



University of
Salford
MANCHESTER

Firesetting and arson in individuals with autism spectrum disorder : a systematic PRISMA review

Allely, CS

<http://dx.doi.org/10.1108/JIDOB-11-2018-0014>

Title	Firesetting and arson in individuals with autism spectrum disorder : a systematic PRISMA review
Authors	Allely, CS
Type	Article
URL	This version is available at: http://usir.salford.ac.uk/id/eprint/50290/
Published Date	2019

USIR is a digital collection of the research output of the University of Salford. Where copyright permits, full text material held in the repository is made freely available online and can be read, downloaded and copied for non-commercial private study or research purposes. Please check the manuscript for any further copyright restrictions.

For more information, including our policy and submission procedure, please contact the Repository Team at: usir@salford.ac.uk.

**Firesetting and Arson in Individuals with Autism Spectrum Disorder: A Systematic
PRISMA Review**

Abstract

Purpose

The present review aims to identify studies which have investigated arson or firesetting in individuals with ASD.

Design/methodology/approach

A systematic PRISMA review was conducted.

Findings

The present review highlighted the relatively little research that has been conducted to date exploring firesetting or arson in individuals with ASD. Eleven papers were identified in the present review study. Six were cases studies and five were empirical studies. The case studies identified in the review highlighted some of the ASD symptomology which may contribute to this type of criminal behaviour. Also, the empirical studies indicate that there is a higher prevalence of individuals with ASD who engage in such criminal behaviours.

Research limitations/implications

There is an urgent need to further empirical research in this area and for there to be an increased awareness and understanding of how ASD can contribute to arson and firesetting in both a legal and clinical context.

Originality/value

This is the first review, to the author's knowledge, to explore the literature on firesetting or arson in individuals with ASD.

Keywords: Autism spectrum disorder; ASD; asperger's; arson; firesetting; firesetters;

The association between Arson and Autism Spectrum Disorder

Autism spectrum disorders (ASDs) are neurodevelopmental disorders characterised by reciprocal social interaction and communication impairments and restricted repetitive behaviours (Wing, 1997). The Diagnostic Statistical Manual fifth edition^{2s} (DSM-5, American Psychiatric Association, 2013) now categorizes two core domains of impairment in ASD (previously it was three core areas of impairment, APA, 2000) which vary across individuals, symptoms, and levels of severity: (1) “persistent deficits in social communication and social interaction” and (2) “restricted, repetitive patterns of behavior, interests, or activities” (American Psychiatric Association, 2013). The DSM-5 criteria for ASD deviates from the previous criteria set out in The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-Text Revision published by the American Psychiatric Association (APA) (2000) in a number of ways. For instance, the DSM-5 no longer distinguishes subtypes of ASD, such as autistic disorder and Asperger disorder. There is now just a single category of ASD. Brugha and colleagues (2011) estimated the prevalence and characteristics of adults with ASD living in the community in England. They estimated that the weighted prevalence of ASD in adults was 9.8 per 1000.

Numerous follow-up studies have argued that, compared to the general population, individuals with ASDs are no more likely to engage in violent criminal behaviour (Wing, 1981; Ghaziuddin et al., 1991; Hippler et al., 2010; Robinson et al., 2012) and some studies have even suggested that they may be less likely (Mouridsen et al., 2008; Lundström et al., 2014; Woodbury-Smith et al., 2006). It has been found that individuals with developmental disabilities (such as ASD) may actually be more likely to be the victims of crime rather than the perpetrator (Sobsey et al., 1995; Modell & Mak, 2008). Currently, there is no empirical support for the idea that there exists an association between ASD and criminality (in particular violent crime) (e.g., Ghaziuddin et al., 1991; Howlin, 2004; Murrie et al., 2002).

In the previous section a brief review indicates that there is increasing evidence in the literature highlighting the higher rates of psychiatric mental health disorders in firesetters, the most common being: schizophrenia, mood disorders (such as anxiety and depression), personality disorders, alcohol abuse, and intellectual disability (Geller, 1987; Tyler & Gannon, 2012). It is well-established that there is a high rate of psychiatric comorbidity in individuals with ASD, the most common being these types of psychiatric mental health disorders which have been found to be higher in firesetters (e.g., depression, anxiety, intellectual disability) (e.g., Wood, 2017; Rai et al., 2018; Zabolski & Storch, 2018; Marín, Rodríguez-Franco, Chugani, Maganto, Villoria, & Bedia, 2018). Therefore, it is possible that having

an ASD coupled with one or more psychiatric co-morbidity increases the risk of engaging in this type of offending behaviour. This is an area which requires robust, empirical study.

Distinction between Arson and Fire-setting

‘Arson’ and ‘fire-setting’ are the terms most often used when referring to deliberate acts of fire setting. In the literature, ‘arson’ and ‘firesetting’ are frequently used interchangeably. However, it is important to highlight that the definitions for each are not the same. It is important to make the distinction between the two. Firstly, arson is a ‘restrictive legal term’ which is used when referring to the use of fire for the unlawful and intentional destruction of property (Kolko, 2002; Williams, 2005). Firesetting, on the other hand, is not a restrictive legal term. Instead, it is a wider term which comprises all the different types of deliberate fires, some of which may have been recorded legally (Gannon & Pina, 2010). In other words, an arsonist is a term for an individual who has been convicted of the crime of arson while ‘firesetting’ refers to behaviour which is characterised by the deliberate setting of fires and there has been no conviction. Some of the reason for this may be the challenges in being able to identify the fire setter, the fire not being detected as deliberate, or resulting in just minimal destruction (Alexander, Chester, Green, Gunaratna, & Hoare, 2015).

There are usually three core elements in arson laws, namely, that the firesetting must be intentional (or reckless in some jurisdictions), it must be for an unlawful purpose, and it must result in damage either to property or person(s) (e.g., Lansdell, Anderson, & King, 2011; Attorney-General’s Department of New South Wales, 2009). Deliberate fire-setting is used when describing “*a more general behaviour that does not necessarily satisfy these three elements, but nonetheless is problematic as it has the potential to cause harm to the fire-setter or others, as well as to property*” (McEwan & Freckelton, 2011, pp. 322).

