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Chapter 5

**FIRESETTING BEHAVIOR AND PSYCHIATRIC DISORDERS**

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**ABSTRACT**

Firesetting behavior results in serious damage to lives and property every year. Firesetting has been linked to a number of comorbid psychiatric disorders including depression, substance abuse, conduct disorder, antisocial personality disorder, obsessive compulsive disorder, psychotic disorder, schizoid personality disorder, and schizophrenia. Psychiatric disorders differ by gender. In addition, juvenile firesetters have a history of a separate set of psychiatric comorbidities. The strong correlation between psychiatric comorbidities and firesetting behavior illustrates the need for fire service and mental health collaboration.

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INTRODUCTION

Firesetting is an often overlooked problem that is completed by youth as well as adults and results in serious damage to lives as well as property. Firesetting has been linked to a number of comorbid psychiatric disorders. Evaluating comorbid psychiatric disorders has important implications in the prevention, diagnosis and treatment of firesetting behavior. Firesetting behavior has been a subject of interest for a number of years in scientific literature. The term pyromania was first used by Marc in 1833 (1). Kraepelin defined pyromania as an “impulsive insanity” (1,2). Sigmund Freud believed pyromania was the result of aberrant psychosexual development (1,2).

The result of firesetting may involve both the legal and mental health systems. The problem is more common than is often realized and results in extensive damage. There are more than 62,000 arsons per year in the United States (1). This number is particularly startling considering that only 3% of suspected arson fires led to conviction (3). The National Fire Protection Association estimated 316,610 intentional fires each year during the period from 2003-2006 (3). Intentional fires during the same time period were associated with 437 civilian fire deaths, and 1404 civilian fire injuries (3). It is estimated that the United States suffers a loss of $2 billion dollars annually due to intentional firesetting. It has been presumed that this behavior is so common, and the losses so great, because firesetting is relatively “easy” to complete (1). Firesetting does not require weapons or interpersonal interaction (1).

A distinction must be made between the terms firesetting behavior, intentional firesetting, pyromania, and arson. Firesetting is a behavior that includes setting fires both accidentally and intentionally (1). The term “intentional firesetting” is not necessarily synonymous with “pyromania” as the latter is a psychiatric diagnosis defined by the DSM. Intentional firesetting does not always imply a psychiatric disorder (1). Arson, on the other hand, is a legal term. Arson is a criminal act “in which one willfully and maliciously sets fire to or aids in setting fire to a structure, dwelling, or property of another” (1,4). In the United States, the law presumes all burning to be accidental. In order to be convicted of arson, the prosecution must overcome this presumption and prove that the fire was set by criminal design (1).

In order to thoroughly understand the term “pyromania” the DSM-IV diagnostic criteria must be reviewed. The updated version of the DSM (DSM-5) is unchanged from the DSM-IV criteria (5). Pyromania is listed along with pathological gambling, kleptomania, intermittent explosive disorder, and
trichotillomania as separate categories within the Impulse Control Disorders (6). Pyromania is defined as “Deliberate and purposeful firesetting on more than one occasion”(1). There is tension or affective arousal before the act. The person must have a fascination with, interest in, curiosity about, or attraction to fire and its situational contexts. In addition, there must be pleasure, gratification, or relief when setting fires or when witnessing or participating in their aftermath. The firesetting cannot be done for monetary gain, as an expression of sociopolitical ideology, to conceal criminal activity, to express anger or vengeance, to improve one’s living circumstances, in response to a delusion or hallucination, or as a result of impaired judgment. Finally, the firesetting is not explained by conduct disorder, a manic episode, or antisocial personality disorder (1).

There are numerous psychiatric comorbidities among those diagnosed with pyromania, those convicted of arson, and those with intentional firesetting behavior. This article will evaluate the current literature regarding various associated psychiatric comorbidities associated with the different types of firesetting behavior. Gender differences, as well as juvenile offenders, are associated with differing psychiatric comorbidities among those with firesetting behavior.

**LITERATURE SEARCH**

Literature search was conducted using PubMed and included terms such as “pyromania”, “firesetting”, “arson”, and “psychiatric disorders”. This review investigates the current literature related to firesetting behaviors and comorbid psychiatric disorders.

