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Contextual, Psychological and Sociological Considerations

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Abstract

Emerging behavioral research on methamphetamine suggests a growing public health concern no longer limited to specific regions of the United States. Given that current evidence-based treatments for addressing methamphetamine addiction have had limited success, there remains a need to further examine the efficacy of these approaches. Here, we synthesize the psychological research literature regarding the prevalence and correlates of methamphetamine use across all segments of the US population, analyze the role that use of the drug plays in relation to sexual risk-taking and consider implications for therapeutic interventions to address this drug addiction.

Keywords

- *addiction*
- *methamphetamine*
- *sexual risk-taking*
- *treatment*

Introduction

METHAMPHETAMINE use continues to evolve as part of a growing epidemic that has historically been rooted within the Western and Midwestern regions of the United States (Rawson, Anglin, & Ling, 2002). Recent trends have highlighted the emergence of methamphetamine within major cities on the East coast (Halkitis, Fischgrund, & Parsons, 2005; Halkitis, Parsons, & Stirratt, 2001; Halkitis, Parsons, & Wilton, 2003; Jacobs, 2002; Rawson et al., 2002), signifying the drug's outreach as having exceeded its original geographic specificity, and highlighting the importance of it being viewed as a long-term and widespread public health problem.

Methamphetamine, a stimulant colloquially known as 'crystal meth', 'crank', 'ice', 'chalk' or 'Tina', is a highly addictive substance that can be snorted, smoked, ingested orally or rectally and injected. It is a methyl derivative of amphetamine, and is a powerful psycho-stimulant that directly affects the autonomic nervous system and central nervous system even when taken in small amounts. Chronic use of high doses of methamphetamine may cause permanent neurological damage, as intense exposure has been shown to cause irreversible damage to neural-cell endings in rats, pigs, cats and nonhuman primates (Halkitis, 2004). Long-term methamphetamine use has also been associated with the reduction of dopamine transporters that negatively affect motor coordination and memory (Nordahl, Salo, & Leamon, 2003), as well as reductions in serotonin levels, the brain chemical most associated with experiencing pleasure. Other long-term effects of methamphetamine use include weight loss, Parkinson's-like symptoms, deterioration of gums and teeth, toxicity of the kidneys and liver, prenatal complications and birth defects. In addition, the continuous stimulation of the nervous system caused by methamphetamine has been shown to induce negative psychological states that include anxiety, confusion, insomnia, aggression, depression, paranoia, psychosis and suicidal ideation (Perdue, Hagan, Thiede, & Velleroy, 2003; Rawson et al., 2000; Swalwell & Davis, 1999).

Much research supports a close association between methamphetamine use and sexual risk-taking especially within the gay community, where use of the drug has been on the rise for the last decade, seriously hampering HIV prevention efforts (Halkitis et al., 2001, 2003; Halkitis, Green, & Mourgues, 2005a; Harris, Thielde, McGough, & Gordon, 1993; Sorvillo et al., 1995). Furthermore, because of the hypersexual-inducing qualities of this substance, use of methamphetamine may exacerbate the transmission of other pathogens such as syphilis, gonorrhea and hepatitis, which have been transmitted at increased rates over the last several years in large metropolises such as New York City (Centers for Disease Control and Prevention, 2002; de Luise, Brown, Rubin, & Blank, 2000).

Significant comorbidity exists between psychopathology and use of methamphetamine (Conway, Swendsen, Rounsaville, & Merikangas, 2002; Matsumoto, Miyakawa, Yabana, Iizuka, & Kishimoto, 2000; Shoptaw, Peck, Reback, & Rotheram-Fuller, 2003), highlighting the importance of disentangling the personality, developmental and contextual factors which contribute to use of this drug. For example, psychiatric comorbidity, including depression, personality disorders and psychoses were found in almost 50 percent of the sample participants diagnosed with methamphetamine dependency (Committee on Opportunities in Drug Abuse Research, 1996, p. 108). Furthermore, some trait models of addiction have emphasized personality characteristics as the major contributing factor toward drug dependence (Petraitis, Flay, & Miller, 1995; Russell & Mehrabian, 1977), creating greater behavioral disinhibition/impulsivity, negative emotionality (i.e. high reactivity, pessimism) and positive emotionality (i.e. extraversion, sociability, agreeableness). Other models of addiction have focused on the synergistic effect of personality and primary socialization sources, including family, schools, the media and peer groups (Oetting, Deffenbeacher, & Donnermeyer, 1998).

The past decade has witnessed alarmingly widespread increases in methamphetamine use across all segments of the United States population, including increased use among adolescents (Johnston, O'Malley, & Bachman, 2003). Moreover, the negative physical and psychological effects of methamphetamine are not merely limited to users of the drug. Children of parents who use or produce methamphetamine are at significant risk for physical and emotional abuse, as well as neglect, malnourishment, parental abandonment and methamphetamine addiction (Swetlow, 2003). The effects of the current methamphetamine epidemic in the United States are far reaching for our society, thus warranting scrutinized investigation that can better inform social policy and treatment efficacy, and provide a lens from

which to consider the potential impact of this drug should it spread to Western Europe and non-industrialized sections of our world.

In what follows, we examine methamphetamine use in the United States from historical, sociological and behavioral perspectives, with a specific emphasis on the psychological and contextual factors related to use of methamphetamine, and its impact on the mental health of individuals, with consideration to matters of treatment and public health.

