suggests that interpersonal stress and relationship conflicts are major triggers for relapse among women in drug treatment and that intimate partner violence may result in continued drug use and relapse.[62]

MIDLIFE AND OLDER WOMEN

Because of the projected growth of the midlife and older adult population in the coming

decades, the treatment of substance abuse problems among midlife and older women is of increasing interest. With the aging of the drug using population, a majority of women in substance abuse treatment are perimenopausal or menopausal.[63] Risk factors for a more complicated menopausal transition (e.g., alcohol, smoking and illicit substance use, medical comorbidities, HIV/AIDS and hepatitis, premorbid and current psychological distress, few social and economic resources, and negative life events) are fairly widespread in substance abusing women.[64] The rate of HIV infection in midlife women, 15% of all cases among women older than 50 (a number that has doubled in the past 12 years), is attributable to the risk behaviors associated with their drug use or sexual practices with heterosexual partners.[65]

No longer concerned with pregnancy prevention, postmenopausal women may not continue barrier methods of contraception, which may include diaphragms, condoms, and cervical caps, and face increased risk of sexually transmitted diseases, including HIV from male sex partners who have a current or past drug history.[66] Furthermore, many of the symptoms associated with menopause (hot and cold flashes, sweats, fatigue, loss of libido, menstrual irregularity, and sleep disturbances) are similar to those associated with substance abuse, especially opiate withdrawal and methadone treatment with improper doses.[63] Those women who are sensitive to these symptoms and experience increased levels of physical discomfort, insomnia, irritability, anxiety, and depression may be at a high risk for relapse to drug use and HIV sexual risk behaviors.

SPECIFIC BARRIERS TO TREATMENT ENTRY FOR WOMEN

Women are underrepresented in substance abuse treatment programs. In 2002, 30% of the admissions to substance abuse treatment programs were women, but the ratio of women to men with dependence on illicit drugs is larger.[4] Research indicates that women seek treatment for substance abuse less often than men.[67,68] The low rates of substance abuse treatment entry among women may reflect the specific barriers they face. Barriers for young women that have been documented in the past two decades include pregnancy, lack of services for pregnant women, fear of losing custody when the baby is born, or fear of prosecution, voyeurism, and sexual harassment.[69–73] Perhaps the most substantial obstacle for these young women is available, affordable childcare.[74,75] Few treatment programs provide on-site childcare or provide assistance with making child care arrangements. Even when women are able to make alternative arrangements, they are likely to face resistance or hostility from family members.[5]

Women seeking treatment have been found to have more substance-related problems, and those problems tend to be more severe than those of men entering treatment.[76,77] For instance, women are more likely to encounter difficulty with transportation to treatment sites,[71] inadequate health insurance, poverty,[75] dealing with a relationship with a drug-abusing partner,[5–7,9,10,74] and being less likely than their male counterparts to have someone actively supporting them in treatment.

Wechsberg et al. found that women entering substance abuse treatment were younger, had lower education and employment levels, were more concerned about child-related issues, were less likely to be married, had more health and mental health problems, had greater exposure to physical and sexual abuse, and had greater concerns about issues related to children compared with men.[78] Women enter treatment with problems related to health, higher HIV/AIDS risk, and family and employment situations[79,80]

Treatment entry for men seems to be facilitated by social institutions such as employers or the criminal justice system, whereas for women treatment entry more often results from social work referral, suggesting that contact with social agencies eases women's entry into treatment.[81]

TREATMENT RETENTION AND COMPLETION

Controversy exists as to whether research varies as to whether greater treatment retention is achieved for women or men. Some studies have positive findings for women. For instance,

women remain in treatment longer[82] and were less likely to drop out or not complete treatment compared with men.[83] Other studies have negative findings. For example, women were more likely than men to drop out of substance abuse treatment,[76] women attend fewer treatment sessions than men, [84] and women with substance use disorders differ significantly from men with substance use disorders in terms of the risk factors for, and natural history of, substance use problems, reasons for relapse, presenting problems, and motivations for treatment.[85–89] However, no gender differences in treatment retention or length of stay were shown in three studies.[90–92]

Sayre et al. examined factors affecting treatment attrition in individuals seeking treatment for cocaine dependence. Sixty-five percent dropped out before completing all 20 therapy sessions. Treatment dropouts were more likely to be women, to be separated from their spouses, to have poorer family/social functioning, and to have fewer years of education. Individuals with higher education levels and those with poorer psychiatric functioning tended to remain in treatment longer.[93] Treatment program characteristics may be associated with retention and completion rates among women. These findings have direct implications for identifying individuals at higher risk for attrition from outpatient substance abuse programs.

