FIRESETTING INTERVENTIONS

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Abstract

Childhood firesetting is a serious nationwide problem with many severe and long lasting repercussions, including hundreds of deaths, thousands of injuries and millions of dollars in property damage each year (Barreto, Boekamp, Armstrong & Gillen, 2004). Children who misuse and abuse fire pose a substantial threat to the health and safety of every community throughout the United States. Yet among behavioral health care providers, many are minimally aware of the extent of the problem, strategies for assessment and the most effective interventions (Barreto & Boekamp, 2005). The following article discusses the history, diagnostic criteria, characteristics, etiology and course of childhood firesetting, as well as methods of assessment and intervention.

Defining Firesetting

Conduct problems in children constitute a wide range of acting-out behaviors that can range from minor behaviors such as whining and temper tantrums to aggression, stealing, lying and physical destructiveness (McMahon & Wells, 1998). Although firesetting is a more advanced or extreme type of conduct problems, it is often (but not always) associated with a diagnosis of Conduct Disorder. The term Conduct Problems (CP) typically refers to the constellation of behaviors used to make a formal diagnosis of Conduct Disorder (CD), or Oppositional Defiant Disorder (ODD). In the DSM-IV (American Psychiatric Association, 1994), the two diagnostic categories that are most relevant to CP are ODD and CD. The essential feature of ODD is a repetitive pattern in which the child is defiant, disobedient, negative and hostile to authority figures (American Psychiatric Association, 1994). The essential feature of CD is a recurrent, persistent pattern of behavior in which the child violates the basic rights of others or major age-appropriate societal norms or rules (American Psychiatric Association, 1994).

Classification

A review of the research indicates an apparent distinction between fireplay and firesetting behavior. Both behaviors may produce varying degrees of damage and injury, but they differ in their levels of intent and malice. Fireplay is often used to convey a low level of intent to inflict harm and an absence of malice. Among adolescents, fireplay involves elements of curiosity and damages are typically viewed as collateral and not maliciously inspired. The degree of malice can vary in firesetting behavior, but the level of intent is higher than in fireplay. Juvenile firesetters are viewed as willful actors who consistently use fire as an instrument of purposeful

action. Additionally, the literature suggests that firesetting may be more conducive to repetition

and chronic behavior than fireplay (Flynn, 2009; Putnam & Kirkpatrick, 2005).

Current literature also distinguishes between child and adolescent firesetting. Child

firesetting is restricted to children age 12 or younger. Adolescent firesetting includes those 13

years old to the age of majority. This distinction arises from the impact of development and

maturation on behavior. As children mature, society holds them increasingly responsible for

their behavior. Reponses to delinquent behavior among the very young differ from responses to

offenses committed by those in their mid-teens. These developmentally based considerations

may explain why firesetting research is generally oriented toward treatment rather than

punishment. Due to age, even the most hostile of juveniles may be perceived as less culpable for

their actions and more amenable to treatment than adults. These age-based distinctions are

implicit in the terms "firesetter" and "arsonist" (Flynn, 2009; Putnam & Kirkpatrick, 2005).

The use of fire by juveniles may indicate that fire can be both an instrument of power and

serve as a weapon, as opposed to merely being a product of curiosity. The concept of expressive

and instrumental behavior addresses motivations of firesetting. Expressive firesetting behavior

suggests that the behavior is an expression of psychopathology or unresolved trauma. In

contrast, instrumental firesetting suggests that the fire was set to achieve an established goal

(Flynn, 2009; Putnam & Kirkpatrick, 2005).

Finally, the literature contains implicit references to external and internal origins of

firesetting behavior. External origins include social and cultural influences that promote the use

of fire by juveniles. Certain elements of a juvenile's experiential world may encourage or

otherwise promote fire usage. These elements may include family dynamics, peer

reinforcement, or representations in the media. Internal origins point to something within the

firesetter, biochemically, neurologically, or psychologically that compels him or her to use fire (Flynn, 2009; Putnam & Kirkpatrick, 2005).