Historical considerations of methamphetamine

First synthesized by German scientists in the late 19th century, amphetamines, the general class of stimulants that includes methamphetamine, have had a history of pharmaceutical and recreational uses both domestically and abroad. In the United States, amphetamines were first introduced in the 1930s, when they were marketed as bronchial inhalers used to treat nasal congestion for allergies, asthma and colds (Anglin, Burke, Perrochet, Stamper, & Dawd-Noursi, 2000). In 1937, an amphetamine tablet was introduced to treat narcolepsy (a spontaneous sleep disorder), and subsequent medical uses included reducing activity in hyperactive children and as an appetite suppressant targeted toward women trying to lose weight (Matsumoto et al., 2000). Amphetamines were first used as a recreational drug in the United States during the Depression and Prohibition by individuals looking for an alcohol substitute. They were also widely used during the Second World War among German, Japanese and American troops, as a sleep inhibitor in order to keep the troops awake, alert and energized. Amphetamines were similarly used by American soldiers throughout the Vietnam War to enhance performance and productivity. It has been documented that American soldiers used more amphetamines during the Vietnam War than the rest of the world's total use during the Second World War (Miller, 1997).

Popular and legal medical amphetamines were first linked to the production of methamphetamine during the original 'street speed scene' occurring in San Francisco in the 1950s. Methamphetamine was first illegally produced by outlawed 'biker clubs', many of whose members were veterans of war (i.e. the Second World War, and later the Korean and Vietnam Wars). Fueled by the demand for pharmaceutical amphetamine, illicitly manufactured powdered methamphetamine was first developed and used by the various members of the 'counter-culture street scene'. Since that time, there has been what can be considered three endemic periods of increased methamphetamine use: post-Second World War, the late 1960s through the 1970s and, most recently, the resurgence of methamphetamine use beginning in the mid-1990s.

There are several factors that distinguish the current period of increased methamphetamine prevalence from the previous epochs. First, while methamphetamine use has historically been limited geographically to the Pacific Rim, there has been a rapid spread of the drug's use to other geographic epicenters, including major eastern cities and Midwestern states (Halkitis et al., 2001, 2003). Second, new production methods using household and store-bought materials, as well as the rise of the Internet as a disseminator of information, provide increased access to the means for production, creating serious psychological and health-based implications for children living in these home-based laboratories, as well as those living in the surrounding areas. Third, the current epidemic comes at a time when HIV prevalence continues to be a major health threat within the US population, and there is strong evidence supporting the relationship between methamphetamine use, increased sexual risk and HIV seroconversion, highlighting the increased risk factors inherent to this particular time frame (Frosch, Shoptaw, Huber, Rawson, & Ling, 1996; Halkitis, Green, & Carragher, 2006; Halkitis, Shrem, & Martin, 2005c; Reback & Ditman, 1997).

Methamphetamine use across populations

Methamphetamine use affects adult and adolescent populations and appears to transcend sociodemographic lines. Below we outline our current understanding of use in these segments of the population and consider correlates of use within each developmental cohort.

Adults

There are several indicators highlighting the increasing trend in methamphetamine use among the adult US population. According to the National Survey on Drug Use and Health that samples the civilian, non-institutionalized population of the United States (US Department of Health & Human Services, 2003), 12.4 million Americans (5.2% of the population) reported having tried methamphetamine at least once

in their lifetime. This number shows a marked increase from the 1994 estimate of 3.8 million. In the most recent sample, approximately 1.3 million (0.6%) reported using in the previous year and 607,000 (0.3%) reported use within the month prior to the survey. While the survey assessed individuals ages 12 and older, the majority of users were found to be adults between the ages of 18 and 34. Even more alarming, the Drug Abuse Warning Network (DAWN) reported progressively increasing methamphetamine-related episodes from hospital emergency departments in 21 metropolitan areas, ranging from 10,447 reports in 1999 to 17,696 reports in 2002 (Office of National Drug Control Policy, 2004). A further indication of more frequent use among adults is the increasing numbers of individuals seeking drug treatment for methamphetamine use. For example, in San Diego, an area known for its high prevalence of methamphetamine, approximately 37 percent of the drug treatment admissions were for stimulant use that included methamphetamine.

Behavioral characteristics associated with chronic methamphetamine use among adult populations include violent and aggressive behaviors, sexual risk-taking and impulsivity. In assessing a sample of 86 methamphetamine users, Wright and Klee (2004) found that 47 percent of their sample had reported committing a violent crime, and 62 percent reported ongoing problems with aggression related to their methamphetamine use. In another sample of 1016 methamphetamine users seeking drug treatment, 80 percent of the women reported being a victim of domestic abuse or violence from their partner, and 73.3 percent of the overall sample reported a history of physical or sexual abuse at the hands of parents, siblings, partners, friends and/or strangers (Cohen et al., 2003). While methamphetamine has a reputation for inducing aggressive and violent behaviors, many abusers of the drug appear to have developmental histories of physical and sexual abuse that is often linked to abusive behavioral patterns in adulthood.

Heterosexual adult users While much recent attention has been given to the sexual risk-taking of gay and bisexual methamphetamine using men, there has been little research with regard to the sexual risk-taking of heterosexual male and female methamphetamine users. However, in a recent study of HIV-negative, methamphetamine dependent heterosexual men and women, Semple, Patterson and Grant (2004) reported the mean number of unprotected vaginal sexual acts within the last two months to be approximately 22 (SD = 26.6). In this sample, one-third reported having anal sex using condoms only 25 percent of the time. While there is no non-methamphetamine using control group for comparison, the substance does appear to be related to sexual risk behaviors among the heterosexual population; these statistics parallel similar patterns among gay and bisexual men (Halkitis et al., 2001). Further research, modeled after current work within the gay and bisexual community, is recommended in order to assess the behavioral and contextual characteristics specific to heterosexual methamphetamine using HIV-positive and HIV-negative men and women.