Women report that services such as health care, domestic violence counseling, transportation, and child care, along with relationships with individual counselors, are the primary reasons they remain in treatment.[94,95] Women's failure rates in treatment programs have been attributed in part to the fact that traditional programs are designed by and for men and that their approaches have been informed by research conducted on the male substance-abusing population.[5,9,75] Previous research indicates that male clients are more likely to evidence greater denial of their drug problem. As such, traditional treatment programs are centered on aggressively confronting the addict about his abuse and resulting consequences. Relapse is often met with a punitive response instead of an exploration of possible environmental factors that may have contributed to recurring drug use. In contrast, women are more likely to experience higher levels of guilt and shame in acknowledging their substance abuse. Therefore, confrontational approaches, which serve to enhance guilt and shame, have been found to be ineffective with female clients.[5,75]

Nearly all prison-based substance abuse treatment programs have also been designed with male prisoners in mind, and little research is available describing the effectiveness of interventions developed for substance abusing female prisoners. Two studies examined county jail inmates in a 6-week residential substance abuse treatment program and federal prisoners who participated in a 9- or 12-month residential substance abuse treatment program, respectively.[96,97] Both studies reported gender differences: female prisoners had more serious patterns of drug use, were more likely to have grown up in homes where drug use was present, were more likely to have experienced physical and sexual abuse as children, and were more likely to have mental and physical health problems compared to male prisoners.[96,97] If treatment services in criminal justice settings are not expanded to address the needs of female substance abusers, large numbers of these individuals will continue to be involved in drug-related crime and will return to the criminal justice system.

Whether women should be in women-specific versus mixed-gender groups is an issue of debate.[98,99] An evaluation of women-only versus mixed-gender addiction groups found that women identified several issues that they would discuss only in women's groups, including guilt regarding being an inadequate mother.[5] Another study found superior outcomes for women treated in specialized women's programs versus mixed-gender programs[100] while other studies found no differences.[101,102]

A meta-analysis examining effectiveness of single-gender substance abuse treatment for women concluded that single-gender treatment was effective, but that its strongest impact was on pregnancy outcomes. Psychological well-being, attitudes and beliefs, and HIV risk reduction were also substantially improved by treatment but psychiatric outcomes improved only modestly. Treatment resulted in only small

improvements in alcohol use, other drug use, and reduced criminal activity.[24] However, few studies in this meta-analysis compared gender-sensitive or gender-specific treatment to mixed-gender programs, making conclusions tentative, suggesting the need for additional research on women's outcomes.

Several studies have suggested that gender differences in interaction styles and men's traditional societal dominance may negatively affect women in mixed-gender group treatment.[103–105] As a result, it is generally asserted that substance abuse treatment for women, particularly pregnant women and women with dependent children, must differentially address these complex psychosocial issues.[106–109] As such, treatment programming designed specifically for women is needed to address not only women's substance abuse related problems, but also their special needs and barriers to treatment.

FUTURE RESEARCH DIRECTIONS

Evidence indicates there are significant gender differences in the epidemiology of substance use disorders, social factors and characteristics, biological responses, patterns of use, progressions to dependence, health consequences, co-occurring psychiatric disorders, and factors related to treatment entry, retention, and completion.

The epidemiology of women's drug use presents challenges separate from those raised by men's drug use. High-risk subpopulations of women (homeless, mentally ill, HIV positive, violence victims, incarcerated, and midlife and aging) necessitate more intensive and specialized services.

Progression, or developmental stages, of drug involvement is not identical for men and women. If the phenomenon of telescoping is, in fact, common to most drugs of abuse, further research is needed. Areas for exploration include pathophysiology to determine whether biological or hormonal differences in response to drugs, societal differences regarding entry into treatment, or gender differences in seeking medical treatment explain the shorter time course for women than men. It may also imply that women have a smaller window of opportunity for intervention before the disease progresses, which has implications on programming and treatment protocols.

Gender-specific medical problems as a result of the interplay of gender-specific drug use patterns and sex-related risk behaviors create an environment in which midlife and older women are more vulnerable than men to HIV. There is a need to develop, engage, and test effective treatments for women across the life cycle with substance use disorders, particularly midlife and older women.