Present Study

The present review aims to identify studies which have investigated arson or firesetting in individuals with ASD. One of the primary reasons which prompted the need for a review of this nature is a study which investigated the specific risks factors of arsonists in a forensic psychiatric hospital (Hagenauw, Karsten, Akkerman-Bouwsema, de Jager, & Lancel, 2015). In a case series study, Hagenauw and colleagues (2015) were interested in identifying the specific dynamic risk factors in arsonists which could be potentially targeted during treatment. Patient files of and interviews with all patients that were currently housed at a forensic psychiatric hospital in the Netherlands (14 arsonists and 59 non-arsonists). The findings, in relation to the dynamic risk factors, revealed that the arsonists had significantly more impaired social and relational skills. They were also found to be more hostile

(Hagenauw et al., 2015). That the arsonists in their sample were found to be more significantly impaired in terms of their social and relational skills is of note, given that these are some of the difficulties that are common in individuals with ASD. Therefore, it would be interesting, particularly given all the literature looking at criminality in individuals with ASD, to explore any studies which have examined the prevalence of ASD in arsonists, for instance. To the author's knowledge, this is the first review to explore the literature on firesetting or arson in individuals with ASD.

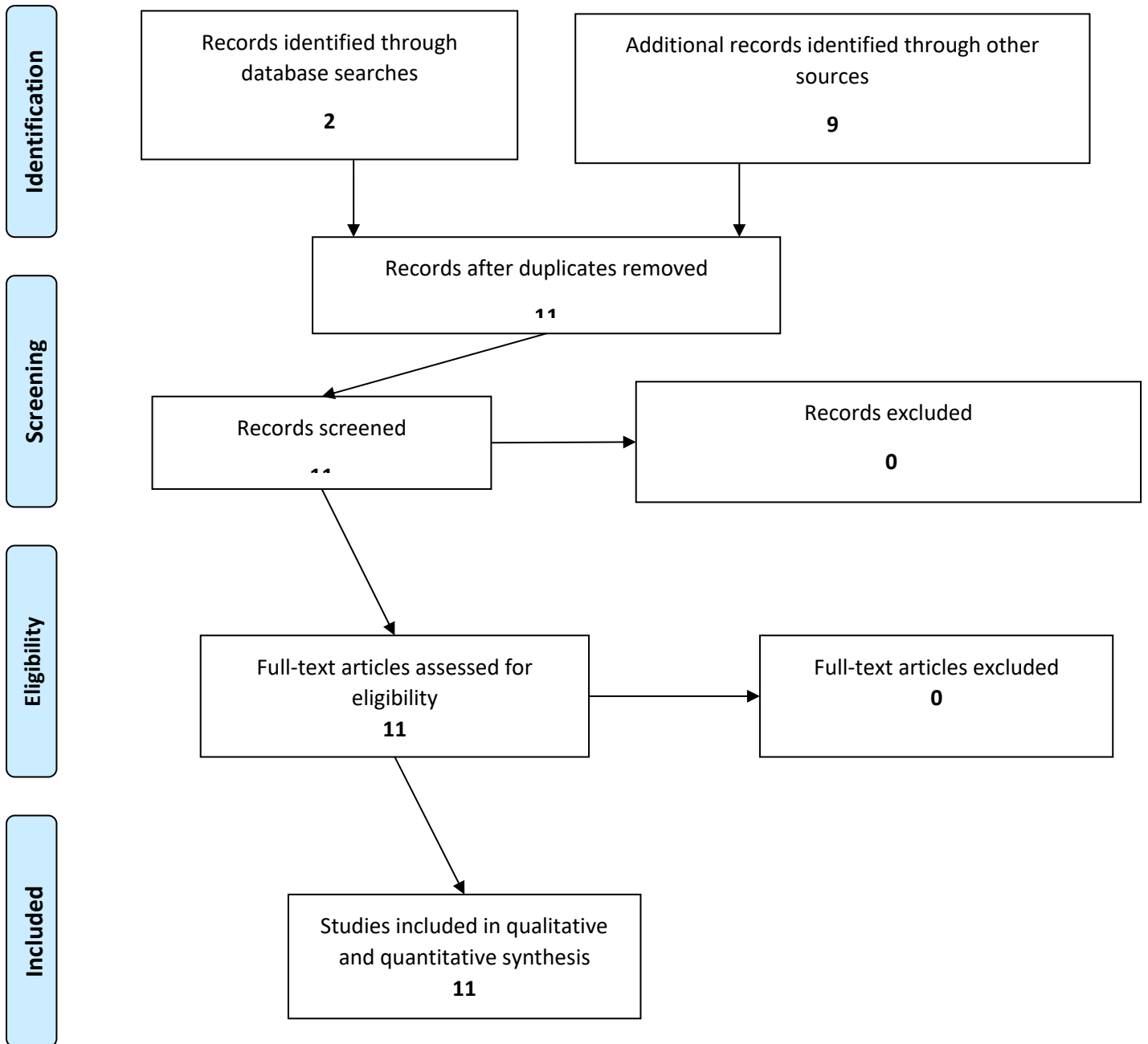
Method

A total of six internet-based bibliographic databases were searched in order to identify studies which examined ASD in relation to arson or firesetting. Specifically, PsycARTICLES Full Text; AMED (Allied and Complementary Medicine) 1985 to October 2018; Ovid MEDLINE(R) without Revisions 1946 to October Week 4 2018; PsycEXTRA 1908 to October 08, 2018; PsycINFO 1806 to October Week 5 2018 and Ovid MEDLINE(R) Epub Ahead of Print November 02, 2018. The search was carried out on 5th November 2018. The search followed PRISMA guidelines (see: Liberati et al., 2009; Moher, Liberati, Tetzlaff, & Altman, 2009). There are a large number of editorial organisations and hundreds of journals (which publish systematic reviews) who endorse the PRISMA Statement (see: <http://www.prisma-statement.org/Endorsement/PRISMAEndorsers>). The PRISMA guidelines provides the reader with transparency regarding how the authors carried out their search and how they ended up with their final papers for inclusion in the review. It also enables other researchers to replicate the search. The search on the databases was not restricted by date. Search terms were applied to title. The following search terms were entered into the databases listed above: (ASD or "autis* spectrum disorder*" or autis* or "autis* spectrum condition*" or asperger*).m_titl. AND (arson* or firesett* or pyromania* or "fire-sett*").m_titl.