In addition, there is a dearth of literature on the psychological profiles of heterosexual methamphetamine using men and women. However, recent data reported from the Methamphetamine Treatment Project (MTP), a multi-site outpatient treatment study of adult methamphetamine using men and women, suggests that users of the drug also have a host of comorbid psychiatric conditions, including high levels of anxiety, depression, suicidality and psychotic symptoms (Zweben et al., 2004). This sample also reported greater difficulty modulating their anger with a greater frequency of assault and weapons charges. Similarly, in a recent report released by the Centers for Disease Control & Prevention (2006), heterosexual male methamphetamine users were found to be more likely to have multiple sexual partners, have casual female partners, have female partners who inject drugs and have had anal intercourse with their female partners. Characteristically, men and women report their motivations for using methamphetamine to include wanting to get high, to gain more energy and to party (US Department of Justice, 2003), again paralleling findings among gay and bisexual men (Halkitis et al., 2003). Women are more likely to report additional reasons for use including weight loss, increased sense of attractiveness and coping with difficult emotions (Gorman et al., 2003); there is further evidence among women that methamphetamine use is also likely to be seen among those with eating disorders (Matsumoto et al., 2000).

Gay and bisexual male adult users Methamphetamine use is not confined to gay and bisexual men, however the majority of literature supports the increasing trend of methamphetamine use within this segment of the population, and much of the psychological research over the last decade is

focused on the interplay of methamphetamine use and HIV in gay men (Hall, 1996; Mendelson & Harrison, 1996; Halkitis et al., 2003, 2005b). While methamphetamine prevalence rates have historically been documented to range between 5 percent and 25 percent of the gay and bisexual men surveyed, more current investigations, including the Seropositive Urban Men's Study (SUMS), a study of HIV-positive men who have sex with men (MSM), estimate the rate of methamphetamine use to be 11 percent, with respective rates of 17 percent and 7 percent in San Francisco and New York (Purcell, Parsons, Halkitis, Mizuno, & Woods, 2001). It should be noted that these data were collected in 1997, and in that time we have seen escalations in methamphetamine use along the east coast of the United States. For example, more current data indicate increasing frequencies of methamphetamine use among gay and bisexual men in New York City regardless of race, ethnicity, SES or HIV status (Halkitis et al., 2003, 2005b). Furthermore, in a sample of gay and bisexual men frequenting gay social venues, Halkitis and Parsons (2002) estimated that 10 percent of their sample were using methamphetamine, and that 25 percent of the methamphetamine users in their sample reported first using the substance within the three months prior to their participation in the study, confirming the time frame of methamphetamine's emergence in New York City to be sometime in the mid- to late 1990s. In addition, a more recent longitudinal investigation found that among a sample of 450 club drug using gay and bisexual men, 64.6 percent (n = 293) reported using methamphetamine in the four months prior to assessment with a mean use of 11.76 days (SD = 19.24) (Halkitis et al., 2005b). These results further indicate increasing trends of methamphetamine use within certain segments of the population in New York City. Use among gay and bisexual men in the Western and Midwestern areas of the United States has a longer history (Freese, Obert, Dickow, Cohen, & Lord, 2000; Rawson et al., 2002). The San Francisco Department of Health (2004) recently estimated that 17 percent to 22 percent of gay men had used methamphetamine in the past 12 months.

The danger inherent to the drastic increases in methamphetamine use currently underway among gay and bisexual men is twofold, and shines the spotlight on what Halkitis et al. (2001) refer to as a 'Double Epidemic', the devastating physiological and psychological consequences of methamphetamine use, as well as its contribution to the increasing risk for HIV transmission. While research demonstrates that methamphetamine use is linked with high risk sex among gay and bisexual men (Frosch et al., 1996; Halkitis et al., 2003, 2005b; Parsons & Halkitis, 2002; Paul, Stall, & Davis, 1993; Reback & Ditman, 1997; Stall, McKusick, Wiley, Coates, & Ostrow, 1986; Stall & Wiley, 1988, Woody et al., 1999), it appears to be layered with complex behavioral and psychologically driven motivations that vary depending on the contextual factors and the personality traits of those who use the drug (Halkitis et al., 2006). Across the board, behavioral motivations and outcomes for methamphetamine use within this demographic include social and sexual disinhibition, enhanced sexual desire, low rates of condom use, prolonged sexual activity and increased multiple and casual/anonymous sexual partners (Gorman, 1998; Hando & Hall, 1994; Molitor, Truax, Ruiz, & Sun, 1998). Psychological correlates of its use appear to be avoidant coping, including the avoidance of unpleasant emotions and physical pain, as well as a means to increase pleasant times with others (Halkitis & Shrem, 2006; Halkitis et al., 2005a, 2006).

At the same time, there appear to be differing motivations associated with use based on HIV serostatus. In examining a convenience sample of HIV-positive men-who-have-sex-with-men (MSM), Semple, Patterson and Grant (2002) found that methamphetamine use was associated with sexual enhancement, as well as cognitive escapism from the negative feelings participants had associated with their HIV serostatus. Similarly, Halkitis et al. (2006) found that HIV-positive men were more likely to use methamphetamine to deal with social pressures and to avoid conflict with others. These studies suggest that there is most clearly an interaction between methamphetamine use and HIV serostatus, and this relationship confirms previously discussed ideas concerning the synergy of HIV and drug use epidemics. Compounding the dangers of methamphetamine use further are the barriers to HIV medication adherence caused by methamphetamine abuse. These include disruptions in sleeping and eating patterns, fears of mixing HIV medications with methamphetamine, and as a strategy for coping with the demanding nature of HIV medication schedules (Halkitis, Kutnick, & Slater, 2005b; Reback, Larkins, & Shoptaw, 2003).