Characteristics

By comparing hospital records of firesetting and nonfiresetting children admitted to a psychiatric facility, Kolko, Kazdin and Meyer (1983) found that firesetters are more often male and more frequently diagnosed as conduct disordered, oppositional defiant disordered and attention deficit disordered. Research also suggests that the occurrence of firesetting is greater in youth who exhibit a combination of shyness, aggressiveness and feelings of peer rejection (Chen, 2003). Additionally, firesetters are perceived as engaging in more property destruction, lying, stealing, vandalism, cruelty to animals, and worrying about doing something wrong (Kolko, Kazdin, Meyer, 1983). A similar study of outpatients by Heath, Hardesty, Goldfine, and Walker (1983) found that firesetters received higher scores in externalizing behaviors and more often came from larger and poorer families than did outpatient nonfiresetters. Frequent firesetters were found to participate in fewer social activities than nonfiresetters and among incarcerated male delinquents, significantly more firesetters than nonfiresetters had been raised without their biological mothers in the home and had more placements (i.e. foster care or orphanages) and residential psychiatric treatments (Heath et al., (1993). Additional individual features of temperament, parental psychopathological factors, social and environmental factors have also been hypothesized to be contributors to childhood firesetting, while feeling angry, ignored, sad or depressed was also commonly reported before acts of firesetting (Kolko et al., 1983; Chen, 2003; Heath et al., 1983).

Prevalence Rates

In surveying psychiatric outpatient populations, clinical investigators have reported the prevalence of firesetting among children to be between 2.4 and 3.3 percent (Kolko & Kazdin, 1988 in Chen, 2003). Additionally, Kolko and Kazdin (1988) found a much higher incidence and greater prevalence among child psychiatric inpatients than in outpatients. Some 30-40% of children seen in outpatient behavioral heath settings report starting fires or misusing matches or lighters (Kolko, 2002). Among inpatient children, fire starting is nearly twice as prevalent.

The majority of arson charges in the U.S. are made against older children and adolescents, though the problem spans childhood and even preschoolers as young as age three have set fires with the intention to harm others (Hanson, MacKay, Atkinson, Staley, & Pignatiello, 1995). In 2006, children playing with fire started an estimated 14,500 structure fires that were reported to U.S. fire departments, causing an estimated 130 civilian deaths, 810 civilian injuries and $328 million in direct property damage (Flynn, 2009). Among serious crimes, arson has the highest rate of juvenile involvement, with juveniles constituting 54% of all arson arrests. However, the number of fires set by juveniles is, in all likelihood, much larger than the number of reported fires due to parental disclosure (Hall, 2001). Home fires are the fifth leading cause of injury-related deaths for children from birth to age fourteen and seventy percent of the fatalities resulting for children playing with fire occur in children under the age of six (Hall, 2001).

<center>Causes and Contributory Factors</center>

A number of parental and family functioning variables have also been associated with firesetting among children. These family factors include poor child-rearing practices, such as lack of supervision and lenient or inconsistent discipline (Kazdin & Kolko, 1986; Kolko &

Kazdin, 1990). Parents reporting higher levels of relationship problems, stressful life events and personal difficulties have also been found among juvenile firesetters (Kolko & Kazdin, 1991). Research has also revealed the impact of adverse childhood experiences such as abuse, neglect and maltreatment on later firesetting (Epps & Hollin, 2000; Schwartzman, Stambaugh, & Kimball, 1998).

While Kolko (2001) argues for the importance of a child's exposure to fire materials and their competence around fire in determining motives and reasons for firesetting behavior, the copious amount of other individual and family factors found to be associated with firesetting has produced mixed feelings in regards to the underlying contributory factors. Due to the variability between individual firestarters and their families, researchers can agree that the complexity of the behavior, motivations, antecedent conditions and consequences that surround firesetting all play an important role.