This search returned only two articles. In addition to the searches conducted on the six databases listed above, a number of permutations of ASD and arson or fire-setting were entered into Google Scholar and thoroughly searched for articles which were not identified through the database searches. For instance, ASD and arson; ASD and firesetting; autism and arson; autism and fire-setting, autism and firesetters; etc. These searches on GoogleScholar resulted in six further studies which was identified as being relevant to the aims of the present review (see Figure 1. For PRISMA Flow Diagram of this process). Lastly, due to the relative lack of research in this area, the present systematic review took an inclusive approach. No exclusion criteria were used for the studies identified which investigated arson or firesetting in relation to ASD.



Figure 1. PRISMA Flow Diagram



Results

A total of eleven studies investigating arson or firesetting in individuals with ASD were identified in the present review. It is important to point out here that the majority of the identified papers were not focused on firesetting or arson in individuals with ASD. There were six papers which included discussion of at least one case of an individual with ASD engaging in fire-setting or arson (Everall & Lecouteur, 1990; Murrie, Warren, Kristiansson, & Dietz, 2002; Barry-Walsh & Mullen, 2004; Haskins & Silva, 2006; Palermo, 2004; Radley & Shaherbano, 2011) and five were empirical studies (Scragg & Shah, 1994; Hare, Gould, Mills, & Wing, 1999; Siponmaa, Kristiansson, Jonson, Nyden, & Gillberg, 2001; Enayati, Grann, Lubbe, & Fazel, 2008; Mouridsen, Rich, Isager, & Nedergaard, 2008).

Case studies

Six papers were identified which included at least one case involving an individual with ASD who had engaged in fire-setting or arson (Everall & Lecouteur, 1990; Murrie et al., 2002; Barry-Walsh & Mullen, 2004; Haskins & Silva, 2006; Palermo, 2004; Radley & Shaherbano, 2011). Everall and Lecouteur (1990) describe the case of a 17-year-old male (DH) with a diagnosis of Asperger's syndrome (first diagnosed at 10-year-old) who was committed acts of arson. The authors outline how the symptoms inherent in Asperger's syndrome contributed to his firesetting. DH's one-year history of firesetting started when he was in his final year in school. DH was expelled from school at 16 years of age as a consequence of his firesetting. At first, the fires would be "small experimental bracken fires" (but although small, the fire brigade was called each time). DH escalated his firesetting to hay and straw stacks late at night (planning and choosing the stack during the day) and self-reported at least nine instances of these instances. One day he impulsively lit a fire during the day, which was atypical of him and resulted in him being apprehended. Despite understanding the meaning of right and wrong, DH's explanation for his firesetting demonstrated that he had a lack of understanding of the consequences and no victim empathy. DH insisted strongly, but nevertheless unconvincingly, that he would not set any other fires. While his firesetting was unrelated to a special area of interest, it did take up a substantial amount of his time and watching the flames caused him great excitement. DH failed in being able to appreciate the impact his actions had on others and the distress it had caused (Everall & Lecouteur, 1990).

In their paper, Murrie and colleagues (2002) describe the case of an individual with ASD (AB) who was referred for forensic evaluation following being charged with 11 cases of arson. AB had no criminal or psychiatric history until he committed arson when he was 31 years of age. His parents reported that when he was a child he was shy and quiet and was considered by his teachers to be "peculiar". AB became very irritated when his parents made any changes to his routine. He had some friendships. However, he would only ever have one social friend at any one time. Mr AB was reportedly

bullied (or had a heightened sensitivity to the behaviours exhibited by his peers). For instance, Mr AB stated that he was not able to forget incidents such as being shot at with a water gun even after the passing of many years. After graduating from a vocational school, he had a number of jobs as a manual labourer. He would frequently have to leave his job following altercations with supervisors or other members of staff. AB lived with his parents and did not engage in any sexual or romantic relationships. He stated that he would be married right away, if he could afford to buy a large apartment. In the year prior to the crime, AB's parents reported that his irritability and verbal aggressiveness become increasing worse. In the year before his crime, he also become increasingly more isolated. He also bought several pornographic magazines and ruminated about times in his childhood where he had believed that his peers had mistreated him. AB reported during evaluation that in the year leading up to his crimes his preoccupied with those who had wronged him in the past increased. He also became increasingly convinced that he had to avenge himself. Initially, he fantasised burglary as a way to exact avenge himself. However, he later started fantasising about firesetting. Following a news report on a case of arson he then viewed that the most effective way to solve his problems was to engage in firesetting. Over the course of two months, he broke into summer homes in his neighbourhood and used gasoline to set them on fire. He immediately confessed to the crimes when he was caught by police. He told the police that his actions were a way to seek revenge against schoolmates who had mistreated him during his childhood. It was later found that the summer houses he targeted in his neighbourhood did not belong to his old schoolmates or their families. However, AB reported that there were small features of the summerhouses which reminded him of the peers who had mistreated him. Following setting the summerhouses on fire he described feeling calm. He did not appear to be affected by the fact that he had destroyed the property of complete strangers as opposed to those whom he believed has mistreated him when he was a child. Assessment during evaluation showed that AB had IQ scores that were within the borderline to low average range. Assessments carried out during the forensic evaluation also revealed that AB fulfilled the diagnostic criteria for pyromania and also for Asperger's syndrome (AS) according to the DSM-IV (Murrie et al., 2002).

In their paper, Barry-Walsh and Mullen (2004) reported three cases of arson perpetrated by individuals with high functioning ASD (hfASDs). Two of these three cases involved the individual having an intense and absorbing interest in fire. The remaining case involved an individual who burned down a radio station whose signal was preventing him from listening to his favourite radio station. Each of these three cases will be described in turn. Firstly, Barry-Walsh and Mullen (2004) describe the case of a 24-year-old man with Asperger's syndrome (KA) who was referred for assessment following being charged with arson. It was revealed during assessment with KA that his preoccupations included armaments of Second World War aircraft and listening to a radio station which would play music he had developed a particular interest in. He was dependent on his mother (never leaving the house without her), was unemployed and had no friends. During the day he would read books (often about warplanes)

and listen to his radio station. The family moved to another city and he had to make a special aerial to tune in to the radio station that he was fascinated with hearing. A year later, a local religious radio station set up a new broadcast on a frequency which was very close to his favourite station, which caused problems in being able to listen to his radio station for a few hours each evening, prompting him to send the radio station numerous letters requesting them to stop this interference. In response to these letters he would receive blessings and Christian tracks. As a result, he walked to the radio station with a can of petrol and burnt the station down. He expressed no remorse and failed to understand why he was in the situation he was in. Indeed, the following morning he had proudly told his mother that he was the one who was responsible for having set fire to the station, a picture of which appeared in the local newspaper. The recommendation that was made was that this man was fit to plead and he was convicted, again with a non-custodial order and community follow-up (Barry-Walsh & Mullen, 2004).