While the overall rate of HIV infections among MSM has declined since the early years of the epidemic, there have been drastic increases over the last four years, with gay and bisexual men continuing to

be at high risk for infection, accounting for 55 percent of estimated new AIDS diagnoses in 2002 (Centers for Disease Control and Prevention, 2002). While there appears to be a strong link between methamphetamine and sexual risk behaviors, there remains some question as to the direction of the relationship between the two. In examining 49 methamphetamine using gay/bisexual men, Halkitis et al. (2005c) found equivalent rates of unprotected sexual intercourse under conditions of methamphetamine use, other drug use (i.e. ecstasy, cocaine) and sobriety. These results may suggest that, in many instances, the same type of individual that actively engages in sexual risk behaviors is also drawn toward using methamphetamine. One hypothesis may be that sensation-seeking individuals are attracted to both the riskiest types of sexual behaviors, as well as the type of high that methamphetamine produces.

Adolescents

Both empirical and anecdotal evidence support increasing trends of methamphetamine use among school age and adolescent populations. While rates of methamphetamine use remained relatively stable between 1989 and 1992, recent data examining the prevalence of use among high school students show an increase of almost 50 percent over the last decade (Oetting et al., 2000). More specifically, data drawn from the National High School Senior Survey, a longitudinal investigation examining the prevalence of drug use among a sample of 15,929 public and private high school students, show that 4.4 percent of teens have tried methamphetamine in their lifetime. In terms of developmental stage, 6.2 percent of high school seniors report lifetime use, followed by 5.2 percent of 10th grade students and 3.9 percent of 8th grade students. Another nationwide report estimates even higher rates of high school student lifetime use at 7.6 percent, with high school boys reporting more frequent lifetime use than high school girls (8.3% vs 6.8%). These numbers represent a significant increase from the rate of 3.3 percent reported in 1991 (US Department of Justice, 2003). Demographic data from this sample showed American Indian and Hispanic teenagers as the most likely users of methamphetamine, followed by Asian-Americans, Whites and Blacks. Overall, these data may underestimate the prevalence of methamphetamine among school age adolescents as they were collected solely from secondary school classrooms, and do not reflect methamphetamine use by high school dropouts. Research suggests that dropouts are more likely to engage in drug use than high school seniors (Gfroerer, 1993). Adolescents in school may also be less likely to report their drug use due to social desirability issues that they may associate with reporting accurately and honestly. In addition, methamphetamine use among teens and adolescents appears to be more severe in the midwestern regions of the country. Anecdotally, an expert of Juvenile Courts Services in Marshall County, Iowa, estimates that an alarming 33 percent of the county high school students had tried the drug (Koch Institute, http://www.kci.org/meth_info/national_trend.htm).

There are sparse empirical data on the social, psychological and behavioral precursors and risk factors specific to methamphetamine using adolescents, highlighting the need for additional research in this area. The little work that has been done suggests that psychosocial precursors to methamphetamine use include a history of family instability and erratic home environments that include physical and sexual abuse, exposure to drug use and preexisting adjustment and psychiatric disorders (Brook, Szandorowska, & Whitehead, 1976). Further, in a sample of 882 adult methamphetamine arrestees, 10 percent indicated that either their parents or other family members had introduced them to the drug, and 29 percent reported their parents to be substance users when they were children. Among this sample, the majority of whom reported their initial use to be in high school, stated that their motivations for initial use included experimentation (34%), peer pressure (25%), to get high (18%) and for increased energy (17%).

Socialization factors and risk perceptions may have a significant influence on adolescent methamphetamine use as well. Methamphetamine has historically received relatively sparse media coverage compared to alcohol, marijuana and cocaine, and as a result, adolescents may not be as aware of the consequences of methamphetamine use. For example, a longitudinal survey of high school students shows a significant reduction in the perception of risk factors associated with methamphetamine and other drug use, and these decreases were positively correlated with more frequent rates of use (Johnston et al., 2003). Additionally, the social effects of methamphetamine lead many adolescents to start using the drug in party scenes to relieve social inhibitions, and improve self-confidence and self-esteem (Moss & Tarter, 1993). Other adolescents have reported feeling happier, being more aware of

their surroundings, and possessing the ability to think faster when using methamphetamines (Moss & Tarter, 1993). The sexual characteristics of the drug may dissuade sexual inhibitions as well, resulting in more frequent sexual experimentation, which may lead to increased risk for sexually transmitted diseases and unwanted teenage pregnancy.

Children

Methamphetamine affects the well-being of children on multiple levels. Its ease of production using store-bought materials has led to a greater number of 'local entrepreneurs' producing the drug in clandestine laboratories, typically found in home kitchens, bathrooms, basements and abandoned buses. The latest data from a 2002 Department of Justice report show that a total of 2023 children were found residing in home-based methamphetamine laboratories, up from 976 children in 2001, and 216 in 2000 (Swetlow, 2003). This trend may be reflective of either an increase in production sites, and/or stronger law enforcement efforts launched at curtailing the production of methamphetamine, resulting in the discovery of more methamphetamine producing laboratories. In addition, 1373 children were reported exposed to some form of chemical contamination. Limited exposure to the chemicals used for production can result in headaches, nausea and dizziness. High exposure and chronic exposure may lead to more serious physical problems including respiratory damage, chemical burns, cancer, brain damage and may also negatively impact the liver, kidney, spleen and immunologic system. Children living in these homes are also at greater risk for exposure to discarded needles and drug paraphernalia, fires and explosions and hazardous life-style conditions (e.g. explosives, booby traps, loaded weapons, unsanitary living conditions).