There is a dearth of research related to the effectiveness of treatment interventions designed specifically for women who abuse substances. Although many service providers acknowledge and address gender differences among clients in substance abuse treatment, these differences and the programming that addresses them have not been adequately studied. Because women remain under-represented in substance abuse treatment programs, new studies on treatment effectiveness are needed to assess gender differences in response to different treatment strategies. In addition, there is a need to develop and examine gender-specific assessment scales and treatment protocols to optimize treatment effectiveness. Future research should be theoretically based and methodologically sound to advance the evidence base of substance abuse treatment for women.

At the national, state, and local levels, policymakers and service providers need new knowledge to understand how male and female clients differ in terms of sociodemographics, substance use characteristics, treatment entry, retention, and completion. Future research examining the factors that underlie gender differences may allow for the development of safe and effective gender-specific interventions for drug abuse.

The research evidence makes it clear that there are significant gender differences in drug abuse and that more research is necessary. The translation of these research findings to the treatment community to improve treatment outcomes for both sexes will be an exciting challenge for the field. Increased and improved policies, services, and new research will

continue to improve the lives of women substance abusers.

REFERENCES

1. Wetherington CL. Sex-gender differences in drug abuse: a shift in the burden of proof? Exp Clin Psychopharmacol 2007; 15:411–7.
2. Brady KT, Randall CL. Gender differences in substance use disorders. Psychiatr Clin North Am 1999; 22:241–52.
3. Substance Abuse and Mental Health Services Administration. Results from the 2006 National Survey on Drug Use and Health: national findings. Rockville, MD: Office of Applied Studies; 2007. NSDUH Series H-32, DHHS Publication, No. SMA 07–4293.
4. Brady T M, Ashley OS, eds. Women in substance abuse treatment: results from the Alcohol and Drug Services Study (ADSS). Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies; 2005. DHHS Publication, No. SMA 04-3968, Analytic Series A-26.
5. Nelson-Zlupko L, Kauffman E, Dore MM. Gender differences in drug addiction and treatment: implications for social work intervention with substance-abusing women. Soc Work 1995; 40:45–54.
6. US Department of Health and Human Services. Treatment Methods for Women. Rockville, MD: US Department of Health and Human Services, National Institutes of Health, National Institute on Drug Abuse, 2003.
7. Kauffman SE, Silver P, Poulin J. Gender differences in attitudes toward alcohol, tobacco, and other drugs. Soc Work 1997; 42:231–41.
8. Lex BW. Gender differences and substance abuse. Adv Subst Abuse 1991; 4:225–96.
9. Bloom B, Covington S. Gender-specific programming for female offenders: what is it and why is it important? Washington, DC: American Society of Criminology, 1998.
10. Manhal-Baugus M. The self-in-relation theory and women for sobriety: female-specific theory and mutual help group for chemically dependent women. J Addict Offender Counseling 1998; 18:78–85.
11. Gomberg ESL. Recent developments in alcoholism: gender issues. In: Galanter M, ed. Recent developments in alcoholism (vol. 11). New York: Plenum Press, 1993:95–107.
12. Graham K, Braun K. Concordance of use of alcohol and other substances among older adult couples. Addict Behav 1999; 24:839–56.
13. Brennan PL, Moos RH, Kim JY. Gender differences in the individual characteristics and life contexts of late-middle-aged and older problem drinkers. Addiction 1993; 88:781–90.
14. Gomberg ESL. Risk factors for drinking over a woman's life span. Alcohol Health Res World 1994; 18:220–7.
15. Simoni-Wastila L. The use of abusable prescription drugs: the role of gender. J Womens Health and Gender-based Med 2000; 9:289–97.
16. Colletti SD. Service providers and treatment access issues. In: Wetherington CL, Roman AB, eds. Drug addiction research and the health of women. Rockville, MD: National Institute on Drug Abuse, 1998:236-244. NIH Publication, No. 98–4290.
17. US Department of Justice. Fact Sheet: Drug-Related Crime. Washington, DC: Office of Justice Programs, Bureau of Justice Statistics, 1994. Publication No. NCJ–149286.
18. Kosten TR, Kosten TA, McDougle CJ, et al. Gender differences in response to intranasal cocaine administration to humans. Biol Psychiatry 1996; 39:147–8.
19. Lucas LR, Angulo JA, Le Moal M, McEwen BS, Piazza PV. Neurochemical characterization of individual vulnerability to addictive drugs in rats. Eur J Neurosci 1998; 10:3153–63.
20. National Institute of Drug Abuse. Gender differences in drug abuse risks and treatment. NIDA Notes 2000; 15(4):1–4.
21. Dawson DA, Archer L. Gender differences in alcohol consumption: effects of measurement. Br J Addict 1992; 87:119–23.
22. Thomasson HR. Gender differences in alcohol metabolism: physiological responses to ethanol. Recent Dev Alcohol 1995; 12:163–79.
23. Mumenthaler MS, Taylor JL, O'Hara R, Yesavage, JA. Gender differences in moderate drinking effects. Alcohol Res Health 1999; 23:55–64.
24. Orwin RG, Francisco L, Bernichon T. Effectiveness of women's substance abuse treatment programs: a meta-analysis. Arlington, VA: Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Substance Abuse Treatment, 2001. NEDS Contract, No. 270-97–7016.
25. Perkins KA. Sex differences in nicotine versus nonnicotine reinforcement as determinants of tobacco smoking. Exp Clin Psychopharmacol 1996; 4: 166–77.
26. Killen JD, Fortmann SP. Craving is associated with smoking relapse: findings from three prospective studies. Exp Clin Psychopharmacol 1997; 5:137–42.
27. Killen JD, Fortmann SP. Role of nicotine dependence in smoking relapse: results from a prospective study using population-based recruitment methodology. Int J Behav Med 1994; 1:320–34.
28. Kabat GC, Wnyder EL. Determinants of quitting smoking. Am J Public Health 1987; 77:1301–5.
29. Ockene JK. Smoking among women across the lifespan: prevalence, interventions, and implications for cessation research. Ann Behav Med 1993; 15: 135–48.