**DISCUSSION**

There are high rates of psychiatric comorbidities among those who set intentional fires, those who are diagnosed with pyromania, and those who are convicted of arson. Multiple studies have evaluated the comorbidities among those with firesetting behavior, and those convicted of arson, and those diagnosed with pyromania. In addition, several studies have identified gender differences among those who set fires. Psychiatric comorbidities have also been identified in juveniles with firesetting behavior.
A high rate of comorbid Axis I mood disorders and impulse control disorders exist among those who meet criteria for pyromania. A study of twenty-one adult and adolescent subjects were recruited from inpatient and outpatient studies of impulse-control disorders who met DSM-IV criteria for lifetime pyromania were administered a semi-structured interview to evaluate for psychiatric comorbidity. Thirteen of the subjects (61.9%) had a comorbid Axis I mood disorder and 10 (47.6%) met criteria for a current impulse control disorder (7).

The same study also evaluated the subject's feelings surrounding the firesetting behavior. All subjects reported a "rush" when watching or setting fires. None of the subjects reported a sexual feeling associated with firesetting. Sixteen subjects (76.2%) reported that the frequency and intensity of the firesetting increased over time. Eighteen subjects (85.7%) reported feelings of relief when setting fires and 19 (90.5%) reported feeling severe distress after firesetting. Eight subjects had thought of suicide in order to control their firesetting behavior. Subjects with current substance use disorder and major depressive disorder reported that the symptoms of pyromania preceded the substance use disorder and depressive symptoms. They also felt the substance use and depressive disorder were a result of distress over setting fires (7).

Although the above study consists of a small sample size, it demonstrates the features that place pyromania as a category under Impulse Control Disorders in the DSM-IV (6). Specifically, the subjects felt a sense of tension or excitement before acting out. They also experienced relief, pleasure or gratification while acting out or shortly thereafter. They reported feeling remorse afterwards. In addition, the frequency and intensity of firesetting increased over time (7). An impulse control disorder is described as "(1) repetitive or compulsive engagement in the behavior despite adverse consequences, (2) diminished control over the problematic behavior, (3) an appetitive urge or craving state prior to engagement in the problematic behavior, and (4) a hedonic quality during the performance of the problematic behavior" (7, 8). Thus, pyromania is categorized in the DSM-IV and DSM 5 as a type of impulse control disorder.

Impulse control disorders may be underdiagnosed among those with a current psychiatric diagnosis. A study involving 102 adolescents who were admitted to an inpatient psychiatric service were screened for impulse control disorders. Forty percent met criteria for impulse control disorder. Those with an impulse control disorder were more likely to report previous psychiatric hospitalization and internalizing disorders. A statistically greater percentage of females met criteria for pyromania (12.5% vs. 0%) (9). A separate study of 234
psychiatric inpatients evaluated the prevalence of impulse control disorders using a structured interview. The lifetime rate of impulse control disorders was found to be 23.5% with a current rate of 18.8%. The most common impulse control disorders were pathologic skin picking, compulsive buying, and intermittent explosive disorder (6).

There are high rates of antisocial behavior in those with a lifetime history of firesetting (10). A large study titled the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) provided data about 407 subjects with a lifetime history of firesetting. Face-to-face interviews were conducted of all 43,000 adults in the study. Lifetime prevalence of firesetting in addition to mood, anxiety, substance use, and personality disorders in DSM-IV were assessed. The lifetime prevalence of firesetting in the United States was 1.0% (10). Firesetting was associated with a broad array of antisocial behaviors. There were strong associations between lifetime alcohol and marijuana use disorders, conduct disorder, antisocial, and obsessive-compulsive personality disorders, and family history of antisocial behavior (10). The most prevalent antisocial behaviors were staying out late without permission, cutting class and leaving without permission, and shoplifting. The least prevalent was forcing someone to have sex. The strongest associations between antisocial behaviors and firesetting behavior were found for robbing or mugging someone or snatching a purse, destroying others' property, and forcing someone to have sex (10).