The psychological repercussions for children living in these homes are devastating as well. Children raised in these environments experience stress and trauma that retard their emotional and cognitive functioning resulting in a host of behavioral problems that are not limited to, but may include, low self-esteem, shame, poor social skills and peer relations, increased risk for teenage pregnancy and school failure (Oishi, West, & Stuntz, 2000). In addition, because many of these methamphetamine-producing parents are users of the drug as well, these children are at increased risk for physical and sexual abuse, resulting in the greater likelihood of an attachment disorder, which manifests itself in the inability to trust, form meaningful relationships and an impaired ability to adapt (Drug Endangered Children Resource Center, 1999). In addition, children with attachment disorders are at greater risk for antisocial and illegal behaviors as they enter adulthood (Fonagy et al., 1997).

Prenatal exposure to methamphetamine also poses serious health risks to newborn children. For example, the state of Iowa estimates that drugs affect 4000 new infants each year, citing that in 90 percent of these cases the drug is methamphetamine (Lucas, 1997). The results to the newborn can be devastating, and may include premature birth, growth retardation, abnormal reflexes, extreme irritability, physical trembling, feeding difficulties, aversion to touch and other withdrawal type symptoms. The prenatal exposure to methamphetamine may also have longitudinal effects. A study that followed children who had intrauterine exposure to methamphetamine were found in adolescence to exhibit higher levels of aggression and school failure, and have greater difficulty adjusting to their environment (Lucas, 1997). These children are at great physical and psychological risk, and as methamphetamine prevalence remains on the rise, there is little reason to believe that the increasing trend in the number of children exposed to these conditions will subside, furthering the urgency for effective and immediate prophylactic and therapeutic intervention.

Treatment considerations for methamphetamine addiction

The complex interaction between intrapsychic, environmental and behavioral factors makes methamphetamine dependence a difficult disorder to treat. Exacerbating the obstacles to recovery are severe withdrawal symptoms that include severe anhedonia and depression, as well as intense cravings for the drug that can be spurred on by environmental cues operating on the principles of classical stimulus–response conditioning (Rawson et al., 2002). These symptoms are antithetical to the intense 'rush' and feelings of empowerment that methamphetamine provides. What logically follows is a vicious cycle whereby methamphetamine users revert back to their use to combat the intense dysphoric experience associated with withdrawal. In reality, they are perpetuating their dependence and

increasing the likelihood that they will experience more frequent depressive symptomatology, further intensifying their craving for the drug, influencing them to return to it as a form of self-medication to alleviate their depressive withdrawal symptoms.

Our comprehensive review of the literature demonstrates the debilitating effects of methamphetamine as transcending age, race, gender and sexual orientation, as it is layered with complex psychological states and behavioral interactions. As the field of psychology continues to move toward structured evidence-based treatments in which the main focus is to target maladaptive behaviors, emphasizing the restructuring of cognitive processes and providing proactive coping strategies, it seems critical to the efficacy of any treatment approach to keep a watchful eye on the more dynamic and affective processes underlying drug using behaviors, particularly if it is determined that the psychiatric disorder predates the drug using behaviors. While there is a great deal of merit and empirical support for the efficacy of current manualized treatment protocols in transforming maladaptive behaviors, including methamphetamine use, specific drug using behaviors do not exist in a vacuum, and contribute and interact within a larger landscape that makes up the individual personality. This has been demonstrated by the comorbid psychological conditions, traumatized developmental histories and anti-social behaviors so often associated with methamphetamine abuse. Other factors such as sexual identity, cultural identity, adolescent identity, HIV serostatus and gender interact with the psychological motivations to use methamphetamine and can also be overlooked when therapists are encouraged to adhere to rigid and inflexible treatment protocols.

Several recommendations should be considered for further investigation. First, in order to best understand the individual behavioral motivations, it is essential to know the 'whole' person, and treatment protocols could be informed by a complete developmental history and assessment of personality in determining best practices for treatment. Also, previous research has demonstrated marked behavioral, contextual and psychological differences based on the frequency, intensity and method of administration associated with methamphetamine use (Semple, Patterson, & Grant, 2003). It is recommended that these factors be assessed prior to therapeutic intervention to determine the progression of methamphetamine use and its interrelationship with maladaptive behaviors, negative psychological states and severity of withdrawal symptoms that so often influence treatment retention. Finally, methamphetamine use is often used to manage negative affective states, providing an illusion of control over what might otherwise be considered unpredictable and overwhelming feelings. In addition, chronic methamphetamine use has the ability to distort cognitive functioning and impact an individual's ability to recognize and appropriately express emotions. While newer treatments have begun utilizing person-centered, group and family therapeutic approaches, consideration also could be given to the integration of insight-oriented therapeutic components into treatment protocols in order to provide therapeutic flexibility when dealing with these psychologically complex and multidimensional issues.

Recently, mindfulness meditation has emerged as a core psychotherapeutic technique adaptable to both cognitive and psychodynamic approaches. Mindfulness has been described as a state of detached awareness, where an individual is able to sit with stillness, examining all aspects of themselves in a non-judgmental and non-threatening way. As a therapeutic modality, mindfulness promotes psychological flexibility and insight, and integrates many of the free associations and cognitive restructuring that is common to both directive and non-directive clinical approaches (Martin, 1997).