30. Pierce JP, Lee L, Gilpin EA. Smoking initiation by adolescent girls, 1944 through 1988: an association with targeted advertising. JAMA 1994; 271:608–11.

31. Piazza NJ, Vrbka JL, Yeager RD. Telescoping of alcoholism in women alcoholics. Int J Addict 1989; 24:19–28.

32. Randall CL, Roberts JS, DelBoca FK, Carroll KM, Connors GC, Mattson ME. Telescoping of landmark events associated with drinking: a gender comparison. J Stud Alcohol 1999; 60:252–60.

33. Westermeyer J, Boedicker AE. Course, severity, and treatment of substance abuse among women versus men. Am J Drug Alcohol. 2000; 26(4):523–35.

34. Jarque-López A, Gonzalez-Reimers E, Rodriguez F. Prevalence and mortality of heavy drinkers in a general medical hospital unit. Alcohol Alcohol 2001; 36:335–8.

35. Urbano-Marquez A, Estruch R, Fernández-Solá J, Nicolás JM, Paré JC, Rubin E. The greater risk of cardiomathopathy and myopathy in women compared with men. JAMA 1995; 274:149–54.

36. Smith-Warner SA, Spiegelman D, Yaun SS, van den Brandt PA, Folsom AR, Goldbohm RA, Graham S, Holmberg L, Howe GR, Marshall JR, Miller AB, Potter JD, Speizer FE, Willett WC, Wolk A, Hunter DJ. Alcohol and breast cancer: a pooled analysis of cohort studies. JAMA 1998; 279:535–40.

37. Zhang Y, Kreger BE, Dorgan JF, Splansky GL, Cupples LA, Ellison RC. Alcohol consumptions and risk of breast cancer: The Framingham Study revisited. Am J Epidemiol 1999; 149:93–101.

38. Wilsnack SC, Bechman LJ, eds. Alcohol problems in women: antecedents, consequences, and intervention. New York: Guilford Press, 1984.

39. US Department of Health and Human Services. Women and smoking: a report of the surgeon general–2001. Washington, DC: Government Printing Office, 2001:343–67.

40. Kure EH, Ryberg D, Hewer A, Phillips DH, Skaug V, Baera R, Haugen A. Mutations in lung tumors: relationship to gender and lung DNA adduct levels. Carcinogenesis 1996; 17:2201–5.

41. Zang EA, Wynder EL. Differences in lung cancer risk between men and women: examination of the evidence. J Natl Cancer Inst 1996; 88:183–92.