Longitudinal Studies on Outcome

Little is knows about progression and change in firesetting behaviors within individuals, and the factors associated with their developing patterns due to the absence of longitudinal research following child firesetters into adulthood. Frequently, children who start fires often fall through the cracks of the public health system due to the lack of a coordinated response from professionals in the areas of juventile justice, fire prevention and behavioral health care (Barreto & Boekamp, 2005). However, Bradford and Dimock's (1986) study that compared adolescent and adult arsonists suggested that while both juvenile and adult firesetters were motivated by aggression and revenge and tended to set fires to their own homes, child firesetters started fires due to conduct disorder whereas fires set by adults were most often a result of alcoholism, schizophrenia, and personality disorders.

Etiology

Over the years, researchers have developed several theories integrating the possible causes and contributory factors of firesetting. Identifying possible causes of behavior can be beneficial since some causes may suggest certain interventions over others (Putnam & Kirkpatrick, 2005). Similarly, understanding how certain characteristics or circumstances influence juvenile firesetting may lead to targeted efforts that can address those characteristics and prevent firesetting behavior. The following table presents the prominent etiological theories of juvenile firesetting: (Putnam & Kirkpatrick, 2005)

Theory	Motive	Origin	Etiological Theme
Opportunity theory	Expressive and instrumental	External	Firesetting is a product of the open and relatively unrestricted access to fire as an instrument and/or weapon (Cohen and Felson, 1979).
Learning theory	Expressive and instrumental	External	Firesetting is a behavior learned through association with family, peers, and subcultural forces that wittingly or unwittingly abet inappropriate fire use (Kolko and Kazdin, 1986).
Expressive trauma theory	Expressive	Internal	Firesetting is a manifestation of preexisting childhood trauma and is used to vent frustration with victimization or other life circumstances (Lowenstein, 1989).
Stress theory	Expressive and instrumental	External and internal	Firesetting is a behavior that releases accumulating stress or seeks stress or danger in an uneventful life. It is often closely related to vandalism, shoplifting, and graffiti among juveniles (Lyng, 1990).
Power association theory	Instrumental	External and internal	Firesetting is a means for juveniles who are otherwise disempowed to attain power over people an/or the environment (Sakheim and Osborn, 1986).
Social acceptance theory	Expressive and instrumental	External and internal	Firesetting is motivated by the desire to gain acceptance by a peer or a peer group (Swaffer and Hollin, 1995).
Societal reaction theory	Instrumental	External and internal	Firesetting is a behavior produced in large part by the firesetters's knowledge that it will produce a substantial reaction or response from the wider society, such as the arrival of police and fire departments (Macht and Mack, 1968).
Risk assessment theory	Expressive and instrumental	External and internal	Firesetting is a behavior that develops as a juvenile matures and either co-occurs with or is produced by other individualistic and/or environmental circumstances (Kolko and Kazdin, 1986).

While firesetting correlations involve relationships between two variables that appear and

fluctuate together, cause involves a direct cause-and-effect relationship.   Due to the lack of

systematically controlled evaluations and variety of measures used over the years to define,

explain and predict firesetting, the theories of firesetting etiology represent a range of theoretical

approaches. In conclusion, since a comprehensive national research study has yet to be designed and implemented, assessing the strengths of the theoretical formulations of juvenile and childhood firesetting continues to be difficult.

Assessment

The assessment of juvenile firesetters to inform an intervention should include a variety of individual, family, and environmental factors. Additionally, it is important to assess the variables relating to a firesetting incident (e.g., variables of intent, social context, personal and emotional reactions, consequences, etc.) along with identifying the individual's fire-related risk factors (e.g., home environment, peers, personality, supervision, etc.) (Kolko, 2001; Cole et al., 1983).

Slavkin and Fineman (2000) proposed that assessment of young firesetters should include a comprehensive structured interview with the juvenile firesetter and their parents, taking into account family functioning, supervision, and discipline practices. Kolko and his colleagues have also developed a variety of measures designed to assess the role of the incident variables among young firesetters, which may be completed by either the child or their parents.