Barry-Walsh and Mullen (2004) describe the case of NY who was 24 years of age at the time of his assessment. He was referred for evaluation after he had carried out an assault on his father (he previously had come to the attention of the courts following a charge of wilful trespass. This charge was later dropped). He had just recently received a diagnosis of AS. He displayed an intense preoccupation with electronics from a young age. In adulthood he was employed by a security firm and for a telecommunications firm as a result of his interest and knowledge of electronics. Prior to being diagnosed the uncertainty regarding his diagnosis and his rigidity caused a great deal of conflict within his family and this was particularly the case with his father. Relevant to this paper, Mr NY also was preoccupied and interested in firesetting. The act which eventually led to the assault on his father was the fire that he started in the middle of the back lawn. His father confronted him when he did this because he was becoming exasperated by Mr NY's behaviour. Mr NY believed that he had every right to light fires and was not able to appreciate or understand why his father was confronting him about what he had done and as a result assaulted his father. Mr NY hit his father on the top of his head and also delivered a number of punches during the assault. Forensic assessment stated that he was fit to plead and he did not have a defence of insanity. The charges were subsequently withdrawn (Barry-Walsh & Mullen, 2004).

The final case involving an individual with ASD who had engaged in arson by Barry-Walsh and Mullen (2004) was that of Mr. BD, a male who was 26 years of age at the time of his assessment and was charged with arson. He had set fire to a hedge which resulted in significant damage. Assessment of his intelligence found him to be within the normal range. At 21 years of age he had received a diagnosis of Asperger's syndrome. Related to his offences, he had started to develop an interest in flickering flames. His family reported a history of him watching in fascination, for hours, the pilot flame in the gas heater. He was able to recount in rote fashion that starting fires damaged property and was dangerous to others. He also stated that he would never set another fire. However, the most recent arson had occurred when he again set a fire so that he could watch the 'fascinating flickering of flames'. Mr.

BD was considered fit to plead. A psychiatric report recommended follow-up with psychiatric and other community support services. He was given a non-custodial disposition (Barry-Walsh & Mullen, 2004). In another identified paper, the case of Mr A was reported by Haskins and colleagues (2006). AB was a young volunteer fireman who was charged with capital murder. He was accused of setting fire to his apartment in order to get insurance money. The fire resulted in the death of his young daughter and nearly resulted in the death of his wife. He was initially considered to be “narcissistic” by his defense attorneys. This was due to his apparent cold and unremorseful presentation (for instance, he rarely showed any emotion on his face). Mr A had a history of making no real friends, being bullied, and being impaired in being able to detect social cues. He was unable to maintain jobs for any length of time. When he was arrested he was working at a grocery store. Mr A had no adult friends. He had been a volunteer fireman in every town that he had ever lived in. His peers at the local fire department did not socialise with him and considered him odd. He stole a credit card from one of his relative’s and used the card to purchase fire-fighting supplies. He blamed a friend for having stolen the credit card even though the fire-fighting supplies he had bought with the credit card were in his apartment. Mr A told people that he was considering purchasing a new jet ski with the insurance money from the death of his daughter in the fire. During his confession, he reported that he had set his apartment on fire in order to rescue his family and to “make a fresh start.” He was considered “cold and calculating” and having no remorse for his actions because he exhibited very little emotion and facial expressions and also very little body language. The evaluation that was carried out following Mr A’s capital murder charge found that he fulfilled the diagnostic criteria for pervasive developmental disorder not otherwise specified (PDD-NOS) as well as major depression. Traits of schizoid personality were also identified. Mr A was given a 60-year sentence (Haskins & Silva, 2006).

In another case study paper, Radley and Shaherbano (2011) described the case of a 24 years-old British male with Asperger’s syndrome, who was admitted to hospital at the age of 22 following a conviction for arson. He denied having started the fire, insisting that another resident set the fire. He was remanded in custody. A psychiatric opinion was requested a month later by the prison medical officer because the offender was convinced that prisoners were being killed by prison officers, and he was refusing to eat due to fear that his food was poisoned. When he was admitted to the local psychiatric hospital for evaluation, he believed that there was a wider conspiracy to kill him and stated that he was being spied on (the smoke alarms were cameras) and he continued to refuse eating. He was then prescribed an anti-psychotic drug and the symptoms of psychosis resolved after a few weeks. However, he still exhibited unusual behaviours. For instance, he stated that he was Scottish and would insist on wearing a kilt. He also displayed a number of features that are common in ASD such as an impaired ability to understand other people’s perspectives and his social interactions with others would be stilted and odd. When he was transferred to a specialist unit he received an ASD diagnosis. He pleaded guilty to arson and was detained under Section 37/41 of the Mental Health Act 1983 (Department of Health,

1983) (Radley & Shaherbano, 2011). Of particular note, from the age of 18 he began drinking heavily. This case highlights features typical of ASD and how it might be related to offending behaviour (Radley & Shaherbano, 2011). His impaired social skills hindered his ability to make appropriate social relationships which resulted in him isolating himself and using alcohol in order to try and manage his anxiety. His difficulty in being able to understand other peoples' perception of him resulted in him developing suspicion and fear of his co-residents. This may have been exacerbated by an alcohol-induced psychosis. Lastly, his special interests in fires and witchcraft led him to manage his anxiety and paranoid thinking by setting a fire (Radley & Shaherbano, 2011).

In their paper, Palermo (2004) described the cases of three patients who had a pervasive developmental disorders (PDD) and comorbid psychiatric disorders. Their admission to the hospital was precipitated by delinquent behaviour. One of the patients they described, Patient 2, is relevant to the present review. Patient 2 is a 33-year-old single man who was admitted voluntarily to hospital after he threatened to burn down his grandmother's home. This threat occurred after his extended family had forced him and his mother out of the house due to family disputes over property issues. Patient 2 would spend the majority of his time at the computer perusing Internet sites and he also displayed a particular interest in chemical weapons and "fire bombs." A mental status examination showed that he had a "minimal spontaneous speech and a monotone and whiny prosody" (Palermo, 2004, pp. 43). It is also important to highlight here that this patient was also exhibiting homicidal impulses toward his grandmother. Based on the DSM-IV, a diagnosis of AS and also depressive disorder not otherwise specified (NOS) were made. The patients' depression NOS was considered to be a key contributor to the hostility he felt towards his family. Other contributing factors to this hostility included his anxiety surrounding the uncertainty about his living arrangements which was exacerbated due to the family discord as a result of the disputes over property (Palermo, 2004).