42. Prescott E, Osler M, Hein HO, Borch-Johnsen K, Lange P, Schnohr P, Vestbo J. Gender and smoking-related risk of lung cancer. Epidemiology 1998; 9:79–83.

43. Silverman EK, Chapman HA, Drazen JM, Weiss ST, Rosner B, Campbell EJ, O'Donnell WJ, Reilly JJ, Ginns L, Mentzer S, Wain J, Speizer FE. Gender-related differences in severe, early-onset chronic obstructive pulmonary disease. Am J Respir Crit Care Med 2000; 162:2152–8.

44. Stevens SJ, Tortu S, Coyle SL. Women drug users and HIV prevention: overview of findings and research needs. In: Stevens SJ, Tortu S, Coyle SL, eds. Women, drug use, and HIV prevention. Binghamton, NY: The Hawthorne Medical Press, 1998:19–47.

45. Weeks MR, Singer M, Himmelgreen DA, Richmond P, Grier M, Radda K. Drug use patterns in substance abusing women: gender and ethnic differences in an AIDS prevention program. In: Stevens SJ, Wexler HK, eds. Women and substance abuse. Binghamton, NY: The Hawthorne Medical Press, 1998:35–61.

46. Center for Disease Control and Prevention. HIV/AIDS Surveillance Report, 2005 (vol. 17, Rev ed). Atlanta: US Department of Health and Human Services, 2007:1-46. Accessed December 9, 2007.

47. Denier CA, Thevos AK, Latham PK, Randall CL. Psychosocial and psychopathology differences in hospitalized male and female cocaine abusers: a retrospective chart review. Addict Behav 1991; 16:489–96.

48. Fornari VM, Kent J, Kabo L, Goodman B. Anorexia nervosa: "thirty something." J Subst Abuse Treat 1994: 11:45–54.

49. Grella CE, Anglin D, Annon JJ. HIV risk behaviors among women in methadone maintenance treatment. Subst Use Misuse 1996; 31:277–301.

50. Grella CE. Services for perinatal women with substance abuse and mental health disorders: the unmet need. J Psychoactive Drugs 1997; 29:67–78.

51. Merikangas KR, Stevens DE, Fenton B, Stolar MS, O'Malley S, Woods SW, Risch N. Co-morbidity and familial aggregation of alcoholism and anxiety disorders. Psychol Med 1998; 28:773–88.

52. Najavits LM, Weiss RD, Shaw SR. The link between substance abuse and posttraumatic stress disorder in women. Am J Addict 1997; 6:273–83.

53. Sonne SC, Back SE, Zuniga CD, Randall CL, Brady KT. Gender differences in individuals with comorbid alcohol dependence and posttraumatic stress disorder. Am J Addict 2003; 12:412–3.

54. Westermeyer J, Kopka S, Nugent S. Course and severity of substance abuse among patients with comorbid major depression. Am J Addict 1996; 6:284–92.

55. Schutte KK, Seable JH, Moos RH. Gender differences in the relations between depressive symptoms and drinking behavior among problem drinkers: a three-wave study. J Consult Clin Psychol 1997; 65:392–404.

56. Brooner RK, King VL, Kidorf M, Schmidt CW Jr, Bigelow GE. Psychiatric and substance comorbidity among treatment-seeking opioid abusers. Arch Gen Psychiatry 1997; 54:71–80.

57. Rounsaville BJ, Anton SF, Carroll K, Budde D, Prusoff BA, Gawin F. Psychiatric diagnoses of treatment-seeking cocaine abusers. Arch Gen Psychiatry 1991; 48:43–51.

58. Kalechstein AD, Newton TF, Longshore D, Anglin MD, van Gorp WG, Gawin FH. Psychiatric comorbidity of methamphetamine dependence in a forensic sample. J Neuropsychiatry Clin Neurosci 2000; 12:480–4.

59. El-Bassel N, Gilbert L, Shilling R, Wada T. Drug abuse and partner violence among women in methadone treatment. J Fam Violence 2000; 15:209–28.

60. Caetano R, Nelson S, Cunradi C. Intimate partner violence: dependence symptoms and social consequences from drinking among White, Black and Hispanic couples in the United States. Am J Addict 2001; 10:60–9.

61. Tjaden P, Thoennes N. Prevalence, incidence, and consequences of violence against women: findings from the national violence against women survey. Washington, DC: Department of Justice, National Institute of Justice, 1998:3–18.