Clinical Assessment

One of the earlier assessments used with juvenile firesetters was the Children's version of the Schedule for Affective Disorders and Schizophrenia (Kiddie-SADS; Chambers, Puid-Antich, Hirsch, Paez, Ambrosini, Tabrizi, & Davis, 1985). The Kiddie-SADS is a comprehensive diagnostic interview for children and their parents, and evaluated various psychiatric disorders and their associated symptoms, incorporating six questions specifically exploring the child's

involvement in firesetting. However, the Kiddie-SADS suffers from lack of empirical evidence regarding its effectiveness in identifying and assessing early firesetting.

The Firesetting Risk Inventory (FRI) and Children's Firesetting Inventory (CFI) were developed to assess fire-related risk factors among children (FRI; Kolko & Kazdin, 1989a; CFI; Kolko & Kazdin, 1989b). The FRI is a parent interview that covers personal, familial, and social dimensions related to firesetting through 99 questions scored on a 5-point Likert scale. The dimensions assessed by the FRI include fire specific ones such as curiosity about fire, involvement in fire-related activities, early experience with fire, and knowledge of fire safety. The FRI also asks about general family variables, including the child's behavior and the frequency, style and efficacy of parental punishment. The CFI is an interview schedule for use with children, with 56 questions on a 5-point Likert scale. The CFI questions address six dimensions relating to firesetting behavior which include curiosity about fire, involvement in fire-related activities, knowledge about things that burn, fire competence, exposure to incendiary materials, and supervision/discipline. The interview also involves role-play responses, which are then utilized to explore the child's primary motives, skills, and experiences relating to firesetting. Comparison of young firesetters and non-firesetters on the CFI showed that while firesetters exhibited increased curiosity about fire, access to incendiary materials, knowledge of combustible materials, exposure to individuals who use fire and involvement in fire-related activities than the non-firesetters, they were less competent when using and responding to fire (Kolko, Kazdin, 1989b).

Kolko and Kazdin (1994) next designed the Fire Incident Analysis for Children (FIA-C; Kolko & Kazdin, 1994), a structured interview for children comprising 21 items. These items cover details of the firesetting incident, the primary motives of the firesetters, consequences for

the firesetters's family and friends, the firesetter's reactions to the incident, and the impact of the

incident on future firesetting behavior. In a study with 95 firesetters, Kolko and Kazdin (1994)

found that children frequently reported having access to fire-setting materials, motives associated

with fun and curiosity, a lack of remorse for the incident, and few parental consequences for their

firesetting behavior.

A parallel parent version of the FIA-C has also been developed, the Fire Incident

Analysis for Parents (FIA-P; Kolko and Kazdin, 1991). The FIA-P addresses five factors, three

general motive factors of curiousity, anger, and attention/help-seeking, and two 'reasons for the

fire' items of accident and peer pressure/destructiveness. In addition, the interview attempts to

gain information on the firesetting incident itself, with questions about how the juvenile obtained

the incendiary materials, information about the child's level of the behavioral and emotional

correlates of firesetting immediately prior to the incident, and the consequences of the fire from a

range of perspectives (family/disciplinary, financial, medical, legal, and social variables) (Kolko

& Kazdin, 1991).

Pinssoneault and Richardson (1989) developed the FIRE Protocol, an assessment that

includes a Firesetter Interview and a Risk Evaluation Instrument. Completion of the protocol

allows five objectives to be attained: (1) assessment of threat posed to public safety by a young

firesetters' behavior; (2) their risk of recidivism; (3) the extent and nature of their firesetting

behavior; (4) identification of specific treatment needs relating social, family, and environmental

factors; and (5) development of specific interventions for the individual. The FIRE Protocol has

been tested extensively in a range of settings (psychology, probation, fire services, criminal

justice, and education), leading the authors to insist that it is a reliable and flexible tool.