While mindfulness-based therapies have proven to be beneficial in other areas, including stress and anxiety reduction, the treatment of borderline personality disorder, depression relapse and in the rehabilitation of physically ill patients, with the exception of Marlatt (2002), limited attention has been given to its potential in the area of addiction. Based on the psychological motivations to use methamphetamine as an escape, to cognitively dissociate and avoid dealing with negative emotions and manage social anxiety, the detached awareness associated with mindfulness may provide a safe way for these individuals to examine their thoughts, feelings, behaviors and perceptions. In addition, mindfulness has been described as a consciousness absorbing process, and is associated with neurological plasticity and benefits that include the promotion of positive emotions (Davidson et al., 2004; Goleman, 2003). These features may provide an alternative experience to the euphoric states associated with methamphetamine use, and could help counteract the neurological and chemical imbalances caused by chronic methamphetamine use, helping to relieve the depressive and aggressive

symptomatology associated with withdrawal. Thus, future research regarding the treatment of methamphetamine should assess the efficacy of mindfulness-based therapies in affecting change.

References

Anglin, M. D., Burke, C., Perrochet, B., Stamper, E., & Dawd-Noursi, S. (2000). History of the methamphetamine problem. *Journal of Psychoactive Drugs*, *32*(2), 137–141.

Brook, R., Szandorowska, B., & Whitehead, P. C. (1976). Psychosocial dysfunctions as precursors to amphetamine abuse among adolescents. *Addictive Diseases: An International Journal*, *2*(3), 465–478.

Centers for Disease Control and Prevention. (2002). Primary and secondary syphilis among men who have sex with men:/New York City. *Morbidity and Mortality Weekly Report*, *51*, 853–856.

Centers for Disease Control and Prevention. (2006). Methampetamine use and HIV risk behaviors among heterosexual men: Preliminary results from five Northern California counties, December 2001–November 2002. *Morbidity and Mortality Weekly Report*, *55*(1), 273–277.

Cohen, J. B., Dickow, A., Horner, K., Zweben, J. E., Balabis, J., Vandersloot, D., & Reiber, C. (2003). Abuse and violence history of men and women in treatment for methamphetamine dependence. *American Journal of Addiction*, *12*, 377–385.

Committee on Opportunities in Drug Abuse Research (Division of Neuroscience and Behavioral Health & Institute of Medicine). (1996). *Pathways of addiction: Opportunities in drug abuse research*. Washington, DC: National Academy Press.

Conway, K. P., Swendsen, J. D., Rounsaville, B. J., & Merikangas, K. R. (2002). Personality, drug of choice, and comorbid psychopathology among substance abusers. *Drug & Alcohol Dependence*, *65*(3), 225–234.

Davidson, R., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. et al. (2004). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*, *66*(1), 564–570.

De Luise, C., Brown, J., Rubin, S., & Blank, S. (2000). *Emerging patterns in primary and secondary syphilis among men: NYC: January—September 2000*. New York City: Department of Health & Mental Hygiene.

Drug Endangered Children Resource Center. (1999). *Medical protocols for children found at methamphetamine lab sites*. Los Angeles, CA: Drug Endangered Children Resource Center.

Fonagy, P., Target, M., Steele, M., Steele, H., Leigh, T., Levinson, A. et al. (1997). Morality, disruptive behavior, borderline personality disorder, crime and their relationship to security of attachment. In L. Atkinson & K. J. Zucker (Eds.), *Attachment and psychopathology* (pp. 223–274). New York: Guilford Press.

Freese, T. E., Obert, J., Dickow, A., Cohen, J., & Lord, R. H. (2000). Methamphetamine abuse: Issues for Special Populations. *Journal of Psychoactive Drugs*, *32*(2), 177–182.

Frosch, D., Shoptaw, S., Huber, A., Rawson, R. A., & Ling, W. (1996). Sexual HIV risk among gay and bisexual male methamphetamine abusers. *Journal of Substance Abuse Treatment*, *3*, 483–486.

Gfroerer, J. (1993). *An overview of the national household survey on drug abuse and related methodological research*. Proceedings of the Survey Research Section of the American Statistical Association, Joint Statistical Meetings, Boston, MA, August.

Goleman, D. (2003). *Destructive emotions. How can we overcome them?* New York: Bantom Dell.

Gorman, M. (1998). A tale of two epidemics: HIV and stimulant use. *FOCUS*, *13*, 1–8.

Gorman, E. M., Clark, C. W., Nelson, K. R., Applegate, T., Amato, E., & Scrol, A. (2003). A community social work study of methamphetamine use among women: Implications for social work practice, education and research. *Journal of Social Work Practice in the Addictions*, *3*(3), 41–62.

Halkitis, P. N. (2004). Methamphetamine: Strategies for prevention, harm reduction and treatment. Paper presented at the Boston Department of Health, Boston, MA, April.

Halkitis, P. N., Fischgrund, B. N., & Parsons, J. T. (2005). Explanations for methamphetamine use among gay and bisexual men in New York City. *Substance Use and Misuse*, *40*, 1–15.

Halkitis, P. N., Green, K. A., & Carragher, D. (2006). Methamphetamine use, sexual behavior, & HIV seroconversion. *Journal of Gay and Lesbian Psychotherapy*, *10*(3/4), 95–109.