62. Gilbert L, El-Bassel N, Rajah V, Foleno A, Frye E. Linking drug-related activities with experiences of partner violence: a focus group study of women in methadone treatment. Violence Vict 2001; 16:517–36.

63. Tuchman E. Methadone and menopause: midlife women in drug treatment. J Soc Work Pract Addict 2003; 3:43–56.

64. Tuchman E. Exploring the prevalence of menopause symptoms in midlife women in methadone maintenance treatment. Soc Work Health Care 2007; 45:43–62.

65. Zablotsky D, Kennedy M. Risk factors and HIV transmission to midlife and older women: knowledge, options, and the initiation of safer sexual practices. J Acquir Immune Defic Syndr 2003; 33:S122–30.

66. Levy JA, Ory MG, Crystal S. HIV/AIDS interventions for midlife and older adults: current status and challenges. JAIDS 2003; 33(2):S59–S67.

67. Shober R, Annis HM. Barriers to help-seeking for change in drinking: a gender-focused review of the literature. Addict Behav 1996; 21:81–92.

68. Weisner C, Schmidt L. Gender disparities in treatment for alcohol problems. JAMA 1992; 268: 1872–6.

69. Paltrow LM. Punishing women for their behavior during pregnancy: an approach that undermines the health of women and children. In: Wetherington CL, Roman AB, eds. Drug addiction research and the health of women. Rockville, MD: National Institute on Drug Abuse, 1998:467-502. NIH Publication, No. 98–4290.

70. Pelissier B, Jones N. A review of gender differences among substance abusers. Crime Delinquency 2005; 51:343–72.

71. Ayyagari S, Boles S, Johnson P, Kleber H. Difficulties in recruiting pregnant substance abusing women into treatment: problems encountered during the cocaine alternative treatment study. Assoc Health Serv Res 1999; 16:80–1.

72. DeAngelis T. Better research, more help needed for pregnant addicts. APA Monitor 1993; 24(9):7–8.

73. Finkelstein N. Treatment issues for alcohol and drug dependent pregnant and parenting women. Health Soc Work 1994; 19:7–15.

74. Bride BE. Single-gender treatment of substance abuse: effect on treatment retention and completion. Soc Work Res 2001; 25:223–32.

75. Hodgins DC, Ed-Guebaly N, Addington J. Treatment of substance abusers: single or mixed gender programs? Addiction 1997; 92:805–12.

76. Arfken CL, Klein C, diMenza S, Shuster CR. Gender differences in problem severity at assessment and treatment retention. J Subst Abuse Treat 2001; 20:53–7.

77. Farid B, Clarke ME. Characteristics of attenders to community based alcohol treatment centre with special reference to sex difference. Drug Alcohol Depend 1992; 30:33–6.

78. Wechsberg WM, Craddock SG, Hubbard RL. How are women who enter substance abuse treatment different than men? A gender comparison from the Drug Abuse Treatment Outcome Study (DATOS). Drugs Soc 1998; 13:97–115.

79. Halikas JA, Crosby RD, Pearson VL, Nugent SM, Carlson GA. Psychiatric comorbidity in treatment-seeking cocaine abusers. Am J Addict 1994; 3:25–35.

80. Marsh JC, Miller NA. Female clients in substance abuse treatment. Int J Addict 1985; 20:995–1019.

81. Grella CE, Joshi V. Gender differences in drug treatment careers among clients in the National Drug Abuse Treatment Outcome Study. Am J Drug Alcohol Abuse 1999; 25:385–406.

82. Chou CP, Hser YI, Anglin MD. Interaction effects of client and treatment program characteristics on retention: an exploratory analysis using hierarchical linear models. Subst Use Misuse 1998; 33:2281–301.

83. Hser YI, Polinsky ML, Maglione M, Anglin MD. Matching clients' needs with drug treatment services. J Subst Abuse Treat 1999; 16:299–305.

84. McCaul ME, Svikis DS, Moore RD. Predictors of outpatient treatment retention:patient versus substance use characteristics. J Subst Abuse 2001; 62: 255–70.

85. Davis S. Drug treatment decisions of chemically-dependent women. Int J Addict 1994; 29:1287–304.

86. Hughes P, Coletti S, Neri R, Urmann C, Stahl S, Sicillian D, Anthony J. Retaining cocaine-abusing women in a therapeutic community: the effect of a child live-in program. Am J Public Health 1995; 85:1149–52.