While a number of psychiatric comorbidities have been linked to firesetting behavior, bipolar I disorder does not appear to be a common comorbidity. A study of 124 bipolar I patients recruited from the outpatient clinic of a Bipolar Disorder unit did find a high prevalence rate of comorbid impulse control disorders (27.4%). The impulse control disorders included pathologic skin picking, compulsive buying, intermittent explosive disorder, and trichotillomania. Interestingly, there were no instances of pyromania or compulsive sexual behavior (11). However, due to the fact that patients with bipolar I disorder appear to be at high rate of having a comorbid impulse control, one cannot rule out firesetting behavior in these patients.

Individuals with schizophrenia and other psychosis appear to be at increased rate of arson conviction. There is evidence in the literature that psychosis is associated with serious crimes such as homicide. A case-control study investigated the association of being diagnosed with schizophrenia or other psychoses and committing arson. Data was used from Swedish national registers for criminal convictions, hospital discharge diagnoses, and sociodemographic factors. The study included the years 1988-2000. All
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convicted arson offenders of both sexes in Sweden were included (1689) and were compared to a random sample of control subjects from the general population. The study found that arson offenders were more likely to be diagnosed with schizophrenia or other psychosis. The rates of comorbidity of the psychotic disorder with a personality disorder were 30.6% (N=60) in men and 42.6% (N=40) in women. There were 48.5% (N=95) men with a psychotic disorder as well as comorbid substance use disorder while 38.5% (N=36) women had same comorbidity. The study concluded that individuals with schizophrenia or other psychosis have increased risk of arson convictions. Thus, arson is in the same category as homicide as both being crimes that are strongly associated with psychotic disorders (12).

Gender differences exist among those with firesetting behavior. Data from the NESARC study was also used to evaluate gender differences and psychiatric correlates in those with lifetime history of firesetting (3). The study found that firesetting is associated with a wide range of antisocial behaviors that differed by gender. Men with a lifetime history of firesetting were more likely than men without firesetting to have a lifetime generalized anxiety disorder, conduct disorder, antisocial personality disorder, alcohol or cannabis use disorder, or obsessive compulsive disorder (3). When women with a lifetime history of firesetting were compared to women without a lifetime history they were found to have a lifetime diagnosis of alcohol abuse and cannabis use disorder, conduct disorder, antisocial personality disorder, oppositional defiant disorder, psychotic disorder, bipolar disorder, or schizoid personality disorder (3). Women with firesetting behavior were more likely than men with firesetting behavior to have lifetime diagnosis of alcohol abuse and antisocial personality disorder as well as a diagnosis of schizoid personality disorder (3).

When female arsonists are compared to male arsonists, female arsonists are more likely to have higher levels of depression and psychosis (13). In addition, the most common comorbid psychiatric diagnosis in female arsonists appears to be borderline personality disorder and antisocial personality disorder (13,14). A study which reviewed records of 167 arsonists (129 male and 38 female) found fewer women had childhood history of stealing, and they were more likely than men to have been sexually abused. More than half of all women sampled suffered from a diagnosable psychiatric illness, mainly affective disorder. Women were less likely than men to have an alcohol problem or to be intoxicated at the time of fire setting. Women were also more likely to have element of attention-seeking or parasuicide (15). Interestingly, women were more likely to be presumed to be suffering from a mental illness
in order to avoid prosecution which may be part of the reason that females tend to be diagnosed with a psychiatric illness (16,15).

One of the most disturbing statistics regarding firesetting is how common the behavior is in our youth. Firesetting occurs in 13.6-17% of youth (3,17). It is associated with high rates of family dysfunction, history of sexual abuse, school difficulties, substance use disorders, and personality traits including impulsivity and hostility (3,17). Children firesetters have been found to be more likely to engage in future delinquent behavior (3,18).