Empirical studies

Only five empirical research studies investigating the association between arson and ASD were identified in the present review (Scragg & Shah, 1994; Hare, Gould, Mills, & Wing, 1999; Siponmaa et al., 2001; Enayati et al., 2008; Mouridsen et al., 2008). Siponmaa and colleagues (2001) investigated 126 individuals aged 15–22 years who had originally been evaluated in relation to serious, predominantly violent, criminal offending. Two individuals who qualified for a pervasive developmental disorder (PDD) diagnosis during childhood were identified in the initial diagnostic evaluation. Additional evaluations (which also consisted of a systematic assessment for neuropsychiatric developmental disorders) identified that 12% of the 126 individuals met the diagnostic criteria for pervasive developmental disorder not otherwise specified (PDD-NOS) and 3% met the diagnostic criteria for Asperger's disorder). In the whole sample, 16 persons had committed arson as a

main crime. Interestingly, of those diagnosed with a PDD, ten (63%) had committed arson (Siponmaa et al., 2001).

In their study examining prevalence and types of criminal behaviour, Mouridsen and colleagues (2008) compared a group of individuals with Asperger's syndrome (AS) (n = 114) with a group of control participants (n = 342). Interestingly, they found a higher prevalence of arson in the Asperger's group, namely five individuals out of the 114 versus no cases in the control group. The five individuals who had committed arson comprised of four males and one female. All five cases of arson were found to be intentional. Three of five convicted for arson had no previous convictions. So only "arson" was found to statistically separate AS cases from the comparison group. Although not the focus of this review, they also found that "sexual offending" in the AS cases was approaching statistical significance (Mouridsen et al., 2008).

In another study, Enayati and colleagues (2008) examined all arsonists who were referred for an inpatient forensic psychiatric examination in Sweden over five years (1997–2001). Diagnostic information was gathered on 214 arsonists (155 men and 59 women). They compared this group of 214 arsonists with 2395 other violent offenders who had a forensic psychiatric examination during the same five-year period on principal and comorbid DSM-IV psychiatric diagnoses. Findings suggested that in the individuals who had been convicted of arson and were referred for forensic psychiatric evaluation, the most frequent Axis I diagnoses included: substance use disorders, personality disorders and the psychoses. These diagnoses did not differ from the diagnoses of other violent offenders who were referred for forensic psychiatric assessment, with the exception of the proportion with learning disability and, in the men, with Asperger's syndrome. In the female arsonists, alcohol use disorders were found to be overrepresented. The pattern of psychiatric morbidity in these arsonists did not appear to differ between women and men. The key finding for Enayati and colleagues (2008) was that the arsonists were more likely to be diagnosed with a learning disability and Asperger's syndrome (in the men) when compared to the other violent offenders referred for forensic psychiatric examinations. Specifically, findings revealed that approximately ten percent of the men had been diagnosed with a learning disability and seven percent had Asperger's syndrome – this was a significantly higher incidence than that found in other male offenders (Enayati et al., 2008).

Hare and colleagues (1999) conducted a preliminary study of individuals with ASD in three special hospitals in England. Thirty-one definite cases of ASD were identified. These individuals were identified from information in hospital records. The same number of individuals (n = 31) also formed an uncertain group. The 'uncertain' group comprised of individuals where there was insufficient information available in order to make a clear diagnosis of an ASD and/or diagnostic criteria were only partially met (Hare et al., 1999). The number of index offences was 215. Interestingly, the study found

that higher numbers of individuals in the ASD group and the uncertain group had arson as an index offence (16% in each case, both $n = 5$) compared to 5% ($n = 8$) in the non-autistic group.

Lastly, of the six men at Broadmoor who were found to have a diagnosis of AS one had committed arson. Of the remaining five men, three of the six had been physically violent and two exhibited aggressive behaviour on the wards such as feigning punches and making threats to injure others (Scragg & Shah, 1994). It is important to highlight here that an investigation of firesetting or arson in relation to ASD was not the focus on this paper. However, it was included because it indicates that arson may be particularly prevalent in this particular forensic group and therefore is worthy of further investigation.

Discussion

A total of eleven studies investigating arson or fire-setting in individuals with ASD were identified in the present review. Six were case study papers (Everall & Lecouteur, 1990; Barry-Walsh & Mullen, 2004; Palermo, 2004; Radley & Shaherbano, 2011) and five were empirical studies (Scragg & Shah, 1994; Hare et al., 1999; Siponmaa et al., 2001; Enayati et al., 2008; Mouridsen et al., 2008). In each of the cases described in the literature the arson or firesetting was understandable in terms of the individual's diagnosis of ASD. Specifically, the six case study papers all highlighted a number of ASD symptomology that can contribute to arson. Some of the key symptoms inherent in this type of behaviour in the individuals with ASD included: a lack of understanding and appreciation of the potential consequences or harm of firesetting (e.g., damage to property and the potential for someone to get injured or killed); considering firesetting as being a way to solve problems; impaired victim empathy and arguably the most critical factor being the preoccupation and special interest in fire and firesetting. As emphasised by Freckelton and List (2009), in an arsonist with ASD there is frequently an obsessive preoccupation and interest with 'flames, cinders, colours, and heat' as opposed to any malicious intention to cause damage to property or put the lives of others in any danger (Freckelton & List, 2009). McEwan and Freckelton (2011) also highlighted that research indicates that in the majority of firesetters there is no intention to kill or cause any harm to others. For these individuals, it is the fire itself which provides a psychological function. Given this, some have argued that conventional punishment and retribution would not be appropriate with such individuals. Such punitive measures would not stop them thinking or fantasising about or setting fires (e.g., Canter & Fritzon, 1998). For individuals with ASD who have a preoccupation in, for example, a flickering flame, this is even more the case (see Freckelton, 2011; McEwan & Freckelton, 2011).