A Firesetters Analysis Worksheet has been designed by Sakheim and Osborn (1994) in order to assess a child's likelihood of future firesetting. The worksheet covers 25 variables that the author's research has consistently found to be associated with juvenile firesetting, along with five variables seen to be indicative of a reduced risk. Of the 25 variables, Sakheim and Osborn (1994) constructed a 'prediction equation' allowing children to be classified into 'minor', 'moderate', definite', or 'extreme' risk of future firesetting, an equation the authors claim to be 96% accurate.

A final instrument for assessing young firesetters age 2-18 is the Juvenile Firesetter Needs Assessment Protocol (JFNAP) (Humphreys & Kopet, 1996). The JFNAP aims to assess mental health needs, document history of firesetting, identify events that may have led to the firesetting, identify firesetting typology, and make recommendations for supervision and treatment. The authors do not, however, view this instrument as a prediction tool.

Functional Behavior Assessment

Attempts have been made to understand behavioral patterns of firesetting and arson using functional analysis (Jackson et al., 1987; Swaffer, 1994). Using this method, firesetting is conceptualized in terms of the social and environmental stimuli that reinforce such behaviors, predisposing an individual to firesetting that is initially positively and negatively reinforced. With firesetting, Fineman (1995) explains that reinforcement can be external or internal. Examples of external reinforcement include situational rewards, such as setting a fire to conceal another crime or lighting a fire for money. Internal reinforcers are "internal" states such as feeling powerful while watching the flames, or a sense of revenge in damaging property by fire.

Interventions

Although there are a variety of treatments involving both behavioral and non-behavioral methods, most methods typically use one of two approaches. The educational approaches involve teaching fire safety skills and provide participants with information and practical skills concerning fire recognition, the dangers and consequences of firesetting, making emergency calls, seeking assistance, and the safe use of fire (Barreto & Boekamp, 2005). Interventions using an educational approach are delivered as both preventative and reactive measures. Secondly, the psychosocial approach addresses psychological and social factors associated with firesetting, often involving cognitive-behavioral treatments and the enhancement of social skills (Barnett & Spitzer, 1994).

Educational Approaches

Empirical studies evaluating the effectiveness of interventions using an educational approach with young firesetters have shown some positive results. The Federal Emergency Management Agency (FEMA, 1983) evaluated the impact of juvenile firesetting intervention programs across eight sites. The program involved fire safety assignments and educational discussion with 766 young firesetters. On the completion of the program, FEMA observed a recidivism rate after eleven months of 1.25%. Without a comparison group however, it is not known whether this recidivism rate would have occurred without any intervention.

Due to an increase in admissions for burns in a pediatric unit, Franklin, Pucci, Arbabi, Brandt, Wahl, and Taheri (2002) developed the Trauma Burn Outreach Prevention Program, an educational program focusing on the medical and societal consequences of firesetting. Participants were followed up for periods ranging from 8 months to 2.5 years. Of 132 juveniles

attending the 1-day program, only one reoffended during the follow-up period, as compared to 37 recidivists in a control group of 102 juveniles.

In 1991, Kolko and Kazdin compared the effectiveness of fire safety skills training on 12 psychiatrically hospitalized young firesetters compared with a group of patients who participated in individual fire awareness discussions. They concluded that the children who had received the fire safety skills training exhibited significantly less fire-related play in an analogue playroom and more fire safety knowledge. At the 6-month follow-up study, the parents of the experimental group also reported less firesetting and match play than the control group, 16.7% and 58.3% respectively (Kolko & Kazdin, 1991).

Overall, as an approach, many authors promote the use of Fire and Rescue Service personnel for delivering educational intervention programs to children and adolescents. Eglintine, Horn, and Muckley (1993) explain, "Firefighters often have face-to-face contact with young firesetters as part of their routine fire investigation procedures and are often best placed to deliver advice to families and children about fire safety" (p. 48). Pinsonneault (1996) also recommends that the family unit should also be actively involved for the effective implementation of educational arson interventions.