In children, firesetting has been found to be related to the number of depressive, conduct disorder, oppositional defiant disorder, and attention deficit hyperactivity disorder symptoms (18,22). In girls, firesetting is associated with problems with anxiety and depression (19,22). Other characteristics of juvenile firesetters include poor social judgment, poor planning, weak social anticipation and feelings of loneliness, isolation and inadequacy in peer relations (20,22) as well as peer rejection (21,22). Those with a history of repetitive firesetting scored higher on measures of depression, interpersonal problems, alienation, and deviation than those individuals who had only one episode of fire setting (22). Severe firesetters were found to lack empathy with others and were significantly less likely to express remorse for the consequences of their behavior (22).

Anger and hostility appear to play a role in juvenile firesetting behavior. Both firesetters and match-players have been found to display more aggression and hostility, and participate in more fighting and arguing (22,23). A past history of physical violence, cruelty to children or animals, power struggles with adults were all more characteristic of severe firesetters or match-players compared to non-firesetters (20,22).

As noted above, fire setting behaviors in children are related to psychopathology and family stressors. One study notes that fire behaviors can be identified in young children using a brief screening measure. A study of 1359 4- to 9-year olds in Australia, were evaluated using parent report surveys. Five percent were reported to engage in any match or fire play. Firesetting in boys was found to be associated with increasing age, parental stress, antisocial behavior, hyperactivity, cruelty to animals, and thrill-seeking temperament. In girls, higher levels of parental stress, both positive and negative parenting, antisocial behavior, and problems with anxiety and depression were correlated with firesetting behavior (19).

A study completed in Canada helps identify the mental health and substance use correlates of firesetting behaviors in adolescents. A total of 3,965 students in grades 7-12 were surveyed about their firesetting behavior. A
total of 13.7% reported one or two episodes during the past year while 13.5% reported three or more episodes during the last year (24). Youth with firesetting beginning before age 10 were more likely to report frequent firesetting during the past year. Compared to nonfiresetters, desisters (lifetime but not in the last year) and low frequency (1-2 times/last 12 months) firesetters were more likely to report psychological distress, binge drinking, frequent cannabis use, and sensation seeking. Higher rates of delinquent behavior, suicidal intent, and low parental monitoring were reported in low frequency firesetters compared to nonfiresetters. Individuals who were high frequency firesetters were found to have elevated risk ratios for all risk monitors plus “other illicit drug use.” Interestingly, but as may be expected, the cumulative number of risk indicators was positively correlated with firesetting severity (24).

Another study sought to evaluate juvenile firesetting in Italy and the relationship to aggression and psychopathology. Surveys were administered to 567 youth ages 11-18 years in Italy as well as to parents, teachers, and peers. Twenty-nine percent of youth were found to have engaged in fire setting. Firesetters had higher rates of delinquent acts than aggressive youth without firesetting behavior. Firesetters had higher levels of withdrawn behavior and social problems than aggressive youth (without firesetting behavior). Youth who were both aggressive and firesetters had more anxiety and depressive difficulties than aggressive youth. At follow-up, youth who were aggressive and firesetters were more likely than controls to report covert antisocial behavior such as physical assault and gang violence (25).

Firesetting behavior is often chronic and longitudinal. Without appropriate treatment, controlled fires may turn into arson (7). Factors associated with arson recidivism include personality disorders, psychosis, and mental retardation (26). Individuals with repeat arson offenses also often have comorbid alcoholism (26). The nature of firesetting behavior requires collaboration between mental health and fire service workers. One example of a program that has been successful is the TAPP-C program (The Arson Prevention Program for Children). This program collaboratively provides education and mental health care for children. Evaluation of the program showed significant benefits to both intra-disciplinary and interdisciplinary knowledge (27). Collaborative relationships among community organizations such as insurance companies, schools, children’s protective service agencies, and juvenile court systems are important for the prevention, identification, and treatment of firesetting behavior (28).
In conclusion, firesetting is a complex behavior arising from multiple factors that shape a person’s behavior. Firesetting has severe consequences to individuals, property and communities. Psychiatric comorbidities that are associated with firesetting include depression, substance abuse, conduct disorder, antisocial personality disorder, obsessive compulsive disorder, psychotic disorder, schizoid personality disorder, and schizophrenia. Further collaborative effort between mental health providers, primary care health providers, fire service workers, and community organizations is needed in order to prevent and treat firesetting behavior.

REFERENCES