It is also worth drawing attention to the case of Mr A described by Haskins and colleagues (2006). They reported that Mr A exhibited little emotion, minimal body language and few facial

expressions. This lack of emotion caused people to view him as lacking in any remorse for his actions which caused the death of his daughter and almost killed his wife. He was considered to be “cold and calculating” (Haskins et al., 2006). A systematic review by Allely and Cooper (2017) highlighted that, given that persons with ASDs are frequently impaired in their ability to appreciate the subjective experiences of others, the person with ASD may not exhibit any outward display of empathy or intersubjective resonance. This leads others to view them as being cold, calculating and lacking any remorse. In many individuals with ASD, this outward expression may not reflect what they are feeling or thinking. These perceptions can be potentially detrimental to a defendant with ASD in terms of being considered guilty and on sentencing decisions (Berryessa, 2014, 2016; Allely & Cooper, 2017). It is therefore crucial that ASD is identified and taken into consideration as early as possible in the criminal justice process in order to help ensure that the defendant with ASD is given a fair trial (see Cooper & Allely, 2017 which discusses the evolving professional responsibilities, liabilities and ‘judgecraft’ when a party has an ASD such as Asperger’s syndrome).

Of the five empirical studies the findings do appear to indicate that arson may be more specifically associated with the symptomology or behaviours which are commonly exhibited in individuals with ASD (e.g., Mouridsen et al., 2008). Siponmaa and colleagues (2001), who studied 126 young people referred for forensic psychiatric examination, noticed that the diagnoses of atypical autistic disorder and AS were statistically more frequent in the arson group than it was in the other crime groupings. Altogether 16 persons had committed arson. Ten (63%) of these people had atypical autistic disorder or AS. Altogether these findings suggest that arson may be more specifically related to behaviours seen in PDD (Siponmaa et al., 2001). Enayati and colleagues (2008) examined all arsonists who were referred for an inpatient forensic psychiatric examination in Sweden over five years (1997–2001). Seven percent had Asperger’s syndrome – this was a significantly higher incidence than that found in other male offenders. Mouridsen and colleagues (2008) compared a group of individuals with Asperger’s syndrome (AS) (n = 114) with a group of control participants (n = 342). Interestingly, they found a higher prevalence of arson in the Asperger’s group, namely five individuals out of the 114 versus no cases in the control group. Lastly, of the six men at Broadmoor who were found to have a diagnosis of AS one had committed arson (Scragg & Shah, 1994). However, as also highlighted by Enayati and colleagues (2008), the findings from these empirical studies cannot be generalised to all arsonists. For instance, it is likely that arsonists who are motivated by insurance fraud are not referred for further psychiatric assessment. It is also possible that there will be unresolved arson cases where no perpetrator is ever identified (Enayati et al., 2008).

Limitations

There are some potential limitations with the present systematic review. It is possible that some relevant articles were not identified in the search conducted on the six databases. However, to minimise the risk of this searches were also performed on ‘Googlescholar’ in addition to the database search. Additionally, all relevant papers were reviewed (including the reference sections) for the purposes of identifying any relevant articles not identified in the database or GoogleScholar searches.

Legal and Clinical Implications and Practical Recommendations

Legal Implications and Considerations

As highlighted recently by Chaplin, McCarthy and Forrester (2017), “*While decisions are often made in the public interest to ensure safety, it is also in the public interest not to incarcerate people when other less restrictive alternatives may exist, and where any threat to public safety can be safely and appropriately managed in other ways.*” (Chaplin et al., 2017, pp. 222; see Department of Health, 2009). Over the last few decades in England and Wales, liaison and diversion services (James, 2010, Srivastava et al., 2013), with the purpose of identifying and supporting people who present with vulnerabilities (including mental health and/or substance misuse problems, learning disabilities or other vulnerabilities) when they find themselves involved in the criminal justice system (Chaplin et al., 2017). After an individual has been brought to court, they will often be assessed by the court liaison and diversion team if there is a suspicion that they may have a mental health issue, or a neurodevelopmental disorder (including an intellectual disability or ASD) (Chaplin et al., 2017).

This is an area which requires further attention within the legal domain. First, there is a need to identify whether the individual who has engaged in fire-setting and is being charged with arson has an ASD. However, there is currently no reliable screening for ASD offered in the court setting. Therefore, it is possible that many individuals are not being identified. The NICE guidelines recommend the Autism Quotient-10 (AQ-10) (National Institute for Health and Clinical Excellence (NICE), 2014) to screen for ASD in community settings. However, research within the criminal justice system indicates that this instrument is over-inclusive and often identifies autistic traits in individuals who do not actually present with ASD (e.g., McCarthy et al., 2015). Therefore, even if screening was introduced across the board, limitations to identification would still remain (Chaplin et al., 2017).

Then, once identified, there is the need to carry out appropriate assessments in order to make recommendations to the court on how the individual’s ASD symptomology may have contributed to their offending behaviour, for instance. If there is evidence from the assessments that the ASD symptomology did have a significant contributory role in the offending behaviour (in this case fire-setting), then this information should have an impact on the judge’s sentencing decision or enable

consideration surrounding the suitability of appropriate diversionary measures for the individual in question. It is imperative that in any case of arson or fire-setting, there is an assessment of whether the individual has an ASD because, as highlighted by the research (although relatively limited), features of ASD can contribute to the offending behaviour. For instance, as stated by Freckelton and List (2009): “...in the context of the arsonist with Asperger’s disorder, there is often an obsessive preoccupation with flames, cinders, colours, and heat, rather than an intention to damage property or put lives at risk. There is a gulf between the focus of the perpetrator and the distress and anger of the property owner.” (pp. 21). In criminal proceedings, such preoccupations or obsessions will typically be relevant to the assessment of moral culpability at the sentencing phase. In some cases, they may go to the accused individual’s capacity to form the ‘requisite criminal intent’ (Freckelton & List, 2009).

Clinical Implications

The national study carried out by Enayati and colleagues (2008) which investigated the psychiatric morbidity in 214 arsonists who were referred for forensic psychiatric assessment over a five-year period found that about 7% had an AS diagnosis and that this level of AS were significantly higher when compared to other male offenders. These findings indicate that close liaison with learning disability services would be of significant benefit to this small subgroup of patients (Enayati et al., 2008). The present review would also support the need for every individual who is apprehended for firesetting or arson is assessed for ASD. It is important to know whether there is a diagnosis of ASD given the case studies indicating how the symptomology of ASD can contribute to these particular types of criminal behaviours. This information is important to guide sentencing decisions and inform what interventions may be appropriate.