Psychosocial Interventions and Treatment Approaches

Over the years treatments for firesetting have included contingency management procedures, aversive techniques, negative practice in firesetting as a satiation and extinction procedure, prosocial skills training in the expression of anger and other emotional arousal and individual or family therapy (Hardesty & Gayton, 2000; McMahon & Wells, 1998). Despite the widespread use of these approaches, only a few outcome studies that incorporated these techniques have been reported in scientific literature (Kolko, 2006).

Cognitive-behavioral treatment (CBT) is a psychotherapeutic approach that strives to solve problems concerning dysfunctional emotions, behaviors and cognitions through a goal-oriented and systematic approach. CBT involves targeting individual forms of behavioral dysfunction (i.e., firesetting) and environmental conditions by enhancing prosocial skills and parent-child relationships (Kolko, 2006). CBT attempts to encourage behaviors other than firesetting by teaching generalized self-control and establishing environmental conditions. Kolko (2006) explains, "CBT strives to alter the psychological significance of firesetting, the child's social-cognitive repertoire, and the functional context in which it occurs" (pp. 229).

Several studies have implemented graphing techniques in their interventions, a component of CBT, to teach children to relate firesetting motives to specific events or affective states, problem-solving skills, and assertion skills. In 1996, Kolko designed an experiment to test the comparative effects of fire safety education as implemented in community settings and psychosocial treatments implemented in mental health settings (Kolko, 1996; McMahon & Wells, 1998). In 1996, Kolko's psychosocial component in his study incorporated cognitive-behavioral procedures designed to modify the characteristics and correlates of firesetting using graphing techniques. Parents also received parent management training focusing on child monitoring. Results indicated significant reductions in child reports of fire involvement in psychosocial treatment versus fire safety skills treatment and reductions in parent-reported fire involvement (McMahon & Wells, 1998). Parent training involves providing parents with information about the environmental context (i.e., motives) of firesetting for their children and training in behavior management practices such as monitoring, reinforcement, punishment, etc. (Kolko, 2006).

In addition to educational and psychosocial interventions, pharmacological interventions can also be used to treat children with CP. As previously mentioned, firesetting is often associated with a diagnosis of attention-deficit and disruptive behavior disorders (i.e., ADHD, CD and ODD). Several studies provide support for the conclusion that stimulant medication can produce reductions in CP in children selected on the basis of primary diagnosis of ADHD or CD (McMahon & Wells, 1998). The prescriptions most commonly used for the treatment of ADHD or CD includes psychostimulant drug treatment such as methylphenidate (i.e., Ritalin and Concerta). Research indicates that methylphenidate may improve attention and decrease distractibility, produce reductions in retaliatory aggression, reduce noncompliance, and decrease stealing and property destruction (Hinshaw, Buhrmester, & Heller, 1989; Conners, 1972; Hinshaw, Henker, Whalen, Erhardt & Dunninton, 1989; in McMahon & Wells, 1998).

Conclusion

To date few studies on treatment outcome and information about the specificity and utility of interventions for child firesetters has been reported. It continues to be difficult to measure the efficacy of intervention efforts since age, type of firesetter or event characteristics vary between subjects. However, all these variables are important for determining best practices in firesetting interventions. Quality evaluation of outcomes will be enhanced by the development of manualized treatment protocols, fire-specific measures of child coping, firesetting antecedents and behaviors, parent-child communication about fire, parental supervision, and environmental factors. Until research indicates definitive results in firesetting prediction and intervention, programs should continue to link practical assessment directly to treatment intervention. Overall, it is important to provide meaningful information to clinicians

about fire history, individual motivation (e.g., anger, curiosity or fascination), child

psychopathology, family functioning and the risk of recidivism in order to gain a better

understanding of childhood and adolescent firesetting.

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