87. Pelissier BMM, Camp SD, Gaes GG, Saylor WG, Rhodes W. Gender differences in outcomes from prison-based residential treatment. J Subst Abuse Treat 2003; 24: 149–60.

88. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on Early Detection of Persons with Harmful Alcohol Consumption-II. Addiction 1993; 88:791–804.

89. Green CA, Polen MR, Dickinson DM, Lynch FL, Bennett MD. Gender differences in predictors of initiation, retention, and completion in an HMO-based substance abuse treatment program. J Subst Abuse Treat 2002; 23:285–95.

90. Kosten TA, Gawin FH, Kosten TR, Rounsaville BJ. Gender differences in cocaine use and treatment response. J Subst Abuse Treat 1993; 10:63–6.

91. Mertens JR, Weisner CM. Predictors of substance abuse treatment retention among women and men in an HMO. Alcohol Clin Exp Res 2000; 24:1525–33.

92. Veach LJ, Remley TP, Kippers SM, Sorg JD. Retention predictors related to intensive outpatient programs for substance use disorders. Am J Drug Alc Abuse 2000; 26:417–28.

93. Sayre SL, Schmitz JM, Stotts AL, Averill PM, Rhoades HM, Grabowski JJ. Determining predictors of attrition in an outpatient substance abuse program. Am J Drug Alcohol Abuse 2002; 28:55–72.

94. Nelson-Zlupko L, Dore MM, Kauffman E, Kaltenbach K. Women in recovery: their perceptions of treatment effectiveness. J Subst Abuse Treat 1996; 13:51–9.

95. Strauss SM, Falkin GP. The relationship between the quality of drug user treatment and program completion: understanding the perceptions of women in a prison-based program. Subst Use Misuse 2000; 35:2127–59.

96. Peters RH, Strozier AL, Murrin MR, Kearns WD. Treatment of substance-abusing jail inmates: examination of gender differences. J Subst Abuse Treat 1997; 14:339–49.

97. Langan NP, Pelissier BMM. Gender differences among prisoners in drug treatment. Journal of Substance Abuse 2001; 13:291–301.

98. McCrady BS, Raytek H. Women and substance abuse: treatment modalities and outcomes. In: Gomberg ESL, Nirenberg TD, eds. Women and substance abuse. Norwood, NJ: Ablex, 1993:314–338.

99. Vannicelli M. Barriers to treatment of alcoholic women. Subst Alcohol Actions/Misuse 1984; 5: 29–37.

100. Dalhgren L, Willander A. Are special treatment facilities for female alcoholics needed? A controlled two-year follow-up study from a specialized female unit (EWA) versus a mixed male/female treatment facility. Alcohol Clin Exp Res 1989; 13:499–504.

101. Copeland J, Hall W, Didcott P, Biggs V. A comparison of a specialist women's alcohol and other drug treatment service with two traditional mixed-sex services: client characteristics and treatment outcome. Drug Alcohol Depend 1993; 2:81–92.

102. Dodge K, Potocky-Tripodi M. The effectiveness of three inpatient intervention strategies for chemically dependent women. Res Soc Work Pract 2001; 11:24–39.

103. LaFave LM, Echols LD. An argument for choice: an alternative women's treatment program. J Subst Abuse Treat 1999; 16:345–352.

104. Schliebner CT. Gender-sensitive therapy: an alternative for women in substance abuse treatment. J Subst Abuse Treat 1994; 11:511–5.

105. Wilke D. Women and alcoholism: how a male-as-norm bias affects research, assessment, and treatment. Health Soc Work 1994; 19:29–35.

106. Jansson LM, Svikis D, Lee J, Paluzzi P, Rutigliano P, Hackerman F. Pregnancy and addiction: a comprehensive care model. J Subst Abuse Treat 1996; 13:321–9.

107. Knight DK, Hood PE, Logan SM, Chatham LR. Residential treatment for women with dependent children: one agency's approach. J Psychoactive Drugs 1999; 31: 339–51.

108. Substance Abuse and Mental Health Services Administration (SAMHSA). 45 CFR 96: Rules and Regulations. Available at: www.treatment.org/legis/45CFR961.html. Accessed December 1, 2007.

109. Volpicelli J, Markman I, Monterosso J, Filing J, O'Brien C. Psychosocially enhanced treatment for cocaine-dependent mothers: evidence of efficacy. J Subst Abuse Treat 2000; 18:41–9.