Future Research Directions

Useful measures to use in research in this field: the ‘Fire Setting Scale’ and the ‘Fire Proclivity Scale’

Gannon and Barrowcliffe (2012) developed two separate scales, namely, the Fire Setting Scale and the Fire Proclivity Scale. They were developed in order to assess, respectively, the antisocial and fire interest factors associated with firesetters and the propensity of firesetters to be attracted to, aroused by, behaviourally inclined, and antisocially motivated to light fires. The Fire Setting Scale comprises of 20-items and was developed drawing from the findings from the empirical literature reviews which have identified factors found to be significant in detecting firesetters (both adolescents and adults) (e.g., Gannon, 2010; Gannon & Pina, 2010; Kolko, 1985). It would be useful for studies to investigate the

utility of these scales with individuals with ASD. Also, it could be useful to investigate whether there are any differences between groups of individuals with ASD and controls on any of these scales. Clearly, there is an urgent need to further empirical research in this area and for there to be an increased awareness and understanding of how ASD can contribute to arson and firesetting in both a legal and clinical context.

Conclusion

The present review highlighted the relatively little research that has been conducted to date exploring firesetting or arson in individuals with ASD. The case studies identified in the review highlighted some of the ASD symptomology which may contribute to this type of criminal behaviour. The six papers which included at least one case study all highlighted a number of ASD symptomology that can contribute to arson or firesetting. Some of the key symptoms inherent in this type of behaviour in the individuals with ASD include: a lack of understanding of the consequences, impaired victim empathy and firesetting being a special area of interest. The empirical studies indicate that there is a higher prevalence of individuals with ASD who engage in such criminal behaviours.

Conflicts of Interest

There are no conflicts of interest to declare

Funding

This paper was unfunded.

References

- Alexander, R. T., Chester, V., Green, F. N., Gunaratna, I., & Hoare, S. (2015). Arson or fire setting in offenders with intellectual disability: clinical characteristics, forensic histories, and treatment outcomes. *Journal of Intellectual and Developmental Disability, 40*(2), 189-197.
- Allely, C. S., & Cooper, P. (2017). Jurors' and judges' evaluation of defendants with autism and the impact on sentencing: a systematic preferred reporting items for systematic reviews and meta-analyses (PRISMA) review of autism spectrum disorder in the courtroom. *Journal of Law and Medicine, 25*(1), 105-123.

- American Psychiatric Association. (1952). *Diagnostic and statistical manual of mental disorders*. Washington, DC: Author.
- American Psychiatric Association. (1968). *Diagnostic and statistical manual of mental disorders* (2nd ed.). Washington, DC: Author.
- American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., Revised). Washington, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: American Psychiatric Association.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- American Psychiatric Association. (2012). Recent updates to proposed revisions for DSM-5. Retrieved April 1, 2013 from <http://www.dsm5.org/Pages/RecentUpdates.aspx>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed., text revision). Washington, DC: Author.
- Attorney-General's Department. (2009). Review of bushfire arson laws. [http://www.lawlink.nsw.gov.au/lawlink/clrd/ll_clrd.nsf/vwFiles/Arson.pdf/\\$file/Arson.pdf](http://www.lawlink.nsw.gov.au/lawlink/clrd/ll_clrd.nsf/vwFiles/Arson.pdf/$file/Arson.pdf)
- Barrowcliffe, E. R., & Gannon, T. A. (2015). The characteristics of un-apprehended firesetters living in the UK community. *Psychology, Crime and Law*, 21(9), 836-853.
- Barry-Walsh, J. B., & Mullen, P. E. (2004). Forensic aspects of Asperger's Syndrome. *Journal of Forensic Psychiatry and Psychology*, 15(1), 96-107.
- Berryessa, C. M. (2014). Judiciary views on criminal behaviour and intention of offenders with high-functioning autism. *Journal of Intellectual Disabilities and Offending Behaviour*, 5(2), 97-106.
- Berryessa, C. M. (2016). Brief Report: judicial attitudes regarding the sentencing of offenders with high functioning autism. *Journal of Autism and Developmental Disorders*, 46(8), 2770-2773.
- Brugha, T. S., McManus, S., Bankart, J., Scott, F., Purdon, S., Smith, J., ... & Meltzer, H. (2011). Epidemiology of autism spectrum disorders in adults in the community in England. *Archives of General Psychiatry*, 68(5), 459-465.
- Canter, D., & Fritzon, K. (1998). Differentiating arsonists: A model of firesetting actions and characteristics. *Legal and Criminological Psychology*, 3, 73-96.

- Chaplin, E., McCarthy, J., & Forrester, A. (2017). Defendants with autism spectrum disorders: what is the role of court liaison and diversion?. *Advances in Autism*, 3(4), 220-228.
- Cooper, P., & Allely, C. S. (2017). You can't judge a book by its cover: evolving professional responsibilities, liabilities and 'judgecraft' when a party has Asperger's Syndrome. *Northern Ireland Legal Quarterly*, 68(1), 35-58.
- Department of Health (1983). *The Mental Health Act 1983*, HMSO, London.
- Enayati, J., Grann, M., Lubbe, S., & Fazel, S. (2008). Psychiatric morbidity in arsonists referred for forensic psychiatric assessment in Sweden. *The Journal of Forensic Psychiatry and Psychology*, 19(2), 139-147.
- Everall, I. P., & Lecouteur, A. (1990). Firesetting in an adolescent boy with Asperger's syndrome. *The British Journal of Psychiatry*, 157(2), 284-287.
- Freckelton, I. (2011). Asperger's disorder and the criminal law. *Journal of Law and Medicine*, 18, 677-691.
- Freckelton Sc, I., & List, D. (2009). Asperger's disorder, criminal responsibility and criminal culpability. *Psychiatry, Psychology and Law*, 16(1), 16-40.
- Gannon, T. A., & Barrowcliffe, E. (2012). Firesetting in the general population: The development and validation of the Fire Setting and Fire Proclivity Scales. *Legal and Criminological Psychology*, 17(1), 105-122.
- Gannon, T. A., & Pina, A. (2010). Firesetting: Psychopathology, theory and treatment. *Aggression and Violent Behavior*, 15, 224-238.
- Gannon, T. (2010). Female arsonists: Key features, psychopathologies and treatment needs. *Psychiatry: Interpersonal and Biological Processes*, 73, 173-189.
- Geller, J. L. (1987). Firesetting the adult psychiatric population. *Hospital and Community Psychiatry*, 38, 501-506.
- Ghaziuddin, M., Tsai, L., & Ghaziuddin, N. (1991). Brief report: violence in Asperger syndrome, a critique. *Journal of Autism and Developmental Disorders*, 21(3), 349-354.
- Hagenauw, L. A., Karsten, J., Akkerman-Bouwsema, G. J., de Jager, B. E., & Lancel, M. (2015). Specific risk factors of arsonists in a forensic psychiatric hospital. *International Journal of Offender Therapy and Comparative Criminology*, 59(7), 685-700.
- Hare, D. J., Gould, J., Mills, R., & Wing, L. (1999). A preliminary study of individuals with autistic spectrum disorders in three special hospitals in England. London: *National Autistic Society*.