Halkitis, P. N., Green, K. A., & Mourgues, P. (2005a). Longitudinal investigation of methamphetamine use among gay and bisexual men in New York City: Findings from Project BUMPS. *Journal of Urban Health*, *82*(1, Supp. 1), i18–i25.

Halkitis, P. N., Kutnick, A., & Slater, S. (2005b). The social realities of adherence to protease inhibitor regimens: Substance use, health care, & psychological states. *Journal of Health Psychology*, *10*(4), 545–558.

Halkitis, P. N., & Parsons, J. T. (2002). Recreational drug use and HIV sexual risk behavior among men frequenting urban gay venues. *Journal of Gay and Lesbian Social Services*, *14*(4), 19–38.

Halkitis, P. N., Parsons, J. T., & Stirratt, M. J. (2001). A double epidemic: Crystal methamphetamine drug use in relation to HIV transmission among gay men. *Journal of Homosexuality*, *41*(2), 7–35.

Halkitis, P. N., Parsons, J. T., & Wilton, L. (2003). An exploratory study of contextual and situational factors related to methamphetamine use among gay and bisexual men in New York City. *Journal of Drug Issues*, *33*(2), 413–432.

Halkitis, P. N., & Shrem, M. T. (2006). Psychological differences between binge and chronic methamphetamine using gay and bisexual men. *Addictive Behaviors*, *31*, 549–552.

Halkitis, P. N., Shrem, M. T., & Martin, F. (2005c). Sexual behavior patterns of methamphetamine using gay and bisexual men in New York City. *Substance Use and Misuse*, *40*, 703–719.

Hall, W. (1996). What have population surveys revealed about substance use disorders and their co-morbidity with other mental disorders? *Drug & Alcohol Review*, *15*(2), 157–170.

Hando, J., & Hall, W. (1994). HIV risk-taking behavior among amphetamine users in Syndey, Australia. *Addiction*, *89*(1), 79–85.

Harris, N. V., Thiede, H., McGough, J. P., & Gordon, D. (1993). Risk factors for HIV infection among injecting drug users: Results of blinded surveys in drug treatment centers, King County, Washington 1988–1991. *Journal of Acquired Immune Deficiency Syndromes*, *6*, 1275–1282.

Jacobs, A. (2002). In clubs, a potent drug stirs fears of an epidemic. *New York Times*, 29 January, p. B1.

Johnston, L. D., O'Malley, P. M., & Bachman, J. G. (2003). *Monitoring the future of: National results on adolescent drug use; overview of key findings*. Bethesda, MD: National Institute on Drug Abuse.

Koch Institute. http://www.kci.org/meth_info/national_trend.htm

Lucas, S. E. (1997). *Proceedings of the national consensus meeting on the use, abuse and sequalae of abuse of methamphetamine with implications for prevention, treatment and research*. Publication No. SMA 96–801 3. Rockville, MD: US Department of Health and Human Services.

Marlatt, G. (2002). Buddhist philosophy and the treatment of addictive behavior. *Cognitive and Behavioral Practice*, *9*, 44–50.

Martin, J. (1997). Mindfulness: A proposed common factor. *Journal of Psychotherapy Integration*, *7*(4), 291–312.

Matsumoto, T., Miyakawa, T., Yabana, T., Iizuka, H., & Kishimoto, H. (2000). A clinical study of comorbid eating disorders in female methamphetamine abusers: First report. *Seishin Igaku*, *42*(11), 1153–1160.

Mendelson, B., & Harrison, L. (1996). Drug trends in Denver and Colorado. *Proceedings of the community epidemiology work group public health service*, *NIDA*, *2*, 52–67.

Miller, M. A. (1997). History and epidemiology of methamphetamine abuse in the United States. In H. Klee (Ed.), *Amphetamine misuse* (pp. 113–133). Amsterdam: Harwood Academic Publishers.

Miller, N. S. (1995). History and review of contemporary addiction treatment. *Alcoholism Treatment Quarterly*, *12*(2), 1–22.

Molitor, F., Truax, S., Ruiz, J., & Sun, R. (1998). Association of female methamphetamine use during sex with risky sexual behaviors and HIV infection among non-injectors drug users. *Western Journal of Medicine*, *168*(2), 93–97.

Moss, H. B., & Tarter, R. E. (1993). Substance abuse, aggression, and violence: What are the connections? *American Journal on Addictions*, *2*(2), 149–160.

Nordahl, T. E., Salo, R., & Leamon, M. (2003). Neuropsychological effects of chronic methamphetamine use on neurotransmitters and cognition: A review. *Journal of Neuropsychiatry and Clinical Neurosciences*, *13*(3), 317–325.

Oetting, E. R., Deffenbeacher, J. L., & Donnermeyer, J. F. (1998). Primary socialization theory: The role played by personal traits in the etiology of drug use and deviance II. *Substance Use & Misuse*, *33*(6), 1337–1366.

Oetting, E. R., Deffenbeacher, J. L., Taylor, M. J., Luther, N., Beauvais, F. M., & Edwards, R. W. (2000). Methamphetamine use by high school students: Recent trends, gender, and ethnicity differences, and use of other drugs. *Journal of Child and Adolescent Substance Abuse*, *10*(1), 33–50.

Office of National Drug Control Policy. (2004). *Methamphetamine: Facts and figures*. http://www.whitehousedrugpolicy.gov/drugfact/methamphetamine/index.html (accessed 9 March 2004).

Oishi, S. M., West, K. M., & Stuntz, S. (2000). *Drug endangered children health and safety manual*. West Los Angeles, CA: Drug Endangered Children Resource Center, May.

Parsons, J. T., & Halkitis, P. N. (2002). Sexual and drug-using practices of HIV-positive men who frequent public and commercial sex environments. *AIDS Care*, *14*(6), 815–826.

Paul, J. P., Stall, R., & Davis, F. (1993). Sexual risk for HIV transmission among gay/bisexual men in substance-abuse treatment. *AIDS Education & Prevention*, *5*(1), 11–24.

Perdue, T., Hagan, H., Thiede, H., & Velleroy, L. (2003). Depression and HIV risk behavior among Seattle-area injection drug users and young men who have sex with men. *AIDS Education and Prevention*, *15*(1), 81–92.

Petraitis, J., Flay, B. R., & Miller, T. Q. (1995). Reviewing theories of adolescent substance use: Organizing pieces in the puzzle. *Psychological Bulletin*, *117*(1), 67–86.

Purcell, D. W., Parsons, J. T., Halkitis, P. N., Mizuno, Y., & Woods, W. J. (2001). Substance use and sexual transmission risk behavior of HIV-positive men who have sex with men. *Journal of Substance Abuse*, *13*(1–2), 185–200.

Rawson, R. A., Anglin, M. D., & Ling, W. (2002). Will the methamphetamine problem go away? *Journal of Addictive Diseases*, *21*, 5–19.

Rawson, R., Huber, A., Brethen, P., Obert, J., Gulati, V., Shoptaw, S., & Ling, W. (2000). Methamphetamine and cocaine users: Differences in characteristics and treatment retention. *Journal of Psychoactive Drugs*, *32*(2), 233–238.

Reback, C., & Ditman, D. (1997). *The social construction of a gay drug: Methamphetamine use among gay and bisexual males in Los Angeles*. Report funded by the City of Los Angeles.

Reback, C. J., Larkins, S., & Shoptaw, S. (2003). Methamphetamine abuse as a barrier to HIV medication adherence among gay and bisexual men. *AIDS Care*, *15*(6), 775–785.

Russell, J. A., & Mehrabian, A. (1977). Environmental effects on drug use. *Environmental Psychology & Nonverbal Behavior*, *2*(2), 109–123.

San Francisco Department of Health. (2004). www.dph.sf.ca.us/PHP/AIDSSurvUnit.htm

Semple, S., Patterson, T. L., & Grant, I. (2002). Motivations associated with methamphetamine use among HIV+ men who have sex with men. *Journal of Substance Abuse Treatment*, *22*(3), 149–156.

Semple, S., Patterson, T. L., & Grant, I. (2003). Binge use of methamphetamine among HIV-positive men who have sex with men: Pilot date and HIV prevention implications. *AIDS Education & Prevention*, *15*(2), 133–147.

Semple, S., Patterson, T. L., & Grant, I. (2004). The context of sexual risk behaviour among heterosexual methamphetamine users. *Addictive Behaviors*, *29*(4), 807–810.

Shoptaw, S., Peck, J., Reback, C. J., & Rotheram-Fuller, E. (2003). Psychiatric and substance dependence comorbidities, sexually transmitted diseases, and risk behaviors among methamphetamine-dependent gay and bisexual men seeking outpatient drug abuse treatment. *Journal of Psychoactive Drugs*, *35*(1), 161–168.

Sorvillo, F., Kerndt, P., Cheng, K., Beall, G., Turner, P. A., Beer, V. L. et al. (1995). Emeriging patterns of HIV transmission: The value of alternative surveillance methods. *AIDS*, *9*, 625–629.

Stall, R., McKusick, L., Wiley, J., Coates, T. J., & Ostow, D. G. (1986). Alcohol and drug use during sexual activity and compliance with safe sex guidelines for AIDS: The AIDS behavioral research project. *Health Education Quarterly*, *13*(4), 1986, 359–371.

Stall, R., & Wiley, J. (1988). A comparison of alcohol and drug use patterns of homosexual and heterosexual men: The San Francisco men's health study. *Drug & Alcohol Dependence*, *22*(1–2), 63–73.

Swalwell, C., & Davis, G. (1999). Methamphetamine as a risk factor for acute aortic dissection. *Journal of Forensic Science*, *44*(1), 23–26.

Swetlow, K. (2003). Children at clandestine methamphetamine labs: Helping meth's youngest victims. http://www.ojp.usdoj.gov/ovc/publications/bulletins/children/welcome.html (accessed 1 November 2003).

United States Department of Justice. (2003). *Meth awareness*. Washington, DC: United States Department of Justice. http://www.usdoj.gov/methawareness (accessed 5 May 2004).

United States Office of Health and Human Services (Substance Abuse and Mental Health Services Administration). (2003). *National survey on drug use and health: Results*. http://www.oas.samhsa.gov/nhsda/2k3nsduh/2k3Results.htm#toc (accessed 1 November 2004).

Woody, G. E., Donnell, D., Seage, G. R., Metzger, D., Marmor, M., Koblin, B. A. et al. (1999). Non-injection substance use correlates with risky sex among men having sex with men: Data from HIVNET. *Drug & Alcohol Dependence*, *53*(3), 197–205.

Wright, S., & Klee, H. (2004). Violent crime, aggression, and amphetamine: What are the implications for drug treatment services*? Drugs: Education, Prevention & Policy*, *8*(1), 73–90.

Zweben, J. E., Cohen, J. B., Christian, D., Galloway, G. P., Salinardi, M., Parent, D., & Iguchi, M. (2004). Psychiatric symptoms in methamphetamine users. *American Journal on Addictions*, *13*(2), 181–190.

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