- Hippler, K., Viding, E., Klicpera, C., & Happé, F. (2010). Brief report: No increase in criminal convictions in Hans Asperger's original cohort. *Journal of Autism and Developmental Disorders*, 40(6), 774-780.
- Howlin, P. (2004). *Autism and Asperger Syndrome: Preparing for Adulthood*, Routledge, Oxon.
- James, D. (2010). Diversion of mentally disordered people from the criminal justice system in England and Wales: an overview. *International Journal of Law and Psychiatry*, 33, 241-8.
- Kolko, D. J. (Ed.). (2002). *Handbook on firesetting in children and youth*. San Diego, CA: Academic Press.
- Kolko, D. J. (1985). Juvenile firesetting: A review and methodological critique. *Clinical Psychology Review*, 5, 345-376.
- Lansdell, G. T., Anderson, J., & King, M. S. (2011). "Terror among the Gum Trees" – Is Our Criminal Legal Framework Adequate to Curb the Peril of Bushfire Arson in Australia?. *Psychiatry, Psychology and Law*, 18(3), 357-377.
- Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P., ... & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS Medicine*, 6(7), e1000100.
- Lundström, S., Forsman, M., Larsson, H., Kerekes, N., Serlachius, E., Långström, N., & Lichtenstein, P. (2014). Childhood neurodevelopmental disorders and violent criminality: a sibling control study. *Journal of Autism and Developmental Disorders*, 44(11), 2707-2716.
- Marín, J. L., Rodríguez-Franco, M. A., Chugani, V. M., Maganto, M. M., Villoria, E. D., & Bedia, R. C. (2018). Prevalence of Schizophrenia Spectrum Disorders in Average-IQ Adults with Autism Spectrum Disorders: A Meta-analysis. *Journal of Autism and Developmental Disorders*, 48(1), 239-250.
- McEwan, T., & Freckelton, I. (2011). Assessment, treatment and sentencing of arson offenders: an overview. *Psychiatry, Psychology and Law*, 18(3), 319-328.
- Modell, S. J., & Mak, S. (2008). A preliminary assessment of police officers' knowledge and perceptions of persons with disabilities. *Intellectual and Developmental Disabilities*, 46(3), 183-189.
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annals of Internal Medicine*, 151(4), 264-269.

- Mouridsen, S. E., Rich, B., Isager, T., & Nedergaard, N. J. (2008). Pervasive developmental disorders and criminal behavior: A case control study. *International Journal of Offender Therapy and Comparative Criminology*, 52(2), 196-205.
- Murphy, G. H., & Clare, I. C. H. (1996). Analysis of motivation in people with mild learning disabilities (mental handicap) who set fires. *Psychology, Crime and Law*, 2, 153–164.
- Murrie, D. C., Warren, J. I., Kristiansson, M., & Dietz, P. E. (2002). Asperger's syndrome in forensic settings. *International Journal of Forensic Mental Health*, 1(1), 59-70.
- NICE (2014), Autistic Spectrum Disorders in Adults, National Institute for Health and Clinical Excellence, London.
- Palermo, M. T. (2004). Pervasive developmental disorders, psychiatric comorbidities, and the law. *International Journal of Offender Therapy and Comparative Criminology*, 48, 40-48.
- Radley, J., & Shaheerban, Z. (2011). Asperger syndrome and arson: A case study. *Advances in Mental Health and Intellectual Disabilities*, 5(6), 32-36.
- Rai, D., Culpin, I., Heuvelman, H., Magnusson, C. M., Carpenter, P., Jones, H. J., ... & Pearson, R. M. (2018). Association of autistic traits with depression from childhood to age 18 years. *JAMA Psychiatry*.
- Scragg, P., & Shah, A. (1994). Prevalence of Asperger's syndrome in a secure hospital. *British Journal of Psychiatry*, 165, 679-682.
- Siponmaa, L., Kristiansson, M., Jonson, C., Nydén, A., & Gillberg, C. (2001). Juvenile and young adult mentally disordered offenders: The role of child neuropsychiatric disorders. *Journal of the American Academy of Psychiatry and the Law*, 29, 420-426.
- Sobsey, D., Wells, D., Lucardie, R., & Mansell, S. (Eds) (1995). *Violence and Disability: An Annotated Bibliography*, Brookes, Baltimore, MD.
- Srivastava, S., Forrester, A., Davies, S., & Nadkarni, R. (2013). Developing criminal justice liaison and diversion services: research priorities and international learning. *Criminal Behaviour and Mental Health*, 23(5), 315-320.
- Williams, D. (2005). *Understanding the arsonist: From assessment to confession*. Tucson, AZ: Lawyers and Judges.
- Wing, L. (1997). The autistic spectrum. *The Lancet*, 350(9093), 1761-1766.
- Wing, L. (1981). Asperger's syndrome: a clinical account. *Psychological Medicine*, 11(01), 115-129.

Wood, S. J. (2017). Autism and schizophrenia: one, two or many disorders?. *The British Journal of Psychiatry*, 210(4), 241-242.

Woodbury-Smith, M. R., Clare, I. C. H., Holland, A. J., & Kearns, A. (2006). High functioning autistic spectrum disorders, offending and other law-breaking: findings from a community sample. *The Journal of Forensic Psychiatry and Psychology*, 17(1), 108-120.

Zaboski, B. A., & Storch, E. A. (2018). Comorbid autism spectrum disorder and anxiety disorders: a brief review. *Future Neurology*, 13(1), 31-37.